

attachment 1

pipeline licence application.



Environment Effects Statement | May 2021

western outer
ring main

a project of
apa

Application for Pipeline Licence

*Pipelines Act 2005 – Sections 28, 29 and 30
Pipelines Regulations 2017 – Regulation 8*

1. Applicant details		
Name and registered address		ABN/ACN/ARBN
APA VTS Australia (Operations) Pty Limited (APA) Level 25, 580 George Street, SYDNEY NSW 2000		65 083 009 278 (ABN)
Phone	Fax	E-mail
[REDACTED]	[REDACTED]	[REDACTED]
2. Application contact person name and address (Lead person managing process)		
[REDACTED] Access and Approvals Project Manager APA Group Level 14, 60 City Road SOUTHBANK VIC 3006		
Phone	Fax	Email
[REDACTED]	[REDACTED]	[REDACTED]
3. Details of what the proposed pipeline will be used for		
<p>APA VTS Australia (Operations) Pty Limited (APA) is proposing to construct and operate a buried, 600 millimetre nominal diameter high-pressure gas transmission pipeline between APA's existing Plumpton Regulating Station (approx. 38 kilometres north west of Melbourne's CBD) and Wollert Compressor Station (approx. 26 kilometres north east of Melbourne's CBD). The pipeline provides a high-pressure connection between the eastern and western pipeline networks of the Victorian Transmission System (VTS).</p> <p>The pipeline will provide the 'missing link' in Victoria's high-pressure gas transmission network. To ensure Victoria's gas transmission network can service current peak demand, the Project proposes to connect the South West Pipeline (SWP) to the Victorian Northern Interconnect (VNI), allowing gas to be circulated across Victoria with greater efficiency by increasing transfer capacity from one side of the State to the other.</p> <p>Figure 1 represents the existing gas network servicing Victoria and shows the WORM high pressure pipeline connection that is proposed to be constructed to address current network constraints.</p>		

Privacy Statement

Any personal information about you or a third party in your correspondence will be protected under the provisions of the Privacy and Data Protection Act 2014. It will only be used or disclosed to appropriate Ministerial, Statutory Authority, or departmental staff in regard to the purpose for which it was provided, unless required or authorised by law. Enquiries about access to information about you held by the Department should be directed to the Privacy Coordinator, Department of Environment, Land, Water and Planning, PO Box 500, East Melbourne, Victoria 8002

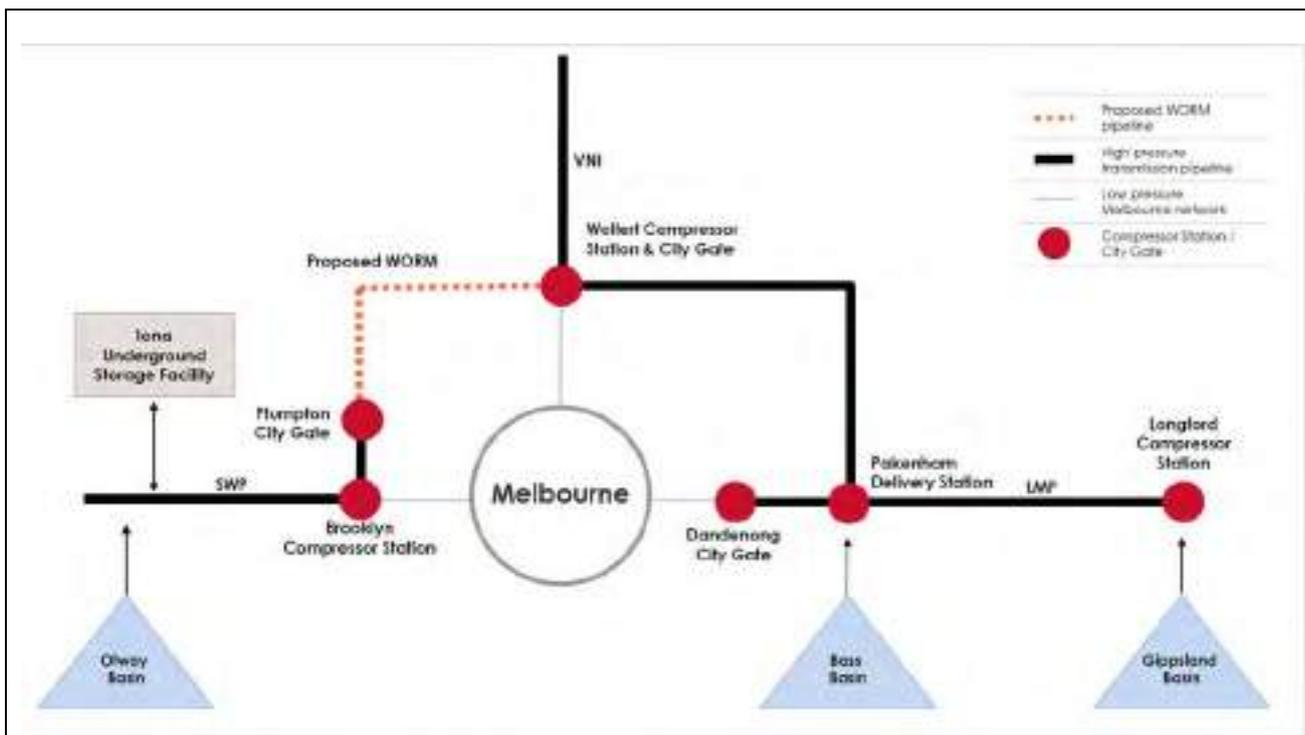


Figure 1 Overview of Victoria's gas infrastructure and the proposed pipeline (WORM) within the wider network

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, the pipeline will address a key capacity constraint in the VTS. The pipeline will deliver critical infrastructure for Victoria's gas supply, transmission, and subsequent security, efficiency and affordability. Key components of the pipeline include:

- A new pipeline: An underground pipeline approximately 51 kilometres (km) in length, buried for its entire length to a minimum depth of 750 millimetres (mm). The pipeline will occupy an operational easement nominally 15 metres (m) wide and will be bi-directional, to allow gas to flow in both directions as required.
- Mainline valves: Three above-ground mainline valves (MLV1, MLV2 and MLV3) located along the pipeline route, spaced at intervals of approximately 15 km. MLV1 will be constructed to the north of Holden Road and will be co-located with the existing Sunbury Pipeline MLV. MLV2 will be constructed to the east of Oaklands Road and MLV3 will be constructed to the south of Gunns Gully Road.
- Wollert Compressor Station upgrade: The construction of a new Solar Centuar 50 compressor, end of line scraper station and regulating station within the existing Wollert Compressor Station facility. The upgrade works included within this Pipeline Licence Application, do not include the new VNI Discharge Flow Control (DFC) and associated bypass valve and new piping at the Wollert Compressor Station, for which APA will seek to amend the existing PL101 licence.

The proposed pipeline infrastructure will transport gaseous hydrocarbons in compliance with the Australian Energy Market Operator *Gas Quality Guidelines* (AEMO, 2017) and *AS4564-2005 Specification for general purpose natural gas* (Standards Australia, 2005). Table 1 summarises the key data for the proposed pipeline.

Privacy Statement

Any personal information about you or a third party in your correspondence will be protected under the provisions of the Privacy and Data Protection Act 2014. It will only be used or disclosed to appropriate Ministerial, Statutory Authority, or departmental staff in regard to the purpose for which it was provided, unless required or authorised by law. Enquiries about access to information about you held by the Department should be directed to the Privacy Coordinator, Department of Environment, Land, Water and Planning, PO Box 500, East Melbourne, Victoria 8002

DEPARTMENT OF ENVIRONMENT, LAND, WATER AND PLANNING

Table 1 Summary of key data for the underground pipeline

Underground pipeline key data	
Length	51 km
Material	American Petroleum Institute (API) Specification 5L X52 Ksi high strength steel pipe. Internally lined with epoxy and externally coated with dual layer fusion bonded epoxy with field applied joint coating
Nominal Diameter	600 mm
Nominal capacity	Approximately 750 TJ/day
Pipe wall thickness	10.31 mm standard wall thickness and 12.7 mm for heavy wall sections
Pipe segment length	18 m
Depth of cover (depth below ground surface)	Minimum depth of 750 mm to the top of the pipeline (deeper at crossing of third-party infrastructure and waterways).
Easement	Nominally 15 m wide
Design principles	Strictly in accordance with the latest version of <i>AS/NZS 2885.1-2018: Pipelines – Gas and liquid petroleum (design and construction)</i> (AS/NZS 2885.1-2018)
Design life	60 years

It is noted that this application is for a 600 mm diameter pipeline. APA’s original design was based on a 500 mm diameter pipeline (refer to Section 14 for further detail). This change was in response to requests by users of the Victorian Gas Declared Transmission System through the Victorian Gas Planning Report in 2021 as an option to accommodate future expansion requirements of the market. Whilst APA is still considering both options, this application has made provision for a 600 mm option as this would present a slightly larger construction footprint.

In procuring the proposed pipe for the WORM project, consideration has been given to the future transport of hydrogen by the pipeline. Whilst the Australian standards for hydrogen pipelines are yet to be published, APA has taken measures to enable the pipe to be able to transport hydrogen if required at some time in the future.

4. Commencement and termination points of the pipeline corridor and the proposed route of the pipeline

A detailed assessment process was undertaken to determine the proposed pipeline route between the existing points in the VTS: the Plumpton Regulating Station and the Wollert Compressor Station. APA has identified a route for the pipeline based on consultation with key stakeholders and assessment of key constraints such as environmental values, cultural heritage, terrain, existing and proposed infrastructure corridors, watercourses, and land use. The assessment process included the consideration of alternative route options which are discussed in Section 11. Kilometric points (KP) are used to locate features along the route, with the pipeline commencing at KP0 and terminating at KP51.045.

Commencement Point

The pipeline will commence approximately 80 m north of the Plumpton Regulating Station, located at Taylors Road, Plumpton (KP0). An indicative area map of the commencement point relative to Plumpton Regulating Station is shown in Figure 2.

Termination Point

The pipeline will terminate at APA’s existing Wollert Compressor Station, located at 365

Privacy Statement

Any personal information about you or a third party in your correspondence will be protected under the provisions of the Privacy and Data Protection Act 2014. It will only be used or disclosed to appropriate Ministerial, Statutory Authority, or departmental staff in regard to the purpose for which it was provided, unless required or authorised by law. Enquiries about access to information about you held by the Department should be directed to the Privacy Coordinator, Department of Environment, Land, Water and Planning, PO Box 500, East Melbourne, Victoria 8002

DEPARTMENT OF ENVIRONMENT, LAND, WATER AND PLANNING

Summerhill Rd, Wollert (KP51.045). An indicative area map of the pipeline termination point, at the existing Wollert Compressor Station site, is illustrated in Figure 2.

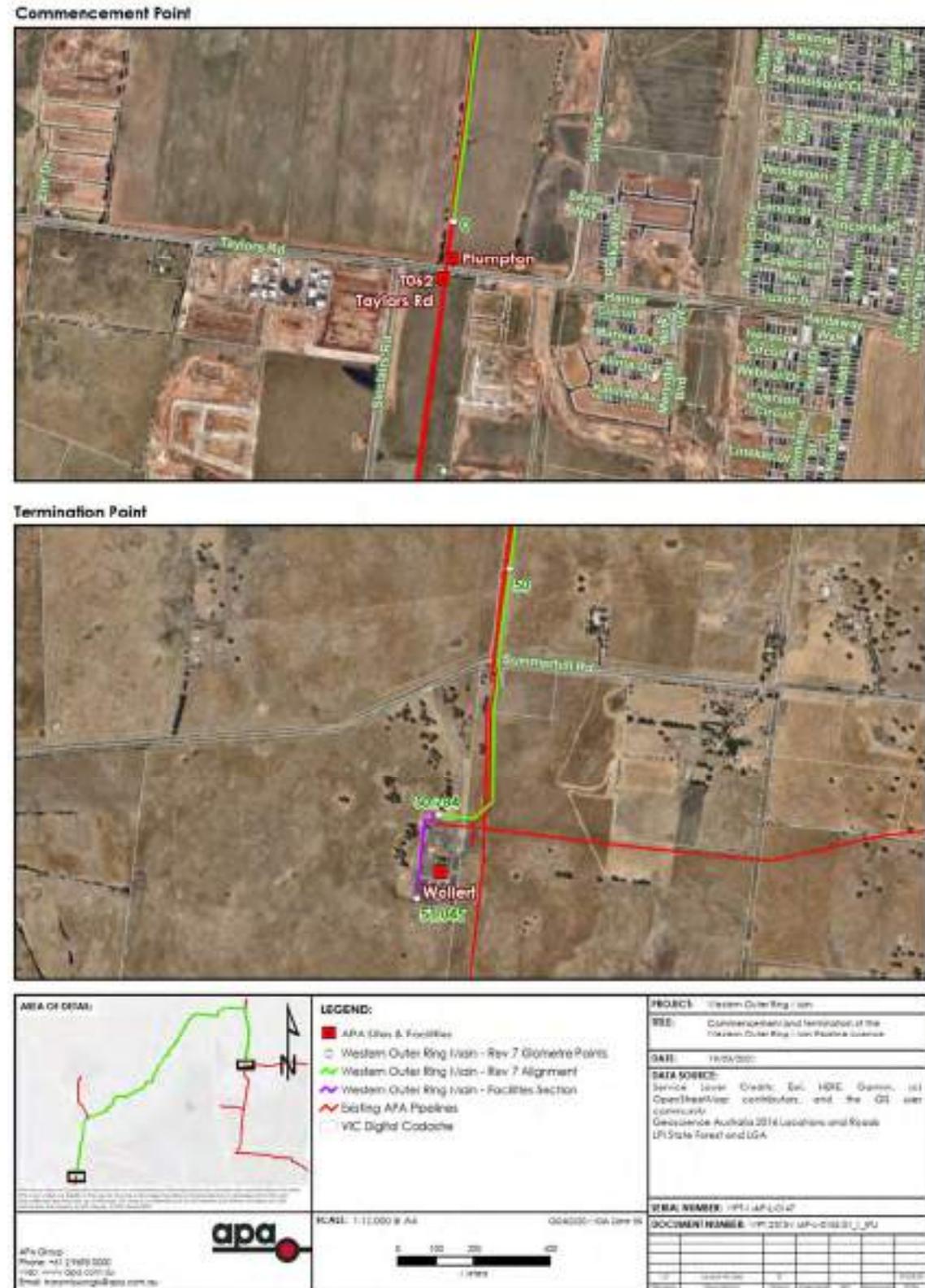


Figure 2: Commencement Point - Plumpton Regulating Station and Termination Point – Wollert Compressor Station

Privacy Statement

Any personal information about you or a third party in your correspondence will be protected under the provisions of the Privacy and Data Protection Act 2014. It will only be used or disclosed to appropriate Ministerial, Statutory Authority, or departmental staff in regard to the purpose for which it was provided, unless required or authorised by law. Enquiries about access to information about you held by the Department should be directed to the Privacy Coordinator, Department of Environment, Land, Water and Planning, PO Box 500, East Melbourne, Victoria 8002

Proposed Pipeline Route

For the purpose of this application, the pipeline route is the term used to define the final designed alignment of the pipeline. The proposed pipeline route commences approximately 80 m north of the Plumpton Regulating Station and ends at the Wollert Compressor Station.

A description of the proposed pipeline route is outlined below and illustrated in Figure 3.

- KP 0.0 – KP 9.0: The pipeline will tie into the existing Plumpton pipeline approximately 80 m north of the Plumpton Regulating Station. To the Calder Freeway, the pipeline route is wholly within an existing pipeline easement for the existing Sunbury Pipeline.
- KP 9.0 – KP 28.0: The pipeline route then crosses the Bendigo railway line and Calder Freeway and runs adjacent to the future Outer Metropolitan Ring / E6 transport corridor (OMR/E6) through Diggers Rest, before deviating to the north and crossing Jacksons Creek, Sunbury Road and Deep Creek. The pipeline then re-joins the OMR transport corridor in Oaklands Junction before following it north east through Mickleham, Merrifield and Kalkallo. From Calder Highway to Mickleham Road, the pipeline will be located within a proposed new 15 m wide pipeline easement, generally located within agricultural properties. Where this new pipeline easement is required, the pipeline route has been selected to avoid direct location on land parcels with established residential, industrial or conservation land uses.
- KP 28.0 - KP 46.9: From Mickleham Road to Donnybrook, the alignment will be predominately within a new pipeline easement, located within or adjacent to the existing Public Acquisition Overlays (PAO) for the future OMR transport corridor, or within existing road reserves, before joining the VNI easement.
- KP 46.9 to KP 51.045: From Donnybrook to Wollert Compressor Station, the pipeline will be wholly within the existing VNI easement, adjacent to the existing Wollert to Wodonga Pipeline route to the Wollert Compressor Station.

Privacy Statement

Any personal information about you or a third party in your correspondence will be protected under the provisions of the Privacy and Data Protection Act 2014. It will only be used or disclosed to appropriate Ministerial, Statutory Authority, or departmental staff in regard to the purpose for which it was provided, unless required or authorised by law. Enquiries about access to information about you held by the Department should be directed to the Privacy Coordinator, Department of Environment, Land, Water and Planning, PO Box 500, East Melbourne, Victoria 8002

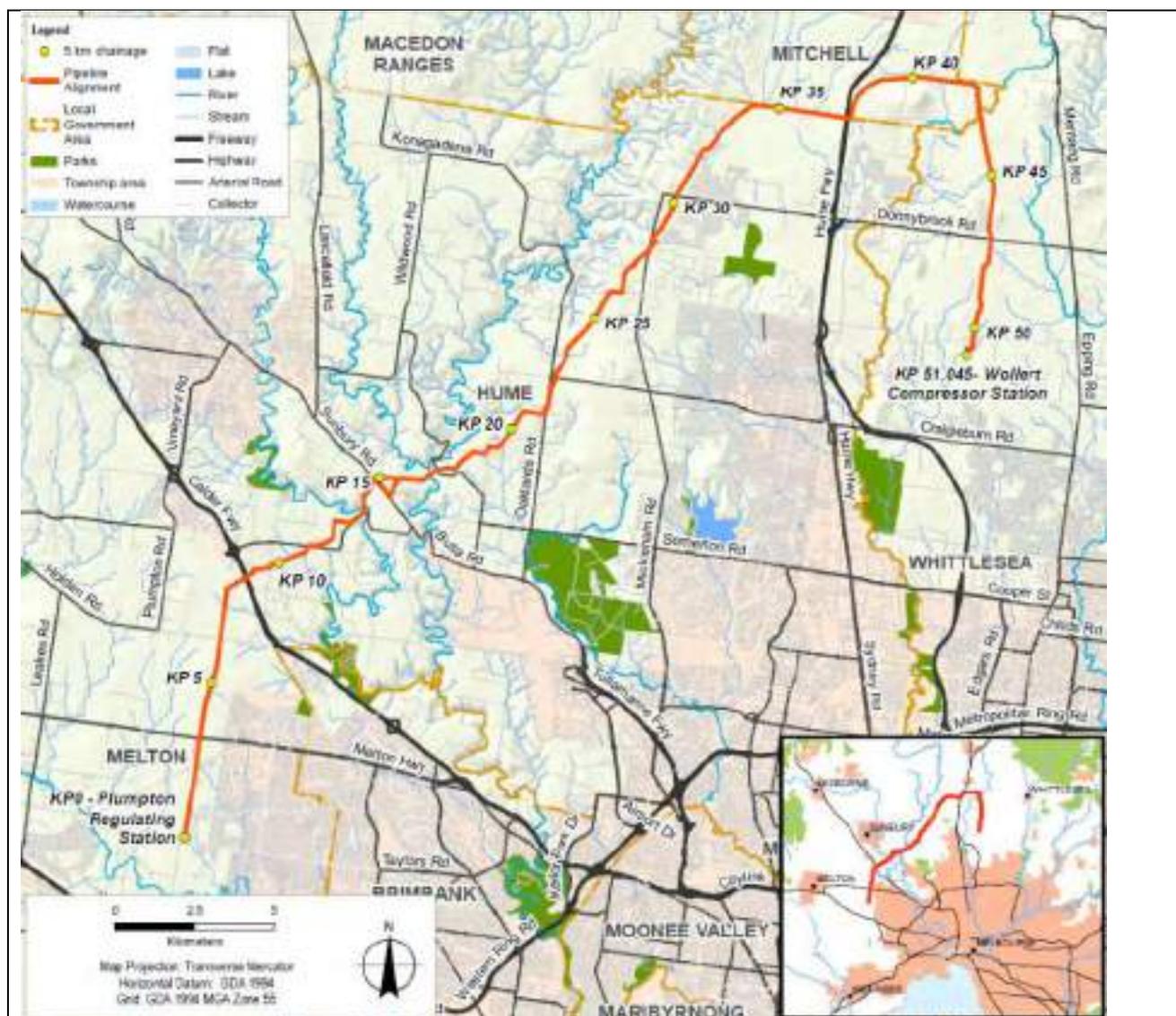


Figure 3 Proposed Pipeline Route

A plan showing the proposed pipeline route is presented in **Attachment 1**.

Proposed Pipeline Corridor

For the purpose of this application the pipeline corridor is the term used to define the entire construction footprint of the pipeline. The proposed pipeline corridor extends approximately 51 km between the Plumpton Regulating Station and Wollert Compressor Station and includes a construction right of way (ROW) area, typically 30 m wide along the proposed pipeline route.

For approximately 18 km of the proposed pipeline route, where the pipeline would be located within an existing APA easement, the additional construction corridor beyond the existing easement would be between 10 m and 15 m wide.

Where feasible, the width of the construction area may be reduced in areas such as sensitive environments and/or watercourses to minimise disturbance to these features.

Pipeline Construction Laydown and Pipe Stockpiling Areas

Privacy Statement

Any personal information about you or a third party in your correspondence will be protected under the provisions of the Privacy and Data Protection Act 2014. It will only be used or disclosed to appropriate Ministerial, Statutory Authority, or departmental staff in regard to the purpose for which it was provided, unless required or authorised by law. Enquiries about access to information about you held by the Department should be directed to the Privacy Coordinator, Department of Environment, Land, Water and Planning, PO Box 500, East Melbourne, Victoria 8002

DEPARTMENT OF ENVIRONMENT, LAND, WATER AND PLANNING

The pipeline corridor also includes additional areas extending beyond the 30 m construction ROW area required to support pipeline construction, including:

- Access tracks (upgrade of existing and construction of new), which would be less than 10 m wide
- Additional work areas up to 50 m x 50 m or 50 m x 100 m (such as vehicle turn-around points, additional workspaces for crossings, set up areas to accommodate horizontal directional drilling (HDD), laying out of pipe for HDD, stockpiling and storage areas)
- Water supply tanks, temporary dams and associated connecting lines for storing water required for dust suppression and hydrostatic testing (pressure testing) of the pipeline.

The following two temporary pipeline stockpiling and laydown areas are proposed to be established for construction. It is noted that the exact location of the offsite facilities is yet to be determined, however, all necessary approvals will be obtained prior to construction.

- An offsite compound for pipeline works: One temporary site compound, laydown and storage area (nominally 200 m x 200 m) would be established for the pipeline construction. The location of this activity is yet to be confirmed but would be located on a site where the activity is permitted under the relevant planning scheme, most likely within an existing industrial area.
- Laydown area at the Wollert Compressor Station: A temporary site laydown area and construction offices would be established within the existing Wollert Compressor Station site.

5. Length of the pipeline

The length of the proposed pipeline subject to this application is 51 km. Commencing approximately 80 m north of the Plumpton Regulating Station and ending at the Wollert Compressor Station.

6. Proposed maximum allowable operating pressure of the pipeline

The maximum allowable operating pressure (MAOP) of the proposed pipeline is 10,200kPa. This MAOP is consistent with other high transmission gas pipelines within the VTS.

7. Proposed dates for commencement and completion of construction of the pipeline

The pipeline construction is scheduled to commence in Q1 of 2022 and be operational by Q4 of 2022. An indicative construction schedule is shown in Table 2. This schedule is subject to ongoing adjustments as needed to deliver the proposed pipeline and subject to the grant of approvals within certain timeframes. The overall construction timeframe for the Project will be approximately nine months followed by one month of commissioning and one month of demobilisation. Rehabilitation of disturbed areas will occur progressively during construction and as soon as practicable after the installation of the pipeline.

The construction corridor will be monitored for a minimum period of 12 months following the completion of construction, subject to the requirements specified in the Construction Environment Management Plan (CEMP) (**Attachment 2**), to ensure it has been suitably rehabilitated. The condition of the pipeline easement will be monitored on an ongoing basis during the operation of the pipeline.

Privacy Statement

Any personal information about you or a third party in your correspondence will be protected under the provisions of the Privacy and Data Protection Act 2014. It will only be used or disclosed to appropriate Ministerial, Statutory Authority, or departmental staff in regard to the purpose for which it was provided, unless required or authorised by law. Enquiries about access to information about you held by the Department should be directed to the Privacy Coordinator, Department of Environment, Land, Water and Planning, PO Box 500, East Melbourne, Victoria 8002

DEPARTMENT OF ENVIRONMENT, LAND, WATER AND PLANNING

Table 2 Indicative construction schedule

Construction activity	Work Period	Duration
Mobilisation	Q1 2022	1 month
Pipeline construction	Q1 2022 to Q3 2022	5 months
Pipeline rehabilitation	Q3 2022 to Q4 2022	3 months
Commissioning	Q4 2022	1 month
Demobilisation	Q4 2022	1 month
Wollert Compressor Station upgrade construction	Q1 2022 to Q4 2022	Approximately 9 months
Overall timeframe	Q1 2022 to Q4 2022	Approximately 9 months
Rehabilitation monitoring period	Q4 2022 to Q4 2024	Between 12 to 24 months

The pipeline construction sequence and activities are described in Table 3. The pipeline construction will comply with all relevant codes and standards including *AS/NZS 2885.1-2018: Pipelines – Gas and liquid petroleum (design and construction)* (AS/NZS 2885.1-2018) (Standards Australia, 2018).

In addition to the relevant codes and standards specified above, the construction of the pipeline will also comply with the requirements specified in the Construction Environment Management Plan (CEMP) (**Attachment 2**) and the Health and Safety Management Plan (HSMP) (**Attachment 3**).

Table 3 Pipeline construction activities and sequencing

Construction sequence	Activity	Description
1	Surveying	Preliminary survey works would be undertaken to mark the extent of the construction area. Markers will be placed along the alignment to identify the pipeline centreline, the boundaries of the construction area, any additional workspaces and access roads/tracks, where required.
2	Site establishment	Preliminary activities would be undertaken to facilitate the construction of the pipeline, including but not limited to: setting up environmental management measures, proving of existing third party assets, use of existing access tracks (where feasible) and installation of temporary access points from existing roads, ancillary areas, and temporary gateways at fence crossings and relocation of any infrastructure within the construction area.
3	Offsite compound	One temporary site compound, laydown and storage area (nominally 200 m x 200 m) would be established for the pipeline construction. This will be located on a site where the activity is permitted under the relevant Planning Scheme, most likely within an existing industrial area.
4	Clearing and grading	Clearing and grading of the area would be undertaken to provide a safe and efficient area for construction activities. Clearing is required to remove trees, shrubs, surface rocks and groundcover vegetation. Graders, bulldozers, and excavators are generally used. Cleared topsoil will be stockpiled on the edge of the construction corridor with breaks left in stockpiles at fence lines, tracks, and drainage lines to allow continued access for stock. Temporary access tracks over watercourses and access points to local roads will be constructed during this phase.
5	Pipe stringing	Stringing involves distributing pipe segments along the corridor in preparation for welding.

Privacy Statement

Any personal information about you or a third party in your correspondence will be protected under the provisions of the Privacy and Data Protection Act 2014. It will only be used or disclosed to appropriate Ministerial, Statutory Authority, or departmental staff in regard to the purpose for which it was provided, unless required or authorised by law. Enquiries about access to information about you held by the Department should be directed to the Privacy Coordinator, Department of Environment, Land, Water and Planning, PO Box 500, East Melbourne, Victoria 8002

DEPARTMENT OF ENVIRONMENT, LAND, WATER AND PLANNING

6	Pipe bending	Where required, pipe lengths would be bent using a hydraulic bending machine to match changes in either elevation or direction of the alignment.
7	Welding, Non-destructive testing (NDT) and joint coating	Pipe segments will be welded in strings. All welding is tested to ensure quality. The areas of the weld are cleaned, and pipe joints are coated to prevent corrosion.
8	Trenching	Specialised trenching machines and excavators would be used to excavate the trench to a depth of approximately two metres and approximate width of one metre. Spoil generated during trench excavation would be stockpiled separate from vegetation and topsoil stockpiled earlier in the construction program. Rock breaking processes such as the use of rock saws/hammers and/or blasting is expected to be required to excavate the trench in areas of rock.
9	Horizontal directional drilling (HDD)	HDD would be used to install the pipeline where trenching is not feasible or suitable. HDD requires the excavation of an exit pit (approximately 3 m x 3 m x 3 m) on the opposite side to where the drilling rig is set up to contain drilling fluids used in the drilling process. A smaller entry pit approximately half the size of the exit pit is excavated on the drilling rig side. A bore hole is then drilled along the designated path of the pipeline from one side to the other and the pipe pulled back through the bore hole. The drilling fluids are monitored through the logging of fluid inputs and returns.
10	Lowering pipe into trench and backfilling	The pipeline would be lowered into the trench with suitable bedding and padding material. The trench is backfilled with the previously excavated subsoil material. In areas of rock excavation, imported bedding and padding material may be required where the previously excavated subsoil is unsuitable for use. Care is taken to maintain separation between topsoil and subsoil during this process. The subsoils are compacted to limit settlement of the trench through the operational life of the pipeline. Any excess spoil is removed from the site.
11	Testing, commissioning and connections	The pipeline would be pressure tested (in accordance with AS/NZS 2885 Part 5) prior to commissioning to ensure that the pipeline passes strength and leak tests. This is done through a process called hydrostatic testing whereby sections of the pipeline (test sections) are filled with water and then pressurised. Following completion of hydrostatic testing and Consent to Operate from Energy Safe Victoria the pipeline would be purged with gas and commissioned. In order to connect the new pipeline to the existing VTS, tie-in works will be required into the existing Truganina to Plumpton pipeline at Plumpton Regulating Station and at the Wollert Compressor Station.
12	Rehabilitation	Rehabilitation of the construction area would be undertaken in accordance with the CEMP and good pipeline construction principles with a view to returning land to its previous use as soon as practicable following pipeline installation. Key activities would include: <ul style="list-style-type: none"> • Re-establishing topsoil cover • Reinstating roadways, road reserves in accordance with the requirements of local councils • Reinstating fencing and access tracks in accordance with the requirements of landowners • Reinstating natural drainage patterns • Application of seed and/or vegetation, where appropriate • Installing any erosion control measures in prone areas • Reinstating waterways to meeting regulatory requirements • Final site clean up It is noted that following rehabilitation, the pipeline would be monitored for between 12 to 24 months to ensure it is suitably rehabilitated.

Privacy Statement

Any personal information about you or a third party in your correspondence will be protected under the provisions of the Privacy and Data Protection Act 2014. It will only be used or disclosed to appropriate Ministerial, Statutory Authority, or departmental staff in regard to the purpose for which it was provided, unless required or authorised by law. Enquiries about access to information about you held by the Department should be directed to the Privacy Coordinator, Department of Environment, Land, Water and Planning, PO Box 500, East Melbourne, Victoria 8002

8. Identification of the environmental, social and safety impacts arising from the proposed pipeline and pipeline operation, based on the surrounding current land uses and reasonably foreseeable future land uses

APA undertook a systematic, risk-based approach to identify potential impacts from the proposed pipeline route. Throughout the risk and impact assessment processes key stakeholders were consulted to ensure a clear appreciation of the environmental, social and economic issues. This approach took into consideration the key constraints and opportunities afforded by existing and foreseeable future land use and infrastructure in consultation with owners/occupiers and other stakeholders. This was completed with reference to the overarching considerations of public health and safety, and potential environmental, social and economic impacts of the proposed pipeline.

The pipeline route selected has been strategically co-located within existing pipeline easements, road reserves and the PAO for the OMR transport corridor where possible to minimise potential environmental, social and economic impacts of the pipeline. Land uses within and nearby the pipeline corridor generally comprise a range of residential, agricultural, open space, commercial, industrial (including extractive industry such as quarries) and community facilities-based land uses. Broadly, land across all sections is generally within a growth area subject to a current or future Precinct Structure Plan (PSP), or within a green wedge.

This section discusses the identified environmental, social, economic, health and safety impacts that remain from the construction and operation of the pipeline. Through the refinement of the pipeline design, route alignment and construction methodology many impacts have been avoided or minimised by applying the principles of sustainable development outlined in the *Pipelines Act 2005* (Pipelines Act). Section 10 of this application provides an overview of the proposed mitigation measures which are included in the CEMP.

The specialist and technical assessments which have been prepared to support the Project have been provided with this application for reference, with a complete list of the documents specified at the end of the Application for a Pipeline Licence.

Further to the requirements of the Pipelines Act, Part 1 Section 4B of the Flora and Fauna Guarantee Act (FFG Act) requires consideration of objectives of the FFG Act, the instruments of the Act and the potential impacts on biodiversity in making a decision on this application.

The Objectives of the FFG Act are:

- (a) to guarantee that all taxa of Victoria's flora and fauna, other than taxa specified in the Excluded List, can persist and improve in the wild and retain their capacity to adapt to environmental change;
- (b) to prevent taxa and communities of flora and fauna from becoming threatened and to recover threatened taxa and communities so their conservation status improves;
- (c) to protect, conserve, restore and enhance biodiversity;
- (d) to identify and mitigate the impacts of potentially threatening processes to address the important underlying causes of biodiversity decline;
- (e) to ensure the use of biodiversity as a natural resource is ecologically sustainable; and
- (f) to identify and conserve areas of Victoria in respect of which critical habitat determinations are made.

For the Minister's consideration, the potential impacts on Victoria's flora, fauna and biodiversity are described below, based on the specialist and technical assessments which have been prepared to support the Project.

The findings of these assessments are that the residual impacts of the proposed works would not jeopardise the persistence of any taxa in the wild or cause them to become threatened.

Privacy Statement

Any personal information about you or a third party in your correspondence will be protected under the provisions of the Privacy and Data Protection Act 2014. It will only be used or disclosed to appropriate Ministerial, Statutory Authority, or departmental staff in regard to the purpose for which it was provided, unless required or authorised by law. Enquiries about access to information about you held by the Department should be directed to the Privacy Coordinator, Department of Environment, Land, Water and Planning, PO Box 500, East Melbourne, Victoria 8002

DEPARTMENT OF ENVIRONMENT, LAND, WATER AND PLANNING

The measures to be undertaken to protect biodiversity, through the control, mitigation and management of identified potential impacts, are outlined in Section 10 and included in the attached CEMP.

Potential impacts of the Project would be managed in accordance with the avoid>mitigate>offset hierarchy. Residual impacts to biodiversity or taxa will be offset to ensure no net loss, as set out by the Guidelines for the removal, destruction or lopping of native vegetation (DELWP 2017) and EPBC Act. The mitigation measures proposed include the development of species-specific management plans that will consider the relevant action statements and management plans prepared under the FFG and EPBC Acts. These will be submitted to the relevant regulator relevant regulator.

These will be submitted to the relevant regulator for approval prior to construction commencing.

The proposed works are considered in the context of ecological sustainability in Table 9.

No areas of critical habitat have been determined under the FFG Act in the vicinity of the proposed Project.

Environmental Impacts

Biodiversity

The findings of this section were sourced from the *Western Outer Ring Main, Environment Effects Statement – Biodiversity and Habitats Report* (GHD 2021).

The total area of the pipeline corridor is approximately 178 ha, and predominately consists of non-native vegetation as a result of agricultural activities, urbanisation and historical vegetation clearing. Native vegetation within the pipeline corridor is generally degraded, fragmented and is dominated by pasture grasses and in some areas, extensive tracts of noxious weeds.

The removal of native vegetation will be required to establish the pipeline construction ROW and allow for trenching to proceed.

Land clearing during construction is expected to impact:

- One individual of threatened plant species, Arching Flax-lily,
- 19.65 of native vegetation in patches, impacting six EVCs, 12 large trees within patches, 16 large scattered trees, and 16 small scattered trees
- 4.26 ha of *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) listed threatened ecological communities (TECs) *Natural Temperate Grassland of the Victorian Volcanic Plain* (0.73 ha inside the approved Melbourne Strategic Assessment Areas (MSA) and 3.43 ha outside the MSA)
- 2.31 ha of EPBC Act TEC *Grassy Eucalypt Woodland of the Victorian Volcanic Plain* (0.06 ha inside the MSA and 2.25 outside the MSA)
- 10.21 of *Flora and Fauna Guarantee Act 1988* (FFG Act) listed threatened community Western Basalt Plains Grasslands Community (1.38 ha inside the MSA and 8.63 ha outside the MSA)
- 4.61 ha of FFG Act threatened community Western Basalt Plains (River Red Gum) Grassy Woodland (0.32 ha inside the MSA and 4.29 ha outside the MSA)

As indicated above, the majority of the extent of impact to EPBC Act and FFG Act threatened communities occurs outside the MSA. The MSA is an agreement between the Victorian and Australian governments made under Part 10 of the EPBC Act whereby impacts on matters of national environmental significance (MNES) that are expected to occur within the Melbourne urban growth boundary are defined and accounted for early in the development of a plan, policy or program.

Overall, the assessment has found that the Project is likely to have a significant impact on both the *Grassy Eucalypt Woodland of the Victorian Volcanic Plain* and *Natural Temperate Grassland*

Privacy Statement

Any personal information about you or a third party in your correspondence will be protected under the provisions of the Privacy and Data Protection Act 2014. It will only be used or disclosed to appropriate Ministerial, Statutory Authority, or departmental staff in regard to the purpose for which it was provided, unless required or authorised by law. Enquiries about access to information about you held by the Department should be directed to the Privacy Coordinator, Department of Environment, Land, Water and Planning, PO Box 500, East Melbourne, Victoria 8002

DEPARTMENT OF ENVIRONMENT, LAND, WATER AND PLANNING

of the Victorian Volcanic Plain. Measures to avoid and minimise impacts to both these TECs have been implemented, including, realignment of the pipeline and the use of horizontal directional drilling (HDD). Residual impacts to these TECs will be addressed through offsetting in accordance with the *EPBC Act Environmental Offsets Policy* (DSEWPC, 2012).

The removal of endangered ecological vegetation classes (EVCs) and large trees will be managed through an offsetting arrangement in accordance with the *Guidelines for the removal, destruction or lopping of native vegetation* (DELWP, 2017).

Three threatened plant species (Arching Flax-lily, Matted Flax-lily and Tough Scurf-pea) have been identified within the pipeline corridor however, only one will be impacted during construction. The threatened plant species to be impacted is a single Arching Flax-lily plant recorded at parcel 2PS343496 (located at KP 8.0 – KP 9.0). The threatened plant species is located on private property outside the approved MSA and will require removal. Impacts to the Matted Flax-lily and Tough Scurf-pea will be avoided through HDD and the establishment of No-Go Zones in locations where species are present.

Some of the vegetation to be impacted are known habitats or suspected to support habitat of threatened fauna. Habitats within the pipeline corridor that support threatened terrestrial fauna are mainly confined to the higher quality grassland areas and waterways. Impacts related to the pipeline construction corridor are expected to be limited to the following four threatened species during construction, Striped Legless Lizard, Golden Sun Moth, Growling Grass Frog and Tussock Skink. The habitats for these four species will be reinstated after construction works.

The Golden Sun Moth and Striped Legless Lizard are very susceptible to ground disturbance and may not successfully recolonise the reinstated areas of existing habitat. As such, the removal of habitat for the Golden Sun Moth and Striped Legless Lizard (19.93 ha and 39.33 ha respectively) is considered a significant residual impact under the EPBC Act and will be managed through offsets.

Growling Grass Frog species are known or assumed to be present at locations outside the MSA (Deep Creek and Jacksons Creek). The species was recorded at Deep Creek, where impacts to instream habitat will be avoided and impacts to the adjacent terrestrial habitat minimised through the use of HDD.

Whilst no sightings of Growling Grass Frogs were recorded at Jacksons Creek, the species has been assumed to be present in the area. Due to HDD being unsuitable at Jacksons Creek (refer to *Surface Water* section below), open-cut methods are proposed to construct this crossing. To minimise potential impacts to Growling Grass Frog at this location during construction, a number of mitigation measures are proposed, including:

- Reduce the width of the construction corridor from 30 m to 20 m to minimise impacts within the waterway structure and vegetation.
- Schedule construction within Jacksons Creek outside the species' peak active period (i.e. November to March).
- Prepare and implement a salvage and translocation plan for the Growling Grass Frog and obtain approval for the plan from the relevant regulator.

Further, the waterway will be reinstated immediately following completion of works and any impacts to Growling Grass Frogs are expected to be temporary (between two to four weeks).

Surface Water

The findings in this section were sourced from the *Western Outer Ring Main Environment Effects Statement – Surface Water Report* (GHD 2021).

Privacy Statement

Any personal information about you or a third party in your correspondence will be protected under the provisions of the Privacy and Data Protection Act 2014. It will only be used or disclosed to appropriate Ministerial, Statutory Authority, or departmental staff in regard to the purpose for which it was provided, unless required or authorised by law. Enquiries about access to information about you held by the Department should be directed to the Privacy Coordinator, Department of Environment, Land, Water and Planning, PO Box 500, East Melbourne, Victoria 8002

DEPARTMENT OF ENVIRONMENT, LAND, WATER AND PLANNING

The proposed pipeline corridor crosses 23 waterways located within the Werribee River, Maribyrnong River and Yarra River catchment areas. As the construction method for each waterway crossing has the potential to have a significant impact on surface water, an assessment was undertaken to inform appropriate construction techniques and management measures. Of the 23 waterways, 17 were identified as minor waterways or drains with ephemeral flow where standard construction techniques (open trenching) and management measures can be applied to minimise potential environmental impacts. The remaining six waterways were identified as requiring further assessment to inform construction methodology, including Tame Street Drain, Jacksons Creek, Deep Creek, Kalkallo Creek, Tributary to Merri Creek and Merri Creek. A summary of the findings of the assessment, including proposed construction techniques and additional mitigation measures, is provided in Table 4 below.

Table 4 Construction methodology and management measures for priority waterways

Waterway Crossing	Construction Methodology	Management Measures (As described in the CEMP)
Tame Street Drain	Open-cut – ephemeral drain with low erosion potential. Impacts to the watercourse structure to be mitigated through implementation of standard controls.	Standard controls
Jacksons Creek	Open-cut – fast-flowing stream with high potential for erosion. Upper soil profile consists of erodible sands and gravel. Open-cut has been selected due to the risks and constraints associated with HDD (including risk of hydro-fracture and accessibility, topographic and bore length constraints). Impacts to the watercourse structure to be mitigated through implementation of standard and additional controls.	Standard Controls Flood Management and Response Plan Water Quality Monitoring Program Site specific construction management measures Site specific rehabilitation measures
Deep Creek	HDD – slow-moving with high potential for erosion. Geology and topography at this location would enable drilling to minimise environmental impacts directly in the waterway.	Standard Controls Flood Management and Response Plan
Kalkallo Creek	Open-cut – ephemeral drain with regular spill-over and low erosion potential. Impacts to the watercourse structure to be mitigated through implementation of standard and additional controls.	Standard Controls Flood Management and Response Plan
Tributary of Merri Creek	Open-cut – ephemeral creek with low erosion potential. Impacts to the watercourse structure to be mitigated through implementation of standard controls.	Standard Controls
Merri Creek	Open-cut – ephemeral creek with moderate erosion potential. Open cut selected as it can utilise an existing APA pipeline easement that was previously trenched. The rehabilitation works associated with this previous pipeline construction have been effective and remain stable. Impacts to the watercourse structure to be mitigated through implementation of standard and additional controls.	Standard Controls Flood Management and Response Plan Water Quality Monitoring Program

For most waterways, the standard controls would achieve ‘minimisation’ and ‘rehabilitation/restoration’ of the impact according to the mitigation hierarchy. ‘Avoidance’ of the impact through the use of HDD is not considered to be practical given geotechnical conditions and construction constraints. Mitigation measures include open-cut construction works to be undertaken during no or low flow conditions with reliance on timing of work and weather forecasts. The period of construction would be limited to minimise the length of time the trench is exposed and reinstated immediately following the installation of the pipes. Temporary measures

Privacy Statement

Any personal information about you or a third party in your correspondence will be protected under the provisions of the Privacy and Data Protection Act 2014. It will only be used or disclosed to appropriate Ministerial, Statutory Authority, or departmental staff in regard to the purpose for which it was provided, unless required or authorised by law. Enquiries about access to information about you held by the Department should be directed to the Privacy Coordinator, Department of Environment, Land, Water and Planning, PO Box 500, East Melbourne, Victoria 8002

DEPARTMENT OF ENVIRONMENT, LAND, WATER AND PLANNING

would also be implemented to divert flow around the site and waterway reinstatement would be designed to avoid future erosion over the pipeline alignment. All waterway beds and banks shall be restored immediately after pipe installation and backfilling works and revegetated with erosion matting providing temporary protection until vegetation is established. With the application of these standard construction management measures, the likelihood of erosion impacts to waterway health and surrounding infrastructure would be reduced.

The potential impacts associated with erosion during open trench construction for Jacksons Creek considered the highly erodible soil conditions at this location. As such, additional mitigation measures will be implemented for Jacksons Creek to manage and reduce the likelihood of potential erosion impacts. The CEMP details these mitigation measures, which include erosion sediment controls for the construction sites, measures to control timing and duration of construction activities and appropriate rehabilitation of the waterway to minimise the impacts associated with bed or bank erosion. With these measures the potential impact to water quality would be expected to be short term and promptly remediated to reduce the downstream extent and magnitude of the impact.

Overall, with the appropriate implementation of mitigation measures, the residual impacts to surface water is not considered to result in any significant adverse environmental effects.

Land Stability and Ground Movement

This section is based on information contained within the *Western Outer Ring Main, Environment Effects Statement – Land Stability and Ground Movement Report* (GHD 2021).

Land stability and ground movement includes the potential for ground movements that may arise during construction or operation of the pipeline. Five sources of potential land stability and ground movement impacts were identified at specific locations along the pipeline corridor, including:

- Open trench excavations in unstable ground
- Volume loss arising from trenchless pipe installation in soil
- Trenchless pipe installation encountering unexpected poor ground
- Pipe installation in proximity to existing slopes and permanent groundwater
- Surface water flow changes as a result of excavations.

The application of management measures would minimise impacts associated with land stability and ground movement. Following the implementation of management measures the potential residual impacts associated with land stability and ground movement during construction and operation are considered to be low.

Groundwater

This section is based on information contained within the *Western Outer Ring Main, Environment Effects Statement – Groundwater Report* (GHD 2021).

The construction and operation of the pipeline has the potential to alter groundwater levels and/or quality within the pipeline corridor. Four sources of potential groundwater construction impacts associated with the Project were identified, including:

- Groundwater dewatering impacts on groundwater users, groundwater dependent ecosystems (GDEs) and activation of acid sulfate soils
- Ground settlement
- Mobilisation of existing contaminated groundwater
- Groundwater quality

During construction of the pipeline, there is likely to be some excavations that are deeper than the water table and will therefore require dewatering over short periods. This may temporarily

Privacy Statement

Any personal information about you or a third party in your correspondence will be protected under the provisions of the Privacy and Data Protection Act 2014. It will only be used or disclosed to appropriate Ministerial, Statutory Authority, or departmental staff in regard to the purpose for which it was provided, unless required or authorised by law. Enquiries about access to information about you held by the Department should be directed to the Privacy Coordinator, Department of Environment, Land, Water and Planning, PO Box 500, East Melbourne, Victoria 8002

DEPARTMENT OF ENVIRONMENT, LAND, WATER AND PLANNING

impact local groundwater levels and flow paths. The construction of the pipeline will be designed and undertaken in a manner to minimise changes in groundwater levels, flows and quality. This includes minimising dewatering durations and utilising trench breakers.

There are a number of GDEs present along the pipeline alignment. During construction dewatering, additional drawdown or lowering of the groundwater level near a GDE may cause a loss in groundwater availability that may impact the GDE health and function. Drawdown was predicted to occur at the Jacksons Creek and Merri Creek crossing areas, however the impact of construction drawdown on these GDEs is considered to be minor considering:

- The drawdown extent and level is localised and minor
- Local potential terrestrial GDEs are considered unlikely to be impacted by drawdown over this short period (< 4 weeks), except for particularly dry periods
- Construction activities (i.e. coffer dams) through the Jacksons Creek and Merri Creek crossing areas will be designed to minimise the degree of groundwater and surface water interaction (i.e. trench breakers) and therefore minimise the dewatering requirements

In consideration of the above, the impacts of groundwater dewatering on GDE's or surface water receiving environments is considered low.

Contaminated Land

This section is based on information contained within the *Western Outer Ring Main, Environment Effects Statement - Contamination Report* (GHD 2021).

The majority of the pipeline corridor is used for agricultural activities. A review of historical land use has identified a generally low risk for the presence of widespread contamination along the construction corridor. However, the following eight areas were identified as having a historic or current land use that is a potential source of contamination:

- Within and immediately adjacent to railway reserves in Diggers Rest (KP8.3) and Beveridge (KP1.1)
- A rural property in Diggers Rest that was used to store large numbers of wrecked cars (KP9.95- KP14)
- Industrial waste illegally dumped in Diggers Rest (near KP11.3)
- A quarry and landfill site in Bulla (south east of KP14.85)
- A second landfill site in Bulla (north of KP15)
- A property in Bulla has been issued a Clean Up Notice by the Environment Protection Authority (EPA) however the source of contamination is unknown (near KP15)
- Retarding basin in Kalkallo (KP35.54)
- A possible former quarry in Beveridge (west of KP37.5)

Construction of the pipeline is not expected to have impacts on known or potential contamination. With appropriate procedures and contingency plans for identifying and managing unexpected contamination during construction of the pipeline, the risk is considered low.

Soil and groundwater investigations at sites identified as potential sources of contamination will be required prior to construction to inform the management requirements. Management measures for contaminated material and excess spoil are included in the CEMP and will be adopted for these relevant locations.

Greenhouse Gas Emissions

The findings in this section were sourced from the *Western Outer Ring Main, Environment Effects Statement – Greenhouse Gas Report* (GHD 2021).

Greenhouse Gas emissions during construction of the pipeline are estimated to contribute 50,810 t of CO₂-e to State and National emissions and 15,830 t CO₂-e per annum during operation. Greenhouse gas emissions during construction and operation are estimated to be

Privacy Statement

Any personal information about you or a third party in your correspondence will be protected under the provisions of the Privacy and Data Protection Act 2014. It will only be used or disclosed to appropriate Ministerial, Statutory Authority, or departmental staff in regard to the purpose for which it was provided, unless required or authorised by law. Enquiries about access to information about you held by the Department should be directed to the Privacy Coordinator, Department of Environment, Land, Water and Planning, PO Box 500, East Melbourne, Victoria 8002

below the *National Greenhouse and Energy Reporting Act 2017* reporting requirements and are the equivalent to less than one per cent of Victoria's total annual greenhouse gas emissions. In its annual Victorian Gas Planning Report (2017), AEMO noted that the current method for transporting gas from Longford to Port Campbell is very inefficient. In the 2018 Victorian Gas Planning Report, AEMO quantified the potential efficiency gains of the Project by estimating that that half of the 414 TJ of fuel gas used in 2016/2017 would be required to transport the same quantity of gas with the operation of the Project. Based on this data from AEMO, the Project's estimated efficiency gains are predicted to lead to a net annual operational saving of 10,110 t CO₂-e per annum across the VTS. Given the net reduction of greenhouse gas emissions across the VTS, operation of the Project contributes to state and national emissions targets.

Noise

The findings in the section were sourced from the *Western Outer Ring Main - Environment Effects Statement Noise and Vibration Report* (GHD, 2021).

During construction and where works would occur in proximity to sensitive receptors, construction activities will likely result in short-term noise and vibration impacts. Construction is expected to progress at an average rate of approximately 700 m per day for open trenching, however, HDD or trenching in rock may have lower daily progress rates. Where works occur near to a noise sensitive receptor, construction activities may result in a short-term noise and/or vibration impacts.

A desktop assessment of construction vibration indicates that there is a low risk of structural damage from general construction activities as predicted levels are below the recommended limits relating to structural integrity for typical dwellings.

Noise from the operation of the upgraded Wollert Compressor Station is predicted to comply with the applicable noise limits at all of the sensitive receptors during the day, evening and night-time.

Air Quality

The findings in the section were sourced from the *Western Outer Ring Main - Environment Effects Statement Air Quality Report* (GHD, 2020).

During construction of the pipeline, the air quality impacts would result from the creation of dust. Certain construction phases are likely to generate slightly more dust than others. Trenching activities have the higher potential for dust and would require mitigation measures where sensitive receptors exist. As part of standard construction and environmental risk management, dust mitigation measures in the CEMP and dust monitoring would be implemented to reduce the likelihood, intensity or extent of dust effects. Impacts to the transport network will be managed through the implementation of Traffic Management Plans in accordance with the CEMP.

During operation, air quality impacts are likely to be limited to operation of the Wollert Compressor Station, however the operation effects are considered minimal and no additional mitigation is required.

Social and Economic Impacts

Agriculture

The findings in this section were sourced from the *Western Outer Ring Main, Environment Effects Statement – Agriculture Impact Assessment Report* (GHD 2020).

The total area of the pipeline corridor is approximately 178 ha and is predominately comprised of agricultural uses (168 ha), with the main land use impacted being grazing modified pastures (134 ha), followed by rural residential with agriculture (16 ha). Other agricultural land uses within the pipeline corridor include cropping and fruit growing.

Privacy Statement

Any personal information about you or a third party in your correspondence will be protected under the provisions of the Privacy and Data Protection Act 2014. It will only be used or disclosed to appropriate Ministerial, Statutory Authority, or departmental staff in regard to the purpose for which it was provided, unless required or authorised by law. Enquiries about access to information about you held by the Department should be directed to the Privacy Coordinator, Department of Environment, Land, Water and Planning, PO Box 500, East Melbourne, Victoria 8002

DEPARTMENT OF ENVIRONMENT, LAND, WATER AND PLANNING

While grazing is the dominant land use within the pipeline corridor, some of the land is transitioning to urban uses due to its location within the Urban Growth Boundary (UGB). At present, approximately a third of the pipeline route already lies within the UGB and is therefore unlikely to be used for agricultural production in the future.

A significant impact of the pipeline on agricultural production is the temporary utilisation of the pipeline corridor during construction by APA. However, given the current low levels of agricultural production, impacts of the pipeline are expected to be minimal. Further, impacts will be temporary in nature limited to the short timeframe required for construction and rehabilitation. Following rehabilitation of the construction corridor, agricultural production activities that do not impact depth of cover above the pipeline, such as grazing, can resume. The area of agricultural land required for operations is negligible and is not expected to impact on existing agricultural enterprises.

The unmitigated economic impact to agriculture at the construction stage is estimated at \$0.2 million which is equivalent to 0.13% of the annual value of agricultural production within the regional study area, as determined by the Agricultural Impact Assessment (GHD 2021).

Given the above, the proposed pipeline corridor is not considered to have a significant adverse impact on agricultural resources at local and regional scales. Further, the direct and indirect impacts can be mitigated via a number of different measures that would minimise potential impacts as detailed within Section 10.

Current Land Uses

The findings in this section were sourced from the *Western Outer Ring Main Environment Effects Statement Technical impact assessment – Land use and planning (GHD, 2021)*.

The proposed pipeline corridor will traverse the local government areas of Melton City Council, Hume City Council, Mitchell Shire Council and Whittlesea City Council. Land uses within the proposed pipeline corridor generally comprise a range of residential, agricultural, open space, commercial, industrial (including extractive industry such as quarries) and community facilities-based land uses. Broadly, land across all sections of the pipeline corridor is generally within a growth area subject to a current or future Precinct Structure Plans (PSP), or within a green wedge. A PSP is a master plan that provides guidance for integrated planning of a local area, typically being located within a growth area. PSP's provide strategic context for new urban development, and generally include plans for Project land use.

Where the pipeline route is located outside of railway land, and outside existing road reserve, a nominal 15 m easement will cover the length of the pipeline route. Where the pipeline route traverses railway land, being the Bendigo rail reserve at KP9 and the North Eastern rail line reserve at KP29, a licence must be obtained from VicTrack and relevant Crown land consents. Where the pipeline route crosses existing road reserves an application for consent from the Coordinating Road Authority must be obtained. Where the pipeline is within the OMR PAO reserve, a 10m easement will cover the length of the pipeline route.

Easements within the pipeline corridor will also limit structures and deep-rooted vegetation on this land, activities that do not impact depth of cover above the pipeline, such as grazing, can continue. Impacts to current land uses will be minimised due to the pipeline corridor being co-located within existing pipeline easements, the PAO for the OMR transport corridor, or existing road reserves. As such, it is not expected that the impacts of this easement will be significant given the nature of land uses affected and the proposed location of the pipeline.

The land required for MLVs along the pipeline route will be acquired by APA to provide ongoing access for any maintenance or inspection activities from existing roads. Following the acquisition of the MLV sites, any existing easements registered over these areas would be relinquished.

The MLVs will be located within the pipeline easement and would be spaced at intervals of

Privacy Statement

Any personal information about you or a third party in your correspondence will be protected under the provisions of the Privacy and Data Protection Act 2014. It will only be used or disclosed to appropriate Ministerial, Statutory Authority, or departmental staff in regard to the purpose for which it was provided, unless required or authorised by law. Enquiries about access to information about you held by the Department should be directed to the Privacy Coordinator, Department of Environment, Land, Water and Planning, PO Box 500, East Melbourne, Victoria 8002

DEPARTMENT OF ENVIRONMENT, LAND, WATER AND PLANNING

approximately 15 km and located at approximately KP 6.0 (MLV 1), KP 22.0 (MLV 2) and KP 35.0 (MLV 3). The land required is a relatively small component of larger land holdings and located close to property boundaries, minimising impact.

Land use impacts during the operation phase will include minor limitations on land use within the green wedge, where an easement is not already present.

During pipeline construction there will likely be minor traffic disruptions and some temporary changes to access arrangements to private properties. Traffic impacts during the operation of the pipeline are expected to be negligible and consistent with the general road use in the area.

Future Land Uses

The findings in this section were sourced from the *Western Outer Ring Main Environment Effects Statement Technical impact assessment – Land use and planning (GHD, 2021)*.

The following provides a summary of the reasonably foreseeable land uses relevant to the proposed pipeline route:

- Where the pipeline route is located within an existing APA gas pipeline easement from Plumpton to the Calder Highway (KP 0 – KP 9), the pipeline route is located within the Koroit and Plumpton PSPs. The PSPs specifically account for the existing easement and the pipeline route was considered in terms of land uses provided for within the PSPs. Reasonably foreseeable land uses alongside the pipeline route are predominantly shown to be residential in nature.
- Where a new pipeline easement is required for the pipeline route from the Calder Highway to Mickleham Road (KP 9 – KP 28), the pipeline route is located entirely within the Sunbury green wedge. The alignment does pass within 500 m of land in the Sunbury South PSP. The PSP does not directly account for the provision of the pipeline.
- From Mickleham to Donnybrook (KP 28 – KP 46.9), the pipeline route adjoins two green wedges (the Sunbury green wedge to the west, and the Whittlesea green wedge to the east) and is otherwise wholly within Melbourne's northern growth corridor. At this location, the route is primarily located within or in proximity to the OMR transport corridor, which is subject to a PAO and is defined and protected within the Lindum Vale, Merrifield West and Lockerbie PSPs. Consultation with the Department of Transport (DoT) has occurred to further refine the pipeline route and corridor where the pipeline is located within or in proximity to the OMR transport corridor (refer to Section 12 for further detail). Within the Donnybrook-Woodstock PSP, the pipeline route is within an existing gas pipeline easement.
- From Donnybrook to the Wollert Compressor Station (KP 46.9 – KP 51.045), the pipeline route is within an existing gas pipeline easement and is not subject to a current PSP but is located within the UGB. The Draft Shenstone Park PSP, currently in preparation, provides for the existing gas pipeline easement at this location.

The pipeline route is generally consistent with the above land use typologies, or the underlying land use policies. Notably, it is supported by policy within *Plan Melbourne 2017-2050*, the Planning Policy Framework and Municipal Strategic Statement of each local council. The pipeline addresses a key gap in the VTS and will provide greater network efficiency, while not prejudicing existing agricultural land uses within green wedges.

Where the Project is located within an existing pipeline easement (KP 0 - KP 9 and KP 42 - KP 51.04), the WORM would not impact the existing PSPs (Plumpton, Koroit, and Donnybrook-Woodstock) and the use of land any more than previously considered in these PSPs.

While predominately consistent with PSPs along the pipeline route alignment, due to the use of existing pipeline easements and the OMR/ E6 PAO, some PSPs do not specifically recognise the pipeline (including the Sunbury South, Lindum Vale, Merrifield West and Lockerbie North PSPs). Where the pipeline is to be constructed within existing PSPs, the pipeline will be

Privacy Statement

Any personal information about you or a third party in your correspondence will be protected under the provisions of the Privacy and Data Protection Act 2014. It will only be used or disclosed to appropriate Ministerial, Statutory Authority, or departmental staff in regard to the purpose for which it was provided, unless required or authorised by law. Enquiries about access to information about you held by the Department should be directed to the Privacy Coordinator, Department of Environment, Land, Water and Planning, PO Box 500, East Melbourne, Victoria 8002

DEPARTMENT OF ENVIRONMENT, LAND, WATER AND PLANNING

designed with consideration to all existing and reasonable foreseeable land uses. For any PSPs that are being prepared, APA would seek for the Area of Consequence to be incorporated into those PSPs as the Notification Area.

The Notification Area extends 65 m on either side of the pipeline and APA would seek ongoing visibility of any proposed sensitive land use within this area to assess if they are compatible with the pipeline design. The Notification Area is equal to the Area of Consequence which is defined as the area potentially impacted in the unlikely event of pipeline puncture and gas escaping and igniting.

Within the Notification Area, there is potential for the proposed pipeline to influence future land uses in cases where unforeseen Sensitive Uses are being proposed. A case by case assessment of any proposed Sensitive Uses or Land Use Classification change within the Notification Area would be required at the time of their consideration. If acceptable management of risk cannot be achieved through an SMS process, APA may object to the change in land use from being permitted by planning authorities. Physical access to land within the pipeline easement would not be restricted, with the exception of the MLV compounds, and activities such as livestock grazing, or shared use and bicycle paths could be accommodated, with the latter providing opportunity to enhance both social and visual outcomes for the relevant PSPs.

Where a PSP has not yet been gazetted, APA is undertaking consultation with the Victorian Planning Authority to ensure the pipeline is incorporated into future PSPs.

Social

The findings in this section were sourced from the *Western Outer Ring Main, Environment Effects Statement – Social Impact Assessment Report (GHD 2021)*.

The majority of properties located within the pipeline corridor are located on agricultural land.

The pipeline construction activities were identified to have the potential to result in temporary social impacts on nearby residents, the general community and community infrastructure facilities. These temporary construction impacts include short term disruption to rural residential and agricultural uses at the properties intersected by the pipeline corridor.

Other temporary social impacts include an increase in demand on time of the landowners and occupiers to engage with the Project during the project planning and construction phases. This activity may lead to impacts on wellbeing, particularly for those owners or occupiers who reside at the affected property or use the property to supplement or generate income.

Other social impacts will include some temporary and intermittent increase in travel time experienced along the Project's construction haul roads, increasing travel time for other road users.

The risk assessment and subsequent social impact assessment found that the residual impacts of the construction of the pipeline would be minor given the short duration and temporary nature of the construction activities, with any potential adverse impacts mitigated or minimised through the implementation of management measures. Further, potential impacts arising from the operation of the pipeline would be negligible given the minimal ongoing requirement for maintenance activities and the underground location of the pipeline.

Amenity

The findings of this section were sourced from the *Western Outer Ring Main Environment Effects Statement – Landscape and visual report (GHD 2021)*.

Impacts to visual amenity during construction may occur due to the removal or alteration of trees and vegetation buffers abutting public road reserves changing the landscape character.

Construction activities, including, laydown areas, construction lighting, activity in the construction

Privacy Statement

Any personal information about you or a third party in your correspondence will be protected under the provisions of the Privacy and Data Protection Act 2014. It will only be used or disclosed to appropriate Ministerial, Statutory Authority, or departmental staff in regard to the purpose for which it was provided, unless required or authorised by law. Enquiries about access to information about you held by the Department should be directed to the Privacy Coordinator, Department of Environment, Land, Water and Planning, PO Box 500, East Melbourne, Victoria 8002

DEPARTMENT OF ENVIRONMENT, LAND, WATER AND PLANNING

corridor and plant/equipment use will also cause a temporary changing landscape character that causes private and public visual impacts.

The occupation of private land has the potential to place a temporary burden on affected owner/occupiers and may be a source of stress for some.

The pipeline will have some minor amenity impacts during the construction of the pipeline however these are not anticipated to have significant or ongoing adverse impacts on sensitive receptors or areas of public land, under the standard construction mitigation measures applicable to the pipeline.

Safety

The findings provided in this section have been sourced from the *Western Outer Ring Main Environment Effects Statement – Safety Report* (GHD 2020).

A Safety Management Study (SMS) assessment was completed in accordance with AS/NZS 2885 to assess threats, risk mitigation measures and residual risk associated with each threat. The SMS assessment classifies land uses to assist in assessing impacts as well as appropriate engineering and procedural control measures to mitigate potential threats.

Within the pipeline route there are current significant features including the OMR transport corridor which will potentially attract a secondary location classification of Crowd (C) in the future due to the potential for further traffic congestion leading to large numbers of people being congregated in close proximity of the pipeline at certain periods.

The pipeline route will also be co-located within existing APA pipelines easements where safety requirements are well-known to the local landowners / occupiers, local councils and shires and other relevant authorities.

The qualitative risk assessment conducted as per AS/NZS 2885.6 identified a number of activities that may lead to the loss of containment of natural gas in the construction and operation phases of the pipeline. This included assessment of risks to people, property and community infrastructure as a result of ignited loss of containment events.

Overall, the safety assessment determined that all safety hazards have a final risk level of medium or below. The SMS demonstrates that the requirements of AS/NZS 2885 have been achieved, with the effective implementation of all of the actions recommended by the SMS. This includes confirming that the provisions for high consequence areas (Clause 4.9 of AS/NZS 2885.1) have been met. Based on the threats that were reviewed and assessed in the SMS, it can be concluded that hazards and impacts to the workforce, nearby operations and public safety are adequately managed.

9. **Outline of the details of the potential impact of the proposed pipeline on cultural heritage (including Indigenous cultural heritage)**

APA is committed to genuine engagement with all Aboriginal people and are committed to the protection of cultural heritage values, including both tangible and intangible values, .

The information provided in this section has been sourced from the *Western Outer Ring Main, Environment Effects Statement technical report – Aboriginal and historic heritage report* (Biosis 2021).

The construction of the proposed pipeline has the potential to impact on both Aboriginal and non-Aboriginal historic heritage, including intangible values. The pipeline corridor has been largely used for agricultural purposes since the 1840s and has been subject to cumulative ground disturbances associated with vegetation clearance, rock removal, long term pastoral and agricultural practices, road and rail construction, installation of existing gas pipelines and other infrastructure works.

Privacy Statement

Any personal information about you or a third party in your correspondence will be protected under the provisions of the Privacy and Data Protection Act 2014. It will only be used or disclosed to appropriate Ministerial, Statutory Authority, or departmental staff in regard to the purpose for which it was provided, unless required or authorised by law. Enquiries about access to information about you held by the Department should be directed to the Privacy Coordinator, Department of Environment, Land, Water and Planning, PO Box 500, East Melbourne, Victoria 8002

DEPARTMENT OF ENVIRONMENT, LAND, WATER AND PLANNING

Aboriginal Cultural Heritage

The pipeline corridor crosses through the evaluation jurisdiction of Aboriginal Victoria (AV), west of Diggers Rest (KP 0 – KP 8.29) and Wurundjeri Woi-wurrung Cultural Heritage Aboriginal Corporation (WWCHAC) Registered Aboriginal Party (RAP) jurisdiction to the east of Diggers Rest (KP 8.29 – KP 50.745).

There are 13 registered Aboriginal cultural heritage places located within pipeline corridor. Of the 13 registered places within the pipeline corridor, one is of high significance and three places are identified as having moderate significance. The remaining nine are less than moderate to extremely low significance. It is anticipated that there would be impacts to Aboriginal cultural heritage places due to ground disturbance during construction. Any impacts to Aboriginal cultural heritage places will be managed through the implementation of Cultural Heritage Management Plans (CHMPs).

Two CHMPs 16593 and 16594 are being prepared in consultation with Aboriginal cultural heritage stakeholders and works can only proceed once the CHMPs are approved by AV and WWCHAC respectively. The CHMPs will include management conditions to mitigate harm through avoidance where possible, planned salvage and contingency measures in relation to Section 61 of the *Aboriginal Heritage Act 2006* (AH Act), which are legal requirements and also outline a chance finds procedure if any items or archaeological potential are uncovered during works.

While mitigation measures would minimise the impact on Aboriginal heritage places, the residual impact on the Aboriginal cultural heritage values could be moderate to high for some of the places. This will be confirmed with ongoing liaison with Traditional Owners through the CHMP assessment and the development of mitigation measures. APA will continue to work with AV, WWCHAC RAP, and all Traditional Owners to assess the significance of the impacts and avoid and mitigate impacts as far as practicable.

Indirect effects from the construction on Aboriginal cultural heritage values, including impacts on intangible values have, or are, being considered in consultation with the RAP..

Non-Aboriginal Historic Cultural Heritage

One Victorian Heritage Inventory (VHI) site is located within the pipeline corridor, the Holden Cobbled Stone Road (H7822-2283 KP 6-7). In this location, HDD will be used to cross this location to mitigate the potential risk to disturbing the site, resulting in no adverse impacts. The potential impact and risk to unlisted historic heritage sites is considered low, due to an unexpected find procedure being included within the CEMP.

10. **Outline of the measures to be undertaken to control, mitigate and manage identified impacts arising from the proposed pipeline and pipeline operation**

A comprehensive set of mitigation measures have been developed to address environmental, heritage, social, health and safety impacts of the pipeline. These mitigation measures will be applied through the CEMP (**Attachment 2**) and HSMP (**Attachment 3**). The CEMP and HSMP will be a condition of the Pipeline Licence and APA will be required to comply with both approved documents. The CEMP outlines the mitigation measures for the pipeline corridor and route which are a suite of performance-based environmental standards to be applied for the construction phase of the pipeline.

APA is responsible for implementation of the CEMP under the Pipeline Licence. APA will manage compliance with the mitigation measures through the contractual arrangements for the design and construction of the pipeline and APA will monitor compliance with the CEMP by way of inspections, reports and audits.

Privacy Statement

Any personal information about you or a third party in your correspondence will be protected under the provisions of the Privacy and Data Protection Act 2014. It will only be used or disclosed to appropriate Ministerial, Statutory Authority, or departmental staff in regard to the purpose for which it was provided, unless required or authorised by law. Enquiries about access to information about you held by the Department should be directed to the Privacy Coordinator, Department of Environment, Land, Water and Planning, PO Box 500, East Melbourne, Victoria 8002

DEPARTMENT OF ENVIRONMENT, LAND, WATER AND PLANNING

This section outlines the measures to be undertaken to control, mitigate and manage the identified impacts arising from the proposed pipeline construction and operation and identifies those management measures developed for the impacts with high residual risks. Further detail on mitigation measures can be found in the CEMP and HSMP.

Environmental

As described in Section 8 and Section 11, the impacts on vegetation and habitat for threatened fauna have been avoided where possible through pipeline route selection and by minimising habitat disturbance through application of construction methodologies (HDD).

Mitigation measures developed and outlined within the CEMP seek to avoid and minimise further vegetation disturbance during construction as much as practical through the avoid then minimise hierarchy of control. In summary, the following measures will be applied to avoid or minimise vegetation disturbance, further detail can be found within the CEMP:

- Planned vegetation clearing will be confined to the defined construction areas.
- All buffer zones, no go zones, tree protection zones and boundary of the construction area will be clearly demarcated with survey pegs and/or flagging.
- Before commencing site work, all project personnel will be required to attend an induction that outlines environmental management requirements.
- Specific threatened fauna management plans will be developed which includes management actions such as habitat reinstatement works and HDD under known Growling Grass Frog habitat (Deep Creek)

Where impacts to ecological values are unavoidable offsets would be obtained in accordance with relevant legislation and guidelines. The ecological impacts of the pipeline that will likely require offsets include:

- State administered offsets:
 - 14.789 ha of native vegetation (including 19 large trees)
- Commonwealth administered offsets:
 - 19.93 ha of Golden Sun Moth habitat
 - 39.34 ha of Striped Legless Lizard habitat
 - 3.81 of Natural Temperate Grassland of the Victorian Volcanic Plain
 - 2.29 ha of Grassy Eucalypt Woodland of the Victorian Volcanic Plain

It is noted that the above offset areas are estimates only based on the pipeline alignment and construction footprint. All native vegetation removal will be offset in accordance with the EPBC Act and State guidelines (DELWP, 2017).

Cultural heritage

APA is committed to genuine engagement with all Aboriginal people and are committed to the protection of cultural heritage values, including both tangible and intangible values. APA is committed to develop and maintain constructive relationships with Traditional Owners of the land where APA will be operating.

The implementation of this genuine engagement based approach has been through direct meetings with the Traditional Owners and utilisation of the CHMP process to consider potential direct and indirect impact, including any on intangible values. Aboriginal cultural heritage impacts will be avoided, minimised or managed through the implementation of mitigation measures which are detailed in two CHMPs which address areas of known recorded Aboriginal places and provide contingency plans for the possible discovery of unknown Aboriginal cultural

Privacy Statement

Any personal information about you or a third party in your correspondence will be protected under the provisions of the Privacy and Data Protection Act 2014. It will only be used or disclosed to appropriate Ministerial, Statutory Authority, or departmental staff in regard to the purpose for which it was provided, unless required or authorised by law. Enquiries about access to information about you held by the Department should be directed to the Privacy Coordinator, Department of Environment, Land, Water and Planning, PO Box 500, East Melbourne, Victoria 8002

DEPARTMENT OF ENVIRONMENT, LAND, WATER AND PLANNING

heritage during works. Consultation with the Traditional Landowners includes consideration of intangible values. CHMPs 16593 and 16594 are being prepared in consultation with Aboriginal cultural heritage stakeholders and must be approved prior to the commencement of works. Mitigation measures detailed within the CHMPs have also been referenced in the CEMP which will be implemented from planning through to operation. The mitigation measures include:

- Implement and comply with the two CHMPs which include management conditions to preserve registered and unidentified Aboriginal cultural heritage places and values
- Identify and complete subsurface testing in all archaeologically sensitive areas within the pipeline corridor.

One Non-Aboriginal heritage site, the Holden Cobbled Stone Road (H7822-2283 KP 6-7) listed on the VHI will be subject to HDD under the road to avoid impacts to the listed heritage site. Additional mitigation measures include:

- Consent to be obtained from Heritage Victoria in advance as pipeline construction has the potential to cause an adverse impact. Consent will include management measures such as fencing off the site during works, monitoring and recording.
- Implementation of an unexpected finds procedure if an unknown historic heritage site, value or object should be discovered during construction.

Social

Through the pipeline route selection process, APA has achieved separation between the pipeline corridor and sensitive receptors or public places to avoid amenity impacts (including noise, vibration, air quality, light and visual) to the community.

Social mitigation measures have been developed to address site access, traffic management, community, stakeholder management and amenity impacts (noise, vibration, air quality, light and visual). These measures include:

- To minimise property impacts due to construction of the Project, construction activities will be undertaken in accordance with the relevant elements of existing property specific biosecurity plans which landholders operate under and project related land access agreements developed with each individual landholder.
- To manage potential impacts to local access during construction, Traffic Management Plans (TMPs), approved by the relevant local government authorities or DoT, will be in place prior to the commencement of construction.
- Prior to any works commencing on a property, agreements will be made with the landowners and occupiers regarding the use of existing roads or tracks, the selection of new access routes and any property-specific measures to be adhered to during construction and operation
- Regional employment and purchasing will be supported through requiring the main construction contractor to detail mechanisms to provide for regional employment and purchasing during the tender phase. The adequacy of this plan will be a consideration in the selection of the preferred construction contractor.
- A Pipeline Consultation Plan (**Attachment 4**) will be implemented to facilitate ongoing consultation with relevant stakeholders, including landowners and occupiers, local councils and DoT, throughout the Project life cycle as provided in Table 2.

Mitigation measures have been developed to avoid and minimise impacts associated with noise and vibration during the construction of the pipeline. These include CEMP control measures that reduce noise producing activity from construction, vibration and condition/dilapidation survey activities. Where required to meet recommended noise and vibration criteria, mitigation

Privacy Statement

Any personal information about you or a third party in your correspondence will be protected under the provisions of the Privacy and Data Protection Act 2014. It will only be used or disclosed to appropriate Ministerial, Statutory Authority, or departmental staff in regard to the purpose for which it was provided, unless required or authorised by law. Enquiries about access to information about you held by the Department should be directed to the Privacy Coordinator, Department of Environment, Land, Water and Planning, PO Box 500, East Melbourne, Victoria 8002

measures may include selecting quieter equipment, installation of onsite noise barriers such as hoardings or temporary screens and restricting the hours that noisy activities can occur.

Safety

Land use and proximity to sensitive receptors are key safety factors of the route selection process. The pipeline route has been selected to minimise proximity to current and future residential areas and sensitive land uses. Health and safety mitigation measures have been developed to control, mitigate and manage health and safety risks through the construction and operation of the pipeline. Both the SMS and additional risk assessment determined that all safety hazards have a residual risk rating of low or below. The residual risks during construction will be controlled using the following risk mitigation measures:

- Pipeline, MLV and compressor works will be designed, constructed and operated in accordance with AS/NZS 2885 (e.g. compliant wall thickness and depth of cover)
- Design and implement process control systems and automated emergency shutdown systems to ensure operations are within operating parameters, and change operators if they are not in compliance with these systems
- Development of emergency response plans for construction and operation phases of the Project.
- Review and update the existing APA Bushfire Management Plan to consider the new infrastructure introduced by the WORM Project in consultation with relevant stakeholders including the Country Fire Authority and Fire Rescue Victoria.

11. Details of alternative pipeline routes considered by the applicant and reasons for selecting the proposed pipeline route in accordance with AS/NZS 2885.1: 2018

Route concepts for the pipeline were first considered in 2007 when the anticipated need for a high-pressure pipeline loop between the west and the north/east was identified by APA and discussed with the Australian Energy Regulator (AER). While not approving the pipeline in 2007, the AER identified the merit and future need for a high-pressure pipeline connecting SWP to the VNI. These early concepts provided some information for the current route, however much of the early work was reworked in subsequent years to address changes to the pipeline start and end locations, policy and land uses for the Project area.

After 2007, the route selection process for the pipeline has undergone three major route iterations, which for the purposes of this application, are described as follows:

- First Generation (2017): Four route options (Options 1, 2, 3, 4) were developed as part of the 2017 AER Business Case Submission. Options were identified considering a direct route between Plumpton Regulating Station and Wollert Compressor Station whilst maximising the use of existing easements and avoiding key constraints such as current and future PSPs, major topographic features and areas of high environmental, social or cultural value. The four options were assessed using a Multi-Criteria Assessment (MCA) (based on parameters listed in Table 5) and Option 4 was the route included in the approved business case.
- Second Generation (2018-2019): Due to the rate of development occurring in the northern and western growth areas (largely associated with the progress of PSPs in the area) the four route options identified as part of the 2017 AER Business Case Submission became increasingly constrained. As such, APA undertook a review of the route options, developing 17 possible routes using a similar identification process to that described above, including the use of existing linear corridors such as powerline easements and road corridors to avoid these constrained areas. A review of the 17 options eliminated 12 routes due to critical

Privacy Statement

Any personal information about you or a third party in your correspondence will be protected under the provisions of the Privacy and Data Protection Act 2014. It will only be used or disclosed to appropriate Ministerial, Statutory Authority, or departmental staff in regard to the purpose for which it was provided, unless required or authorised by law. Enquiries about access to information about you held by the Department should be directed to the Privacy Coordinator, Department of Environment, Land, Water and Planning, PO Box 500, East Melbourne, Victoria 8002

DEPARTMENT OF ENVIRONMENT, LAND, WATER AND PLANNING

flaws, with five options (Option A, B, C, D, E) progressed for an MCA. . This identified Option C as the preferred route alignment option.

- Third Generation (2019 – early 2021): Following the selection of Option C as the preferred route, APA has undertaken further refinement of the pipeline alignment in consultation with key stakeholders, such as the DoT, and in response to additional field surveys (e.g. biodiversity and cultural heritage) and design/constructability assessments.

The following section provides a detailed outline of the route selection process.

Further information on the route selection process is also provided within the *Route Options Report - Western Outer Ring Main Project* (APA, March 2021).

Route Selection Process

To assess pipeline route alignment options for the Project, APA developed a set of qualitative and quantitative evaluation criteria specific for the Project.

The evaluation criteria were developed in line with the objectives of the Pipelines Act, the Australian Pipelines and Gas Association (APGA) Code of Environmental Practice and AS/NZS 2885.1: 2018.

Once the criteria were identified, a ranking and scoring system was then applied using an MCA assessment approach (refer to Table 5).

Table 5 Multi-Criteria Assessment

Parameter	Criteria	Weighting
Environment and heritage	Special biodiversity values, length of MSA conservation areas intersected, length of threatened ecological communities intersected, extent of remnant vegetation, watercourses, wetlands, floodplains, registered heritage sites, cultural heritage sensitivity, native title claims, amenity impacts (noise, dust, visual)	20%
Community	Potential community benefit, community safety, impacts to known areas of high value to the community	20%
Land	Variation in number of parcels intersected between options, residential tenure (current or zoned), industrial tenure, resource tenure (production), resource tenure (exploration), forestry tenure, conservation tenure, future land use conflicts	20%
Capital cost	Approvals cost, offset cost, labour costs, land procurement costs and capital costs	15%
Relative length	Relative length of each pipeline option	5%
Constructability	Design and engineering complexity, terrain and geology risks, complex crossings, space for efficient construction, logistics and access for construction, worker safety	5%
Operability	Operational complexity, pipeline third party damage risk, worker safety, soil types, rehabilitation and easement maintenance risks	5%
Infrastructure	Number of State and Federal roads, local roads and railways intersected	5%
Approvals	Complexity of approval pathway, length of existing or proposed infrastructure easements followed, schedule impact of approval pathway	5%
Total		100%

Privacy Statement

Any personal information about you or a third party in your correspondence will be protected under the provisions of the Privacy and Data Protection Act 2014. It will only be used or disclosed to appropriate Ministerial, Statutory Authority, or departmental staff in regard to the purpose for which it was provided, unless required or authorised by law. Enquiries about access to information about you held by the Department should be directed to the Privacy Coordinator, Department of Environment, Land, Water and Planning, PO Box 500, East Melbourne, Victoria 8002

Pipeline Route Options

The pipeline has undergone three major route iterations (First Generation, Second Generation and Third Generation). The following section details the process undertaken as part of these route iterations.

First Generation

In response to inefficiency concerns in the VTS raised by AEMO in 2017, APA prepared a business case for the WORM Project which focused on securing an easement for the pipeline. As part of the business case, four route options were considered by APA including:

- **Option 1:** Following the existing Sunbury pipeline easement, the OMR, Gunns Gully Road and the existing VNI easement south to Wollert (47.1 km in length)
- **Option 2:** Following the Sunbury pipeline easement, OMR/ E6 and Wildwood Road, traversing cross country to the north east through rural land, crossing the OMR near Donnybrook Road, crossing the Hume Highway between Donnybrook Road and Gunns Gully Road and then following the VNI south to Wollert (47.3 km in length)
- **Option 3:** Following the same route as Option 1 to Mickleham Road but then following the Ausnet 500 kV easement through Mount Ridley to Wollert (39.3 km in length)
- **Option 4:** Following the same route as Option 1 to Gunns Gully Road but then continuing to follow the OMR/ E6 through the intersection with the VNI (50.1 km in length)

Option 4 was the route included in the approved AER Business Case (2017) as at the time it best avoided urban encroachment.

Second Generation

Given the rate of development occurring in the northern and western growth areas (largely associated with the progress of PSPs in the area), APA identified that the preferred option (Option 4) included in the AER Business Case (2017) had become increasingly constrained. As such, APA undertook a further program of site investigations and stakeholder consultation between early 2018 and early 2019 to review and revise the route options and ensure that ongoing development and changes to planning controls (i.e. PSPs) were considered.

As part of this review process, APA engaged with the four relevant local government authorities within the study area (Melton City, Hume City, Whittlesea City and Mitchell Shire), in addition to the Department of Environment, Land, Water and Planning (DELWP), DoT, VicTrack, Victorian Planning Authority and SP AusNet.

The process identified 17 route options, including the four options within the AER submission (2017), which were progressed for review. The review comprised assessing the 17 options for feasibility constraints and to identify any critical flaws, with each route assessed based on the following criteria:

- Alignment length
- Existing and proposed infrastructure
- Constructability
- Existing land use
- Environment

The outcome of the review, including the routes progressed for an MCA assessment and eliminated options, is summarised in Table 6.

Privacy Statement

Any personal information about you or a third party in your correspondence will be protected under the provisions of the Privacy and Data Protection Act 2014. It will only be used or disclosed to appropriate Ministerial, Statutory Authority, or departmental staff in regard to the purpose for which it was provided, unless required or authorised by law. Enquiries about access to information about you held by the Department should be directed to the Privacy Coordinator, Department of Environment, Land, Water and Planning, PO Box 500, East Melbourne, Victoria 8002

DEPARTMENT OF ENVIRONMENT, LAND, WATER AND PLANNING

Table 6 Summary of 17 options review outcomes

Route Option	Outcome of Review
Greenfields – Cameron Street (Option 1)	This option was not progressed due to: <ul style="list-style-type: none"> • Constructability constraints and operational issues as a result of the pipeline being co-located within an existing power easement. • Pipeline would be installed within the Lockerbie and Donnybrook PSPs in close proximity to a number of sensitive land uses such as schools, at variance to Australian Standard 2885 Pipelines – gas and liquid petroleum (AS 2885). AS 2885 requires that pipeline routes avoid sensitive land uses where a feasible alternative exists.
OMR/E6 (Option 2a)	This option was progressed for the MCA process (Option C). A description of the key environmental, social and land use impacts associated with this pipeline route is provided in Table 7.
Gunns Gully Road Extension (Option 2b)	This option was not progressed due to: <ul style="list-style-type: none"> • Pipeline would be constructed in proximity to sensitive land uses and residential areas within the Lockerbie and Donnybrook PSPs, at variance to AS 2885. • Pipeline would traverse an additional Growling Grass Frog conservation area (in comparison to other route options).
OMR/E6 and High-Voltage (HV) powerline co-location (Option 2c)	This option was progressed for the MCA process (Option D). A description of the key environmental, social and land use impacts associated with this pipeline route is provided in Table 7.
HV powerline co-location (Option 3a)	A variation of this option was progressed for the MCA process (Option A). The variation used the pipeline route along the powerline easement from Option 3a in combination with the overall pipeline route in Option 2a. A description of the key environmental, social and land use impacts associated with this pipeline route is provided in Table 7.
HV powerline (Option 3b)	This option was progressed for the MCA process (Option B). A description of the key environmental, social and land use impacts associated with this pipeline route is provided in Table 7.
HV powerline co-location (Option 3c)	This option was not progressed due to: <ul style="list-style-type: none"> • Pipeline alignment would not maximise the use of the existing Sunbury easement. • Route would require three crossings of Deep Creek (compared to one for other options). • Constructability constraints and operational issues as a result of the pipeline being co-located within an existing power easement.
HV powerline co-location (Option 4)	This option was not progressed due to: <ul style="list-style-type: none"> • Pipeline would be longer than similar, alternate options (i.e. Option 3b and 3c). • Pipeline alignment would not maximise the use of the existing Sunbury easement. • Constructability constraints and operational issues as a result of the pipeline being co-located within an existing power easement. • Pipeline would traverse a longer section of a Growling Grass Frog conservation area in comparison to other alternatives.
Somerton Road (Option 5)	It is noted that this option was similar to Option 9 however this option was not progressed due to: <ul style="list-style-type: none"> • Pipeline would not maximise the use of the existing Sunbury easement. • Constructability constraints and operational issues as a result of the pipeline being co-located within an existing power easement.
North of Greenvale	This option was not progressed due to: <ul style="list-style-type: none"> • Constructability constraints with installing pipeline in Greenvale Reservoir.

Privacy Statement

Any personal information about you or a third party in your correspondence will be protected under the provisions of the Privacy and Data Protection Act 2014. It will only be used or disclosed to appropriate Ministerial, Statutory Authority, or departmental staff in regard to the purpose for which it was provided, unless required or authorised by law. Enquiries about access to information about you held by the Department should be directed to the Privacy Coordinator, Department of Environment, Land, Water and Planning, PO Box 500, East Melbourne, Victoria 8002

DEPARTMENT OF ENVIRONMENT, LAND, WATER AND PLANNING

Reservoir (Option 6)	
Outer Route (Option 7)	This option was not progressed due to: <ul style="list-style-type: none"> Length of pipeline (65 km). Constructability constraints associated with steep terrain.
Alternate Outer Route (Option 8)	This option was not progressed due to: <ul style="list-style-type: none"> Length of pipeline (64 km). Constructability constraints associated with steep terrain.
Alternate Somerton Road (Option 9)	This option was progressed for the MCA process (Option E). A description of the key environmental, social and land use impacts associated with this pipeline route is provided in Table 7.
Alternate Outer Route (Option 10)	This option was not progressed due to: <ul style="list-style-type: none"> Pipeline would be installed within the Lockerbie and Donnybrook PSPs in close proximity to a number of sensitive land uses such as schools, at variance to AS 2885.
HV powerline co-location (Option 11)	This option was not progressed due to: <ul style="list-style-type: none"> Pipeline would not maximise the use of the existing Sunbury easement. Constructability constraints and operational issues as a result of the pipeline being co-located within an existing power easement.
HV powerline co-location (Option 12)	This option was not progressed due to: <ul style="list-style-type: none"> Constructability constraints and operational issues as a result of the pipeline being co-located within an existing power easement. Route would require an additional crossing of the OMR/E6 PAO (in comparison to alternate routes).
HV powerline co-location (Option 13)	This option was not progressed due to: <ul style="list-style-type: none"> Constructability constraints and operational issues as a result of the pipeline being co-located within an existing power easement. Pipeline would not maximise the use of the existing Sunbury easement.

It is noted that in addition to the routes listed in Table 6, three other options were considered during the Second Generation process. These were identified and discounted prior to the assessment of the 17 route options. Whilst these options provided more direct routes and would have resulted in less interface with the OMR/E6, they were not progressed for the following reasons:

- Mt Ridley Road – pipeline would have been installed in established residential areas of Mickleham and Craigieburn North. In addition, Mount Ridley Road is of insufficient width to accommodate a 30m right of way to without the closure of the road for the duration of construction.
- Residential Land between Mount Ridley Road and the Ausnet 500kV Easement – pipeline would have traversed additional conservation areas in comparison to other options. Further, the presence of existing land uses would have required the pipeline to take an indirect route, increasing the number of properties affected by the project.
- Donnybrook Road – Donnybrook Road is of insufficient width to accommodate a 30m right of way without the closure of the road for the duration of construction. Further, the area is densely populated with residential properties on the northern and southern side of Donnybrook Road (Merrifield West PSP).

As highlighted in Table 6, the review identified five preferred options which were selected for a detailed MCA process. These five options (Options A, B, C, D, and E) are shown on Figure 4.

Privacy Statement

Any personal information about you or a third party in your correspondence will be protected under the provisions of the Privacy and Data Protection Act 2014. It will only be used or disclosed to appropriate Ministerial, Statutory Authority, or departmental staff in regard to the purpose for which it was provided, unless required or authorised by law. Enquiries about access to information about you held by the Department should be directed to the Privacy Coordinator, Department of Environment, Land, Water and Planning, PO Box 500, East Melbourne, Victoria 8002

DEPARTMENT OF ENVIRONMENT, LAND, WATER AND PLANNING

All five options feature the following common characteristics:

- Share a common alignment in the south, between the Plumpton Regulating Station (KP 0) and the Sunbury Road crossing (KP 14.8).
- Follow part of the existing AusNet 500kV high voltage powerline easement alignment for approximately 2 km south of the Sunbury Road crossing (KP 14.8).
- Cross the Sunbury rail line and Calder Freeway (KP 8.8) before traversing in a north-easterly direction through land in the Green Wedge A Zone.

Through the MCA process, Option C was identified as being the optimum alignment in satisfying key criteria which the Project weighted with greatest importance, being environment and heritage; and, community and land impact considerations. Specifically, Option C was the preferred pipeline route for the following reasons:

- Option C avoids environmental impacts to the greatest extent possible, particularly in areas of high biodiversity value, including the Mount Ridley Nature Conservation Reserve, adjoining MSA conservation areas and Merri Creek.
- Option C avoids the requirement for land tenure or direct impact to properties with established residential, industrial or conservation uses, and it traverses a lower number of properties than the other options.
- Option C minimises co-location within existing high-voltage transmission easements which would add design, construction and operational complexity to the pipeline.

Option D (ranked 2nd) was identified as providing the next best route alignment with Option D and Option C sharing a common alignment for the majority of their lengths. The northern section of Option D's alignment is approximately 11 km shorter than Option C and would result in a lower overall capital cost for the pipelines delivery. However, Option D was identified as resulting in greater environmental impacts and would require direct access to a much larger number of properties than Option C as it crosses the northern growth corridor further south and is much closer to established growth area development.

Option E (ranked 3rd) was identified as the third most favourable option and shares about 16.5 kilometres of its alignment with Option C. Option E is the only route option that cuts directly through established urban development within the northern growth area corridor (near Somerton). Given that the northern end of its alignment largely traverses established urban areas, this route is expected to have lesser impact to remnant native vegetation than most other routes. Option E however does traverse some pockets of higher biodiversity value (endangered and vulnerable ecological communities including the Craigieburn Grassland Nature Conservation Reserve and land covered by the Vegetation Protection Overlay in Epping North).

Option E would require land tenure across a high number of properties including residential and industrial land. It rates poorly in terms of ongoing operability, with higher risk of third-party damage, operational complication and related safety risk, due to its location within constrained areas of established urban growth.

Option B (ranked 4th) is the third shortest option, however, has the least favourable ranking for operability and environment and heritage. This option follows the Ausnet 500kV easement for most of its length, with associated operation complexity and increased worker safety risks. This option also intersects the greatest length of remnant vegetation and MSA conservation areas.

Option A (ranked 5th) scored poorly on capital cost and relative length. This option also scored relatively poorly on constructability, operability, approvals and environment and heritage.

Privacy Statement

Any personal information about you or a third party in your correspondence will be protected under the provisions of the Privacy and Data Protection Act 2014. It will only be used or disclosed to appropriate Ministerial, Statutory Authority, or departmental staff in regard to the purpose for which it was provided, unless required or authorised by law. Enquiries about access to information about you held by the Department should be directed to the Privacy Coordinator, Department of Environment, Land, Water and Planning, PO Box 500, East Melbourne, Victoria 8002

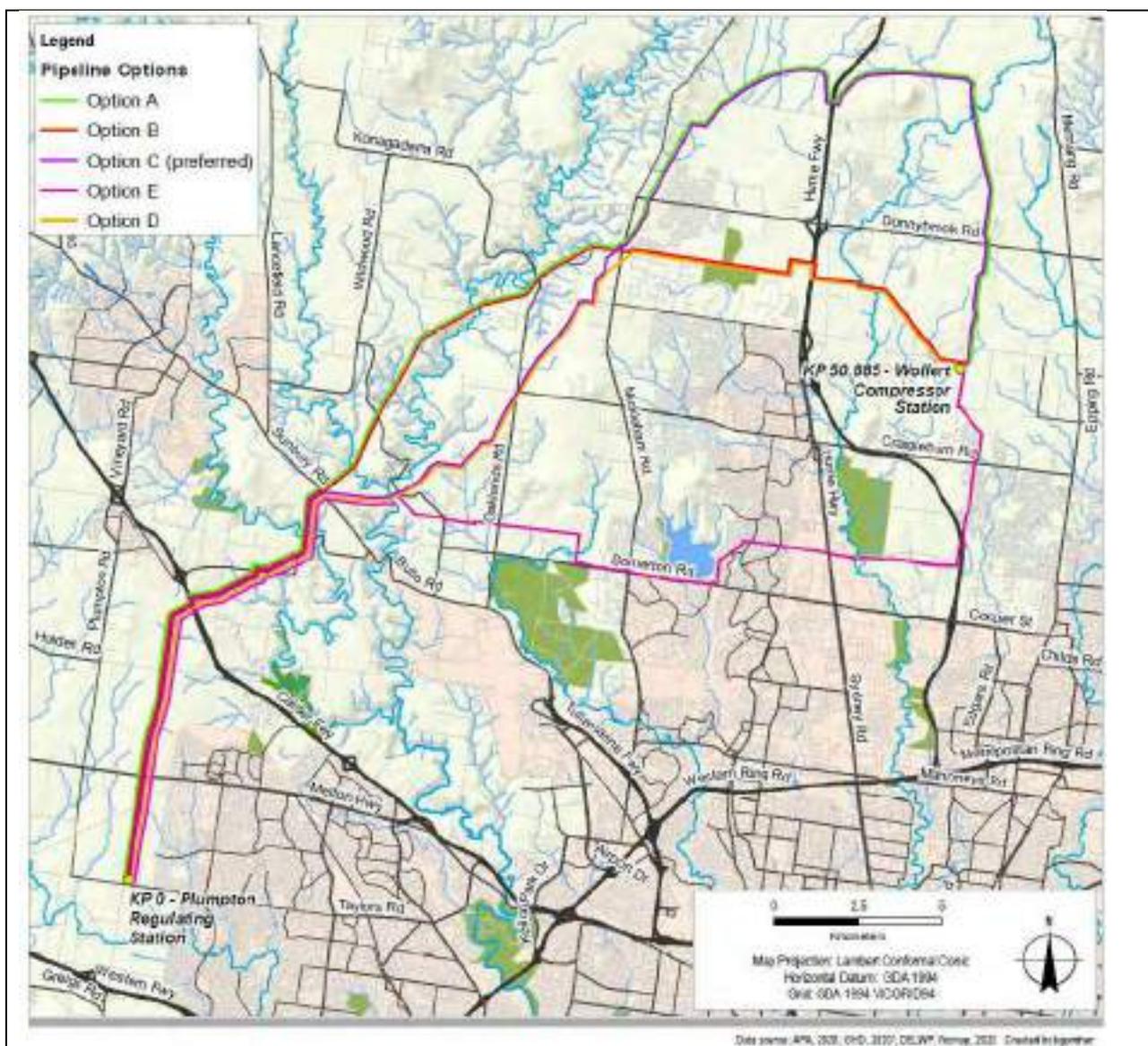


Figure 4: WORM Route Options (APA Options Report, 2019)

Third Generation

Following the selection of Option C as the preferred route option, a process of further route refinement was undertaken. The intention of this process was to identify a preliminary pipeline alignment (PPA) which would form the basis of engagement with directly affected landholders and other stakeholders.

As part of this process a number of refinements were made to the Option C alignment, including:

- Minor alignment changes at the crossings of Jacksons Creek, Sunbury Road and Deep Creek to better respond to terrain, more closely follow property boundaries and avoid impacts to urban growth land within the Sunbury South PSP area.

Privacy Statement

Any personal information about you or a third party in your correspondence will be protected under the provisions of the Privacy and Data Protection Act 2014. It will only be used or disclosed to appropriate Ministerial, Statutory Authority, or departmental staff in regard to the purpose for which it was provided, unless required or authorised by law. Enquiries about access to information about you held by the Department should be directed to the Privacy Coordinator, Department of Environment, Land, Water and Planning, PO Box 500, East Melbourne, Victoria 8002

DEPARTMENT OF ENVIRONMENT, LAND, WATER AND PLANNING

- Amendment of the alignment between Gunns Gully Road and the Hume Freeway to reduce the overall alignment length by following Gunns Gully Road rather than the OMR/ E6 corridor further to the north.

Following this, APA undertook further refinement of the pipeline alignment in consultation with key stakeholders such as the DoT and local government authorities:

- At KP8.70, the construction footprint within the highway road reserve was reduced and an alignment change was made to minimise any impact to the OMR/E6 transport corridor.
- Alignment change at KP19.48 to avoid impacts to the future construction of OMR/E6 transport corridor
- Alignment change at KP21.44 to avoid an overlap between the pipeline easement and future road widening of Oakland Road
- Construction footprint change at KP28.06 as the construction works within the road corridor is no longer required and an alternative access is provided
- Alignment change at KP28.25 to locate the pipeline on the western side of the OMR/E6 transport corridor in this location
- Reduction to the pipeline easement width at KP32.00 where within OMR/E6 transport corridor
- Reduction to easement KP36.73 at the request of DoT
- Reduction of pipeline easement to 10 m at KP37.11 to KP41.98 at the request of DoT
- Realignment of the pipeline between Gunns Gully Road (KP35.8) and the Hume Freeway (KP37.2) to reduce the overall alignment length (by following Gunns Gully Road rather than the OMR/ E6 corridor further to the north) and to optimise the crossing location at the Hume Freeway

As a number of sections of the WORM pipeline is proposed to be installed within the OMR/E6 PAO, APA has undertaken considerable consultation with DoT to ensure key concerns raised regarding the interface between the two projects have been addressed. A working group between DoT and APA was formed in early 2019 and has ensured constant engagement between the two parties. A risk assessment has been undertaken by APA and the DoT to assess the potential impact of the WORM pipeline on the future development of the OMR/E6 Transport Corridor, based on the preliminary OMR/E6 concept design undertaken by DoT. Where the WORM poses an unacceptable risk to development (design, construction and operation) of the OMR/E6 transport corridor, DoT has provided APA with specific requirements relating to the alignment, design and construction methodology to reduce these risks. These specific requirements, including those outlined further below, have focussed on changes to the vertical and/or horizontal alignment of the pipeline at critical locations and construction specific requirements for works within the OMR PAO.

DoT's requirements considered during the Project's development phase include, but are not limited to:

Pipeline Alignment

1. Re-alignment of the pipeline at:
 - a. Calder Freeway Interchange (pipeline kilometre point 9).
 - b. Oaklands Rd (pipeline kilometre point 20).
 - c. Mickleham Road to north of Donnybrook Rd (pipeline kilometre point 28 to 32).
2. The alignment of the pipeline to extend beyond all ramp infrastructure within the PAO with no bends and no access pits within the PAO, unless otherwise agreed with DoT.

Privacy Statement

Any personal information about you or a third party in your correspondence will be protected under the provisions of the Privacy and Data Protection Act 2014. It will only be used or disclosed to appropriate Ministerial, Statutory Authority, or departmental staff in regard to the purpose for which it was provided, unless required or authorised by law. Enquiries about access to information about you held by the Department should be directed to the Privacy Coordinator, Department of Environment, Land, Water and Planning, PO Box 500, East Melbourne, Victoria 8002

3. Pipeline easement width to be reduced from 15m to 10m at locations within the OMR/E6 PAO.

Depth requirements

Pipeline depth requirements range from 1.2m to 5m from the surface level to the obvert level of the pipe. Depth requirements will be determined during detailed design with due consideration to location specific matters such as future transport and drainage infrastructure requirements.

Back fill requirements

The backfill material(s), construction methodology and quality assurance adopted by APA shall comply with DoT minimum requirements.

APA will provide all the necessary documentation associated with its proposed work including, but not limited to, contract specifications and Issued for Construction drawings that would detail how the works will be carried out in accordance with DoT standards and requirements.

These requirements have been incorporated into a draft Coordination Deed to be executed by APA and DoT prior to the commencement of construction. Further, it is recognised there may be additional changes to the WORM Project such as to the pipeline alignment and/or construction methodology that may alter DoT's position or require DoT's approval prior to construction. APA will construct the pipeline within the OMR/E6 PAO in accordance with the Coordination Deed agreed to with DoT.

Relevant DoT requirements are also reflected in the Project's management measures (as outlined in the CEMP).

12. A comparison of the environmental, social and safety impacts arising from each of the alternative pipeline routes set out in 10 above and the proposed pipeline

This section discusses how the five preferred route options outlined in Section 11 underwent the design iteration process to minimise potential environmental, social and safety impacts, resulting in the preferred pipeline route. The pipeline route selection is one of the primary mitigation tools in avoiding and reducing potential environmental, social and safety impacts associated with linear infrastructure. The selection process was informed by regular consultation throughout the process to understand and minimise potential impacts on the local community, indigenous heritage, environment and other land uses such as road corridors.

Environmental, Social and Land Use Impacts

The key environmental, social and land use impacts of each of the five route options identified in the Second Generation route selection process (Option A, B, C, D and E) which influenced the identification of the preferred pipeline route (Option C) are described within Table 7 below.

Through landowner/occupier and stakeholder consultation, in addition to environmental investigations, further refinement of the preferred pipeline route has occurred. The environmental, social and safety reasons behind these alignment changes has been outlined in Section 11 – Third Generation.

Privacy Statement

Any personal information about you or a third party in your correspondence will be protected under the provisions of the Privacy and Data Protection Act 2014. It will only be used or disclosed to appropriate Ministerial, Statutory Authority, or departmental staff in regard to the purpose for which it was provided, unless required or authorised by law. Enquiries about access to information about you held by the Department should be directed to the Privacy Coordinator, Department of Environment, Land, Water and Planning, PO Box 500, East Melbourne, Victoria 8002

DEPARTMENT OF ENVIRONMENT, LAND, WATER AND PLANNING

Table 7 Environmental and social impacts of Options A, B, C, D and E

Option	Environment and heritage impacts	Land use and social impacts
Preferred option		
Option C (Ranked 1st – preferred option)	<ul style="list-style-type: none"> • Least environmental impact compared to other options • Alignment achieves the greatest avoidance of MSA conservation areas (approx. 1.6 km traversing conservation areas) • Alignment has second shortest impact length of mapped areas of remnant vegetation, threatened ecological communities and habitat for threatened species (approx. 5.7 km). • Alignment intersects fewer areas of potential Aboriginal cultural heritage sensitivity than Options A, B and E. • Alignment would use an existing crossing at Merri Creek established for an existing APA pipeline easement in the area. 	<ul style="list-style-type: none"> • Northern section of route travels a greater distance north (in rural areas) from established urban growth north of Melbourne • Follows a similar alignment to the part of the OMR/E6 transport corridor • Co-locates with AusNet 500kV power easement for 12 kilometres
Discounted options		
Option A (Ranked 5th – least preferred option)	<ul style="list-style-type: none"> • Environmental impact would be higher than preferred Option C, given the alignment traverses 3 more wetlands, MSA conservation areas (approx. 1.7 km) and mapped areas of remnant vegetation, threatened ecological communities and habitat for threatened species (7.3 km). • The highest risk to areas of potential Aboriginal cultural heritage sensitivity as the alignment traverses approximately 5.1 km of Aboriginal cultural heritage sensitivity. 	<ul style="list-style-type: none"> • The northern section of this route travels a greater distance north (in rural areas) from established urban growth north of Melbourne (same as Option C). As such the route avoids residential or commercial tenure. • Co-locates with AusNet 500kV power easement for over 12 kilometres. Consultation with Ausnet indicated that the ability to use the easement for additional HV overhead lines needs to be preserved. As such, AusNet advised they would only support the route Option with the least amount of co-location of a pipeline within the HV easement (i.e. Option C).
Option B (Ranked 4th – second least preferred option)	<ul style="list-style-type: none"> • This alignment was identified as having the greatest environmental impact • Alignment features the longest intersect with MSA conservation areas (approximately 3.5 km) and mapped areas of remnant vegetation, threatened ecological communities 	<ul style="list-style-type: none"> • This alignment co-locates with the AusNet 500kV easement for most of its length (approximately 22 km) • The alignment requires residential and industrial tenure as the northern section of the alignment cuts through the northern growth corridor at Mickleham where urban development

Privacy Statement

Any personal information about you or a third party in your correspondence will be protected under the provisions of the Privacy and Data Protection Act 2014. It will only be used or disclosed to appropriate Ministerial, Statutory Authority, or departmental staff in regard to the purpose for which it was provided, unless required or authorised by law. Enquiries about access to information about you held by the Department should be directed to the Privacy Coordinator, Department of Environment, Land, Water and Planning, PO Box 500, East Melbourne, Victoria 8002

DEPARTMENT OF ENVIRONMENT, LAND, WATER AND PLANNING

	<p>and habitat for threatened species (approximately 9.2 km)</p> <ul style="list-style-type: none"> • Alignment also traverses land within the Mount Ridley Nature Conservation Reserve, land affected by the Environmental Significance Overlay, and a high number of waterways near Deep Creek and along the AusNet 500kV power easement • Traverses area with sloping terrain and risk of landslip along part of easement near Deep Creek valley 	<p>and higher density subdivision is present</p> <ul style="list-style-type: none"> • This option also requires tenure through the Mount Ridley Nature Conservation Reserve
<p>Option D (Ranked 2nd – second preference option)</p>	<ul style="list-style-type: none"> • This alignment was identified as having a greater environmental impact than preferred Option C but a lesser impact than the other options. • Second longest intersected length of MSA conservation areas (approx. 3.4 km) and impacts required at the Mount Ridley Nature Conservation Reserve • Alignment has second longest impact length through mapped areas of remnant vegetation, threatened ecological communities and habitat for threatened species (approx. 7.7 km). • Alignment also traverses land within the Environmental Significance Overlay, particularly in Mickleham, the southern parts of Donnybrook and north-western parts of Wollert • Alignment would require new crossing at Merri Creek where records of Growling Grass Frog have been identified 	<ul style="list-style-type: none"> • The northern section of the alignment (which is shared with Option B) cuts through the northern growth corridor at Mickleham where urban development and higher density subdivision is present. • Residential and industrial tenure required, in addition to tenure through the Mount Ridley Nature Conservation Reserve. • Northern section of route co-locates with AusNet 500kV power easement for approximately 9 km
<p>Option E (Ranked 3rd – third preference option)</p>	<ul style="list-style-type: none"> • Due to its location through established urban areas (previously disturbed land) this alignment traverses approximately 5.5 km through mapped areas of vegetation, in comparison to Option C, which traverses only 200 m more (traversing approximately 5.7 km through mapped areas of remnant vegetation). • Overall Option E was expected to have greater environmental impact than preferred Option C as it traverses approximately 750 metres more through MSA conservation 	<ul style="list-style-type: none"> • The alignment comprises the southern-most route of all options considered • The alignment crosses the northern growth corridor just south of the Greenvale Reservoir, traversing established urban areas including Greenvale, Roxburgh Park and Somerton

Privacy Statement

Any personal information about you or a third party in your correspondence will be protected under the provisions of the Privacy and Data Protection Act 2014. It will only be used or disclosed to appropriate Ministerial, Statutory Authority, or departmental staff in regard to the purpose for which it was provided, unless required or authorised by law. Enquiries about access to information about you held by the Department should be directed to the Privacy Coordinator, Department of Environment, Land, Water and Planning, PO Box 500, East Melbourne, Victoria 8002

DEPARTMENT OF ENVIRONMENT, LAND, WATER AND PLANNING

	<p>areas than Option C (Option E has approx. 2.3 km impact length through MSA conservation areas compared to approx. 1.6 km for Option C).</p> <ul style="list-style-type: none"> This option also intersects land in Epping North covered by the Vegetation Protection Overlay and identified as having high and medium habitat significance at regional and local level; and conservation areas east of Somerton and west of Epping, including part of the Craigieburn Grassland Nature Conservation Reserve Has the longest impact area of all routes on areas of cultural heritage sensitivity (approx. 5.5 km) 	<ul style="list-style-type: none"> This alignment would require tenure across a larger number of land holdings compared to other options given its southern alignment through areas of higher density subdivision This option largely avoids co-location within the AusNet easement This option has the greatest risk of construction amenity impacts on established residential and commercial uses, and operational risks due to location in congested urban areas
--	---	---

Safety Impacts

Land use and proximity of the pipeline to sensitive receptors are key safety factors in route selection. The separation of the pipeline from sensitive receptors and land use is a primary safety mitigation and addressed through the route selection process with distances between sensitive receptors and the pipeline maximised where possible. Option C best avoids residential and industrial tenure, thereby limiting the route alignments proximity to sensitive receptors.

The physical protective measures of wall thickness and depth of cover have been designed conservatively and exceed the requirements of AS/NZS 2885.1.

13. **Details of land ownership and title details (if applicable) for the land through which the proposed pipeline route or corridor is to be constructed**

Table 8 below summarises the details of land ownership and title details for the land through which the proposed pipeline route is to be constructed. In relation to Caveats referenced in Table 8, 'Affected by Pipeline' identifies properties which will be directly impacted by pipeline construction and 'Other Access' refers to properties which will be required to access the pipeline, however no construction will occur.

Table 8 Details of land through which the proposed pipeline route or corridor is to be constructed

Parcel ID	Lot / Plan	Parcel Type	Tenure	Caveats
WPT001	APS709426	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT002	1PS604066	Lot Parcel	Private	Other Access (Rev 7)
WPT003	1PS709426	APA Owned Lot Parcel	Private	Other Access (Rev 7)
WPT004	425711868	Road Casement	Public	Other Access (Rev 7)
WPT008	HPS820465	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT009	431529230	Road Casement	Public	Other Access (Rev 7)
WPT011	RES1PS820465	Lot Parcel	Private	Other Access (Rev 7)
WPT012	RES2PS817165	Reserve	Public	Other Access (Rev 7)
WPT013	431492474	Road Casement	Public	Other Access (Rev 7)
WPT015	431200954	Road Casement	Public	Other Access (Rev 7)
WPT017	RES2PS817163	Reserve	Public	Other Access (Rev 7)
WPT018	218165707	Road Casement	Public	Affected by Pipeline (Rev 7)
WPT019	10LP116565	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT024	425711870	Road Casement	Public	Affected by Pipeline (Rev 7)
WPT025	218160972	Road Casement	Public	Affected by Pipeline (Rev 7)

Privacy Statement

Any personal information about you or a third party in your correspondence will be protected under the provisions of the Privacy and Data Protection Act 2014. It will only be used or disclosed to appropriate Ministerial, Statutory Authority, or departmental staff in regard to the purpose for which it was provided, unless required or authorised by law. Enquiries about access to information about you held by the Department should be directed to the Privacy Coordinator, Department of Environment, Land, Water and Planning, PO Box 500, East Melbourne, Victoria 8002

DEPARTMENT OF ENVIRONMENT, LAND, WATER AND PLANNING

WPT026	1TP710684	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT027	1TP132544	Lot Parcel	Private	Other Access (Rev 7)
WPT028	1TP901066	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT029	218162378	Road Casement	Public	Affected by Pipeline (Rev 7)
WPT030	2022PP3061	Road Casement	Public	Affected by Pipeline (Rev 7)
WPT031	218162862	Road Casement	Public	Affected by Pipeline (Rev 7)
WPT032	2LP119116	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT034	1TP946706	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT035	2PS343496	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT037	218166159	Road Casement	Public	Other Access (Rev 7)
WPT038	218166927	Road Casement	Public	Affected by Pipeline (Rev 7)
WPT039	218257150	Road Casement	Public	Affected by Pipeline (Rev 7)
WPT040	1TP829278	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT041	1TP710576	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT042	2LP90878	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT043	2015PP2761	Road Casement	Public	Affected by Pipeline (Rev 7)
WPT044	218268838	Road Casement	Public	Affected by Pipeline (Rev 7)
WPT045	5LP92520	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT046	6LP92520	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT047	10LP215406	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT048	11LP215406	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT049	11LP92520	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT050	12LP92520	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT051	218265274	Road Casement	Public	Affected by Pipeline (Rev 7)
WPT052	13LP92520	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT054	218260126	Road Casement	Public	Affected by Pipeline (Rev 7)
WPT055	2LP137651	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT056	1LP137651	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT057	D16PP2761	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT058	1PS635728	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT059	2PS635728	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT060	3PS635728	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT061	1TP333383	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT063	2029PP2761	Water Casement	Crown	Affected by Pipeline (Rev 7)
WPT064	2010PP2258	Water Casement	Crown	Affected by Pipeline (Rev 7)
WPT065	1TP909157	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT066	218261530	Road Casement	Public	Affected by Pipeline (Rev 7)
WPT067	218261878	Road Casement	Public	Affected by Pipeline (Rev 7)
WPT068	1LP200366	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT070	3LP200366	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT072	4LP200366	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT073	2002PP2258	Water Casement	Crown	Affected by Pipeline (Rev 7)
WPT074	1TP424528	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT075	218265262	Road Casement	Public	Affected by Pipeline (Rev 7)
WPT076	1TP107502	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT077	2LP130112	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT078	1LP130112	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT079	218268694	Road Casement	Public	Affected by Pipeline (Rev 7)
WPT080	218261314	Road Casement	Public	Affected by Pipeline (Rev 7)
WPT081	B7PP2258	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT083	218264222	Road Casement	Public	Affected by Pipeline (Rev 7)
WPT084	5LP88261	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT085	10LP110642	Lot Parcel	Private	Affected by Pipeline (Rev 7)

Privacy Statement

Any personal information about you or a third party in your correspondence will be protected under the provisions of the Privacy and Data Protection Act 2014. It will only be used or disclosed to appropriate Ministerial, Statutory Authority, or departmental staff in regard to the purpose for which it was provided, unless required or authorised by law. Enquiries about access to information about you held by the Department should be directed to the Privacy Coordinator, Department of Environment, Land, Water and Planning, PO Box 500, East Melbourne, Victoria 8002

DEPARTMENT OF ENVIRONMENT, LAND, WATER AND PLANNING

WPT087	2LP218160	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT088	1TP212870	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT089	218271946	Road Casement	Public	Affected by Pipeline (Rev 7)
WPT090	1TP104933	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT091	2LP68808	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT092	1PS733043	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT093	218266378	Road Casement	Public	Affected by Pipeline (Rev 7)
WPT094	218268306	Road Casement	Public	Affected by Pipeline (Rev 7)
WPT095	1PS733045	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT097	218265906	Road Casement	Public	Other Access (Rev 7)
WPT098	2PS503800	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT100	3PS503800	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT101	1PS503800	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT102	218259318	Road Casement	Public	Other Access (Rev 7)
WPT103	2LP218323	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT104	218263730	Road Casement	Public	Affected by Pipeline (Rev 7)
WPT105	218260106	Road Casement	Public	Affected by Pipeline (Rev 7)
WPT106	32LP93445	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT108	5LP92893	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT109	4LP92893	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT110	1TP108439	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT111	218271310	Road Casement	Public	Affected by Pipeline (Rev 7)
WPT112	1TP947284	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT113	GPS819168	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT114	GPS806997	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT116	1TP427446	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT118	426092500	Road Casement	Public	Affected by Pipeline (Rev 7)
WPT119	APS702756	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT121	AAPS746088	Lot Parcel	Private	Other Access (Rev 7)
WPT122	1LP126752	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT123	1PS714700	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT124	1PS714688	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT125	2PS714701	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT126	4LP126752	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT127	PPS814703	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT128	MPS814703	Lot Parcel	Private	Other Access (Rev 7)
WPT129	218299285	Road Casement	Public	Affected by Pipeline (Rev 7)
WPT130	2TP215633	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT131	1TP201330	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT132	218258374	Road Casement	Public	Affected by Pipeline (Rev 7)
WPT133	29PP3100	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT134	425010097	Road Casement	Public	Other Access (Rev 7)
WPT135	1LP136262	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT136	2LP136262	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT138	3LP136262	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT139	4LP136262	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT140	5LP136262	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT141	6LP136262	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT143	7LP136262	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT144	8LP136262	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT146	9LP136262	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT147	10LP136262	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT149	218266966	Road Casement	Public	Affected by Pipeline (Rev 7)

Privacy Statement

Any personal information about you or a third party in your correspondence will be protected under the provisions of the Privacy and Data Protection Act 2014. It will only be used or disclosed to appropriate Ministerial, Statutory Authority, or departmental staff in regard to the purpose for which it was provided, unless required or authorised by law. Enquiries about access to information about you held by the Department should be directed to the Privacy Coordinator, Department of Environment, Land, Water and Planning, PO Box 500, East Melbourne, Victoria 8002

DEPARTMENT OF ENVIRONMENT, LAND, WATER AND PLANNING

WPT150	218263378	Road Casement	Public	Affected by Pipeline (Rev 7)
WPT151	2LP123742	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT152	1LP221466	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT153	2LP221466	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT154	10LP5364	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT155	1LP113763	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT156	218378893	Road Casement	Public	Other Access (Rev 7)
WPT158	2LP113763	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT159	1TP599592	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT160	1TP332315	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT161	6TP394032	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT162	2TP394032	Lot Parcel	Private	Other Access (Rev 7)
WPT163	2PS328947	Lot Parcel	Private	Other Access (Rev 7)
WPT164	1TP250233	Lot Parcel	Private	Other Access (Rev 7)
WPT165	218349043	Road Casement	Public	Other Access (Rev 7)
WPT166	1PS328946	Lot Parcel	Private	Other Access (Rev 7)
WPT167	6TP250233	Lot Parcel	Private	Other Access (Rev 7)
WPT168	1TP709372	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT169	2006PP3093	Water Casement	Crown	Affected by Pipeline (Rev 7)
WPT170	2LP67181	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT171	2TP843230	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT172	1TP746632	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT174	PC372952	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT175	1LP208748	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT176	218359831	Road Casement	Public	Affected by Pipeline (Rev 7)
WPT177	1LP38239	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT179	1TP709759	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT181	2LP133657	Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT182	218355271	Road Casement	Public	Affected by Pipeline (Rev 7)
WPT183	1TP168481	APA Owned Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT184	1TP710356	APA Owned Lot Parcel	Private	Affected by Pipeline (Rev 7)
WPT185	2LP130336	APA Owned Lot Parcel	Private	Affected by Pipeline (Rev 7)

14. **Plans and design specifications of the proposed pipeline including metering stations, aboveground and underground facilities**

A Design Basis Manual (WPT.2373-DBM-A-001) (**Attachment 5**) has been developed by APA for the pipeline and the associated pipeline facilities. The Design Basis Manual details the design scope, intent and requirements associated with the proposed WORM Project. Specifically, the Design Basis Manual describes the systems and components that are to be included in the delivery of the pipeline and those aspects which will be subject to further detailed design. The Design Basis Manual also includes the responsibilities, boundaries and interfaces of APA with other related entities.

APA is currently assessing whether there is market interest in constructing a DN600 pipeline to accommodate future expansion requirements of the market. This process will not be completed until mid-2021. Consequently, the Design Basis Manual has been based on a DN500 pipeline, however, with the option for a DN600 to be carried forward. Should a decision be made to progress with a DN600 pipeline, APA would need to make minor updates to the Design Basis Manual (to capture specific details, such as wall thickness), however, a change in diameter would not see any amendment to the proposed pipeline route and very minor impact to the construction footprint.

Privacy Statement

Any personal information about you or a third party in your correspondence will be protected under the provisions of the Privacy and Data Protection Act 2014. It will only be used or disclosed to appropriate Ministerial, Statutory Authority, or departmental staff in regard to the purpose for which it was provided, unless required or authorised by law. Enquiries about access to information about you held by the Department should be directed to the Privacy Coordinator, Department of Environment, Land, Water and Planning, PO Box 500, East Melbourne, Victoria 8002

DEPARTMENT OF ENVIRONMENT, LAND, WATER AND PLANNING

A plan of the proposed pipeline route is provided in **Attachment 1**. In addition, APA has provided a general process schematic, which presents an overview of the design parameters of the pipeline. The pipeline will terminate at the existing Wollert Compressor Station which will be upgraded to include a new Solar Centaur 50 compressor, an end of line scraper station and a regulating station.

Three above-ground mainline valves (MLV1, MLV2 and MLV3) will be located along the pipeline route, spaced at intervals of approximately 15 km. MLV1 will be constructed to the north of Holden Road and will be co-located with the existing Sunbury Pipeline MLV, MLV2 will be constructed to the east of Oaklands Road and MLV3 will be constructed to the south of Gunns Gully Road.

The design life of the pipeline and pipeline valves and assemblies (excluding scraper traps) is 60 years. Other station equipment, piping fixtures and instrumentation have a design life of between 10 and 40 years and will require maintenance and replacement during the pipeline design life.

The pipeline and facilities will be designed to be operated as an unmanned facility that is remotely controlled. The pipeline will also be provided with full local control facilities for flexibility of operation and maintenance troubleshooting for emergency management. The systems will be designed for fully automated, safe operation with optimised maintenance routines, in keeping with APA's procedures for emergency management, operability, maintainability and reliability requirements.

The APA basis of design and general technical requirements for the pipeline and pipeline facilities is subject to further detailed engineering design, which includes both technical and safety review. APA has procedures in place for the internal design review and approval that align with the requirements of AS/NZS 2885.1.

15. The benefit of the proposed pipeline to Victoria relative to its potential impacts

In 2020, AEMO identified risks of a natural gas supply shortfall in Victoria from 2024 onwards due to supply factors including network capacity constraints of the VTS resulting in inadequate transfer and storage rates in summer to meet winter peak demand (AEMO, 2020).

The pipeline will address this key capacity constraint in the 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. Addressing this missing link will provide system security and deliver improved network reliability by increasing the amount of natural gas that can be stored for times of peak demand and ensuring sufficient volumes of natural gas can be moved where it is needed most.

The AEMO 2021 updated forecasts, which projects a sufficient supply to address the 2024 shortfall, have assumed that the WORM Project would be operational by 2023 (AEMO, 2021). The preferred pipeline route and construction methodology has been selected to avoid and minimise impacts to areas of environmental, heritage or social significance. However, the pipeline results in localised environmental, cultural heritage, land use and social impacts during construction and operation. Some of the key impacts as identified by the supporting technical reports and discussion in Section 9 of this Pipeline Licence Application include:

- The removal of EPBC Act and FFG Act listed threatened communities
- The removal of habitat for the Golden Sun Moth and Striped Legless Lizard
- The loss of heritage value at 13 registered Aboriginal cultural heritage places.

Privacy Statement

Any personal information about you or a third party in your correspondence will be protected under the provisions of the Privacy and Data Protection Act 2014. It will only be used or disclosed to appropriate Ministerial, Statutory Authority, or departmental staff in regard to the purpose for which it was provided, unless required or authorised by law. Enquiries about access to information about you held by the Department should be directed to the Privacy Coordinator, Department of Environment, Land, Water and Planning, PO Box 500, East Melbourne, Victoria 8002

DEPARTMENT OF ENVIRONMENT, LAND, WATER AND PLANNING

Offsets would be provided in accordance with the Guidelines for the removal, destruction or lopping of native vegetation (DELWP 2017) and as required under the EPBC Act where impacts to ecological values are unavoidable.

Access and amenity impacts of the pipeline are not anticipated to have significant or ongoing adverse impacts on agricultural land uses, sensitive receptors or public areas after the pipeline is constructed and during its operational life. The impacts to current and future land uses will also be minimised due to the pipeline corridor being co-located within existing pipeline easements, the PAO for the OMR/E6 transport corridor, or existing road reserves.

The pipeline's impact on the OMR/E6 PAO has been avoided or minimised through consultation with DoT and the pipeline route design process. Any specific design requirements agreed to with DoT will be incorporated into a Coordination Deed between APA and DoT prior to commencement of works. These design requirements will ensure that the risks associated with the pipeline are reduced to an acceptable level to DoT.

Overall, the pipeline will provide increased energy security and reliability to Victoria whilst resulting in reductions to greenhouse gas emissions as a result of network operational efficiencies and reduced fuel requirements. Further, the pipeline will support the foundation for maintaining energy security to support the State's economic growth and development as Victoria transitions to a low-carbon economy.

In procuring the proposed pipe for the WORM project, consideration has been given to the future transport of hydrogen by the pipeline. Whilst the Australian standards for hydrogen pipelines are yet to be published, APA has taken measures to enable the pipe to be able to transport hydrogen if required at some time in the future.

The key sustainability aspects of the Project and the impact reduction measures as detailed in this application are summarised in Table 9 below.

Table 9 Principles of sustainable development, Pipelines Act 2005 (S4(2a-j))

Principle	Consideration
(a) individual and community wellbeing and welfare should be enhanced by following a path of economic development that safeguards the welfare of future generations;	As described in Section 3, the Project addresses a key capacity constraint in the VTS, delivering improved network reliability and energy security.
(b) there should be equity within and between generations;	As described in Section 8, APA has investigated the greenhouse gas emissions associated with the construction and operation of the Project to understand the implications of these emissions for Victorian and Commonwealth emission targets and the Climate Change Act 2017. Operation of the Project is estimated to result in a net reduction in emissions of 10,700 t CO ₂ -e per annum from improved network performance of the VTS, thereby contributing to Victoria's target of net-zero emissions by 2050.

Privacy Statement

Any personal information about you or a third party in your correspondence will be protected under the provisions of the Privacy and Data Protection Act 2014. It will only be used or disclosed to appropriate Ministerial, Statutory Authority, or departmental staff in regard to the purpose for which it was provided, unless required or authorised by law. Enquiries about access to information about you held by the Department should be directed to the Privacy Coordinator, Department of Environment, Land, Water and Planning, PO Box 500, East Melbourne, Victoria 8002

DEPARTMENT OF ENVIRONMENT, LAND, WATER AND PLANNING

<p>(c) biological diversity should be protected and ecological integrity maintained;</p>	<p>As described in Sections 8, 10 and 11, the impacts on vegetation and habitat for threatened fauna have been avoided where possible through pipeline route selection and by minimising habitat disturbance through application of construction methodologies and management measures. Where impacts to ecological values are unavoidable or cannot be mitigated, offsets would be obtained in accordance with relevant legislation and guidelines to achieve no net loss to biodiversity from the operation of the VTS.</p>
<p>(d) there should be recognition of the need to develop a strong, growing, diversified and internationally competitive economy that can enhance the capacity for environment protection;</p>	<p>The Project will improve network reliability and energy security to support economic development, while also delivering energy efficiencies that reduce emissions from the operation of the VTS.</p>
<p>(e) measures to be adopted should be cost effective and flexible, not disproportionate to the issues being addressed, including improved valuation, pricing and incentive mechanisms;</p>	<p>As described in Section 10, mitigation measures have been developed to address environmental, heritage, social, health and safety impacts of the Project. These measures are effective, appropriate and consistent with industry standards.</p>
<p>(f) both long and short term economic, environmental, social and equity considerations should be effectively integrated into decision-making;</p>	<p>As described in Section 10 and 11, the economic, environmental, social and equity considerations have driven decision making in the development of the Project. In particular, during the route selection process and the development of management measures. The identification of potential impacts (Section 8 and 9) and the proposed management measures allows the Minister to consider these matters in making a decision on this application.</p>
<p>(g) if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation;</p>	<p>As described in Section 8, 9 and 10, the environmental impacts of the Project are well understood, with measures taken to avoid or mitigate environmental degradation. As a result, there are no residual serious or irreversible environmental risks identified.</p>
<p>(h) decision-making should be guided by—</p> <p>(i) a careful evaluation to avoid serious or irreversible damage to the environment wherever practicable; and</p> <p>(ii) an assessment of the risk-weighted consequences of various options;</p>	<p>As described in Section 11 and 12, the route selection entailed a detailed iterative design process to avoid and minimise potential impacts. This included consideration of the risks of the various options and resulted in the selection of a route where environmental impacts were avoided to the greatest extent possible (Option C).</p>
<p>(i) development should make a positive contribution to regional</p>	<p>APA is committed to contributing to local communities, both through understanding the communities values and identifying opportunities</p>

Privacy Statement

Any personal information about you or a third party in your correspondence will be protected under the provisions of the Privacy and Data Protection Act 2014. It will only be used or disclosed to appropriate Ministerial, Statutory Authority, or departmental staff in regard to the purpose for which it was provided, unless required or authorised by law. Enquiries about access to information about you held by the Department should be directed to the Privacy Coordinator, Department of Environment, Land, Water and Planning, PO Box 500, East Melbourne, Victoria 8002

DEPARTMENT OF ENVIRONMENT, LAND, WATER AND PLANNING

<p>development and respect the aspirations of the community and of Indigenous peoples;</p>	<p>where economic and social benefits can be explored via the Project. In identifying any opportunities, APA's engagement activities with Traditional Owners is based on a relationship approach with our commitment to developing and maintaining constructive relationships. In addition to the identification and respect of Aboriginal values, the WORM project will seek to provide mutual value for both Traditional Owners and APA.</p> <p>Section 3 of this application describes the WORM pipeline as critical infrastructure in the delivery of Victoria's gas supply and its more efficient transmission, security of supply and affordability. The Project is expected to generate up to 500 jobs during the design, procurement, approvals and construction phases. It is important to recognise that the majority of these jobs will be specialised occupations via contractors.</p> <p>APA will engage with local businesses to identify potential opportunities to be involved with the project. Through our procurement and contractor engagement processes, APA seeks responses to utilisation of local people and services and employment opportunities for first peoples.</p> <p>APA's approach and consideration of community investment is evolving and is considered on a project by project basis. Community investment provides opportunities for the community, including Traditional Owners, to benefit from various types of support, including potentially financial, for programs or projects of value to them. Opportunities for such investment will be sought through direct engagement with the communities and governance bodies such as the RAP and Local Government.</p> <p>As described in Section 8 and 9, the Project has engaged with community and Traditional Owner groups to identify and understand social and cultural values held and therefore better understand the potential impacts arising from the construction and operation of the pipeline. The development of the Project has sought to avoid these impacts where possible. Residual social impacts associated with the Project are considered minor with any potential adverse impacts mitigated or minimised through the implementation of management measures.</p> <p>Two CHMPs are being developed for the Project, with cultural heritage impacts avoided or minimised through the implementation of mitigation measures developed in consultation with Traditional Owners. Further, APA is working with Traditional Owners to identify and document potential intangible cultural heritage values within the Project area.</p> <p>The Project will seek to foster a culture of responsibility, leadership and awareness of heritage obligations and practices, and maintain respect for the past and protection of the future, in accordance with APA's Environment and Heritage Policy.</p>
<p>(j) decisions and actions should provide for community involvement in issues that affect them.</p>	<p>As described in Section 12, the development of the Project has occurred through ongoing consultation with affected stakeholders. This has included consultation with landowners to discuss potential issues or concerns. Measures for managing impacts to landowners during the construction and operation of the Project are provided in</p>

Privacy Statement

Any personal information about you or a third party in your correspondence will be protected under the provisions of the Privacy and Data Protection Act 2014. It will only be used or disclosed to appropriate Ministerial, Statutory Authority, or departmental staff in regard to the purpose for which it was provided, unless required or authorised by law. Enquiries about access to information about you held by the Department should be directed to the Privacy Coordinator, Department of Environment, Land, Water and Planning, PO Box 500, East Melbourne, Victoria 8002

DEPARTMENT OF ENVIRONMENT, LAND, WATER AND PLANNING

	<p>the CEMP. Stakeholder engagement processes, including consultation with landowners, is described in the Consultation Plan.</p> <p>In addition to the above, the community will have the opportunity for further involvement and input through the advertised exhibition and submission process for this pipeline licence application and associated EES.</p>
--	---

16. The assessment of the Environment Effects Minister in relation to the proposed pipeline, if an assessment has been made

APA referred the gas pipeline proposal to the Victorian Government under the *Environment Effects Act 1978* (EE Act) and on 22 December 2019, the Minister for Planning issued a decision determining that an Environment Effects Statement (EES) was required for the proposal. The EES process is underway and the Minister's assessment is expected at the conclusion of this process.

The pipeline proposal was referred to the Commonwealth Government under the EPBC Act and was designated as a controlled action on 2 February 2020, requiring assessment and approval under the EPBC Act prior to the Project proceeding.

The EES process is the accredited environmental assessment process for the controlled action decisions under the EPBC Act in accordance with the bilateral agreement between the Commonwealth and Victoria.

Privacy Statement

Any personal information about you or a third party in your correspondence will be protected under the provisions of the Privacy and Data Protection Act 2014. It will only be used or disclosed to appropriate Ministerial, Statutory Authority, or departmental staff in regard to the purpose for which it was provided, unless required or authorised by law. Enquiries about access to information about you held by the Department should be directed to the Privacy Coordinator, Department of Environment, Land, Water and Planning, PO Box 500, East Melbourne, Victoria 8002

DEPARTMENT OF ENVIRONMENT, LAND, WATER AND PLANNING

17. Signature(s)	
Signature of authorised person(s)	Date
	17 June 2021
Full name	Position
	General Manager Infrastructure Planning & Approvals
Company	
APA VTS Australia (Operations) Pty Limited	

Affix Company seal(s) here if applicable (refer to s127 of the *Corporations Act 2001* for requirement to execute a document either with a Company seal affixed or without)

This application must be accompanied by the following:
<p>1. Please provide all documents and this application in an electronic form.</p> <p><i>Attachments</i></p> <ul style="list-style-type: none"> <i>Attachment 1 – Pipeline Licence Application Mapbook</i> <i>Attachment 2 – Construction Environment Management Plan</i> <i>Attachment 3 – Health and Safety Management Plan</i> <i>Attachment 4 – Pipeline Consultation Plan</i> <i>Attachment 5 – Design Basis Manual</i> <i>Attachment 6 – General Layout Plan - Wollert Compressor Station</i> <p><i>References</i></p> <ul style="list-style-type: none"> ■ <i>S/NZS 2885.1-2018: Pipelines – Gas and liquid petroleum (design and construction)</i> ■ <i>Route Options Report - Western Outer Ring Main Project (APA, March 2019)</i> ■ <i>Western Outer Ring Main, Environment Effects Statement – Biodiversity and Habitats Report (GHD 2021).</i> ■ <i>Western Outer Ring Main Environment Effects Statement – Surface Water Report (GHD 2021).</i> ■ <i>Western Outer Ring Main, Environment Effects Statement – Land Stability and Ground Movement Report (GHD 2021)</i> ■ <i>Western Outer Ring Main, Environment Effects Statement – Groundwater Report (GHD 2021).</i> ■ <i>Western Outer Ring Main, Environment Effects Statement - Contamination Report (GHD 2021).</i> ■ <i>Western Outer Ring Main, Environment Effects Statement – Greenhouse Gas Report (GHD 2021).</i>

Privacy Statement

Any personal information about you or a third party in your correspondence will be protected under the provisions of the Privacy and Data Protection Act 2014. It will only be used or disclosed to appropriate Ministerial, Statutory Authority, or departmental staff in regard to the purpose for which it was provided, unless required or authorised by law. Enquiries about access to information about you held by the Department should be directed to the Privacy Coordinator, Department of Environment, Land, Water and Planning, PO Box 500, East Melbourne, Victoria 8002

DEPARTMENT OF ENVIRONMENT, LAND, WATER AND PLANNING

- *Western Outer Ring Main, Environment Effects Statement – Agriculture Impact Assessment Report (GHD 2021).*
- *Western Outer Ring Main Environment Effects Statement Technical impact assessment – Land use and planning (GHD, 2021).*
- *Western Outer Ring Main, Environment Effects Statement – Social Impact Assessment Report (GHD 2021).*
- *Western Outer Ring Main Environment Effects Statement – Landscape and visual report (GHD 2020)*
- *Western Outer Ring Main - Environment Effects Statement Noise Vibration Report (GHD, 2021)*
- *Western Outer Ring Main - Environment Effects Statement Air Quality Report (GHD, 2021)*
- *Western Outer Ring Main, Environment Effects Statement technical report – Aboriginal and historic heritage report (Biosis 2021).*
- *Western Outer Ring Main Route Selection (APA, October 2020)*
- *WORM/OMR PAO Interface Report – Access and Approvals – Western Outer Ring Main (APA, March 2020)*

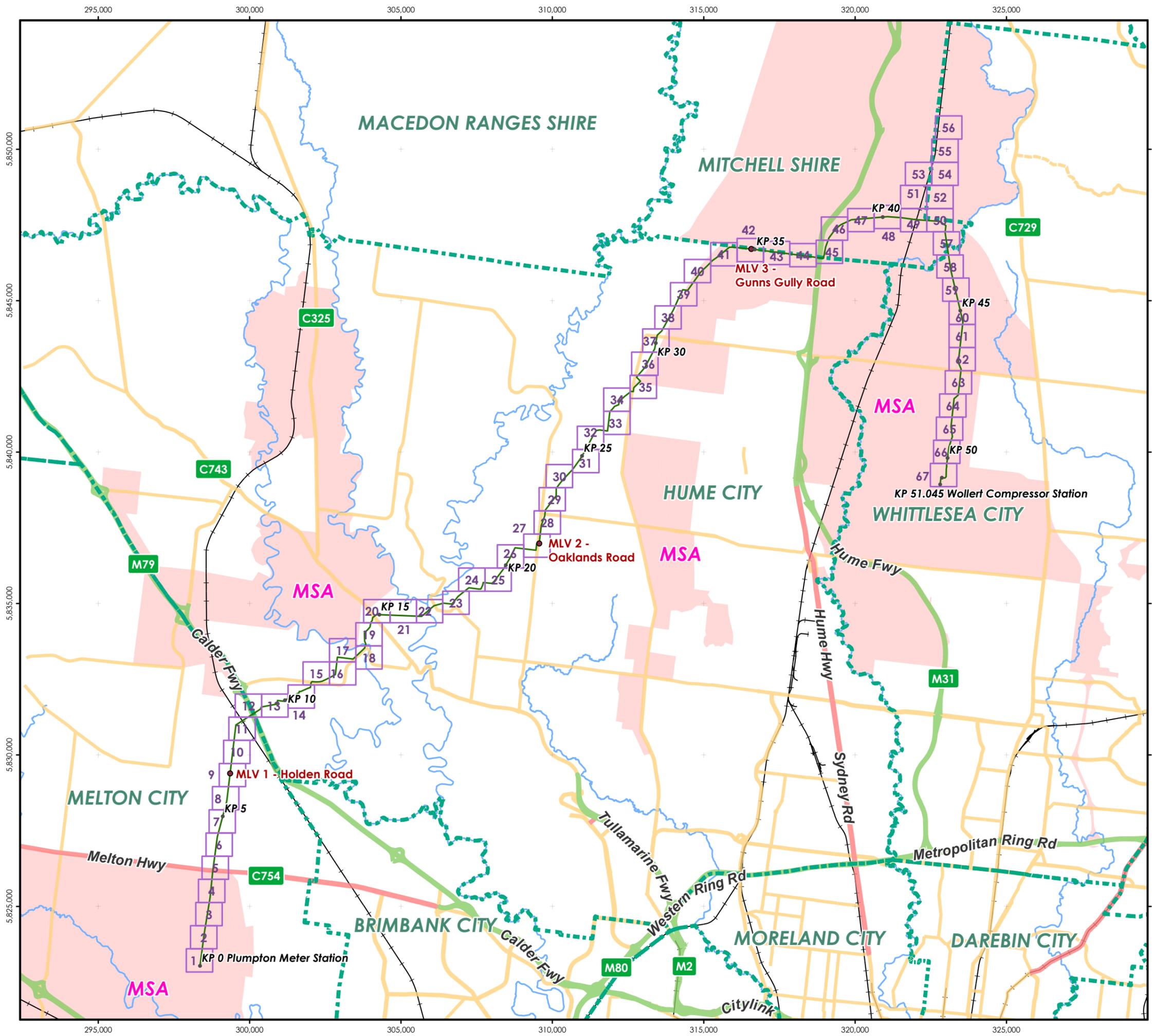
Privacy Statement

Any personal information about you or a third party in your correspondence will be protected under the provisions of the Privacy and Data Protection Act 2014. It will only be used or disclosed to appropriate Ministerial, Statutory Authority, or departmental staff in regard to the purpose for which it was provided, unless required or authorised by law. Enquiries about access to information about you held by the Department should be directed to the Privacy Coordinator, Department of Environment, Land, Water and Planning, PO Box 500, East Melbourne, Victoria 8002

Attachment 1 – Pipeline Licence Application Mapbook

Privacy Statement

Any personal information about you or a third party in your correspondence will be protected under the provisions of the Privacy and Data Protection Act 2014. It will only be used or disclosed to appropriate Ministerial, Statutory Authority, or departmental staff in regard to the purpose for which it was provided, unless required or authorised by law. Enquiries about access to information about you held by the Department should be directed to the Privacy Coordinator, Department of Environment, Land, Water and Planning, PO Box 500, East Melbourne, Victoria 8002



PROJECT: Western Outer Ring Main
TITLE: Pipeline Licence Application
SUBTITLE: Mapbook Overview
DATE: 28/06/2021
DATA SOURCE:
 © Geoscience Australia 2016 - Locations and Roads

LEGEND:

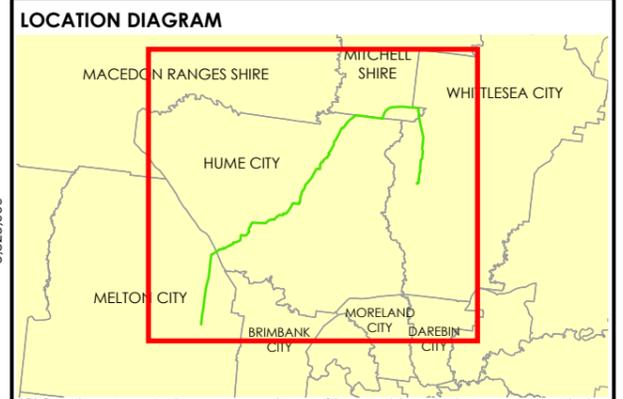
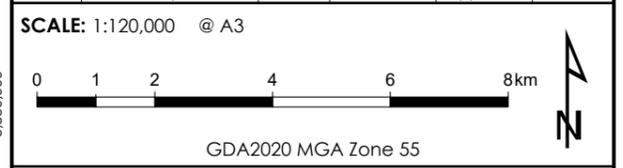
- Main Line Valve Location
- Pipeline Kilometre Points
- Railway Track
- Drainage Line
- Municipal Boundary
- MSA

Roads

- Freeway
- Highway
- Primary Road
- Secondary Road
- Secondary Road, Unsealed

SERIAL NUMBER: WPT-MAP-L-0165
DOCUMENT NUMBER: WPT.2373-MAP-L-0175.00_3_IFU

3.0	Issued for Use	ST	MG	BS	28/06/21
2.0	Issued for Use	ST	EH	BS	17/06/21
1.0	Issued for Use	ST	EH	BS	15/06/21
0.2	Draft	ST	EH	BS	9/06/21
0.1	Draft	ST	EH	BS	6/06/21
Revision	Description	Drawn	Checked/QC	Approved	Date



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.



APA Group
 Phone: 1800 951 444
 Web: www.apa.com.au
 Email: worm@apa.com.au

PROJECT: Western Outer Ring Main
TITLE: Pipeline Licence Application
SUBTITLE: Map 1 of 67
DATE: 28/06/2021

DATA SOURCE:
 Nearmap AU Image Service:
 © Geoscience Australia 2016 - Locations and Roads

LEGEND:

- Pipeline Kilometre Points
- Neighbouring Map
- Water
- Drainage Line
- Parcel Boundary Along Pipeline Route (Survey Adjusted)
- Pipeline Corridor
- Municipal Boundary
- MSA

Roads

- Tertiary Road
- Minor Road
- Future Road

Pipeline Route (Pipeline Construction Method)

- Open Trench

Easement Status

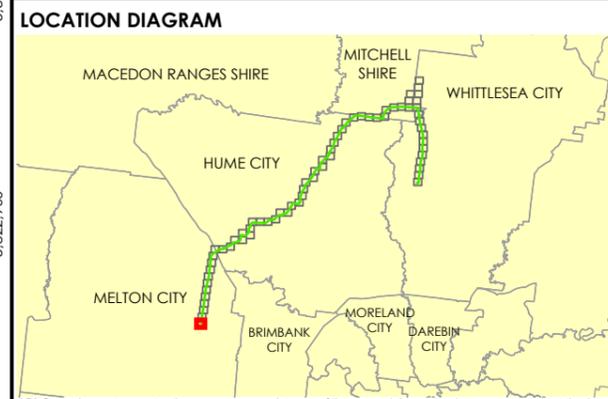
- Existing Pipeline Easement

SERIAL NUMBER: WPT-MAP-L-0165
DOCUMENT NUMBER: WPT.2373-MAP-L-0175.01_3_IFU

Revision	Description	Drawn	Checked/QC	Approved	Date
3.0	Issued for Use	ST		BS	28/06/21
2.0	Issued for Use	ST	MG	BS	17/06/21
1.0	Issued for Use	ST	EH	BS	15/06/21
0.2	Draft	ST	EH	BS	9/06/21
0.1	Draft	ST	EH	BS	6/06/21

SCALE: 1:3,000 @ A3

GDA2020 MGA Zone 55



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.

298,100 298,200 298,300 298,400 298,500 298,600 298,700 298,800 298,900

5,824,300
5,824,200
5,824,100
5,824,000
5,823,900
5,823,800
5,823,700
5,823,600



APA Group
Phone: 1800 951 444
Web: www.apa.com.au
Email: worm@apa.com.au

PROJECT: Western Outer Ring Main

TITLE: Pipeline Licence Application

SUBTITLE: Map 2 of 67

DATE: 28/06/2021

DATA SOURCE:
Nearmap AU Image Service:
© Geoscience Australia 2016 - Locations and Roads

LEGEND:

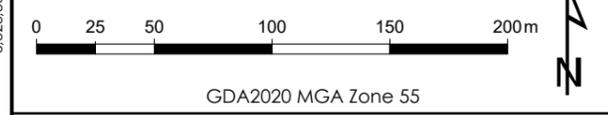
- Pipeline Kilometre Points
- Neighbouring Map
- Water
- Drainage Line
- Parcel Boundary Along Pipeline Route (Survey Adjusted)
- Pipeline Corridor
- Municipal Boundary
- MSA
- Roads**
- Tertiary Road
- Minor Road
- Future Road
- Pipeline Route (Pipeline Construction Method)**
- Open Trench
- Preplaced Concrete Sleeve
- Easement Status**
- Existing Pipeline Easement

SERIAL NUMBER: WPT-MAP-L-0165

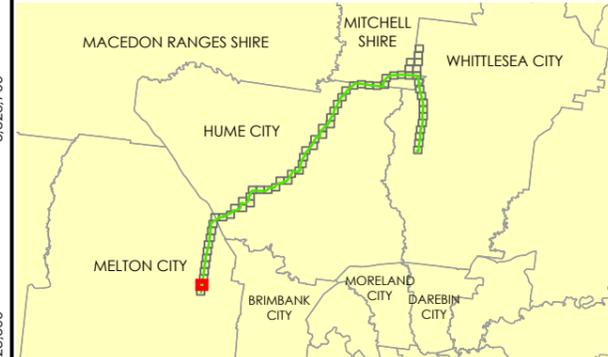
DOCUMENT NUMBER: WPT.2373-MAP-L-0175.02_3_IFU

3.0	Issued for Use	ST	MG	BS	28/06/21
2.0	Issued for Use	ST	EH	BS	17/06/21
1.0	Issued for Use	ST	EH	BS	15/06/21
0.2	Draft	ST	EH	BS	9/06/21
0.1	Draft	ST	EH	BS	6/06/21
Revision	Description	Drawn	Checked/QC	Approved	Date

SCALE: 1:3,000 @ A3



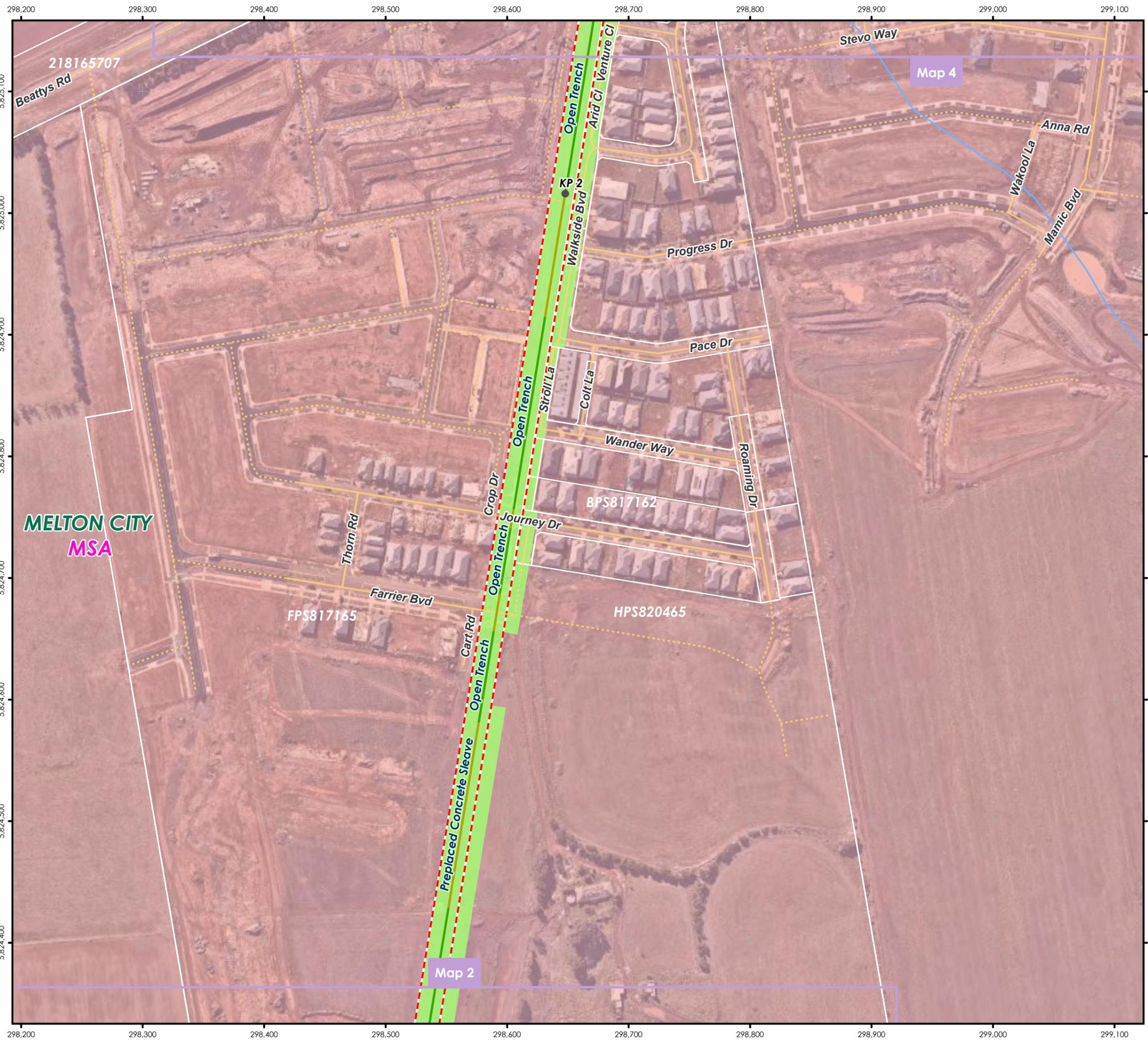
LOCATION DIAGRAM



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.

298,100 298,200 298,300 298,400 298,500 298,600 298,700 298,800 298,900

Y:\Projects\WORM\ArcPro\WORM_Rev8_Layouts\WORM_Rev8_Layouts.aprx - 28 Jun 2021 - simll



MELTON CITY
MSA



APA Group
 Phone: 1800 951 444
 Web: www.apa.com.au
 Email: worm@apa.com.au

PROJECT: Western Outer Ring Main
TITLE: Pipeline Licence Application
SUBTITLE: Map 3 of 67
DATE: 28/06/2021

DATA SOURCE:
 Nearmap AU Image Service:
 © Geoscience Australia 2016 - Locations and Roads

LEGEND:

- Pipeline Kilometre Points
- ▭ Neighbouring Map
- Drainage Line
- ▭ Parcel Boundary Along Pipeline Route (Survey Adjusted)
- ▭ Pipeline Corridor
- ▭ Municipal Boundary
- ▭ MSA

Roads

- Minor Road
- Minor Road, Unsealed
- Future Road

Pipeline Route (Pipeline Construction Method)

- Open Trench
- Preplaced Concrete Sleeve

Easement Status

- - - Existing Pipeline Easement

SERIAL NUMBER: WPT-MAP-L-0165
DOCUMENT NUMBER: WPT.2373-MAP-L-0175.03_3_IFU

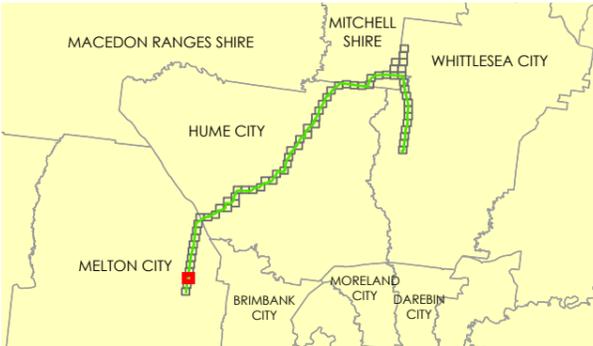
Revision	Description	Drawn	Checked/QC	Approved	Date
3.0	Issued for Use	ST		BS	28/06/21
2.0	Issued for Use	ST	MG	BS	17/06/21
1.0	Issued for Use	ST	EH	BS	15/06/21
0.2	Draft	ST	EH	BS	9/06/21
0.1	Draft	ST	EH	BS	6/06/21

SCALE: 1:3,000 @ A3



GDA2020 MGA Zone 55

LOCATION DIAGRAM



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.

Y:\Projects\WORM\ArcPro\WORM_Rev8_Layouts\WORM_Rev8_Layouts.aprx - 28 Jun 2021 - simli



APA Group
 Phone: 1800 951 444
 Web: www.apa.com.au
 Email: worm@apa.com.au

PROJECT: Western Outer Ring Main
TITLE: Pipeline Licence Application
SUBTITLE: Map 4 of 67
DATE: 28/06/2021

DATA SOURCE:
 Nearmap AU Image Service:
 © Geoscience Australia 2016 - Locations and Roads

LEGEND:

- Neighbouring Map
- Drainage Line
- Parcel Boundary Along Pipeline Route (Survey Adjusted)
- Pipeline Corridor
- Municipal Boundary
- MSA

Roads

- Minor Road
- Minor Road, Unsealed
- Future Road

Pipeline Route (Pipeline Construction Method)

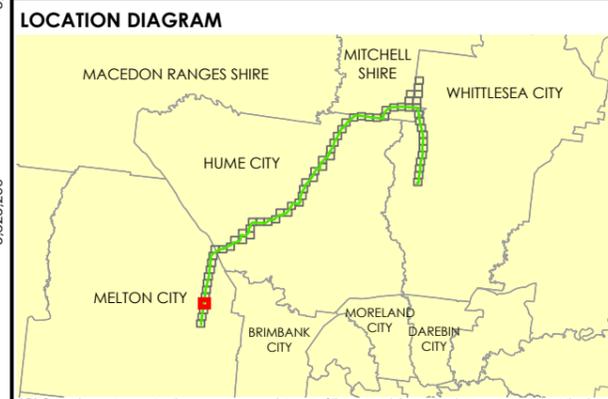
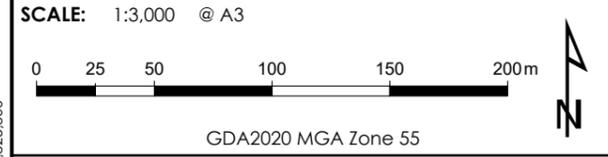
- HDD
- Open Trench

Easement Status

- Existing Pipeline Easement

SERIAL NUMBER: WPT-MAP-L-0165
DOCUMENT NUMBER: WPT.2373-MAP-L-0175.04_3_IFU

Revision	Description	Drawn	Checked/QC	Approved	Date
3.0	Issued for Use	ST		BS	28/06/21
2.0	Issued for Use	ST	MG	BS	17/06/21
1.0	Issued for Use	ST	EH	BS	15/06/21
0.2	Draft	ST	EH	BS	9/06/21
0.1	Draft	ST	EH	BS	6/06/21



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.



Map 6

Map 4



APA Group
 Phone: 1800 951 444
 Web: www.apa.com.au
 Email: worm@apa.com.au

PROJECT: Western Outer Ring Main

TITLE: Pipeline Licence Application

SUBTITLE: Map 5 of 67

DATE: 28/06/2021

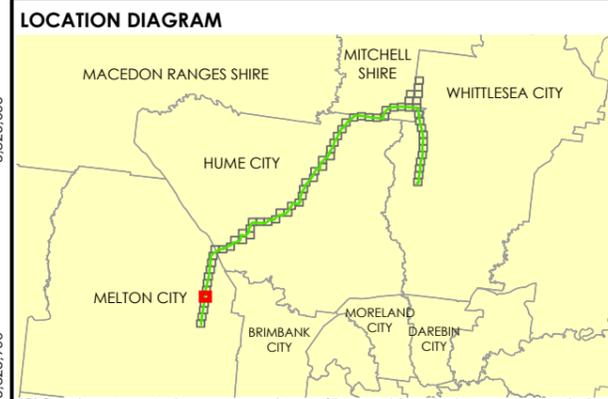
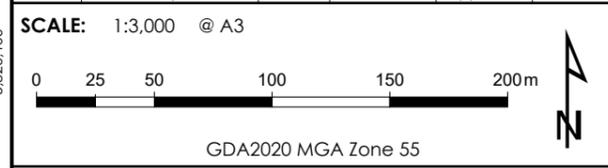
DATA SOURCE:
 Nearmap AU Image Service:
 © Geoscience Australia 2016 - Locations and Roads

LEGEND:

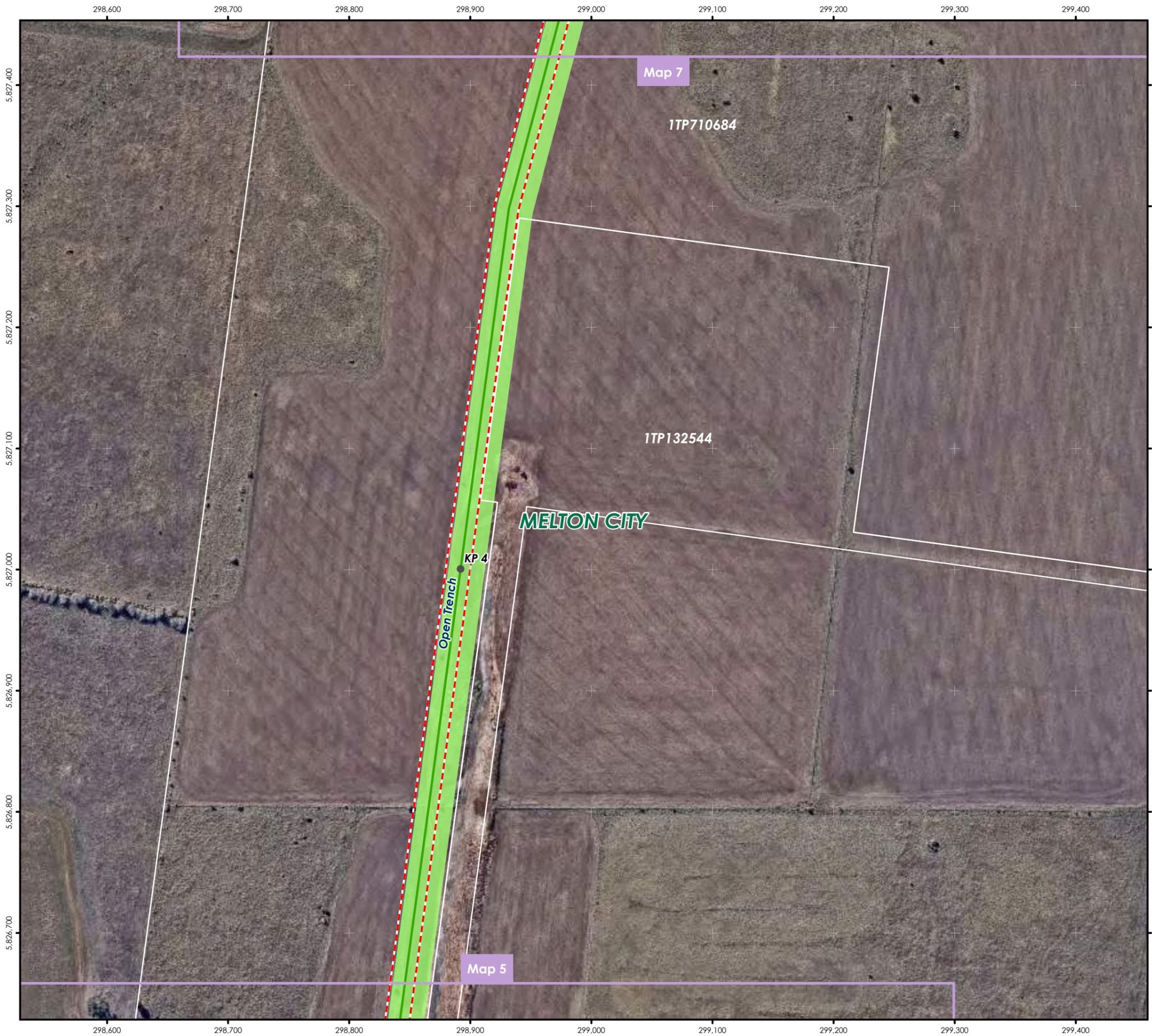
- Pipeline Kilometre Points
- Neighbouring Map
- Water
- Parcel Boundary Along Pipeline Route (Survey Adjusted)
- Pipeline Corridor
- Municipal Boundary
- MSA
- Roads**
- Highway
- Minor Road
- Future Road
- Pipeline Route (Pipeline Construction Method)**
- HDD
- Open Trench
- Easement Status**
- - - Existing Pipeline Easement

SERIAL NUMBER: WPT-MAP-L-0165
DOCUMENT NUMBER: WPT.2373-MAP-L-0175.05_3_IFU

Revision	Description	Drawn	Checked/QC	Approved	Date	
3.0	Issued for Use	ST		MG	BS	28/06/21
2.0	Issued for Use	ST		EH	BS	17/06/21
1.0	Issued for Use	ST		EH	BS	15/06/21
0.2	Draft	ST		EH	BS	9/06/21
0.1	Draft	ST		EH	BS	6/06/21



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.



APA Group
 Phone: 1800 951 444
 Web: www.apa.com.au
 Email: worm@apa.com.au

PROJECT: Western Outer Ring Main
TITLE: Pipeline Licence Application
SUBTITLE: Map 6 of 67
DATE: 28/06/2021

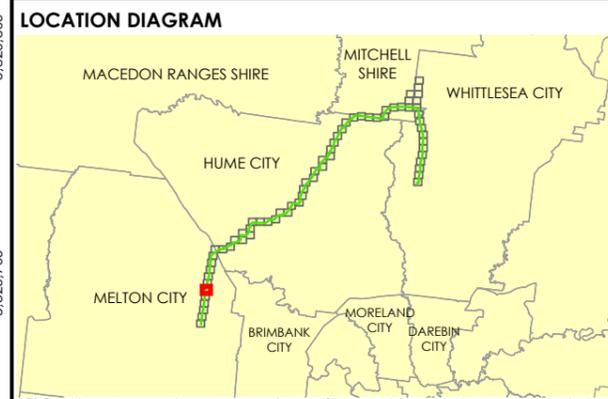
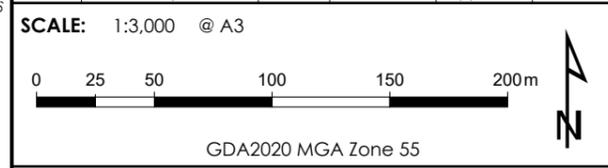
DATA SOURCE:
 Nearmap AU Image Service:
 © Geoscience Australia 2016 - Locations and Roads

LEGEND:

- Pipeline Kilometre Points
- Neighbouring Map
- ▭ Parcel Boundary Along Pipeline Route (Survey Adjusted)
- ▭ Pipeline Corridor
- ▭ Municipal Boundary
- Pipeline Route (Pipeline Construction Method)
 - Open Trench
 - - - Existing Pipeline Easement

SERIAL NUMBER: WPT-MAP-L-0165
DOCUMENT NUMBER: WPT.2373-MAP-L-0175.06_3_IFU

Revision	Description	Drawn	Checked/QC	Approved	Date
3.0	Issued for Use	ST			28/06/21
2.0	Issued for Use	ST	MG	BS	17/06/21
1.0	Issued for Use	ST	EH	BS	15/06/21
0.2	Draft	ST	EH	BS	9/06/21
0.1	Draft	ST	EH	BS	6/06/21



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.



APA Group
 Phone: 1800 951 444
 Web: www.apa.com.au
 Email: worm@apa.com.au

PROJECT: Western Outer Ring Main
TITLE: Pipeline Licence Application
SUBTITLE: Map 7 of 67
DATE: 28/06/2021

DATA SOURCE:
 Nearmap AU Image Service:
 © Geoscience Australia 2016 - Locations and Roads

LEGEND:

- Pipeline Kilometre Points
- Neighbouring Map
- Drainage Line
- ▭ Parcel Boundary Along Pipeline Route (Survey Adjusted)
- ▭ Pipeline Corridor
- ▭ Municipal Boundary

Pipeline Route (Pipeline Construction Method)

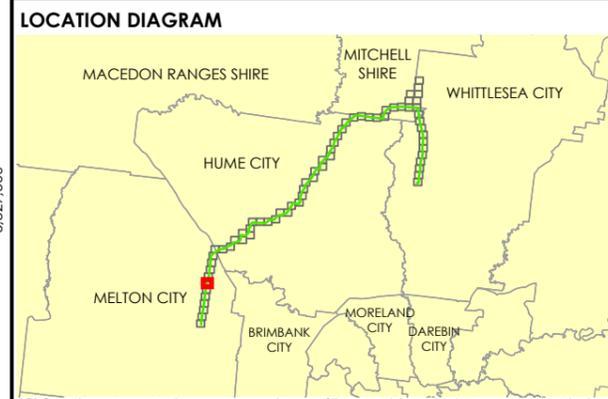
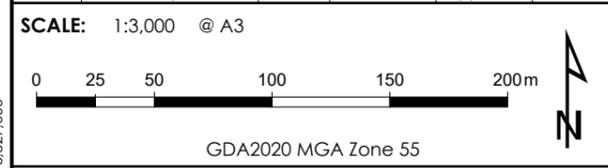
- Open Trench

Easement Status

- - - Existing Pipeline Easement

SERIAL NUMBER: WPT-MAP-L-0165
DOCUMENT NUMBER: WPT.2373-MAP-L-0175.07_3_IFU

Revision	Description	Drawn	Checked/QC	Approved	Date
3.0	Issued for Use	ST			28/06/21
2.0	Issued for Use	ST	MG	BS	17/06/21
1.0	Issued for Use	ST	EH	BS	15/06/21
0.2	Draft	ST	EH	BS	9/06/21
0.1	Draft	ST	EH	BS	6/06/21



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.



APA Group
 Phone: 1800 951 444
 Web: www.apa.com.au
 Email: worm@apa.com.au

PROJECT: Western Outer Ring Main
TITLE: Pipeline Licence Application
SUBTITLE: Map 8 of 67
DATE: 28/06/2021

DATA SOURCE:
 Nearmap AU Image Service:
 © Geoscience Australia 2016 - Locations and Roads

LEGEND:

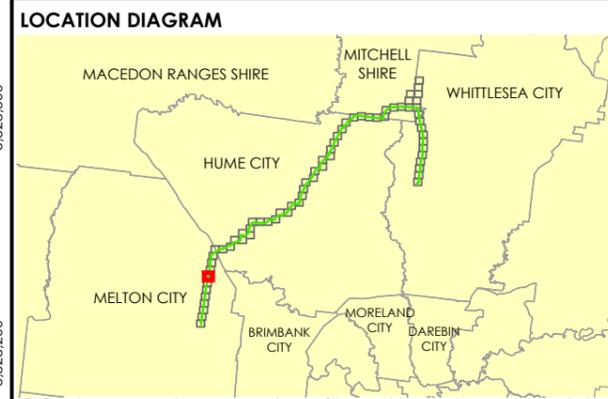
- Pipeline Kilometre Points
- Neighbouring Map
- ▭ Parcel Boundary Along Pipeline Route (Survey Adjusted)
- ▭ Pipeline Corridor
- ▭ Municipal Boundary
- Pipeline Route (Pipeline Construction Method)
 - Open Trench
- Easement Status
 - - - Existing Pipeline Easement

SERIAL NUMBER: WPT-MAP-L-0165
DOCUMENT NUMBER: WPT.2373-MAP-L-0175.08_3_IFU

Revision	Description	Drawn	Checked/QC	Approved	Date
3.0	Issued for Use	ST			28/06/21
2.0	Issued for Use	ST	MG	BS	17/06/21
1.0	Issued for Use	ST	EH	BS	15/06/21
0.2	Draft	ST	EH	BS	9/06/21
0.1	Draft	ST	EH	BS	6/06/21

SCALE: 1:3,000 @ A3

GDA2020 MGA Zone 55



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.



APA Group
 Phone: 1800 951 444
 Web: www.apa.com.au
 Email: worm@apa.com.au

PROJECT: Western Outer Ring Main
TITLE: Pipeline Licence Application
SUBTITLE: Map 9 of 67
DATE: 28/06/2021

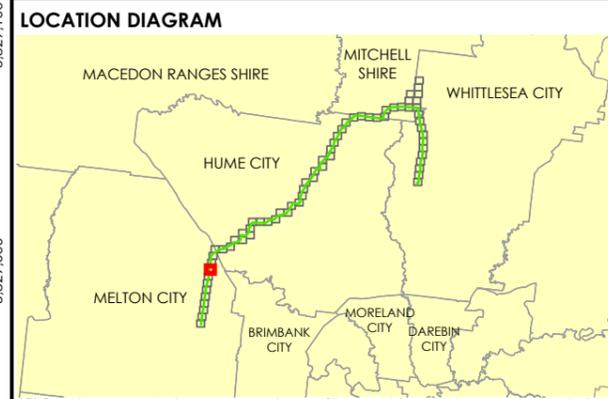
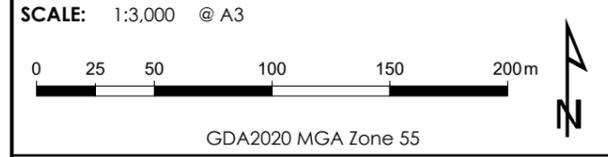
DATA SOURCE:
 Nearmap AU Image Service:
 © Geoscience Australia 2016 - Locations and Roads

LEGEND:

- Main Line Valve Location
- Pipeline Kilometre Points
- Neighbouring Map
- Drainage Line
- Parcel Boundary Along Pipeline Route (Survey Adjusted)
- Pipeline Corridor
- Municipal Boundary
- Roads**
- Minor Road, Unsealed
- Pipeline Route (Pipeline Construction Method)**
- Horizontal Bore - Special Crossing
- Open Trench
- Easement Status**
- Existing Pipeline Easement

SERIAL NUMBER: WPT-MAP-L-0165
DOCUMENT NUMBER: WPT.2373-MAP-L-0175.09_3_IFU

3.0	Issued for Use	ST		BS	28/06/21
2.0	Issued for Use	ST	MG	BS	17/06/21
1.0	Issued for Use	ST	EH	BS	15/06/21
0.2	Draft	ST	EH	BS	9/06/21
0.1	Draft	ST	EH	BS	6/06/21
Revision	Description	Drawn	Checked/QC	Approved	Date



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.



APA Group
 Phone: 1800 951 444
 Web: www.apa.com.au
 Email: worm@apa.com.au

PROJECT: Western Outer Ring Main
TITLE: Pipeline Licence Application
SUBTITLE: Map 10 of 67
DATE: 28/06/2021

DATA SOURCE:
 Nearmap AU Image Service:
 © Geoscience Australia 2016 - Locations and Roads

LEGEND:

- Pipeline Kilometre Points
- Neighbouring Map
- Water
- Drainage Line
- Parcel Boundary Along Pipeline Route (Survey Adjusted)
- Pipeline Corridor
- Municipal Boundary

Pipeline Route (Pipeline Construction Method)

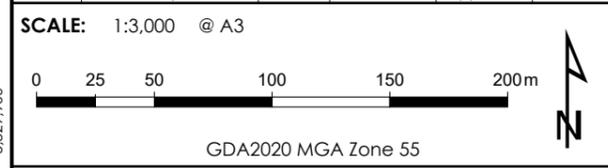
- Open Trench

Easement Status

- - - Existing Pipeline Easement

SERIAL NUMBER: WPT-MAP-L-0165
DOCUMENT NUMBER: WPT.2373-MAP-L-0175.10_3_IFU

Revision	Description	Drawn	Checked/QC	Approved	Date
3.0	Issued for Use	ST			28/06/21
2.0	Issued for Use	ST	MG	BS	17/06/21
1.0	Issued for Use	ST	EH	BS	15/06/21
0.2	Draft	ST	EH	BS	9/06/21
0.1	Draft	ST	EH	BS	6/06/21



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.



APA Group
 Phone: 1800 951 444
 Web: www.apa.com.au
 Email: worm@apa.com.au

PROJECT: Western Outer Ring Main

TITLE: Pipeline Licence Application

SUBTITLE: Map 11 of 67

DATE: 28/06/2021

DATA SOURCE:
 Nearmap AU Image Service:
 © Geoscience Australia 2016 - Locations and Roads

LEGEND:

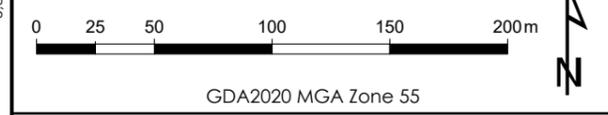
- Pipeline Kilometre Points
- Neighbouring Map
- Railway Track
- Water
- Drainage Line
- Parcel Boundary Along Pipeline Route (Survey Adjusted)
- Pipeline Corridor
- Municipal Boundary
- Roads**
- Freeway
- Pipeline Route (Pipeline Construction Method)**
- Horizontal Laser Bore - Pipe Jacking
- Open Trench
- Easement Status**
- Existing Pipeline Easement

SERIAL NUMBER: WPT-MAP-L-0165

DOCUMENT NUMBER: WPT.2373-MAP-L-0175.11_3_IFU

3.0	Issued for Use	ST			28/06/21
2.0	Issued for Use	ST	MG	BS	17/06/21
1.0	Issued for Use	ST	EH	BS	15/06/21
0.2	Draft	ST	EH	BS	9/06/21
0.1	Draft	ST	EH	BS	6/06/21
Revision	Description	Drawn	Checked/QC	Approved	Date

SCALE: 1:3,000 @ A3



LOCATION DIAGRAM



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.





APA Group
 Phone: 1800 951 444
 Web: www.apa.com.au
 Email: worm@apa.com.au

PROJECT: Western Outer Ring Main
TITLE: Pipeline Licence Application
SUBTITLE: Map 12 of 67
DATE: 28/06/2021

DATA SOURCE:
 Nearmap AU Image Service:
 © Geoscience Australia 2016 - Locations and Roads

LEGEND:

- Pipeline Kilometre Points
- Neighbouring Map
- Railway Track
- Water
- Drainage Line
- Parcel Boundary Along Pipeline Route (Survey Adjusted)
- Pipeline Corridor
- Municipal Boundary

Roads

- Freeway
- Minor Road

Pipeline Route (Pipeline Construction Method)

- HDD
- Open Trench

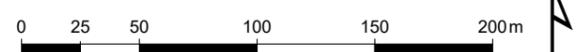
Easement Status

- Existing Pipeline Easement
- New Easement to Operate Pipeline

SERIAL NUMBER: WPT-MAP-L-0165
DOCUMENT NUMBER: WPT.2373-MAP-L-0175.12_3_IFU

Revision	Description	Drawn	Checked/QC	Approved	Date	
3.0	Issued for Use	ST		MG	BS	28/06/21
2.0	Issued for Use	ST		MG	BS	17/06/21
1.0	Issued for Use	ST		EH	BS	15/06/21
0.2	Draft	ST		EH	BS	9/06/21
0.1	Draft	ST		EH	BS	6/06/21

SCALE: 1:3,000 @ A3



GDA2020 MGA Zone 55

LOCATION DIAGRAM



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.

Y:\Projects\WORM\ArcPro\WORM_Rev8_Layouts\WORM_Rev8_Layouts.aprx - 28 Jun 2021 - simll



APA Group
 Phone: 1800 951 444
 Web: www.apa.com.au
 Email: worm@apa.com.au

PROJECT: Western Outer Ring Main
TITLE: Pipeline Licence Application
SUBTITLE: Map 13 of 67
DATE: 28/06/2021

DATA SOURCE:
 Nearmap AU Image Service:
 © Geoscience Australia 2016 - Locations and Roads

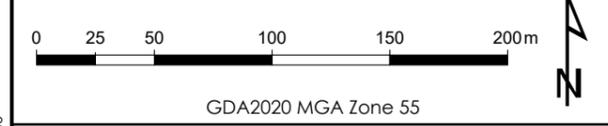
LEGEND:

- Pipeline Kilometre Points
- ▭ Neighbouring Map
- Water
- Drainage Line
- ▭ Parcel Boundary Along Pipeline Route (Survey Adjusted)
- ▭ Pipeline Corridor
- ▭ Municipal Boundary
- Roads**
- Minor Road
- Minor Road, Unsealed
- Pipeline Route (Pipeline Construction Method)**
- Horizontal Bore - Special Crossing
- Open Trench
- Easement Status**
- ▭ New Easement to Operate Pipeline

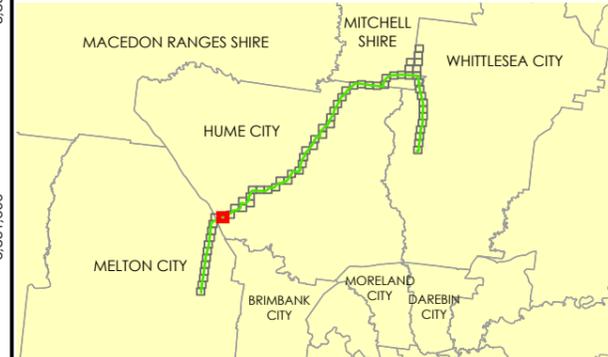
SERIAL NUMBER: WPT-MAP-L-0165
DOCUMENT NUMBER: WPT.2373-MAP-L-0175.13_3_IFU

3.0	Issued for Use	ST			28/06/21
2.0	Issued for Use	ST	MG	BS	17/06/21
1.0	Issued for Use	ST	EH	BS	15/06/21
0.2	Draft	ST	EH	BS	9/06/21
0.1	Draft	ST	EH	BS	6/06/21
Revision	Description	Drawn	Checked/QC	Approved	Date

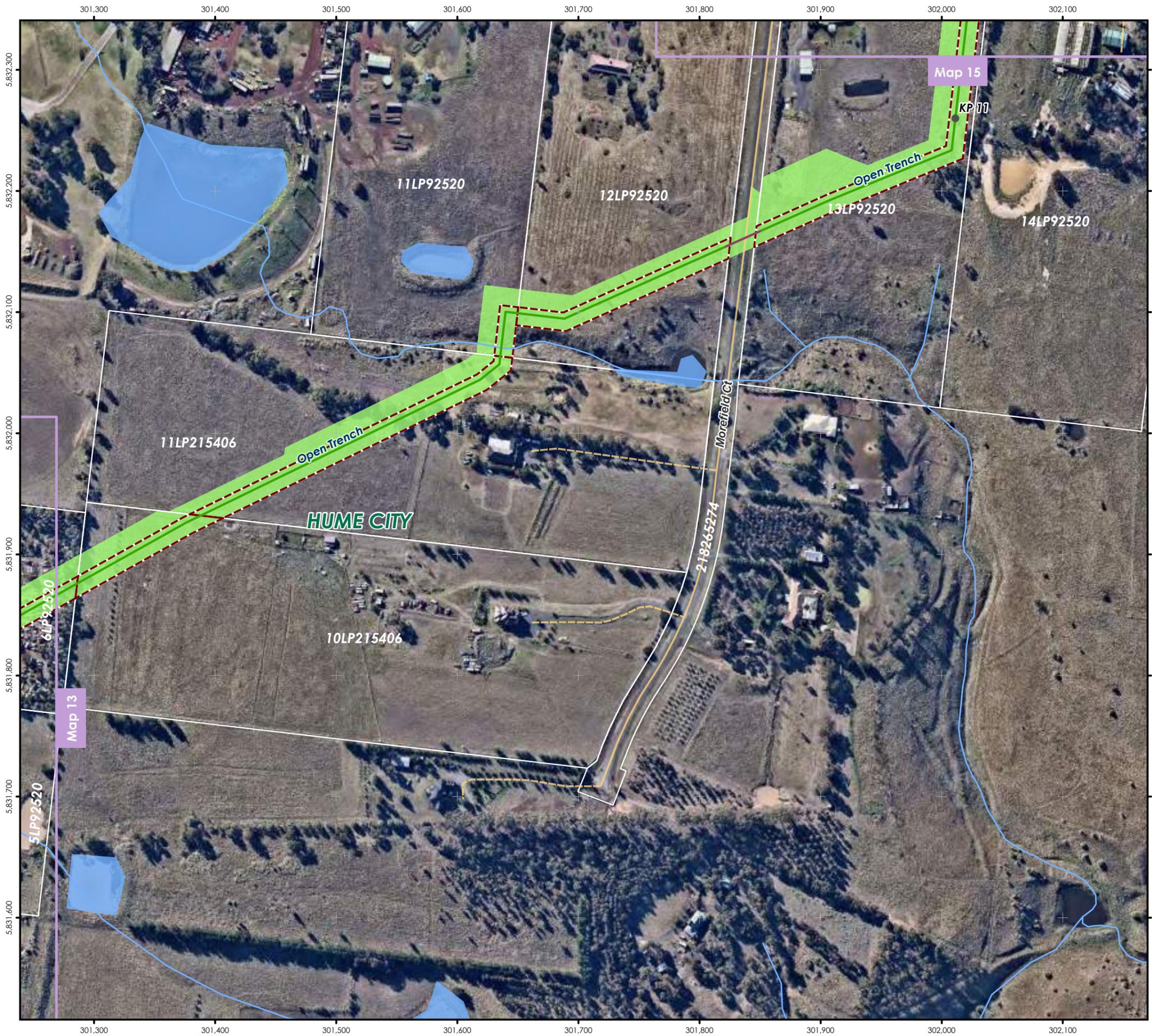
SCALE: 1:3,000 @ A3



LOCATION DIAGRAM



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.



APA Group
 Phone: 1800 951 444
 Web: www.apa.com.au
 Email: worm@apa.com.au

PROJECT: Western Outer Ring Main
TITLE: Pipeline Licence Application
SUBTITLE: Map 14 of 67
DATE: 28/06/2021

DATA SOURCE:
 Nearmap AU Image Service:
 © Geoscience Australia 2016 - Locations and Roads

LEGEND:

- Pipeline Kilometre Points
- Neighbouring Map
- Water
- Drainage Line
- Parcel Boundary Along Pipeline Route (Survey Adjusted)
- Pipeline Corridor
- Municipal Boundary

Roads

- Minor Road
- Minor Road, Unsealed

Pipeline Route (Pipeline Construction Method)

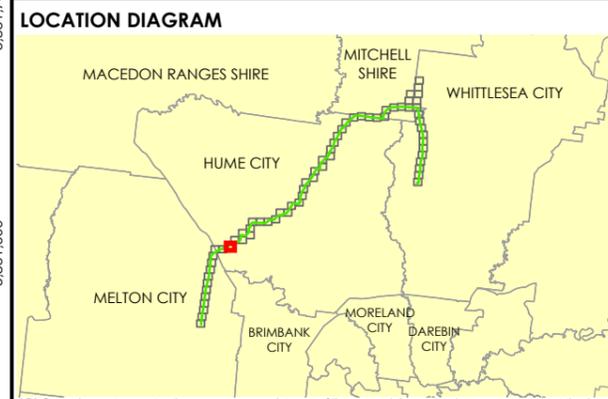
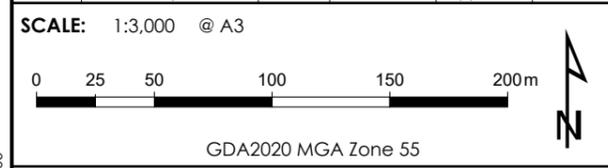
- Horizontal Bore - Special Crossing
- Open Trench

Easement Status

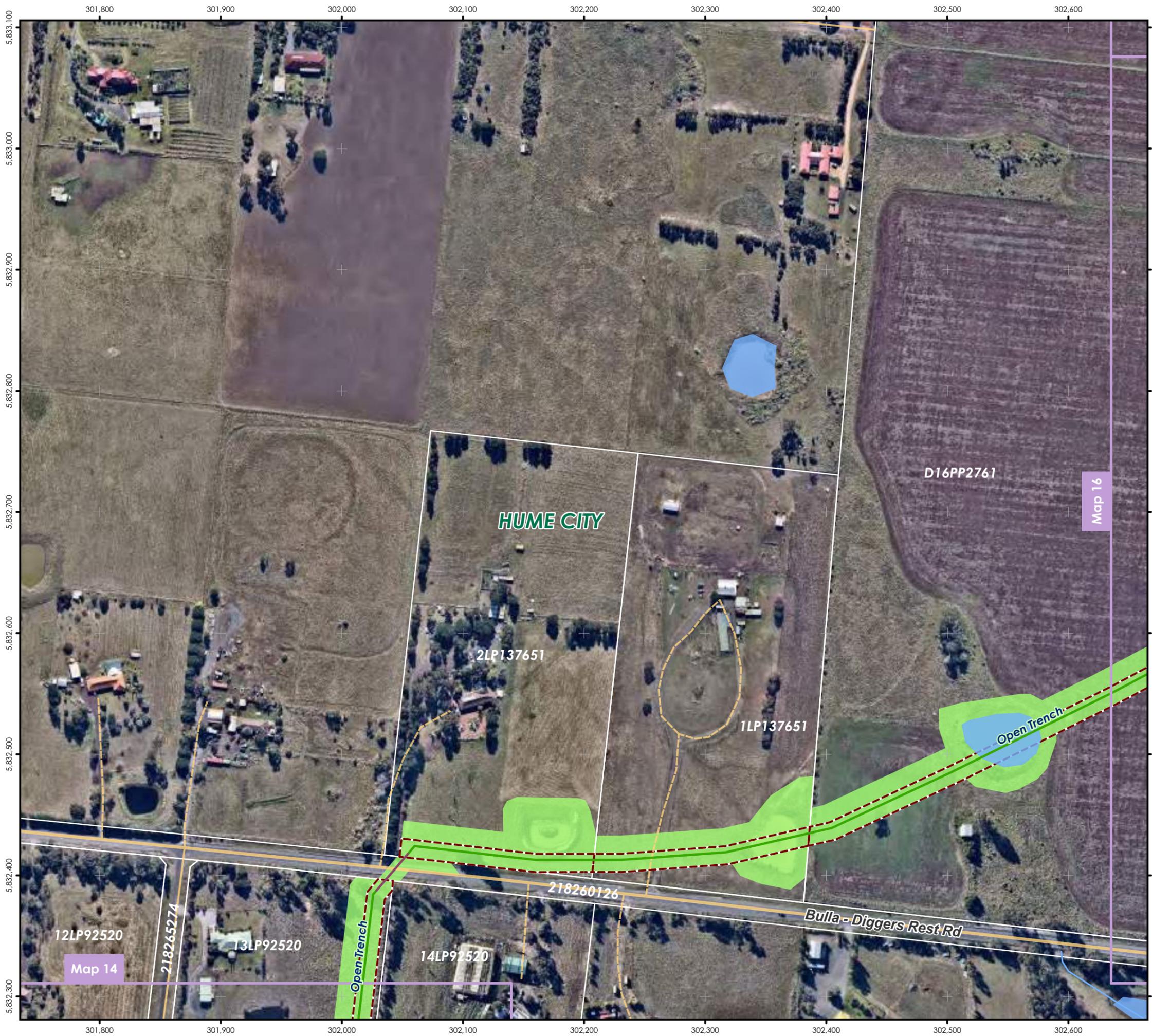
- New Easement to Operate Pipeline

SERIAL NUMBER: WPT-MAP-L-0165
DOCUMENT NUMBER: WPT.2373-MAP-L-0175.14_3_IFU

Revision	Description	Drawn	Checked/QC	Approved	Date	
3.0	Issued for Use	ST		MG	BS	28/06/21
2.0	Issued for Use	ST		MG	BS	17/06/21
1.0	Issued for Use	ST		EH	BS	15/06/21
0.2	Draft	ST		EH	BS	9/06/21
0.1	Draft	ST		EH	BS	6/06/21



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.



APA Group
 Phone: 1800 951 444
 Web: www.apa.com.au
 Email: worm@apa.com.au

PROJECT: Western Outer Ring Main

TITLE: Pipeline Licence Application

SUBTITLE: Map 15 of 67

DATE: 28/06/2021

DATA SOURCE:
 Nearmap AU Image Service:
 © Geoscience Australia 2016 - Locations and Roads

LEGEND:

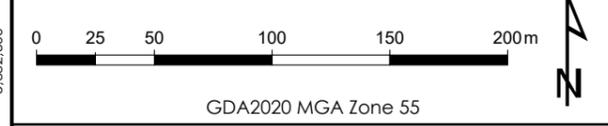
- Neighbouring Map
- Water
- Drainage Line
- Parcel Boundary Along Pipeline Route (Survey Adjusted)
- Pipeline Corridor
- Municipal Boundary
- Roads**
 - Secondary Road
 - Minor Road
 - Minor Road, Unsealed
- Pipeline Route (Pipeline Construction Method)**
 - Horizontal Bore - Special Crossing
 - Open Trench
- Easement Status**
 - New Easement to Operate Pipeline

SERIAL NUMBER: WPT-MAP-L-0165

DOCUMENT NUMBER: WPT.2373-MAP-L-0175.15_3_IFU

3.0	Issued for Use	ST				28/06/21
2.0	Issued for Use	ST	MG	BS		17/06/21
1.0	Issued for Use	ST	EH	BS		15/06/21
0.2	Draft	ST	EH	BS		9/06/21
0.1	Draft	ST	EH	BS		6/06/21
Revision	Description	Drawn	Checked/QC	Approved		Date

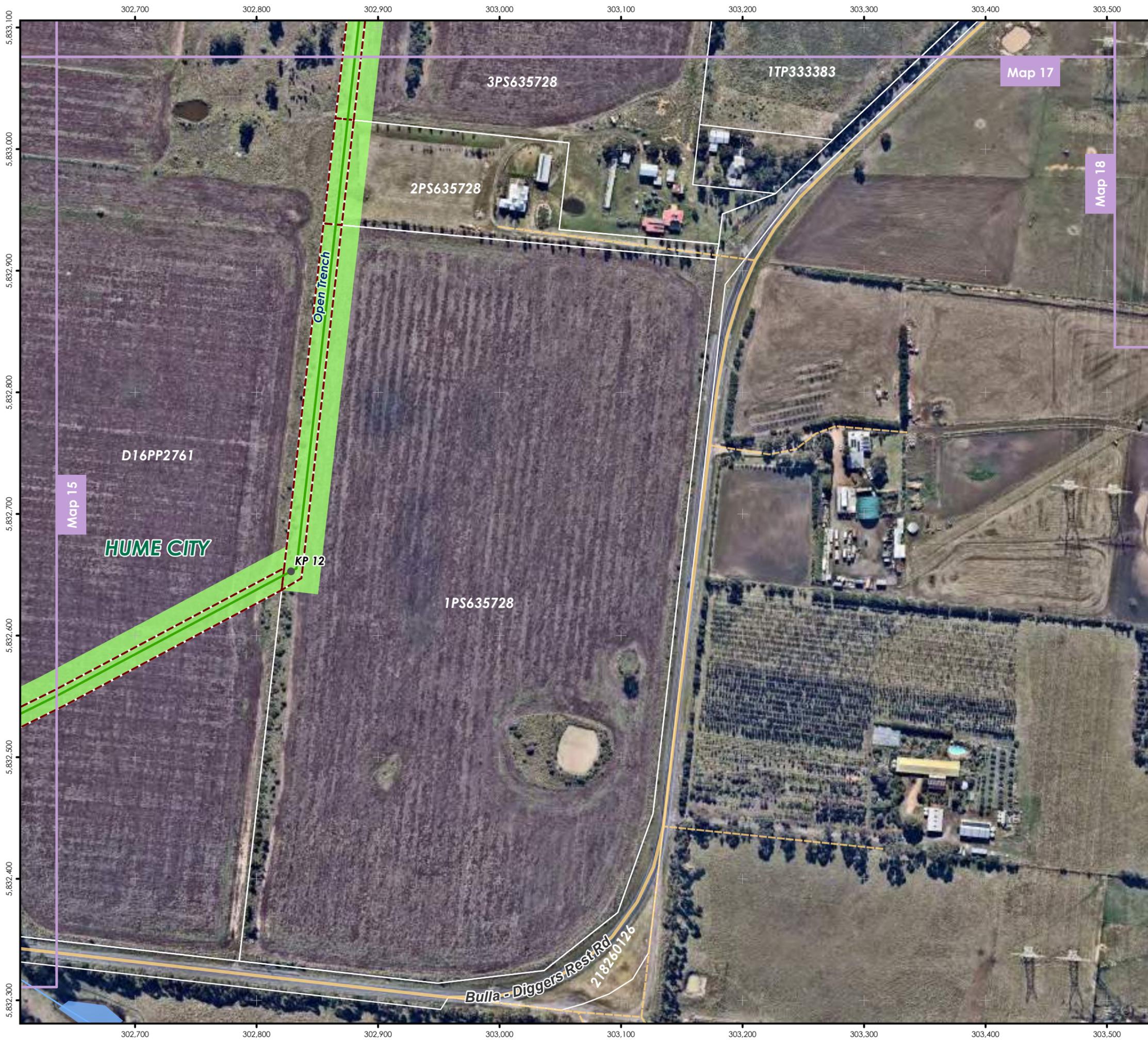
SCALE: 1:3,000 @ A3



LOCATION DIAGRAM



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.




APA Group
 Phone: 1800 951 444
 Web: www.apa.com.au
 Email: worm@apa.com.au

PROJECT: Western Outer Ring Main
TITLE: Pipeline Licence Application
SUBTITLE: Map 16 of 67
DATE: 28/06/2021

DATA SOURCE:
 Nearmap AU Image Service:
 © Geoscience Australia 2016 - Locations and Roads

LEGEND:

- Pipeline Kilometre Points
- Neighbouring Map
- Water
- Drainage Line
- Parcel Boundary Along Pipeline Route (Survey Adjusted)
- Pipeline Corridor
- Municipal Boundary
- Roads**
- Secondary Road
- Minor Road, Unsealed
- Pipeline Route (Pipeline Construction Method)**
- Open Trench
- Easement Status**
- New Easement to Operate Pipeline

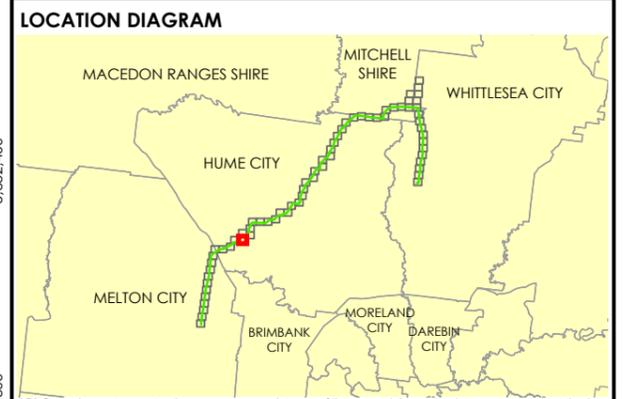
SERIAL NUMBER: WPT-MAP-L-0165
DOCUMENT NUMBER: WPT.2373-MAP-L-0175.16_3_IFU

Revision	Description	Drawn	Checked/QC	Approved	Date
3.0	Issued for Use	ST			28/06/21
2.0	Issued for Use	ST	MG	BS	17/06/21
1.0	Issued for Use	ST	EH	BS	15/06/21
0.2	Draft	ST	EH	BS	9/06/21
0.1	Draft	ST	EH	BS	6/06/21

SCALE: 1:3,000 @ A3



GDA2020 MGA Zone 55

APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.



APA Group
 Phone: 1800 951 444
 Web: www.apa.com.au
 Email: worm@apa.com.au

PROJECT: Western Outer Ring Main

TITLE: Pipeline Licence Application

SUBTITLE: Map 17 of 67

DATE: 28/06/2021

DATA SOURCE:
 Nearmap AU Image Service:
 © Geoscience Australia 2016 - Locations and Roads

LEGEND:

- Pipeline Kilometre Points
- Neighbouring Map
- Water
- Drainage Line
- Parcel Boundary Along Pipeline Route (Survey Adjusted)
- Pipeline Corridor
- Municipal Boundary
- MSA
- Roads
 - Secondary Road
 - Minor Road, Unsealed
- Pipeline Route (Pipeline Construction Method)
 - Open Trench
- Easement Status
 - New Easement to Operate Pipeline

SERIAL NUMBER: WPT-MAP-L-0165

DOCUMENT NUMBER: WPT.2373-MAP-L-0175.17_3_IFU

3.0	Issued for Use	ST			28/06/21
2.0	Issued for Use	ST	MG	BS	17/06/21
1.0	Issued for Use	ST	EH	BS	15/06/21
0.2	Draft	ST	EH	BS	9/06/21
0.1	Draft	ST	EH	BS	6/06/21
Revision	Description	Drawn	Checked/QC	Approved	Date

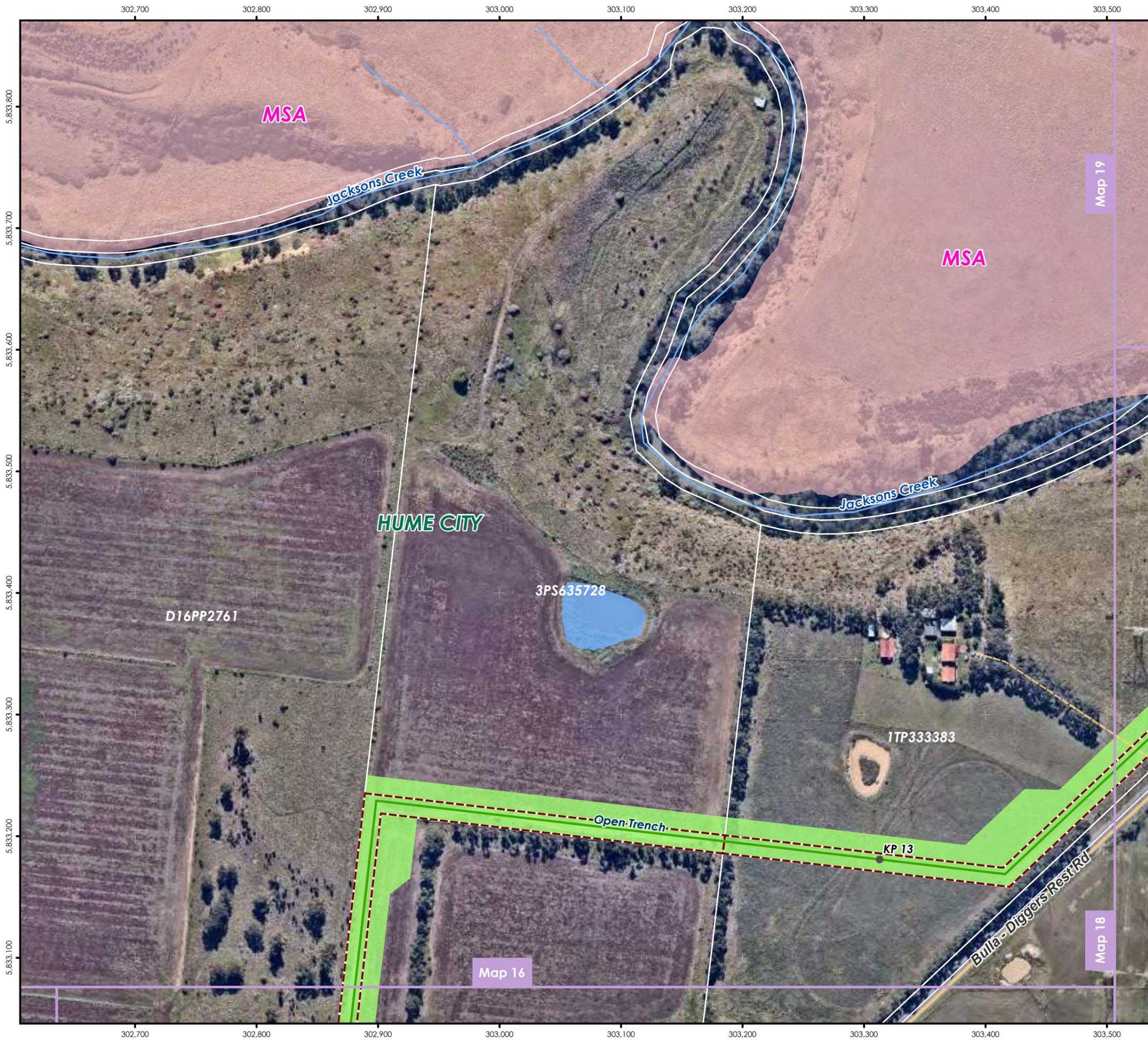
SCALE: 1:3,000 @ A3



LOCATION DIAGRAM



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.





APA Group
 Phone: 1800 951 444
 Web: www.apa.com.au
 Email: worm@apa.com.au

PROJECT: Western Outer Ring Main
TITLE: Pipeline Licence Application
SUBTITLE: Map 18 of 67
DATE: 28/06/2021

DATA SOURCE:
 Nearmap AU Image Service:
 © Geoscience Australia 2016 - Locations and Roads

LEGEND:

- Neighbouring Map
- Drainage Line
- Parcel Boundary Along Pipeline Route (Survey Adjusted)
- Pipeline Corridor
- Municipal Boundary
- MSA

Roads

- Secondary Road
- Minor Road, Unsealed

Pipeline Route (Pipeline Construction Method)

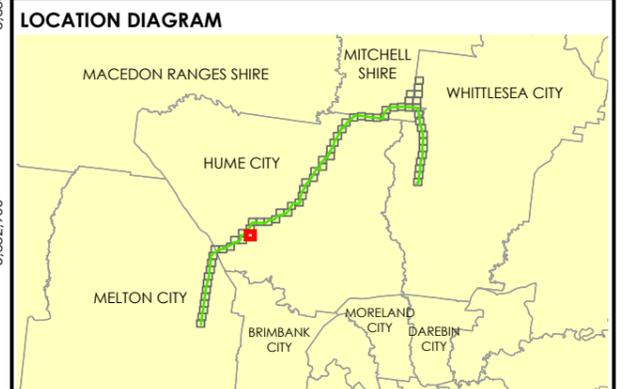
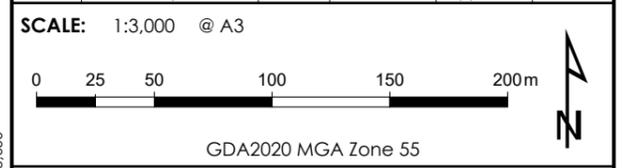
- Open Trench
- Open Trench - Special Crossing

Easement Status

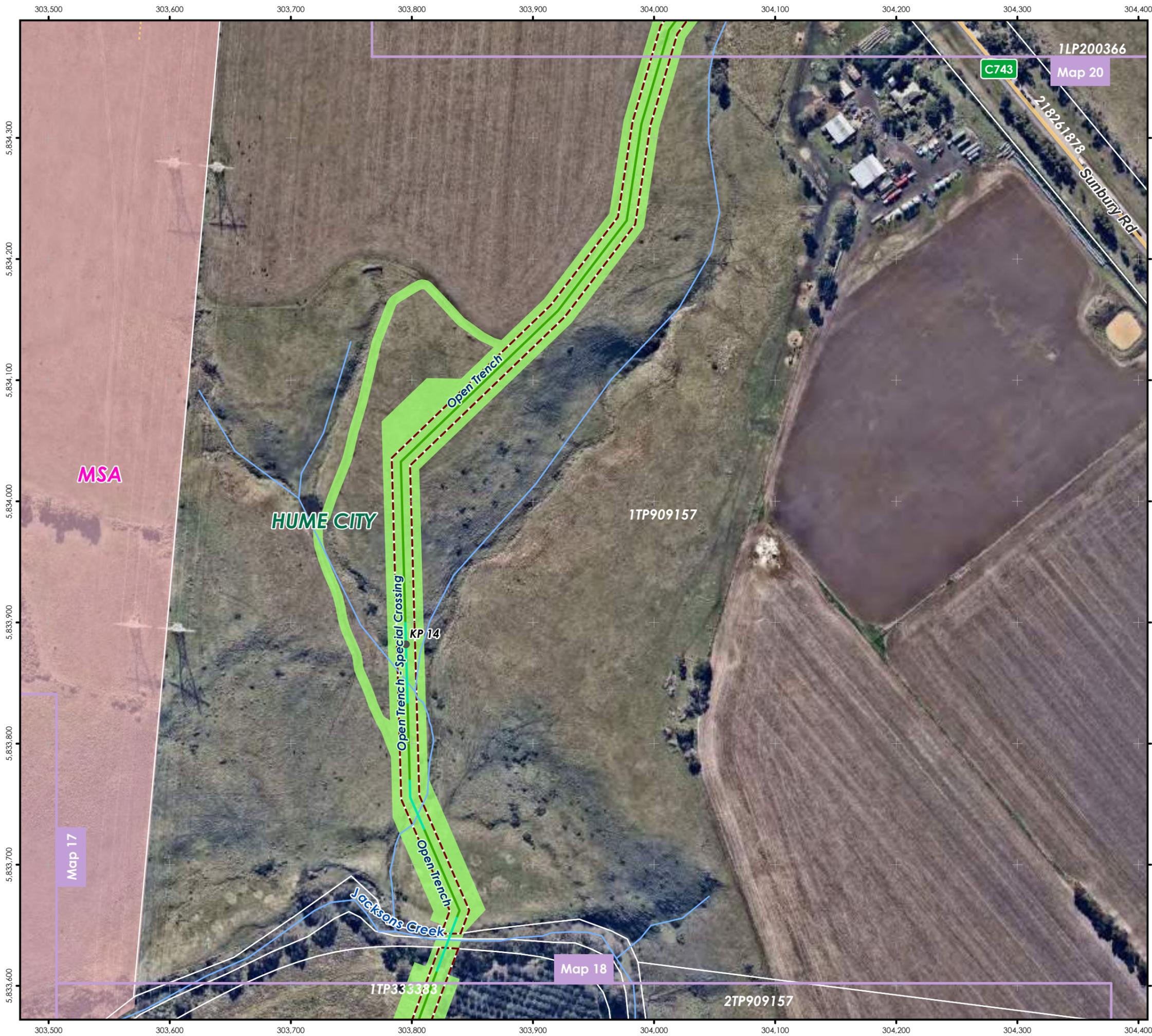
- New Easement to Operate Pipeline

SERIAL NUMBER: WPT-MAP-L-0165
DOCUMENT NUMBER: WPT.2373-MAP-L-0175.18_3_IFU

Revision	Description	Drawn	Checked/QC	Approved	Date
3.0	Issued for Use	ST		BS	28/06/21
2.0	Issued for Use	ST	MG	BS	17/06/21
1.0	Issued for Use	ST	EH	BS	15/06/21
0.2	Draft	ST	EH	BS	9/06/21
0.1	Draft	ST	EH	BS	6/06/21



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.



APA Group
 Phone: 1800 951 444
 Web: www.apa.com.au
 Email: worm@apa.com.au

PROJECT: Western Outer Ring Main
TITLE: Pipeline Licence Application
SUBTITLE: Map 19 of 67
DATE: 28/06/2021

DATA SOURCE:
 Nearmap AU Image Service:
 © Geoscience Australia 2016 - Locations and Roads

LEGEND:

- Pipeline Kilometre Points
- Neighbouring Map
- Drainage Line
- ▭ Parcel Boundary Along Pipeline Route (Survey Adjusted)
- ▭ Pipeline Corridor
- ▭ Municipal Boundary
- ▭ MSA

Roads

- Primary Road
- Future Road

Pipeline Route (Pipeline Construction Method)

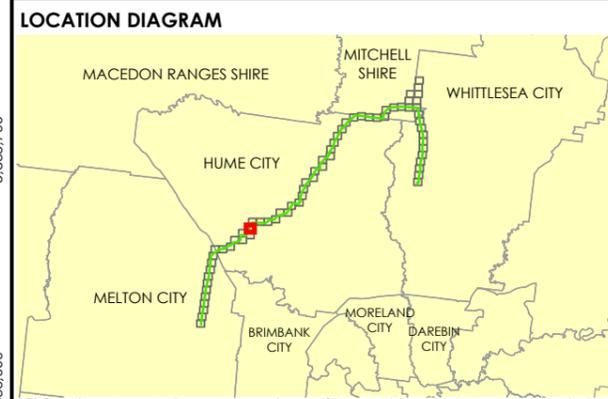
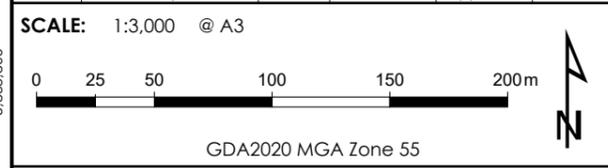
- Open Trench
- Open Trench - Special Crossing

Easement Status

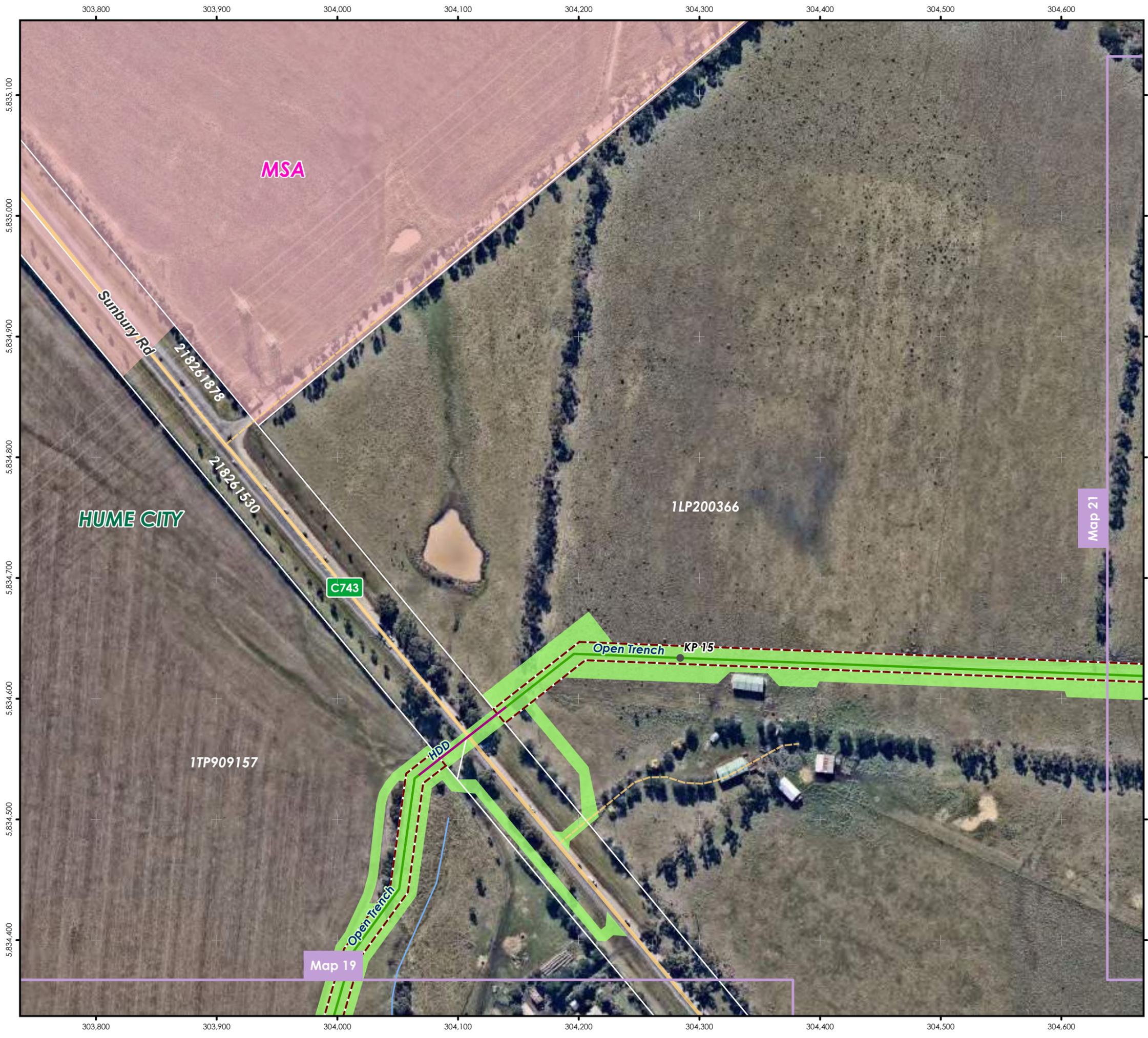
- - - New Easement to Operate Pipeline

SERIAL NUMBER: WPT-MAP-L-0165
DOCUMENT NUMBER: WPT.2373-MAP-L-0175.19_3_IFU

Revision	Description	Drawn	Checked/QC	Approved	Date
3.0	Issued for Use	ST			28/06/21
2.0	Issued for Use	ST	MG	BS	17/06/21
1.0	Issued for Use	ST	EH	BS	15/06/21
0.2	Draft	ST	EH	BS	9/06/21
0.1	Draft	ST	EH	BS	6/06/21



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.



apa
 APA Group
 Phone: 1800 951 444
 Web: www.apa.com.au
 Email: worm@apa.com.au

PROJECT: Western Outer Ring Main
TITLE: Pipeline Licence Application
SUBTITLE: Map 20 of 67
DATE: 28/06/2021
DATA SOURCE:
 Nearmap AU Image Service:
 © Geoscience Australia 2016 - Locations and Roads

LEGEND:

- Pipeline Kilometre Points
- Neighbouring Map
- Drainage Line
- Parcel Boundary Along Pipeline Route (Survey Adjusted)
- Pipeline Corridor
- Municipal Boundary
- MSA

Roads

- Primary Road
- Minor Road, Unsealed

Pipeline Route (Pipeline Construction Method)

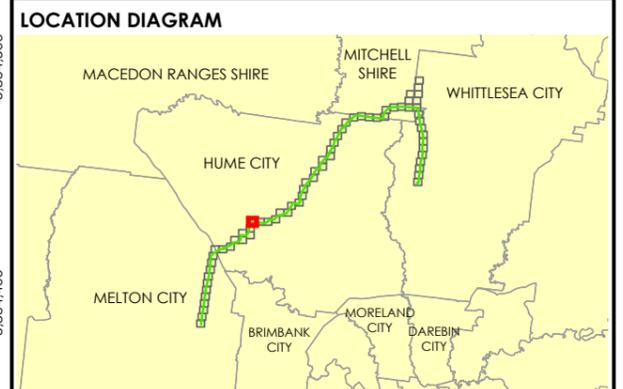
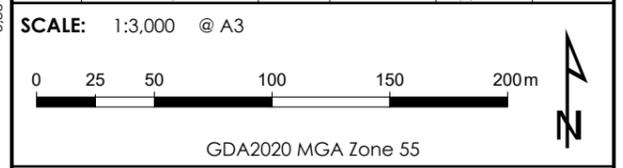
- HDD
- Open Trench

Easement Status

- New Easement to Operate Pipeline

SERIAL NUMBER: WPT-MAP-L-0165
DOCUMENT NUMBER: WPT.2373-MAP-L-0175.20_3_IFU

Revision	Description	Drawn	Checked/QC	Approved	Date
3.0	Issued for Use	ST		BS	28/06/21
2.0	Issued for Use	ST	MG	BS	17/06/21
1.0	Issued for Use	ST	EH	BS	15/06/21
0.2	Draft	ST	EH	BS	9/06/21
0.1	Draft	ST	EH	BS	6/06/21



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.



APA Group
 Phone: 1800 951 444
 Web: www.apa.com.au
 Email: worm@apa.com.au

PROJECT: Western Outer Ring Main
TITLE: Pipeline Licence Application
SUBTITLE: Map 21 of 67
DATE: 28/06/2021

DATA SOURCE:
 Nearmap AU Image Service:
 © Geoscience Australia 2016 - Locations and Roads

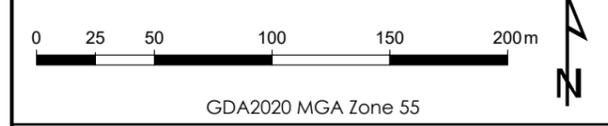
LEGEND:

- Pipeline Kilometre Points
- ▭ Neighbouring Map
- Drainage Line
- ▭ Parcel Boundary Along Pipeline Route (Survey Adjusted)
- ▭ Pipeline Corridor
- ▭ Municipal Boundary
- Roads**
- Minor Road, Unsealed
- Pipeline Route (Pipeline Construction Method)**
- Open Trench
- Easement Status**
- ▭ New Easement to Operate Pipeline

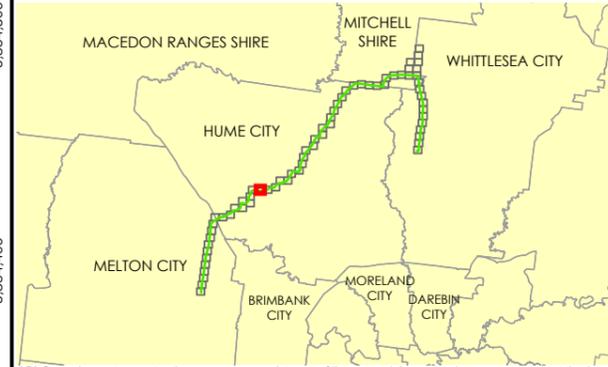
SERIAL NUMBER: WPT-MAP-L-0165
DOCUMENT NUMBER: WPT.2373-MAP-L-0175.21_3_IFU

Revision	Description	Drawn	Checked/QC	Approved	Date	
3.0	Issued for Use	ST		MG	BS	28/06/21
2.0	Issued for Use	ST		MG	BS	17/06/21
1.0	Issued for Use	ST		EH	BS	15/06/21
0.2	Draft	ST		EH	BS	9/06/21
0.1	Draft	ST		EH	BS	6/06/21

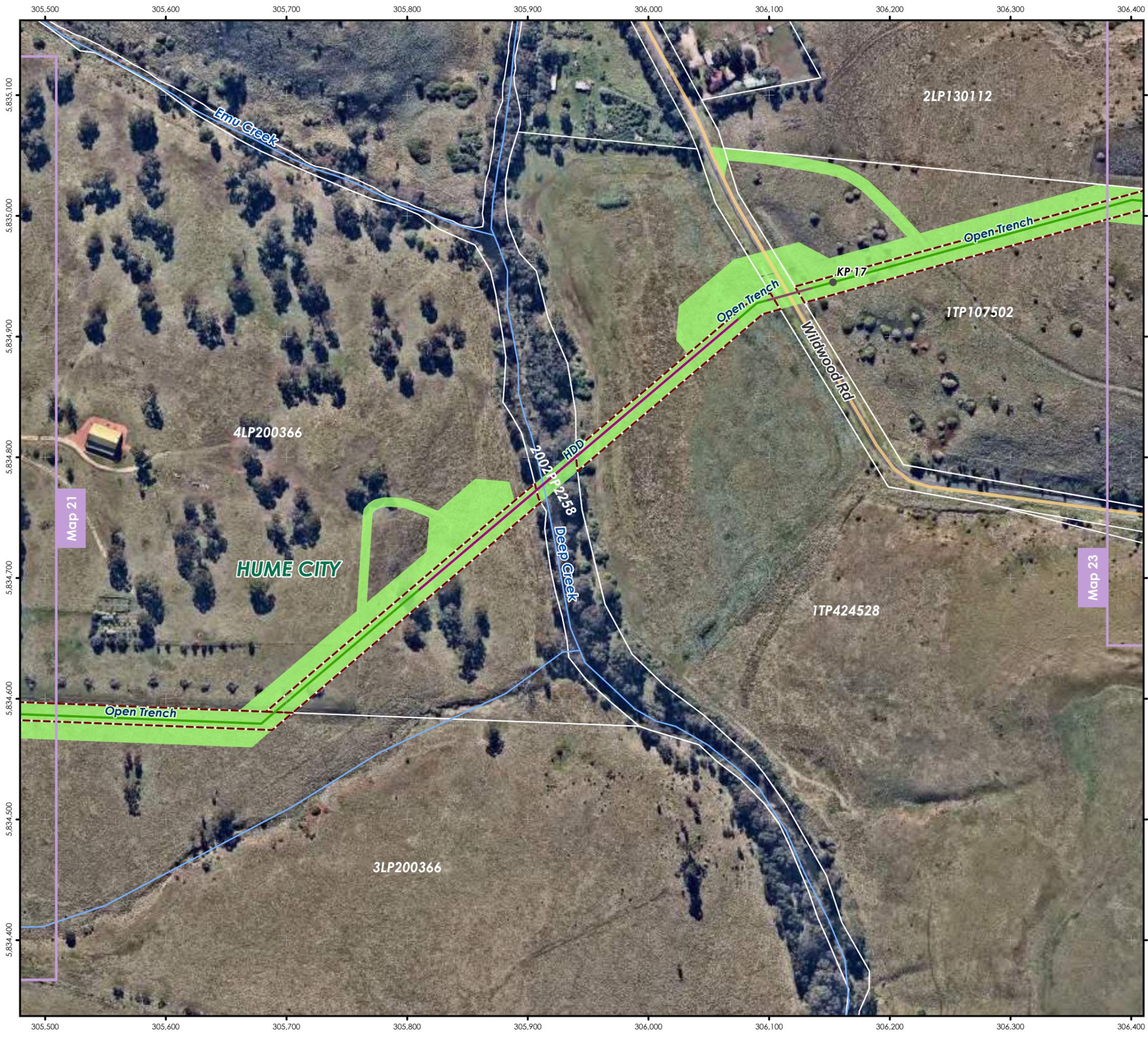
SCALE: 1:3,000 @ A3



LOCATION DIAGRAM



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.



APA Group
 Phone: 1800 951 444
 Web: www.apa.com.au
 Email: worm@apa.com.au

PROJECT: Western Outer Ring Main

TITLE: Pipeline Licence Application

SUBTITLE: Map 22 of 67

DATE: 28/06/2021

DATA SOURCE:
 Nearmap AU Image Service:
 © Geoscience Australia 2016 - Locations and Roads

LEGEND:

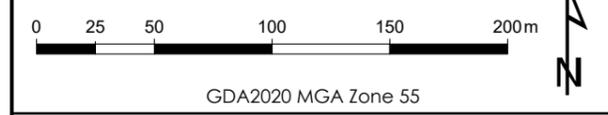
- Pipeline Kilometre Points
- ▭ Neighbouring Map
- Drainage Line
- ▭ Parcel Boundary Along Pipeline Route (Survey Adjusted)
- ▭ Pipeline Corridor
- ▭ Municipal Boundary
- Roads
 - Secondary Road
- Pipeline Route (Pipeline Construction Method)
 - HDD
 - Horizontal Bore - Special Crossing
 - Open Trench
- Easement Status
 - ▭ New Easement to Operate Pipeline

SERIAL NUMBER: WPT-MAP-L-0165

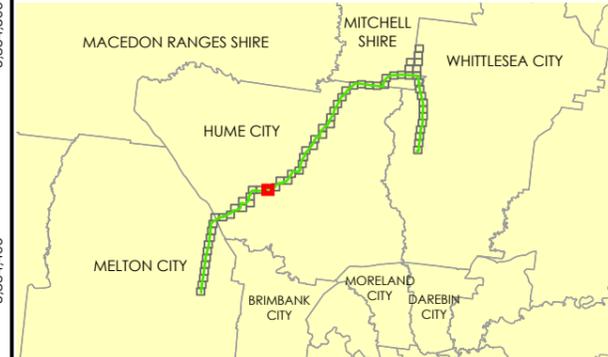
DOCUMENT NUMBER: WPT.2373-MAP-L-0175.22_3_IFU

3.0	Issued for Use	ST			28/06/21
2.0	Issued for Use	ST	MG	BS	17/06/21
1.0	Issued for Use	ST	EH	BS	15/06/21
0.2	Draft	ST	EH	BS	9/06/21
0.1	Draft	ST	EH	BS	6/06/21
Revision	Description	Drawn	Checked/QC	Approved	Date

SCALE: 1:3,000 @ A3



LOCATION DIAGRAM



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.



APA Group
 Phone: 1800 951 444
 Web: www.apa.com.au
 Email: worm@apa.com.au

PROJECT: Western Outer Ring Main
TITLE: Pipeline Licence Application
SUBTITLE: Map 23 of 67
DATE: 28/06/2021

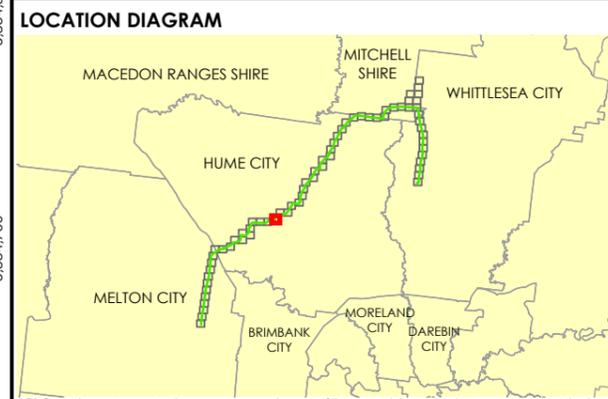
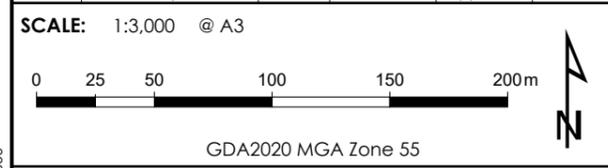
DATA SOURCE:
 Nearmap AU Image Service:
 © Geoscience Australia 2016 - Locations and Roads

LEGEND:

- Pipeline Kilometre Points
- Neighbouring Map
- Water
- Drainage Line
- Parcel Boundary Along Pipeline Route (Survey Adjusted)
- Pipeline Corridor
- Municipal Boundary
- Roads**
- Secondary Road
- Pipeline Route (Pipeline Construction Method)**
- Open Trench
- Easement Status**
- New Easement to Operate Pipeline

SERIAL NUMBER: WPT-MAP-L-0165
DOCUMENT NUMBER: WPT.2373-MAP-L-0175.23_3_IFU

3.0	Issued for Use	ST			28/06/21
2.0	Issued for Use	ST	MG	BS	17/06/21
1.0	Issued for Use	ST	EH	BS	15/06/21
0.2	Draft	ST	EH	BS	9/06/21
0.1	Draft	ST	EH	BS	6/06/21
Revision	Description	Drawn	Checked/QC	Approved	Date



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.



APA Group
 Phone: 1800 951 444
 Web: www.apa.com.au
 Email: worm@apa.com.au

PROJECT: Western Outer Ring Main
TITLE: Pipeline Licence Application
SUBTITLE: Map 24 of 67
DATE: 28/06/2021

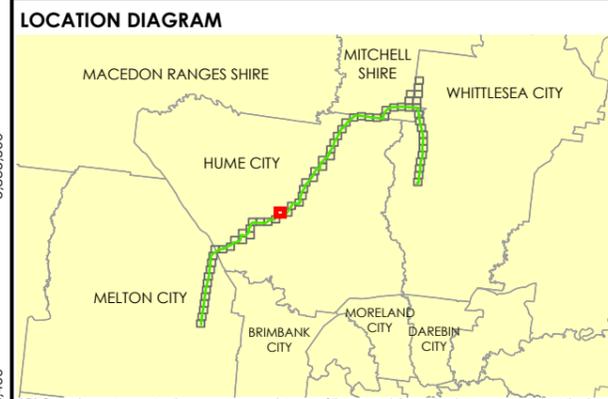
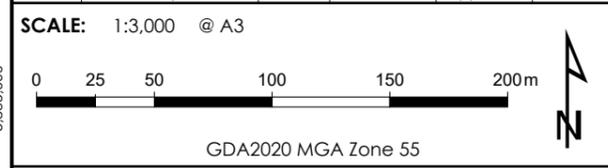
DATA SOURCE:
 Nearmap AU Image Service:
 © Geoscience Australia 2016 - Locations and Roads

LEGEND:

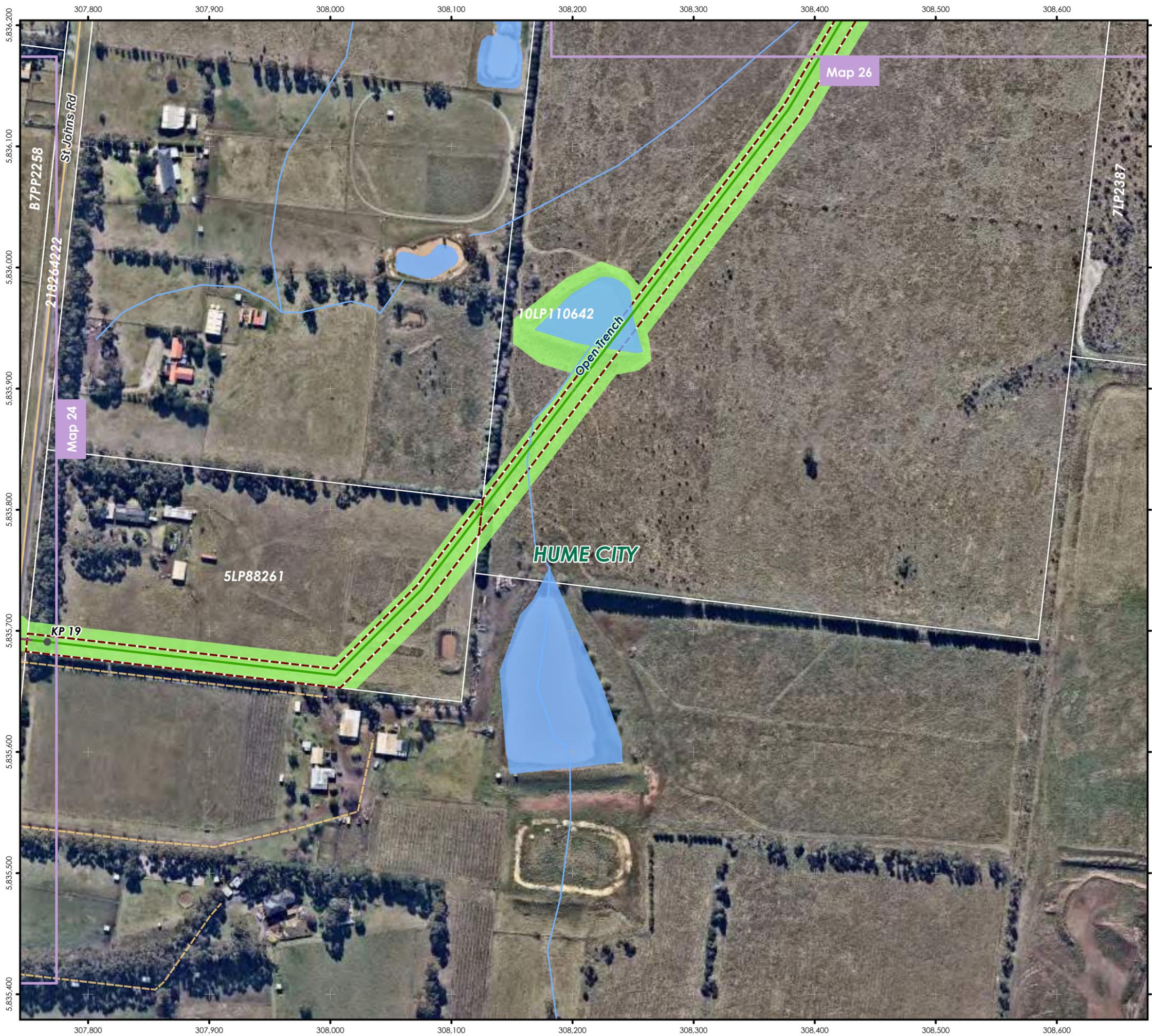
- Pipeline Kilometre Points
- ▭ Neighbouring Map
- Water
- Drainage Line
- ▭ Parcel Boundary Along Pipeline Route (Survey Adjusted)
- ▭ Pipeline Corridor
- ▭ Municipal Boundary
- Roads**
- Minor Road
- - - Minor Road, Unsealed
- Pipeline Route (Pipeline Construction Method)**
- Horizontal Bore - Special Crossing
- Open Trench
- Easement Status**
- - - New Easement to Operate Pipeline

SERIAL NUMBER: WPT-MAP-L-0165
DOCUMENT NUMBER: WPT.2373-MAP-L-0175.24_3_IFU

3.0	Issued for Use	ST			28/06/21
2.0	Issued for Use	ST	MG	BS	17/06/21
1.0	Issued for Use	ST	EH	BS	15/06/21
0.2	Draft	ST	EH	BS	9/06/21
0.1	Draft	ST	EH	BS	6/06/21
Revision	Description	Drawn	Checked/QC	Approved	Date



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.



APA Group
 Phone: 1800 951 444
 Web: www.apa.com.au
 Email: worm@apa.com.au

PROJECT: Western Outer Ring Main
TITLE: Pipeline Licence Application
SUBTITLE: Map 25 of 67
DATE: 28/06/2021

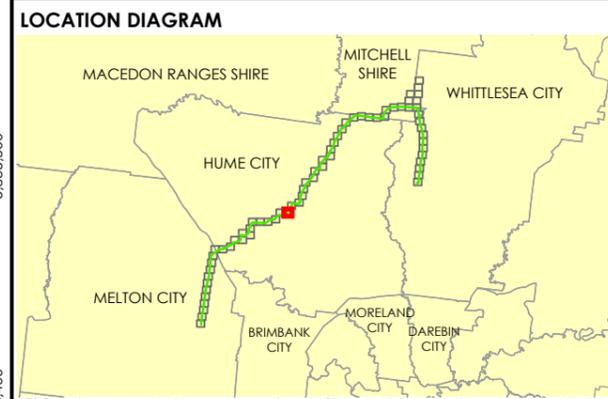
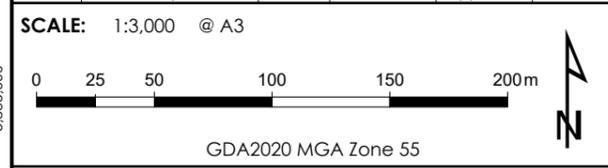
DATA SOURCE:
 Nearmap AU Image Service:
 © Geoscience Australia 2016 - Locations and Roads

LEGEND:

- Pipeline Kilometre Points
- Neighbouring Map
- Water
- Drainage Line
- Parcel Boundary Along Pipeline Route (Survey Adjusted)
- Pipeline Corridor
- Municipal Boundary
- Roads**
- Minor Road
- Minor Road, Unsealed
- Pipeline Route (Pipeline Construction Method)**
- Horizontal Bore - Special Crossing
- Open Trench
- Easement Status**
- New Easement to Operate Pipeline

SERIAL NUMBER: WPT-MAP-L-0165
DOCUMENT NUMBER: WPT.2373-MAP-L-0175.25_3_IFU

3.0	Issued for Use	ST			28/06/21
2.0	Issued for Use	ST	MG	BS	17/06/21
1.0	Issued for Use	ST	EH	BS	15/06/21
0.2	Draft	ST	EH	BS	9/06/21
0.1	Draft	ST	EH	BS	6/06/21
Revision	Description	Drawn	Checked/QC	Approved	Date



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.



APA Group
 Phone: 1800 951 444
 Web: www.apa.com.au
 Email: worm@apa.com.au

PROJECT: Western Outer Ring Main
TITLE: Pipeline Licence Application
SUBTITLE: Map 26 of 67
DATE: 28/06/2021

DATA SOURCE:
 Nearmap AU Image Service:
 © Geoscience Australia 2016 - Locations and Roads

LEGEND:

- Pipeline Kilometre Points
- Neighbouring Map
- Water
- Drainage Line
- Parcel Boundary Along Pipeline Route (Survey Adjusted)
- Pipeline Corridor
- Municipal Boundary

Pipeline Route (Pipeline Construction Method)

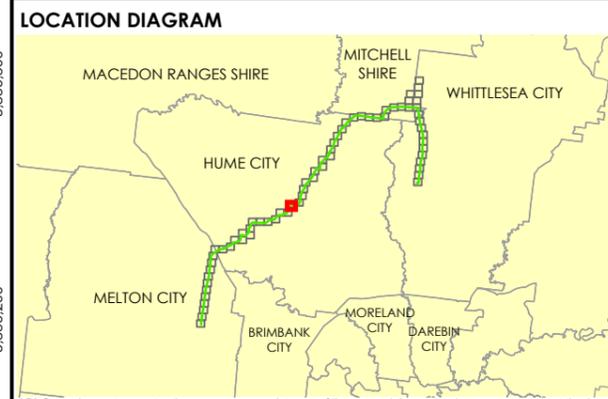
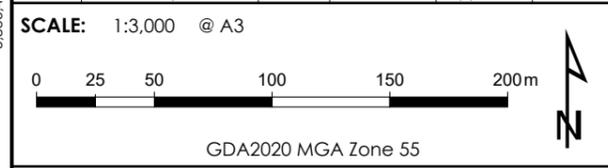
- Open Trench

Easement Status

- - - New Easement to Operate Pipeline

SERIAL NUMBER: WPT-MAP-L-0165
DOCUMENT NUMBER: WPT.2373-MAP-L-0175.26_3_IFU

Revision	Description	Drawn	Checked/QC	Approved	Date
3.0	Issued for Use	ST			28/06/21
2.0	Issued for Use	ST	MG	BS	17/06/21
1.0	Issued for Use	ST	EH	BS	15/06/21
0.2	Draft	ST	EH	BS	9/06/21
0.1	Draft	ST	EH	BS	6/06/21



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.



apa
 APA Group
 Phone: 1800 951 444
 Web: www.apa.com.au
 Email: worm@apa.com.au

PROJECT: Western Outer Ring Main
TITLE: Pipeline Licence Application
SUBTITLE: Map 27 of 67
DATE: 28/06/2021

DATA SOURCE:
 Nearmap AU Image Service:
 © Geoscience Australia 2016 - Locations and Roads

LEGEND:

- Main Line Valve Location (Red dot)
- Pipeline Kilometre Points (Black dot)
- Neighbouring Map (Purple outline)
- Parcel Boundary Along Pipeline Route (Survey Adjusted) (White dashed line)
- Pipeline Corridor (Green shaded area)
- Municipal Boundary (Green dashed line)

Roads

- Secondary Road (Yellow dashed line)
- Minor Road, Unsealed (Orange dashed line)

Pipeline Route (Pipeline Construction Method)

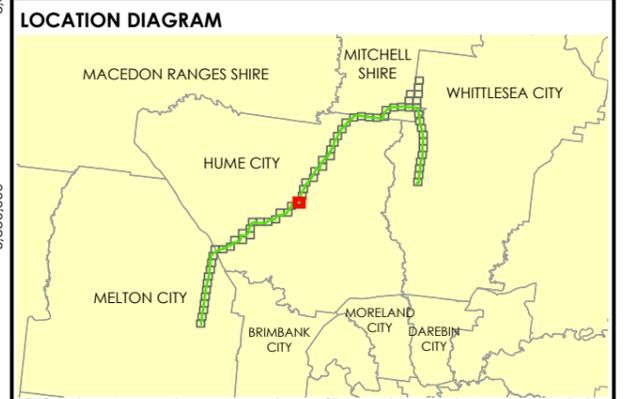
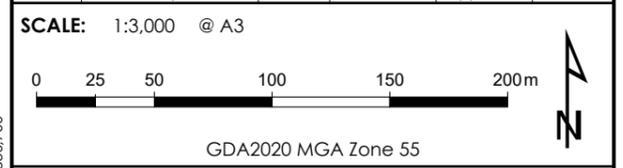
- Horizontal Bore - Special Crossing (Red dashed line)
- Open Trench (Green shaded area)

Easement Status

- New Easement to Operate Pipeline (Red dashed outline)

SERIAL NUMBER: WPT-MAP-L-0165
DOCUMENT NUMBER: WPT.2373-MAP-L-0175.27_3_IFU

Revision	Description	Drawn	Checked/QC	Approved	Date
3.0	Issued for Use	ST			28/06/21
2.0	Issued for Use	ST	MG	BS	17/06/21
1.0	Issued for Use	ST	EH	BS	15/06/21
0.2	Draft	ST	EH	BS	9/06/21
0.1	Draft	ST	EH	BS	6/06/21



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.



APA Group
 Phone: 1800 951 444
 Web: www.apa.com.au
 Email: worm@apa.com.au

PROJECT: Western Outer Ring Main
TITLE: Pipeline Licence Application
SUBTITLE: Map 28 of 67
DATE: 28/06/2021

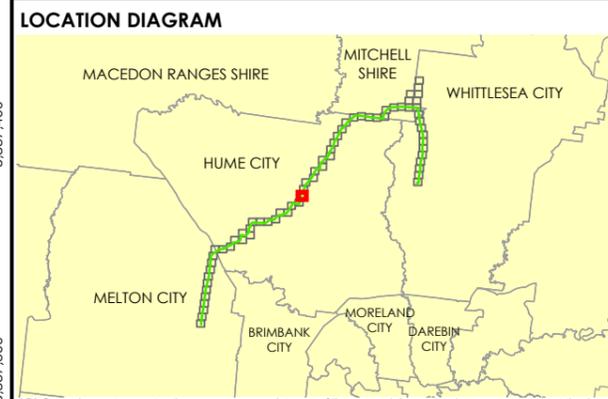
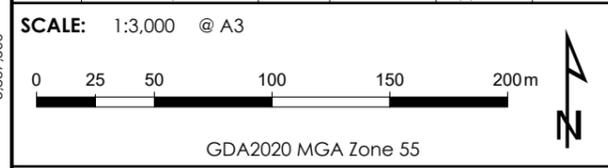
DATA SOURCE:
 Nearmap AU Image Service:
 © Geoscience Australia 2016 - Locations and Roads

LEGEND:

- Pipeline Kilometre Points
- Neighbouring Map
- ▭ Parcel Boundary Along Pipeline Route (Survey Adjusted)
- ▭ Pipeline Corridor
- ▭ Municipal Boundary
- Roads**
- Secondary Road
- - - Secondary Road, Unsealed
- - - Minor Road, Unsealed
- Pipeline Route (Pipeline Construction Method)**
- Horizontal Bore - Special Crossing
- Open Trench
- Easement Status**
- - - New Easement to Operate Pipeline

SERIAL NUMBER: WPT-MAP-L-0165
DOCUMENT NUMBER: WPT.2373-MAP-L-0175.28_3_IFU

3.0	Issued for Use	ST			28/06/21
2.0	Issued for Use	ST	MG	BS	17/06/21
1.0	Issued for Use	ST	EH	BS	15/06/21
0.2	Draft	ST	EH	BS	9/06/21
0.1	Draft	ST	EH	BS	6/06/21
Revision	Description	Drawn	Checked/QC	Approved	Date



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.



APA Group
 Phone: 1800 951 444
 Web: www.apa.com.au
 Email: worm@apa.com.au

PROJECT: Western Outer Ring Main

TITLE: Pipeline Licence Application

SUBTITLE: Map 29 of 67

DATE: 28/06/2021

DATA SOURCE:
 Nearmap AU Image Service:
 © Geoscience Australia 2016 - Locations and Roads

LEGEND:

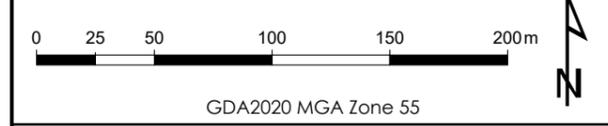
- Pipeline Kilometre Points
- Neighbouring Map
- Water
- Drainage Line
- Parcel Boundary Along Pipeline Route (Survey Adjusted)
- Pipeline Corridor
- Municipal Boundary
- Roads**
- Secondary Road
- Minor Road, Unsealed
- Pipeline Route (Pipeline Construction Method)**
- Open Trench
- Easement Status**
- New Easement to Operate Pipeline

SERIAL NUMBER: WPT-MAP-L-0165

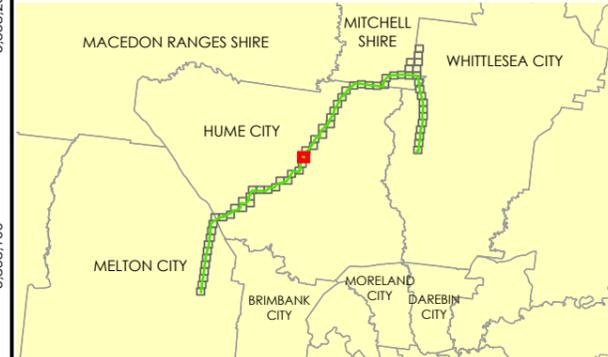
DOCUMENT NUMBER: WPT.2373-MAP-L-0175.29_3_IFU

3.0	Issued for Use	ST			28/06/21
2.0	Issued for Use	ST	MG	BS	17/06/21
1.0	Issued for Use	ST	EH	BS	15/06/21
0.2	Draft	ST	EH	BS	9/06/21
0.1	Draft	ST	EH	BS	6/06/21
Revision	Description	Drawn	Checked/QC	Approved	Date

SCALE: 1:3,000 @ A3



LOCATION DIAGRAM



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.



APA Group
 Phone: 1800 951 444
 Web: www.apa.com.au
 Email: worm@apa.com.au

PROJECT: Western Outer Ring Main
TITLE: Pipeline Licence Application
SUBTITLE: Map 30 of 67
DATE: 28/06/2021

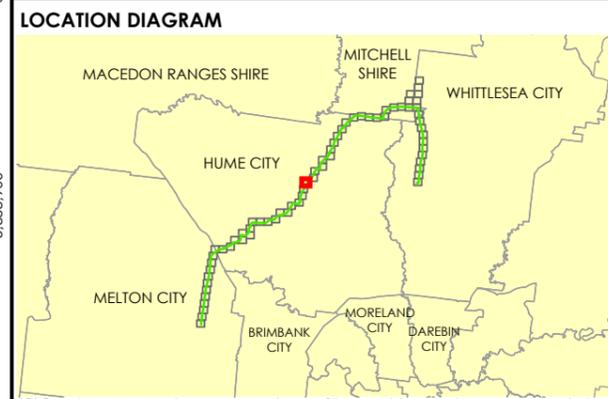
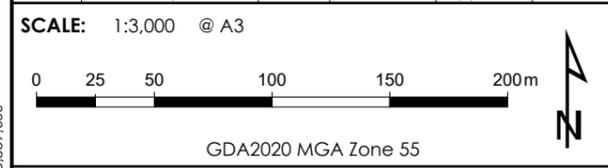
DATA SOURCE:
 Nearmap AU Image Service:
 © Geoscience Australia 2016 - Locations and Roads

LEGEND:

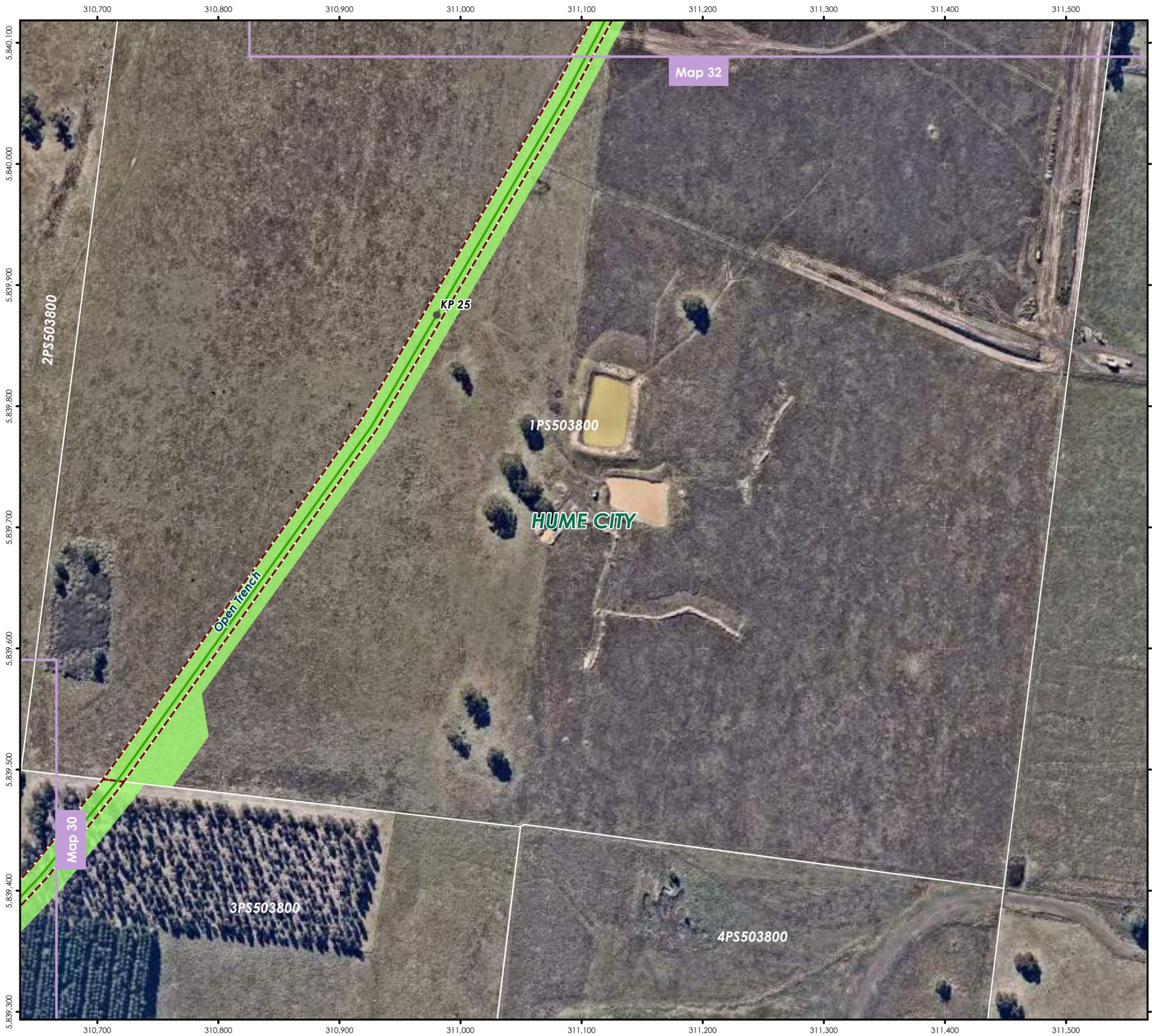
- Pipeline Kilometre Points
- Neighbouring Map
- Drainage Line
- ▭ Parcel Boundary Along Pipeline Route (Survey Adjusted)
- ▭ Pipeline Corridor
- ▭ Municipal Boundary
- Roads
 - Secondary Road
- Pipeline Route (Pipeline Construction Method)
 - Open Trench
- Easement Status
 - - - New Easement to Operate Pipeline

SERIAL NUMBER: WPT-MAP-L-0165
DOCUMENT NUMBER: WPT.2373-MAP-L-0175.30_3_IFU

3.0	Issued for Use	ST		BS	28/06/21
2.0	Issued for Use	ST	MG	BS	17/06/21
1.0	Issued for Use	ST	EH	BS	15/06/21
0.2	Draft	ST	EH	BS	9/06/21
0.1	Draft	ST	EH	BS	6/06/21
Revision	Description	Drawn	Checked/QC	Approved	Date



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.



APA Group
 Phone: 1800 951 444
 Web: www.apa.com.au
 Email: worm@apa.com.au

PROJECT: Western Outer Ring Main
TITLE: Pipeline Licence Application
SUBTITLE: Map 31 of 67
DATE: 28/06/2021

DATA SOURCE:
 Nearmap AU Image Service:
 © Geoscience Australia 2016 - Locations and Roads

LEGEND:

- Pipeline Kilometre Points
- Neighbouring Map
- ▭ Parcel Boundary Along Pipeline Route (Survey Adjusted)
- ▭ Pipeline Corridor
- ▭ Municipal Boundary

Pipeline Route (Pipeline Construction Method)

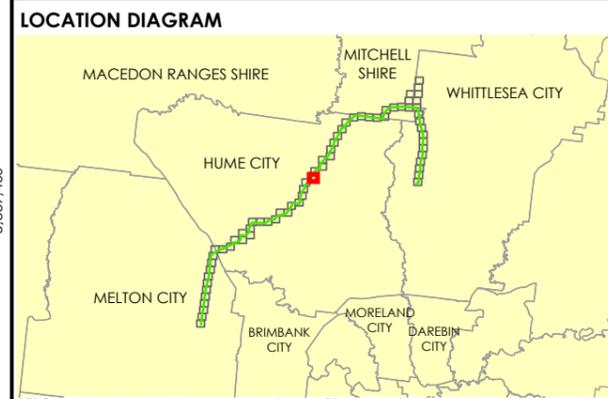
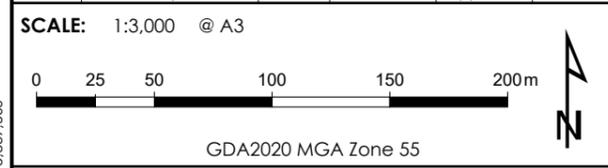
- Open Trench

Easement Status

- - - New Easement to Operate Pipeline

SERIAL NUMBER: WPT-MAP-L-0165
DOCUMENT NUMBER: WPT.2373-MAP-L-0175.31_3_IFU

Revision	Description	Drawn	Checked/QC	Approved	Date
3.0	Issued for Use	ST			28/06/21
2.0	Issued for Use	ST	MG	BS	17/06/21
1.0	Issued for Use	ST	EH	BS	15/06/21
0.2	Draft	ST	EH	BS	9/06/21
0.1	Draft	ST	EH	BS	6/06/21



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.



APA Group
 Phone: 1800 951 444
 Web: www.apa.com.au
 Email: worm@apa.com.au

PROJECT: Western Outer Ring Main
TITLE: Pipeline Licence Application
SUBTITLE: Map 32 of 67
DATE: 28/06/2021

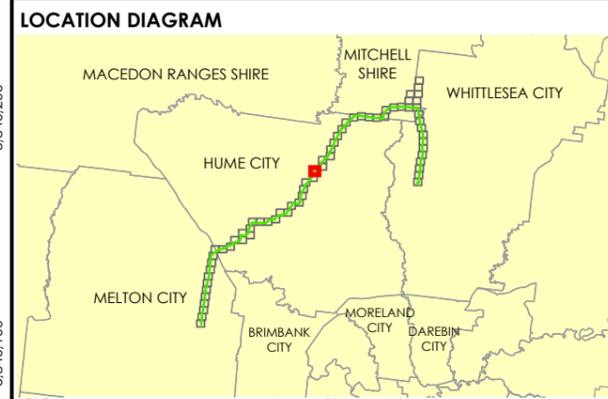
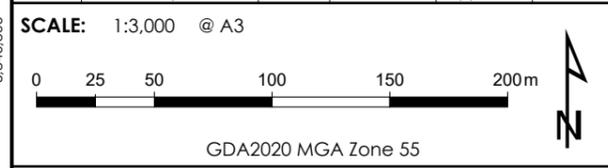
DATA SOURCE:
 Nearmap AU Image Service:
 © Geoscience Australia 2016 - Locations and Roads

LEGEND:

- Pipeline Kilometre Points
- Neighbouring Map
- Drainage Line
- ▭ Parcel Boundary Along Pipeline Route (Survey Adjusted)
- ▭ Pipeline Corridor
- ▭ Municipal Boundary
- Roads
 - Minor Road
- Pipeline Route (Pipeline Construction Method)
 - Open Trench
- Easement Status
 - - - New Easement to Operate Pipeline

SERIAL NUMBER: WPT-MAP-L-0165
DOCUMENT NUMBER: WPT.2373-MAP-L-0175.32_3_IFU

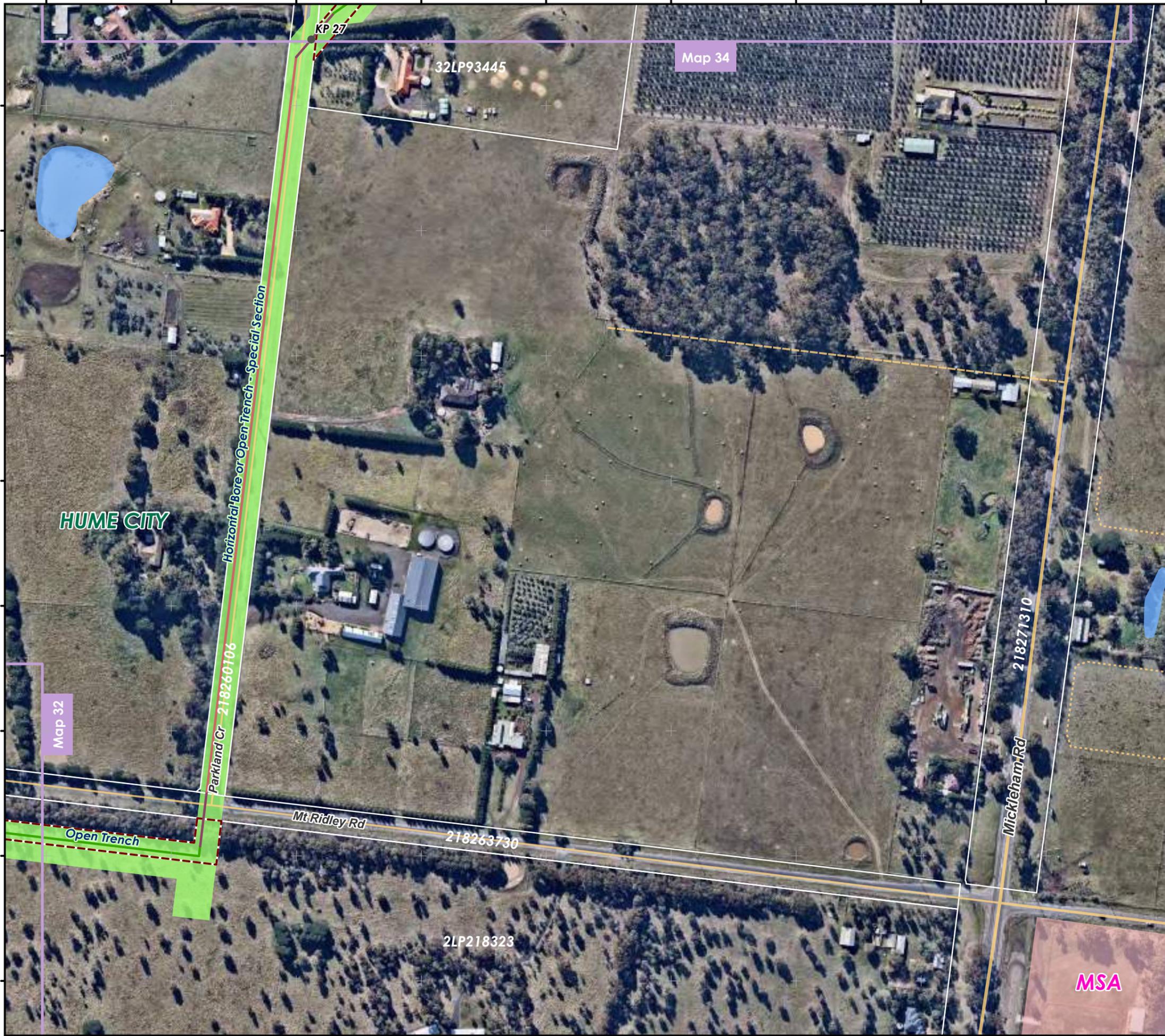
Revision	Description	Drawn	Checked/QC	Approved	Date
3.0	Issued for Use	ST			28/06/21
2.0	Issued for Use	ST	MG	BS	17/06/21
1.0	Issued for Use	ST	EH	BS	15/06/21
0.2	Draft	ST	EH	BS	9/06/21
0.1	Draft	ST	EH	BS	6/06/21



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.

311,700 311,800 311,900 312,000 312,100 312,200 312,300 312,400 312,500

5,841,300
5,841,200
5,841,100
5,841,000
5,840,900
5,840,800
5,840,700
5,840,600



Map 32

Map 34



APA Group
Phone: 1800 951 444
Web: www.apa.com.au
Email: worm@apa.com.au

PROJECT: Western Outer Ring Main

TITLE: Pipeline Licence Application

SUBTITLE: Map 33 of 67

DATE: 28/06/2021

DATA SOURCE:
Nearmap AU Image Service:
© Geoscience Australia 2016 - Locations and Roads

LEGEND:

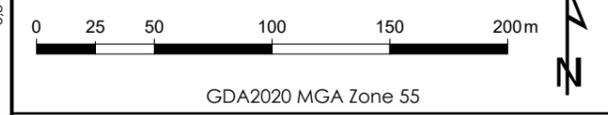
- Pipeline Kilometre Points
- ▭ Neighbouring Map
- Water
- ▭ Parcel Boundary Along Pipeline Route (Survey Adjusted)
- ▭ Pipeline Corridor
- ▭ Municipal Boundary
- ▭ MSA
- Roads**
- ▭ Secondary Road
- ▭ Tertiary Road
- ▭ Minor Road
- ▭ Minor Road, Unsealed
- ▭ Future Road
- Pipeline Route (Pipeline Construction Method)**
- ▭ Horizontal Bore - Special Crossing
- ▭ Open Trench
- ▭ Horizontal Bore or Open Trench - Special Section
- Easement Status**
- ▭ New Easement to Operate Pipeline

SERIAL NUMBER: WPT-MAP-L-0165

DOCUMENT NUMBER: WPT.2373-MAP-L-0175.33_3_IFU

3.0	Issued for Use	ST			28/06/21
2.0	Issued for Use	ST	MG	BS	17/06/21
1.0	Issued for Use	ST	EH	BS	15/06/21
0.2	Draft	ST	EH	BS	9/06/21
0.1	Draft	ST	EH	BS	6/06/21
Revision	Description	Drawn	Checked/QC	Approved	Date

SCALE: 1:3,000 @ A3



LOCATION DIAGRAM



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.

311,700 311,800 311,900 312,000 312,100 312,200 312,300 312,400 312,500



APA Group
 Phone: 1800 951 444
 Web: www.apa.com.au
 Email: worm@apa.com.au

PROJECT: Western Outer Ring Main
TITLE: Pipeline Licence Application
SUBTITLE: Map 34 of 67
DATE: 28/06/2021

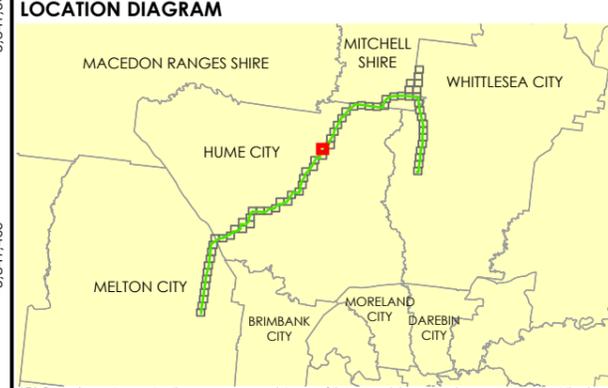
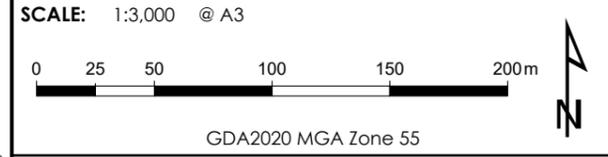
DATA SOURCE:
 Nearmap AU Image Service:
 © Geoscience Australia 2016 - Locations and Roads

LEGEND:

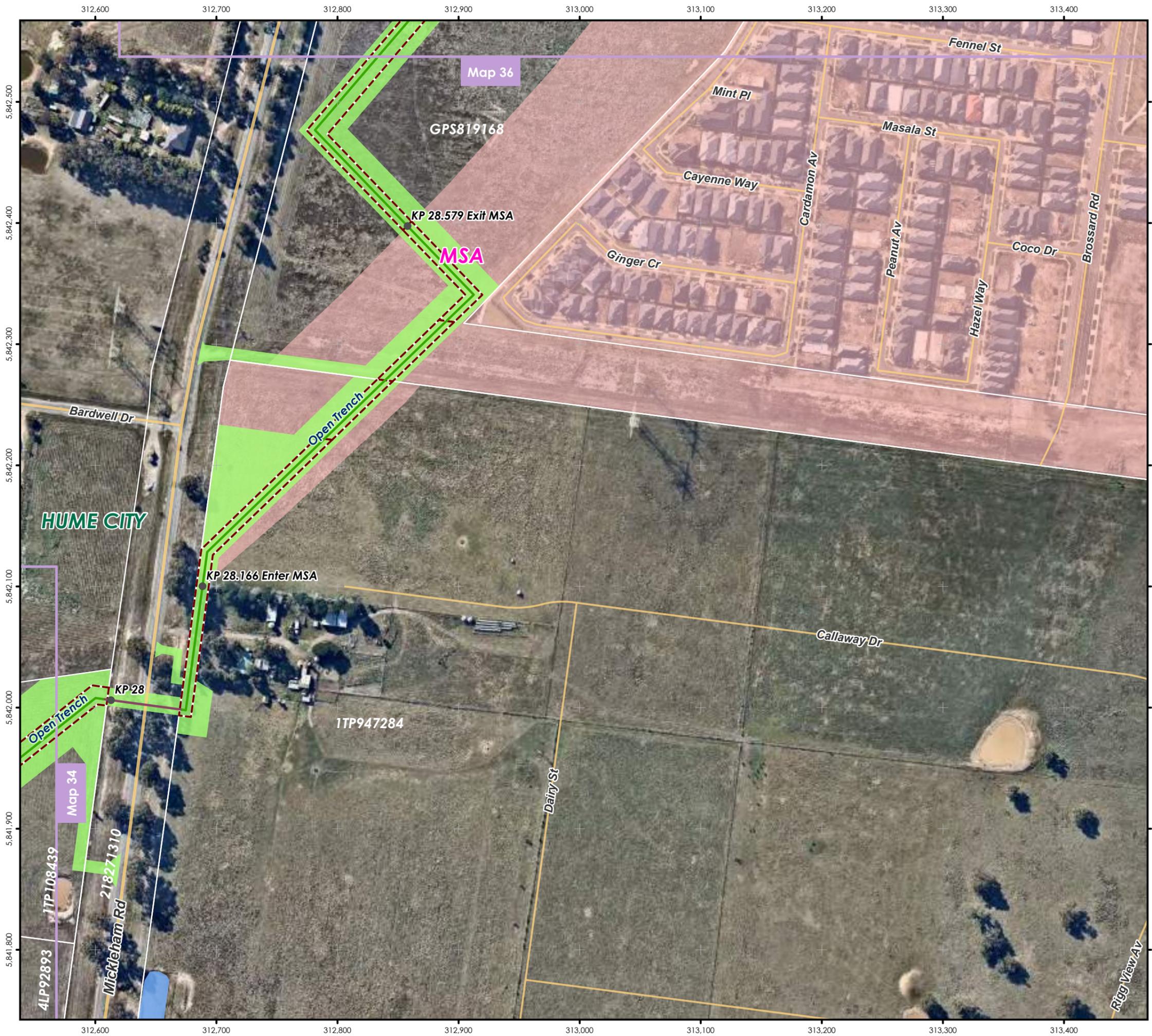
- Pipeline Kilometre Points
- Neighbouring Map
- Water
- Parcel Boundary Along Pipeline Route (Survey Adjusted)
- Pipeline Corridor
- Municipal Boundary
- Roads
 - Secondary Road
 - Tertiary Road
 - Minor Road
 - Minor Road, Unsealed
- Pipeline Route (Pipeline Construction Method)
 - Horizontal Bore - Special Crossing
 - Open Trench
 - Horizontal Bore or Open Trench - Special Section
- Easement Status
 - New Easement to Operate Pipeline

SERIAL NUMBER: WPT-MAP-L-0165
DOCUMENT NUMBER: WPT.2373-MAP-L-0175.34_3_IFU

Revision	Description	Drawn	Checked/QC	Approved	Date	
3.0	Issued for Use	ST		MG	BS	28/06/21
2.0	Issued for Use	ST		EH	BS	17/06/21
1.0	Issued for Use	ST		EH	BS	15/06/21
0.2	Draft	ST		EH	BS	9/06/21
0.1	Draft	ST		EH	BS	6/06/21



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.




 APA Group
 Phone: 1800 951 444
 Web: www.apa.com.au
 Email: worm@apa.com.au

PROJECT: Western Outer Ring Main
TITLE: Pipeline Licence Application
SUBTITLE: Map 35 of 67
DATE: 28/06/2021

DATA SOURCE:
 Nearmap AU Image Service:
 © Geoscience Australia 2016 - Locations and Roads

LEGEND:

- Pipeline Kilometre Points
- Neighbouring Map
- Water
- Parcel Boundary Along Pipeline Route (Survey Adjusted)
- Pipeline Corridor
- Municipal Boundary
- MSA

Roads

- Secondary Road
- Tertiary Road
- Minor Road

Pipeline Route (Pipeline Construction Method)

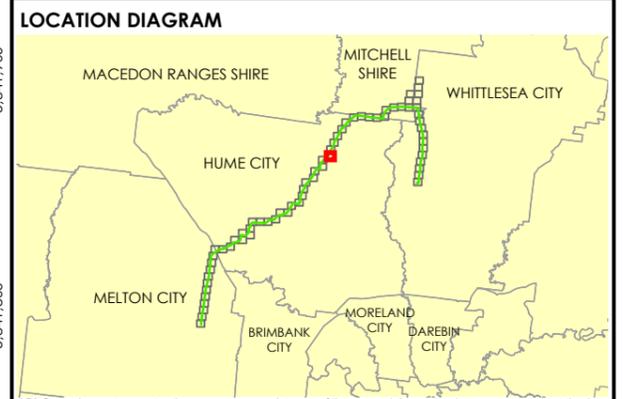
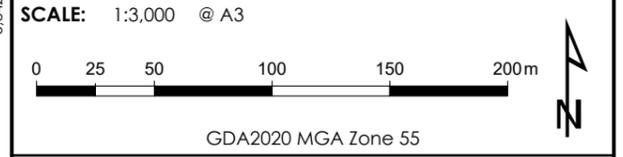
- Horizontal Bore - Special Crossing
- Open Trench

Easement Status

- - - New Easement to Operate Pipeline

SERIAL NUMBER: WPT-MAP-L-0165
DOCUMENT NUMBER: WPT.2373-MAP-L-0175.35_3_IFU

Revision	Description	Drawn	Checked/QC	Approved	Date
3.0	Issued for Use	ST			28/06/21
2.0	Issued for Use	ST	MG	BS	17/06/21
1.0	Issued for Use	ST	EH	BS	15/06/21
0.2	Draft	ST	EH	BS	9/06/21
0.1	Draft	ST	EH	BS	6/06/21



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.



APA Group
 Phone: 1800 951 444
 Web: www.apa.com.au
 Email: worm@apa.com.au

PROJECT: Western Outer Ring Main

TITLE: Pipeline Licence Application

SUBTITLE: Map 36 of 67

DATE: 28/06/2021

DATA SOURCE:
 Nearmap AU Image Service:
 © Geoscience Australia 2016 - Locations and Roads

LEGEND:

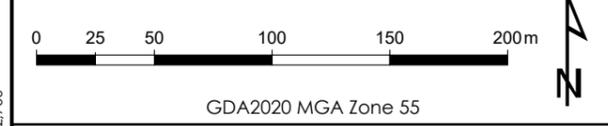
- Pipeline Kilometre Points
- Neighbouring Map
- Water
- Drainage Line
- Parcel Boundary Along Pipeline Route (Survey Adjusted)
- Pipeline Corridor
- Municipal Boundary
- MSA
- Roads**
- Secondary Road
- Minor Road
- Minor Road, Unsealed
- Future Road
- Pipeline Route (Pipeline Construction Method)**
- Horizontal Bore - Special Crossing
- Open Trench
- Easement Status**
- New Easement to Operate Pipeline

SERIAL NUMBER: WPT-MAP-L-0165

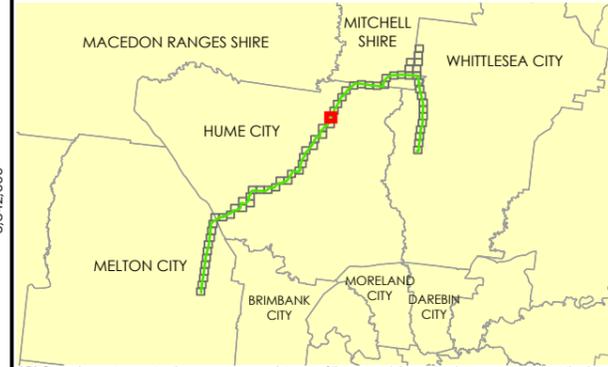
DOCUMENT NUMBER: WPT.2373-MAP-L-0175.36_3_IFU

3.0	Issued for Use	ST			28/06/21
2.0	Issued for Use	ST	MG	BS	17/06/21
1.0	Issued for Use	ST	EH	BS	15/06/21
0.2	Draft	ST	EH	BS	9/06/21
0.1	Draft	ST	EH	BS	6/06/21
Revision	Description	Drawn	Checked/QC	Approved	Date

SCALE: 1:3,000 @ A3



LOCATION DIAGRAM



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.



APA Group
 Phone: 1800 951 444
 Web: www.apa.com.au
 Email: worm@apa.com.au

PROJECT: Western Outer Ring Main
TITLE: Pipeline Licence Application
SUBTITLE: Map 37 of 67
DATE: 28/06/2021

DATA SOURCE:
 Nearmap AU Image Service:
 © Geoscience Australia 2016 - Locations and Roads

LEGEND:

- Pipeline Kilometre Points
- Neighbouring Map
- Water
- Parcel Boundary Along Pipeline Route (Survey Adjusted)
- Pipeline Corridor
- Municipal Boundary
- MSA

Roads

- Secondary Road
- Tertiary Road
- Minor Road
- Minor Road, Unsealed
- Future Road

Pipeline Route (Pipeline Construction Method)

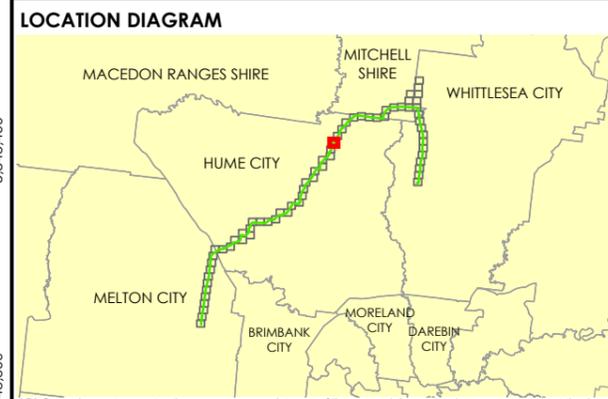
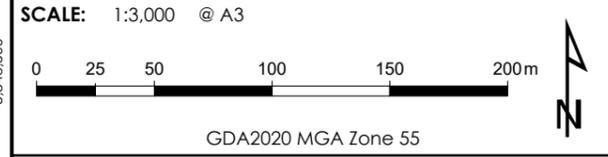
- Horizontal Bore - Special Crossing
- Open Trench

Easement Status

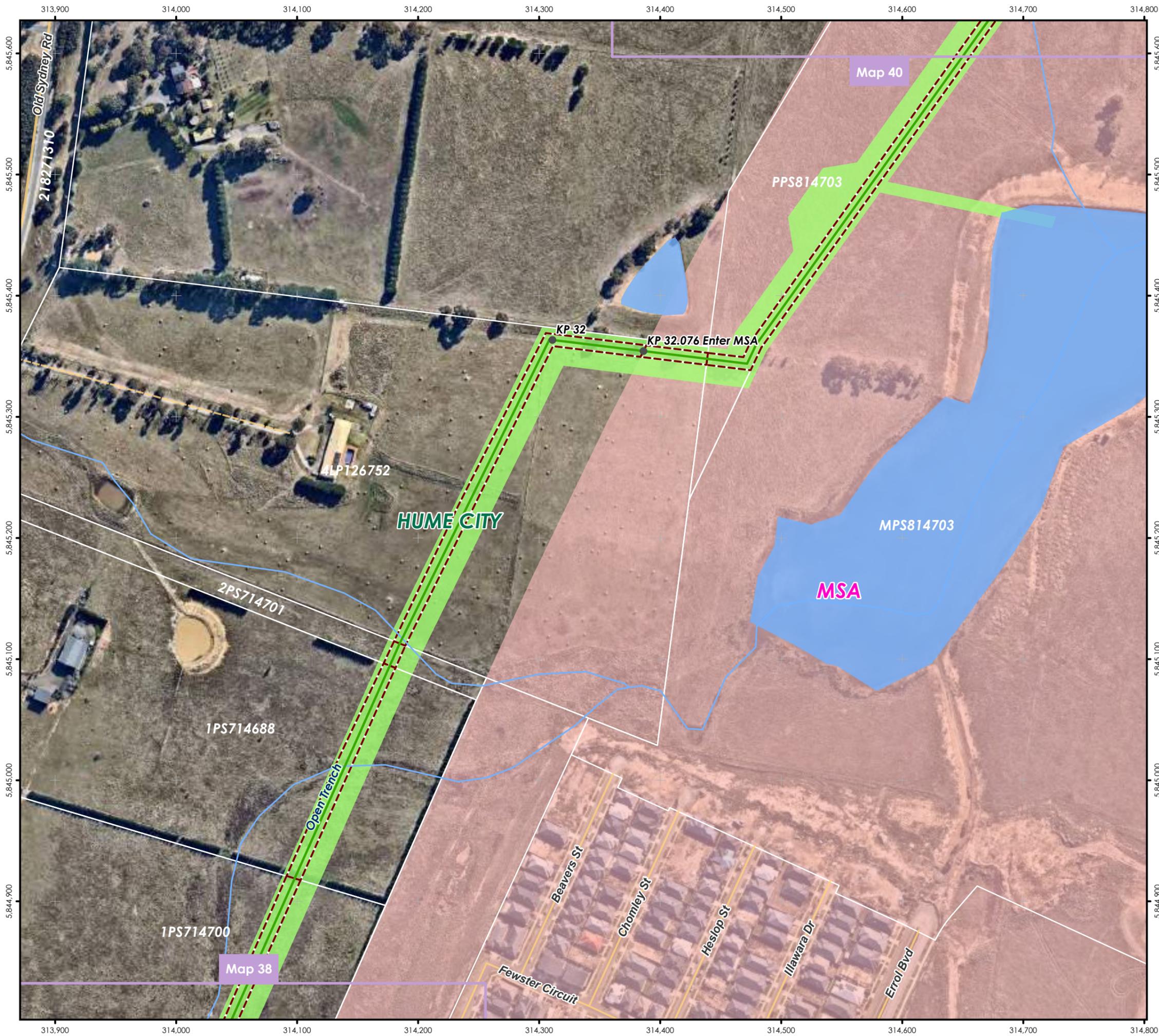
- New Easement to Operate Pipeline

SERIAL NUMBER: WPT-MAP-L-0165
DOCUMENT NUMBER: WPT.2373-MAP-L-0175.37_3_IFU

3.0	Issued for Use	ST	MG	BS	28/06/21
2.0	Issued for Use	ST	EH	BS	17/06/21
1.0	Issued for Use	ST	EH	BS	15/06/21
0.2	Draft	ST	EH	BS	9/06/21
0.1	Draft	ST	EH	BS	6/06/21
Revision	Description	Drawn	Checked/QC	Approved	Date



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.



APA Group
 Phone: 1800 951 444
 Web: www.apa.com.au
 Email: worm@apa.com.au

PROJECT: Western Outer Ring Main
TITLE: Pipeline Licence Application
SUBTITLE: Map 39 of 67
DATE: 28/06/2021

DATA SOURCE:
 Nearmap AU Image Service:
 © Geoscience Australia 2016 - Locations and Roads

LEGEND:

- Pipeline Kilometre Points
- Neighbouring Map
- Water
- Drainage Line
- Parcel Boundary Along Pipeline Route (Survey Adjusted)
- Pipeline Corridor
- Municipal Boundary
- MSA

Roads

- Tertiary Road
- Minor Road
- Minor Road, Unsealed

Pipeline Route (Pipeline Construction Method)

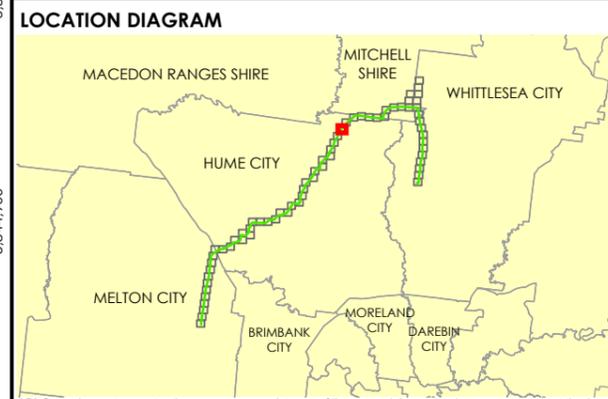
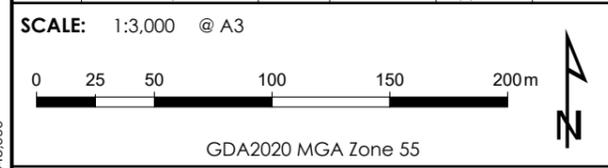
- Open Trench

Easement Status

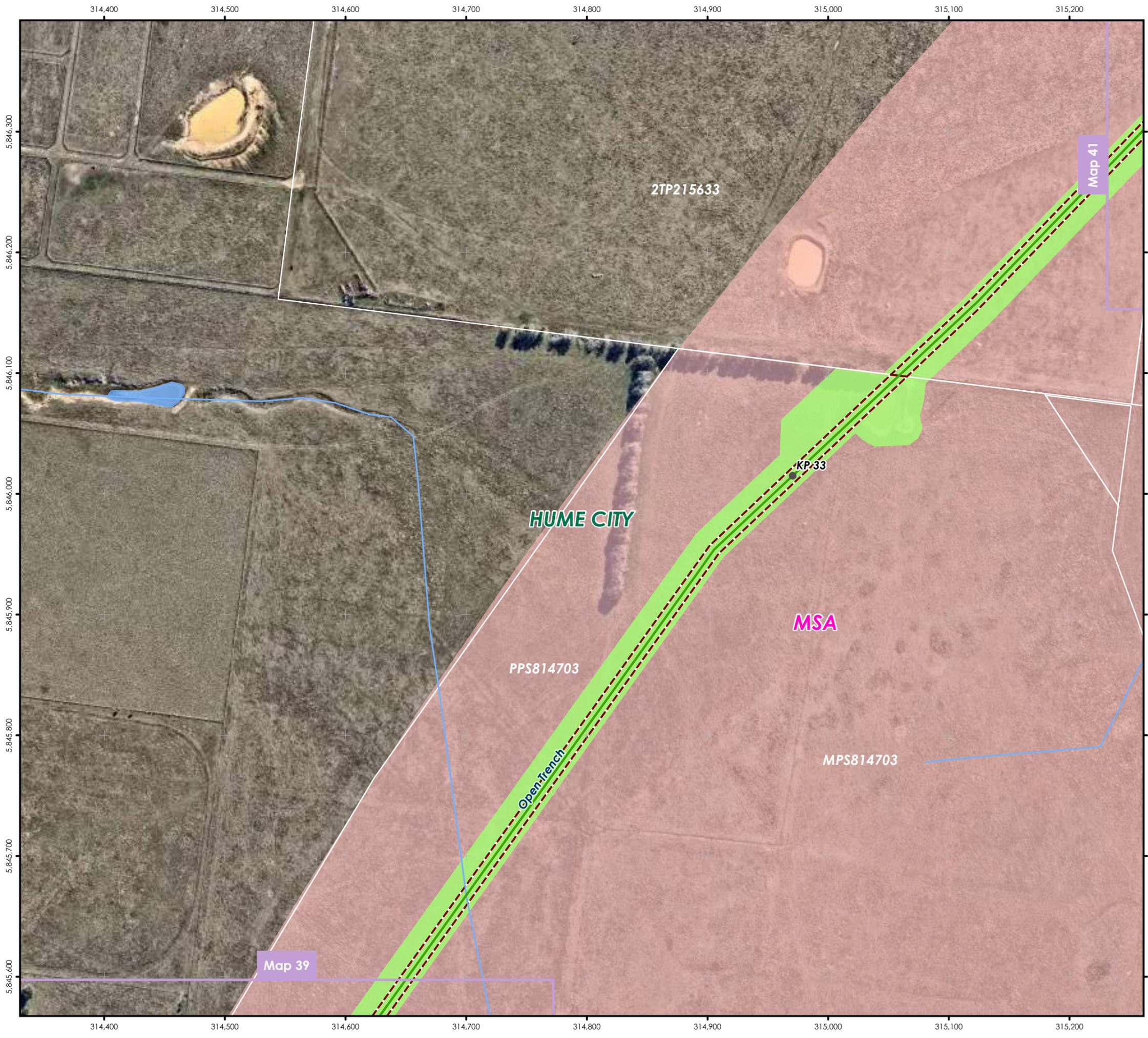
- New Easement to Operate Pipeline

SERIAL NUMBER: WPT-MAP-L-0165
DOCUMENT NUMBER: WPT.2373-MAP-L-0175.39_3_IFU

3.0	Issued for Use	ST			28/06/21
2.0	Issued for Use	ST	MG	BS	17/06/21
1.0	Issued for Use	ST	EH	BS	15/06/21
0.2	Draft	ST	EH	BS	9/06/21
0.1	Draft	ST	EH	BS	6/06/21
Revision	Description	Drawn	Checked/QC	Approved	Date



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.



APA Group
 Phone: 1800 951 444
 Web: www.apa.com.au
 Email: worm@apa.com.au

PROJECT: Western Outer Ring Main
TITLE: Pipeline Licence Application
SUBTITLE: Map 40 of 67
DATE: 28/06/2021

DATA SOURCE:
 Nearmap AU Image Service:
 © Geoscience Australia 2016 - Locations and Roads

LEGEND:

- Pipeline Kilometre Points
- Neighbouring Map
- Water
- Drainage Line
- Parcel Boundary Along Pipeline Route (Survey Adjusted)
- Pipeline Corridor
- Municipal Boundary
- MSA

Pipeline Route (Pipeline Construction Method)

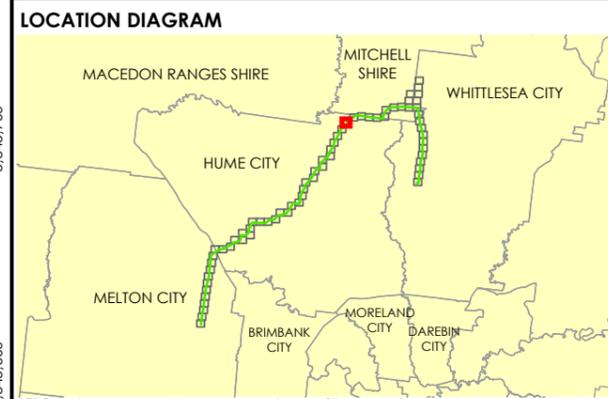
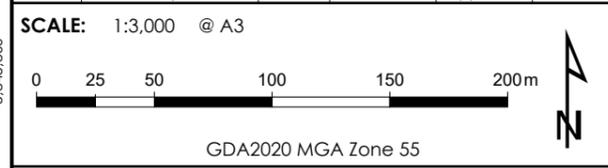
- Open Trench

Easement Status

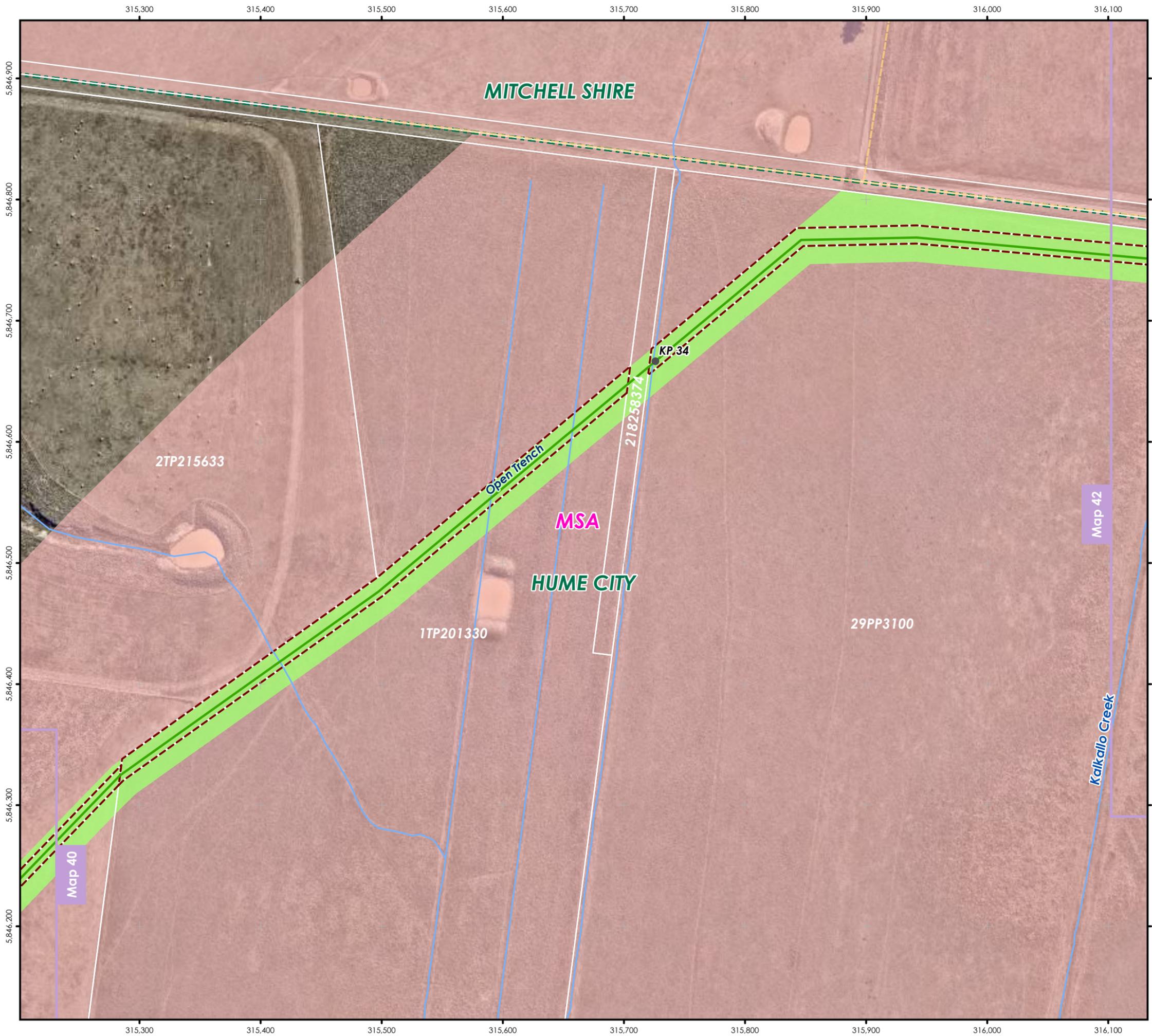
- - - New Easement to Operate Pipeline

SERIAL NUMBER: WPT-MAP-L-0165
DOCUMENT NUMBER: WPT.2373-MAP-L-0175.40_3_IFU

Revision	Description	Drawn	Checked/QC	Approved	Date
3.0	Issued for Use	ST			28/06/21
2.0	Issued for Use	ST	MG	BS	17/06/21
1.0	Issued for Use	ST	EH	BS	15/06/21
0.2	Draft	ST	EH	BS	9/06/21
0.1	Draft	ST	EH	BS	6/06/21



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.



APA Group
 Phone: 1800 951 444
 Web: www.apa.com.au
 Email: worm@apa.com.au

PROJECT: Western Outer Ring Main
TITLE: Pipeline Licence Application
SUBTITLE: Map 41 of 67
DATE: 28/06/2021

DATA SOURCE:
 Nearmap AU Image Service:
 © Geoscience Australia 2016 - Locations and Roads

LEGEND:

- Pipeline Kilometre Points
- Neighbouring Map
- Drainage Line
- ▭ Parcel Boundary Along Pipeline Route (Survey Adjusted)
- ▭ Pipeline Corridor
- ▭ Municipal Boundary
- ▭ MSA

Roads

- Minor Road, Unsealed

Pipeline Route (Pipeline Construction Method)

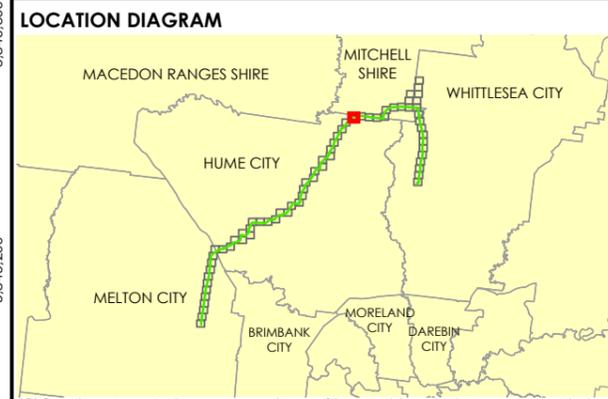
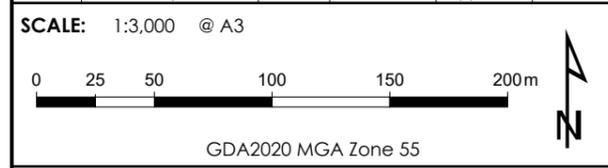
- Open Trench

Easement Status

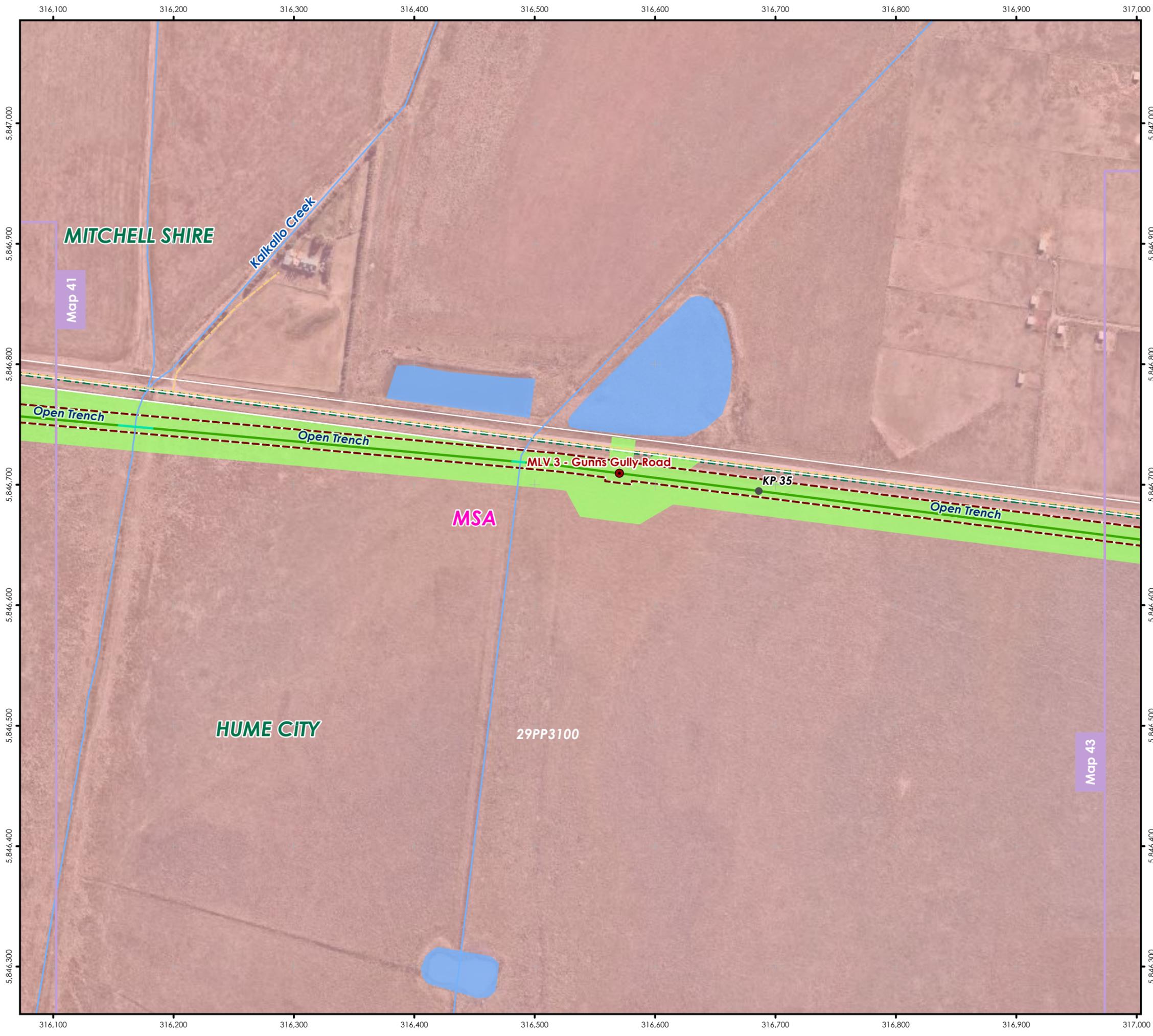
- ▭ New Easement to Operate Pipeline

SERIAL NUMBER: WPT-MAP-L-0165
DOCUMENT NUMBER: WPT.2373-MAP-L-0175.41_3_IFU

3.0	Issued for Use	ST	MG	BS	28/06/21
2.0	Issued for Use	ST	EH	BS	17/06/21
1.0	Issued for Use	ST	EH	BS	15/06/21
0.2	Draft	ST	EH	BS	9/06/21
0.1	Draft	ST	EH	BS	6/06/21
Revision	Description	Drawn	Checked/QC	Approved	Date



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.



APA Group
 Phone: 1800 951 444
 Web: www.apa.com.au
 Email: worm@apa.com.au

PROJECT: Western Outer Ring Main
TITLE: Pipeline Licence Application
SUBTITLE: Map 42 of 67
DATE: 28/06/2021

DATA SOURCE:
 Nearmap AU Image Service:
 © Geoscience Australia 2016 - Locations and Roads

LEGEND:

- Main Line Valve Location
- Pipeline Kilometre Points
- Neighbouring Map
- Water
- Drainage Line
- Parcel Boundary Along Pipeline Route (Survey Adjusted)
- Pipeline Corridor
- Municipal Boundary
- MSA

Roads

- Minor Road, Unsealed

Pipeline Route (Pipeline Construction Method)

- Open Trench
- Open Trench - Special Crossing

Easement Status

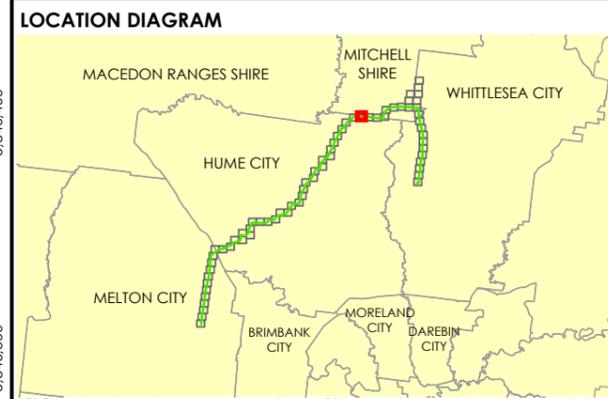
- New Easement to Operate Pipeline

SERIAL NUMBER: WPT-MAP-L-0165
DOCUMENT NUMBER: WPT.2373-MAP-L-0175.42_3_IFU

Revision	Description	Drawn	Checked/QC	Approved	Date
3.0	Issued for Use	ST			28/06/21
2.0	Issued for Use	ST	MG	BS	17/06/21
1.0	Issued for Use	ST	EH	BS	15/06/21
0.2	Draft	ST	EH	BS	9/06/21
0.1	Draft	ST	EH	BS	6/06/21

SCALE: 1:3,000 @ A3

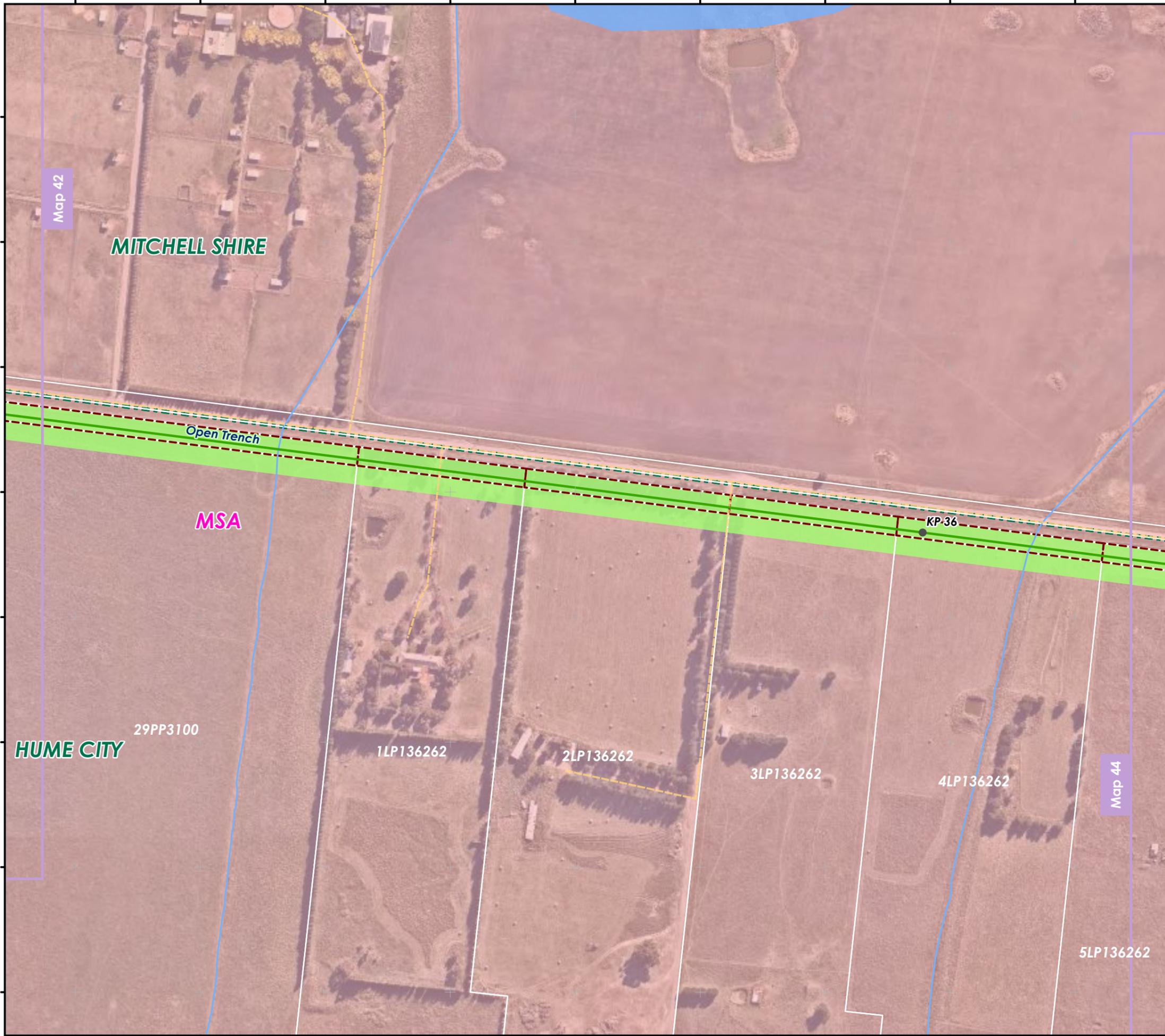
GDA2020 MGA Zone 55



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.

317,000 317,100 317,200 317,300 317,400 317,500 317,600 317,700 317,800

5.846,900
5.846,800
5.846,700
5.846,600
5.846,500
5.846,400
5.846,300
5.846,200



APA Group
Phone: 1800 951 444
Web: www.apa.com.au
Email: worm@apa.com.au

PROJECT: Western Outer Ring Main

TITLE: Pipeline Licence Application

SUBTITLE: Map 43 of 67

DATE: 28/06/2021

DATA SOURCE:
Nearmap AU Image Service:
© Geoscience Australia 2016 - Locations and Roads

LEGEND:

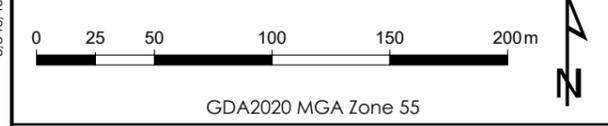
- Pipeline Kilometre Points
- ▬ Neighbouring Map
- Water
- Drainage Line
- ▭ Parcel Boundary Along Pipeline Route (Survey Adjusted)
- ▭ Pipeline Corridor
- ▭ Municipal Boundary
- ▭ MSA
- Roads
 - Minor Road, Unsealed
- Pipeline Route (Pipeline Construction Method)
 - Open Trench
- Easement Status
 - ▭ New Easement to Operate Pipeline

SERIAL NUMBER: WPT-MAP-L-0165

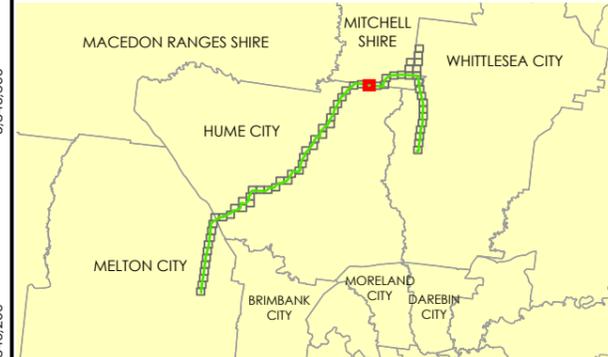
DOCUMENT NUMBER: WPT.2373-MAP-L-0175.43_3_IFU

3.0	Issued for Use	ST			28/06/21
2.0	Issued for Use	ST	MG	BS	17/06/21
1.0	Issued for Use	ST	EH	BS	15/06/21
0.2	Draft	ST	EH	BS	9/06/21
0.1	Draft	ST	EH	BS	6/06/21
Revision	Description	Drawn	Checked/QC	Approved	Date

SCALE: 1:3,000 @ A3



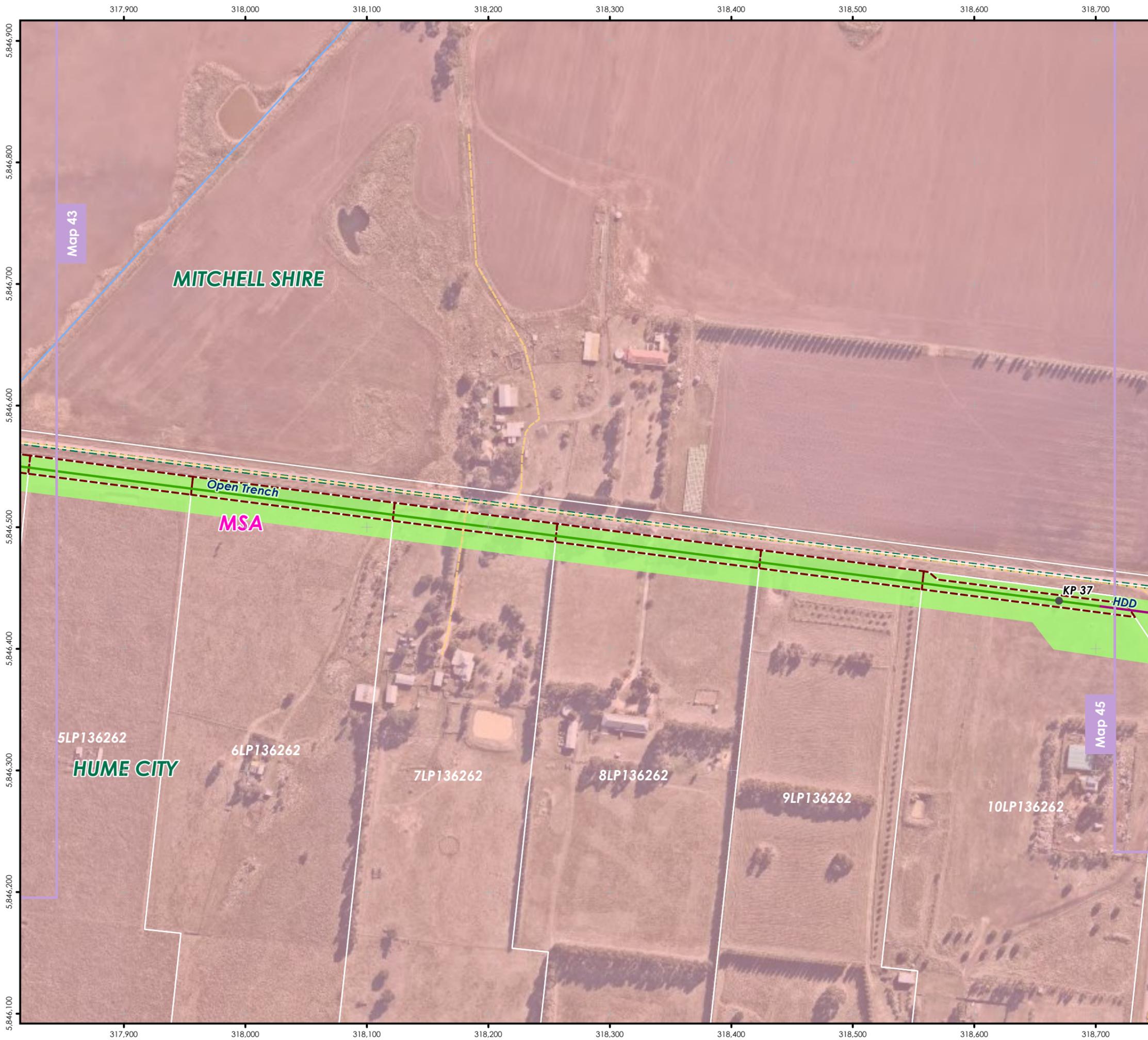
LOCATION DIAGRAM



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.

317,000 317,100 317,200 317,300 317,400 317,500 317,600 317,700 317,800

Y:\Projects\WORM\ArcPro\WORM_Rev8_Layouts\WORM_Rev8_Layouts.aprx - 28 Jun 2021 - siml



APA Group
 Phone: 1800 951 444
 Web: www.apa.com.au
 Email: worm@apa.com.au

PROJECT: Western Outer Ring Main
TITLE: Pipeline Licence Application
SUBTITLE: Map 44 of 67
DATE: 28/06/2021

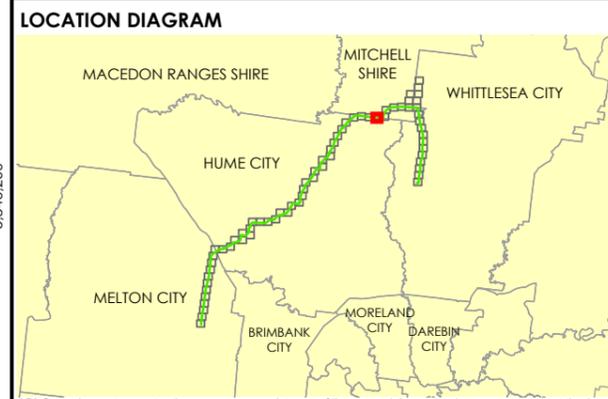
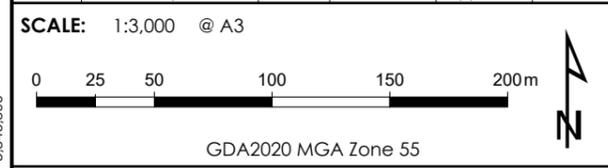
DATA SOURCE:
 Nearmap AU Image Service:
 © Geoscience Australia 2016 - Locations and Roads

LEGEND:

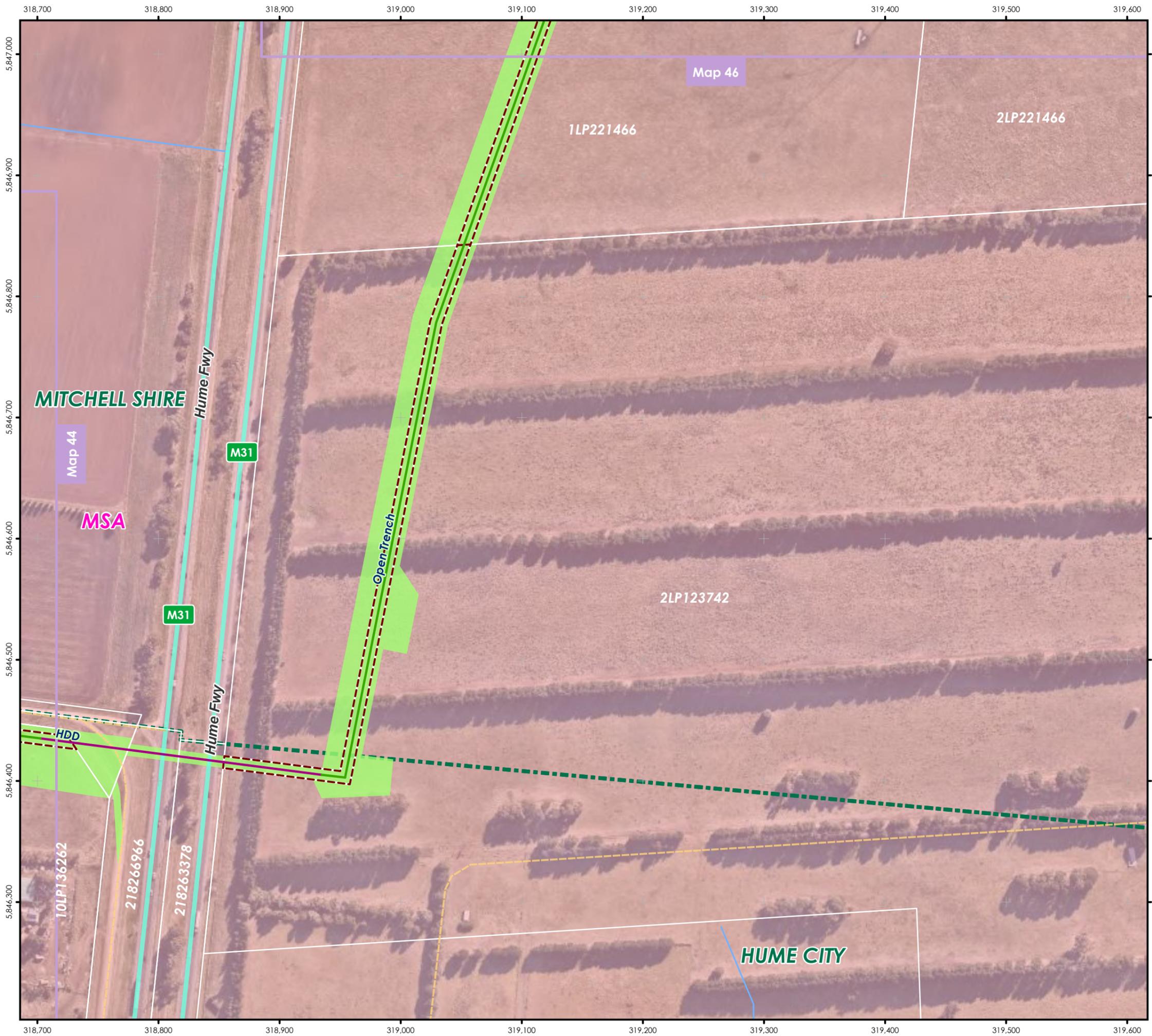
- Pipeline Kilometre Points
- Neighbouring Map
- Drainage Line
- ▭ Parcel Boundary Along Pipeline Route (Survey Adjusted)
- ▭ Pipeline Corridor
- ▭ Municipal Boundary
- ▭ MSA
- Roads**
- Minor Road, Unsealed
- Pipeline Route (Pipeline Construction Method)**
- HDD
- Open Trench
- Easement Status**
- ▭ New Easement to Operate Pipeline

SERIAL NUMBER: WPT-MAP-L-0165
DOCUMENT NUMBER: WPT.2373-MAP-L-0175.44_3_IFU

3.0	Issued for Use	ST	MG	BS	28/06/21
2.0	Issued for Use	ST	EH	BS	17/06/21
1.0	Issued for Use	ST	EH	BS	15/06/21
0.2	Draft	ST	EH	BS	9/06/21
0.1	Draft	ST	EH	BS	6/06/21
Revision	Description	Drawn	Checked/QC	Approved	Date



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.



APA Group
 Phone: 1800 951 444
 Web: www.apa.com.au
 Email: worm@apa.com.au

PROJECT: Western Outer Ring Main
TITLE: Pipeline Licence Application
SUBTITLE: Map 45 of 67
DATE: 28/06/2021

DATA SOURCE:
 Nearmap AU Image Service:
 © Geoscience Australia 2016 - Locations and Roads

LEGEND:

- Neighbouring Map
- Drainage Line
- Parcel Boundary Along Pipeline Route (Survey Adjusted)
- Pipeline Corridor
- Municipal Boundary
- MSA

Roads

- Freeway
- Minor Road, Unsealed

Pipeline Route (Pipeline Construction Method)

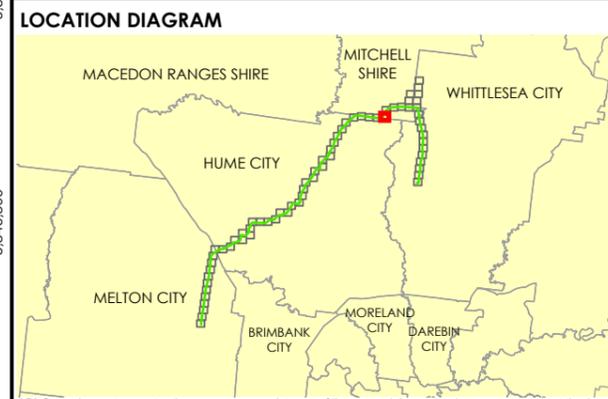
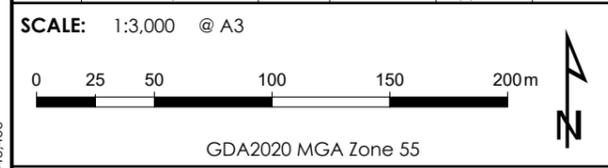
- HDD
- Open Trench

Easement Status

- New Easement to Operate Pipeline

SERIAL NUMBER: WPT-MAP-L-0165
DOCUMENT NUMBER: WPT.2373-MAP-L-0175.45_3_IFU

Revision	Description	Drawn	Checked/QC	Approved	Date
3.0	Issued for Use	ST		BS	28/06/21
2.0	Issued for Use	ST	MG	BS	17/06/21
1.0	Issued for Use	ST	EH	BS	15/06/21
0.2	Draft	ST	EH	BS	9/06/21
0.1	Draft	ST	EH	BS	6/06/21



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.



APA Group
 Phone: 1800 951 444
 Web: www.apa.com.au
 Email: worm@apa.com.au

PROJECT: Western Outer Ring Main
TITLE: Pipeline Licence Application
SUBTITLE: Map 46 of 67
DATE: 28/06/2021

DATA SOURCE:
 Nearmap AU Image Service:
 © Geoscience Australia 2016 - Locations and Roads

LEGEND:

- Pipeline Kilometre Points
- Neighbouring Map
- Water
- Drainage Line
- Parcel Boundary Along Pipeline Route (Survey Adjusted)
- Pipeline Corridor
- Municipal Boundary
- MSA

Roads

- Freeway
- Minor Road, Unsealed

Pipeline Route (Pipeline Construction Method)

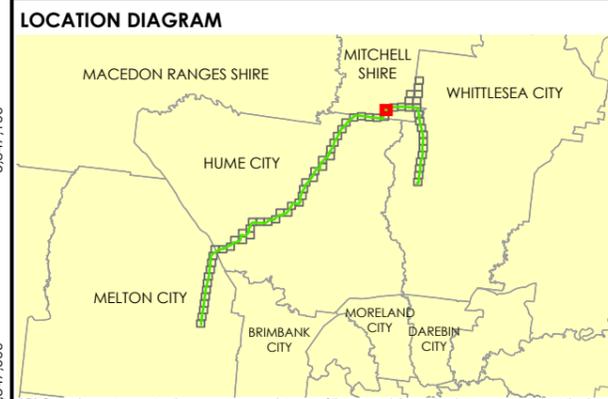
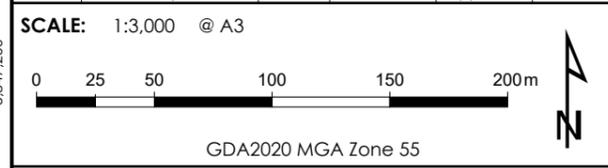
- Open Trench

Easement Status

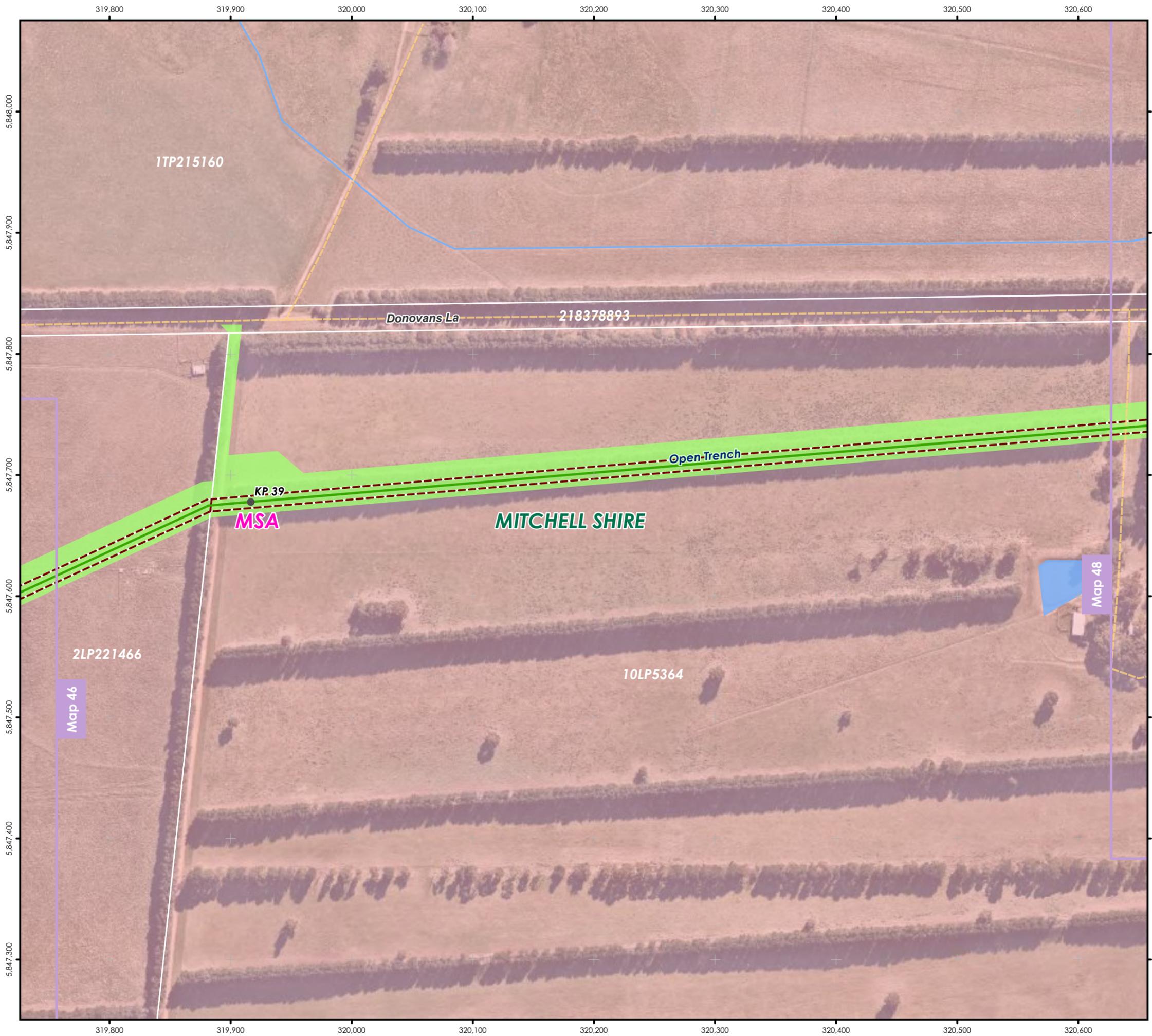
- New Easement to Operate Pipeline

SERIAL NUMBER: WPT-MAP-L-0165
DOCUMENT NUMBER: WPT.2373-MAP-L-0175.46_3_IFU

Revision	Description	Drawn	Checked/QC	Approved	Date
3.0	Issued for Use	ST			28/06/21
2.0	Issued for Use	ST	MG	BS	17/06/21
1.0	Issued for Use	ST	EH	BS	15/06/21
0.2	Draft	ST	EH	BS	9/06/21
0.1	Draft	ST	EH	BS	6/06/21



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.



APA Group
 Phone: 1800 951 444
 Web: www.apa.com.au
 Email: worm@apa.com.au

PROJECT: Western Outer Ring Main
TITLE: Pipeline Licence Application
SUBTITLE: Map 47 of 67
DATE: 28/06/2021

DATA SOURCE:
 Nearmap AU Image Service:
 © Geoscience Australia 2016 - Locations and Roads

LEGEND:

- Pipeline Kilometre Points
- ▭ Neighbouring Map
- Water
- Drainage Line
- ▭ Parcel Boundary Along Pipeline Route (Survey Adjusted)
- ▭ Pipeline Corridor
- ▭ Municipal Boundary
- ▭ MSA

Roads

- Minor Road, Unsealed

Pipeline Route (Pipeline Construction Method)

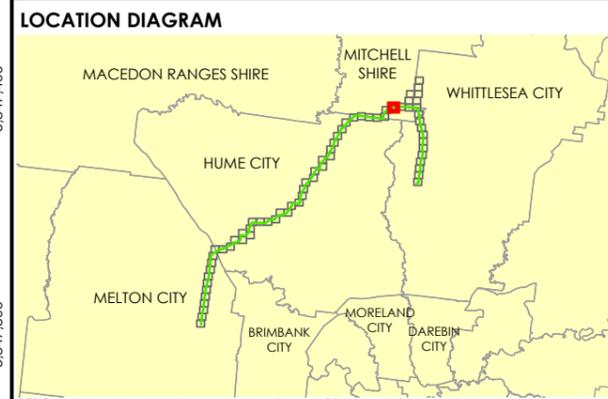
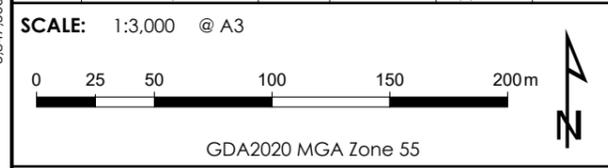
- Open Trench

Easement Status

- ▭ New Easement to Operate Pipeline

SERIAL NUMBER: WPT-MAP-L-0165
DOCUMENT NUMBER: WPT.2373-MAP-L-0175.47_3_IFU

Revision	Description	Drawn	Checked/QC	Approved	Date
3.0	Issued for Use	ST			28/06/21
2.0	Issued for Use	ST	MG	BS	17/06/21
1.0	Issued for Use	ST	EH	BS	15/06/21
0.2	Draft	ST	EH	BS	9/06/21
0.1	Draft	ST	EH	BS	6/06/21



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.



APA Group
 Phone: 1800 951 444
 Web: www.apa.com.au
 Email: worm@apa.com.au

PROJECT: Western Outer Ring Main
TITLE: Pipeline Licence Application
SUBTITLE: Map 48 of 67
DATE: 28/06/2021

DATA SOURCE:
 Nearmap AU Image Service:
 © Geoscience Australia 2016 - Locations and Roads

LEGEND:

- Pipeline Kilometre Points
- ▭ Neighbouring Map
- Water
- Drainage Line
- ▭ Parcel Boundary Along Pipeline Route (Survey Adjusted)
- ▭ Pipeline Corridor
- ▭ Municipal Boundary
- ▭ MSA

Roads

- Minor Road, Unsealed

Pipeline Route (Pipeline Construction Method)

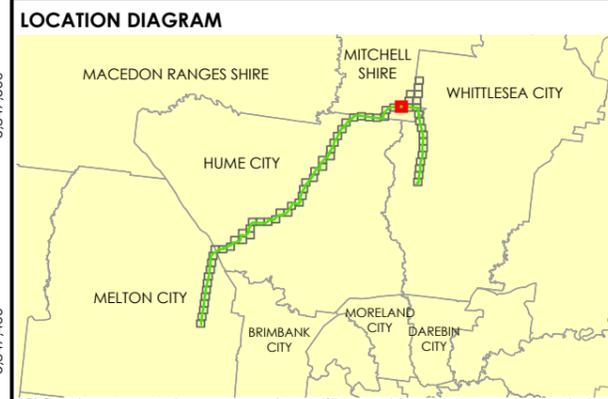
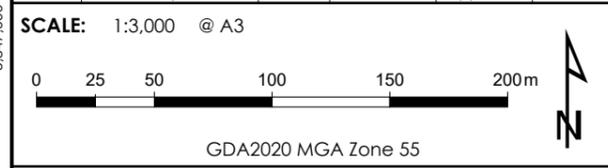
- Open Trench

Easement Status

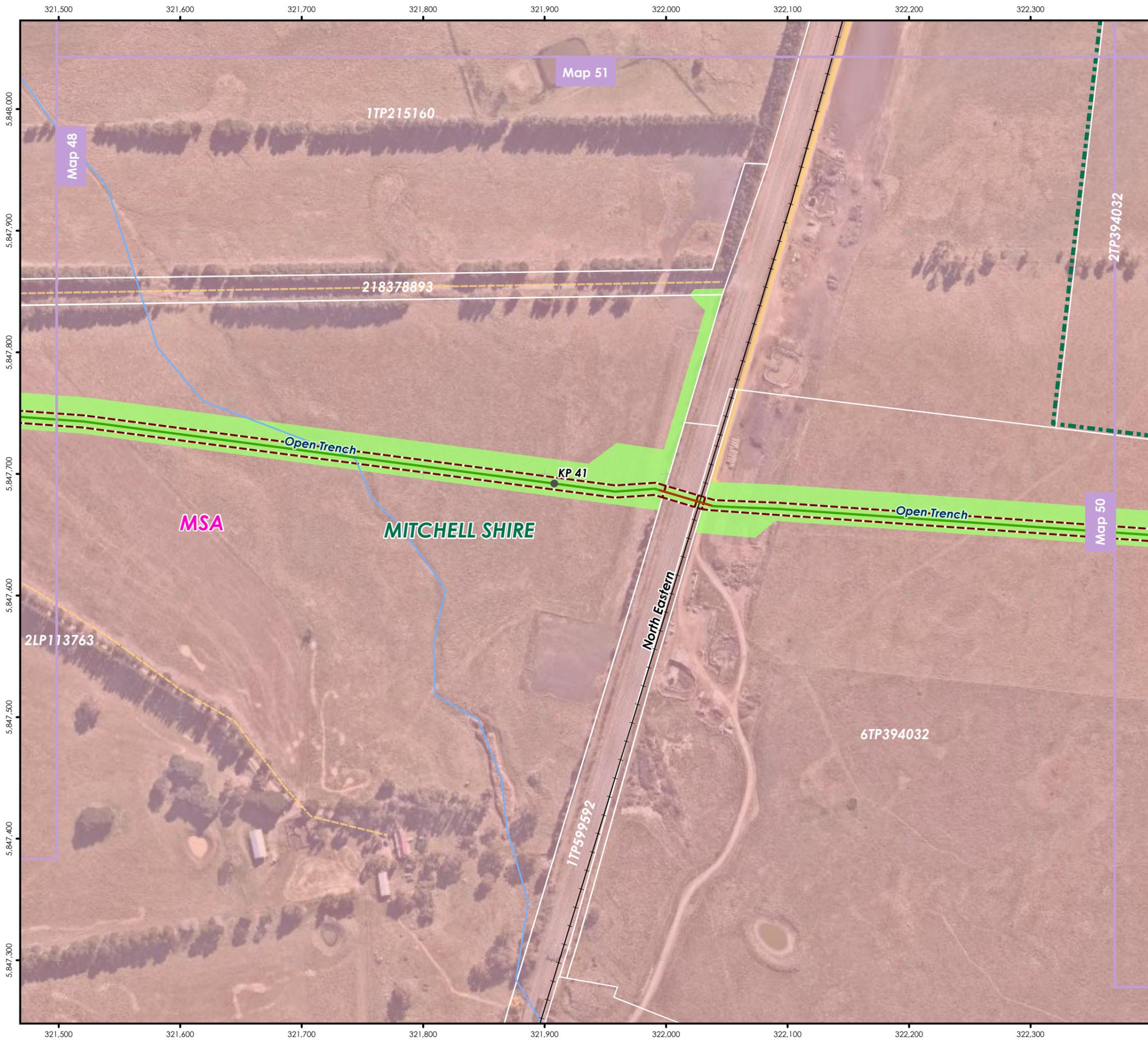
- ▭ New Easement to Operate Pipeline

SERIAL NUMBER: WPT-MAP-L-0165
DOCUMENT NUMBER: WPT.2373-MAP-L-0175.48_3_IFU

Revision	Description	Drawn	Checked/QC	Approved	Date
3.0	Issued for Use	ST			28/06/21
2.0	Issued for Use	ST	MG	BS	17/06/21
1.0	Issued for Use	ST	EH	BS	15/06/21
0.2	Draft	ST	EH	BS	9/06/21
0.1	Draft	ST	EH	BS	6/06/21



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.




 APA Group
 Phone: 1800 951 444
 Web: www.apa.com.au
 Email: worm@apa.com.au

PROJECT: Western Outer Ring Main
TITLE: Pipeline Licence Application
SUBTITLE: Map 49 of 67
DATE: 28/06/2021

DATA SOURCE:
 Nearmap AU Image Service:
 © Geoscience Australia 2016 - Locations and Roads

LEGEND:

- Pipeline Kilometre Points
- Neighbouring Map
- Railway Track
- Drainage Line
- Parcel Boundary Along Pipeline Route (Survey Adjusted)

Comp_Class

- Access Options
- Pipeline Corridor
- Municipal Boundary
- MSA

Roads

- Minor Road, Unsealed

Pipeline Route (Pipeline Construction Method)

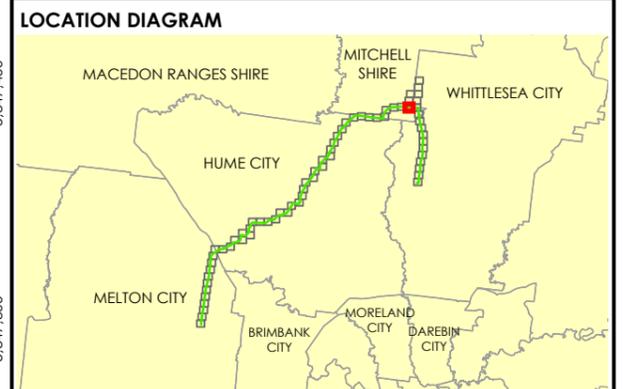
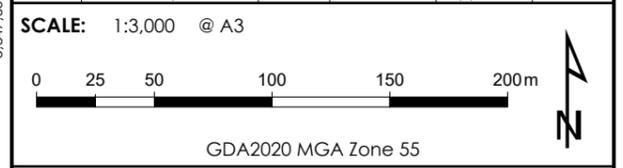
- Horizontal Laser Bore - Pipe Jacking
- Open Trench

Easement Status

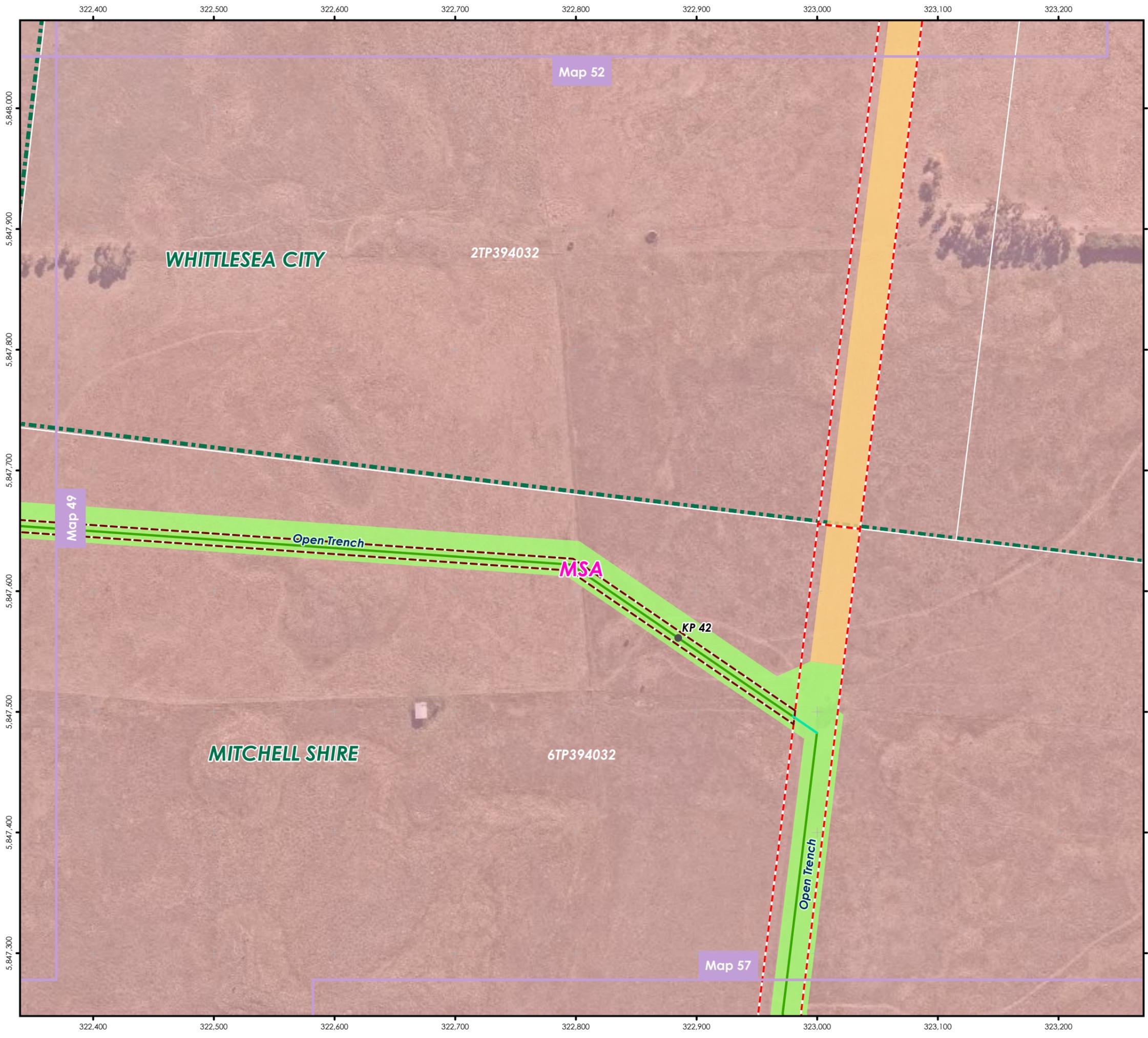
- New Easement to Operate Pipeline

SERIAL NUMBER: WPT-MAP-L-0165
DOCUMENT NUMBER: WPT.2373-MAP-L-0175.49_3_IFU

Revision	Description	Drawn	Checked/QC	Approved	Date
3.0	Issued for Use	ST		BS	28/06/21
2.0	Issued for Use	ST	MG	BS	17/06/21
1.0	Issued for Use	ST	EH	BS	15/06/21
0.2	Draft	ST	EH	BS	9/06/21
0.1	Draft	ST	EH	BS	6/06/21



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.



APA Group
 Phone: 1800 951 444
 Web: www.apa.com.au
 Email: worm@apa.com.au

PROJECT: Western Outer Ring Main
TITLE: Pipeline Licence Application
SUBTITLE: Map 50 of 67
DATE: 28/06/2021

DATA SOURCE:
 Nearmap AU Image Service:
 © Geoscience Australia 2016 - Locations and Roads

LEGEND:

- Pipeline Kilometre Points
- Neighbouring Map
- ▭ Parcel Boundary Along Pipeline Route (Survey Adjusted)

Comp_Class

- Access Options
- Pipeline Corridor
- ▬ Municipal Boundary
- MSA

Pipeline Route (Pipeline Construction Method)

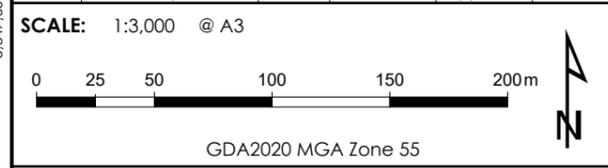
- Open Trench
- Open Trench - Special Crossing

Easement Status

- ▬ Existing Pipeline Easement
- ▬ New Easement to Operate Pipeline

SERIAL NUMBER: WPT-MAP-L-0165
DOCUMENT NUMBER: WPT.2373-MAP-L-0175.50_3_IFU

Revision	Description	Drawn	Checked/QC	Approved	Date
3.0	Issued for Use	ST			28/06/21
2.0	Issued for Use	ST	MG	BS	17/06/21
1.0	Issued for Use	ST	EH	BS	15/06/21
0.2	Draft	ST	EH	BS	9/06/21
0.1	Draft	ST	EH	BS	6/06/21



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.



APA Group
 Phone: 1800 951 444
 Web: www.apa.com.au
 Email: worm@apa.com.au

PROJECT: Western Outer Ring Main
TITLE: Pipeline Licence Application
SUBTITLE: Map 51 of 67
DATE: 28/06/2021

DATA SOURCE:
 Nearmap AU Image Service:
 © Geoscience Australia 2016 - Locations and Roads

LEGEND:

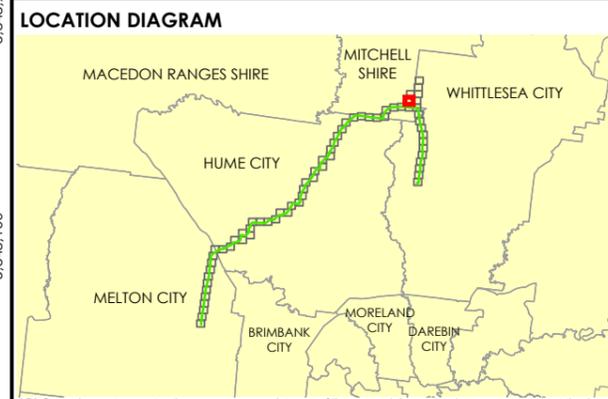
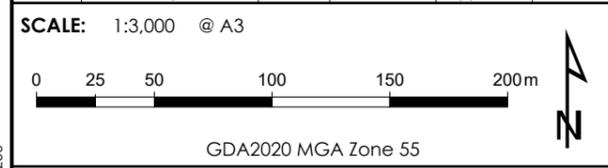
- Neighbouring Map
- Railway Track
- Drainage Line
- Parcel Boundary Along Pipeline Route (Survey Adjusted)

Comp_Class

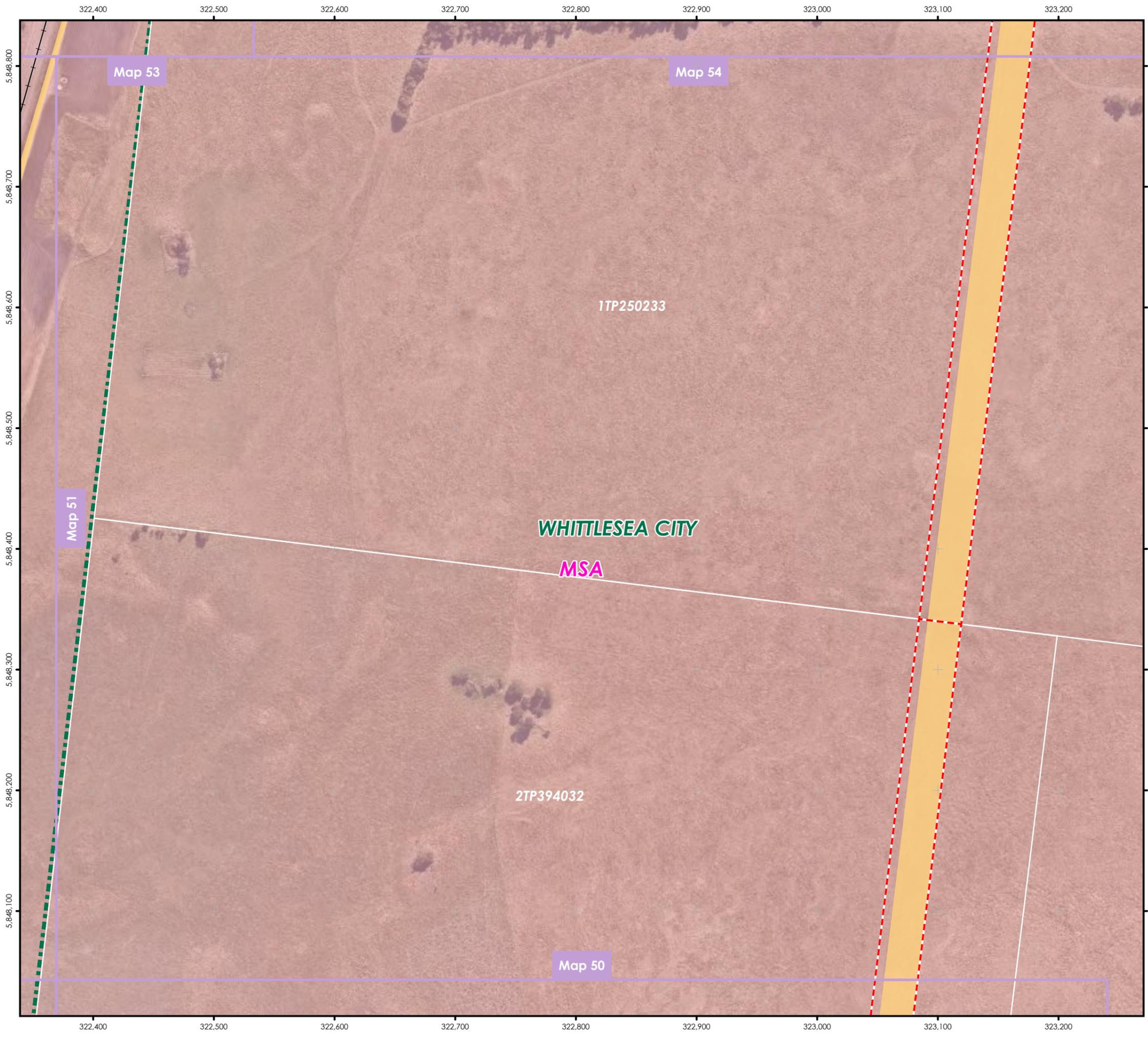
- Access Options
- Municipal Boundary
- MSA

SERIAL NUMBER: WPT-MAP-L-0165
DOCUMENT NUMBER: WPT.2373-MAP-L-0175.51_3_IFU

3.0	Issued for Use	ST			28/06/21
2.0	Issued for Use	ST	MG	BS	17/06/21
1.0	Issued for Use	ST	EH	BS	15/06/21
0.2	Draft	ST	EH	BS	9/06/21
0.1	Draft	ST	EH	BS	6/06/21
Revision	Description	Drawn	Checked/QC	Approved	Date



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.



APA Group
 Phone: 1800 951 444
 Web: www.apa.com.au
 Email: worm@apa.com.au

PROJECT: Western Outer Ring Main
TITLE: Pipeline Licence Application
SUBTITLE: Map 52 of 67
DATE: 28/06/2021

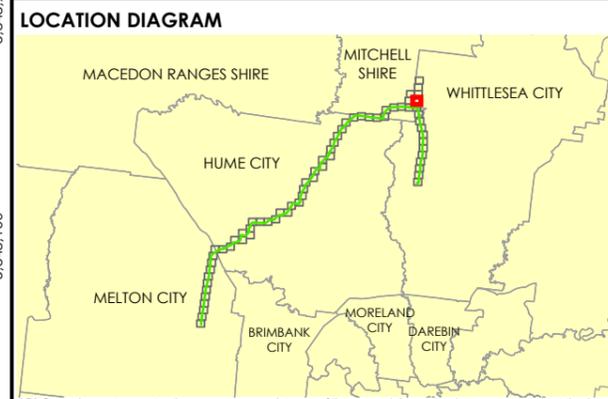
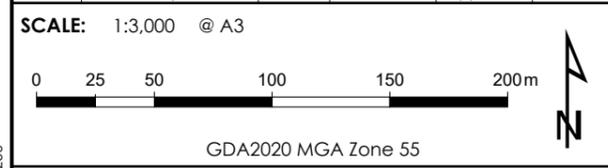
DATA SOURCE:
 Nearmap AU Image Service:
 © Geoscience Australia 2016 - Locations and Roads

LEGEND:

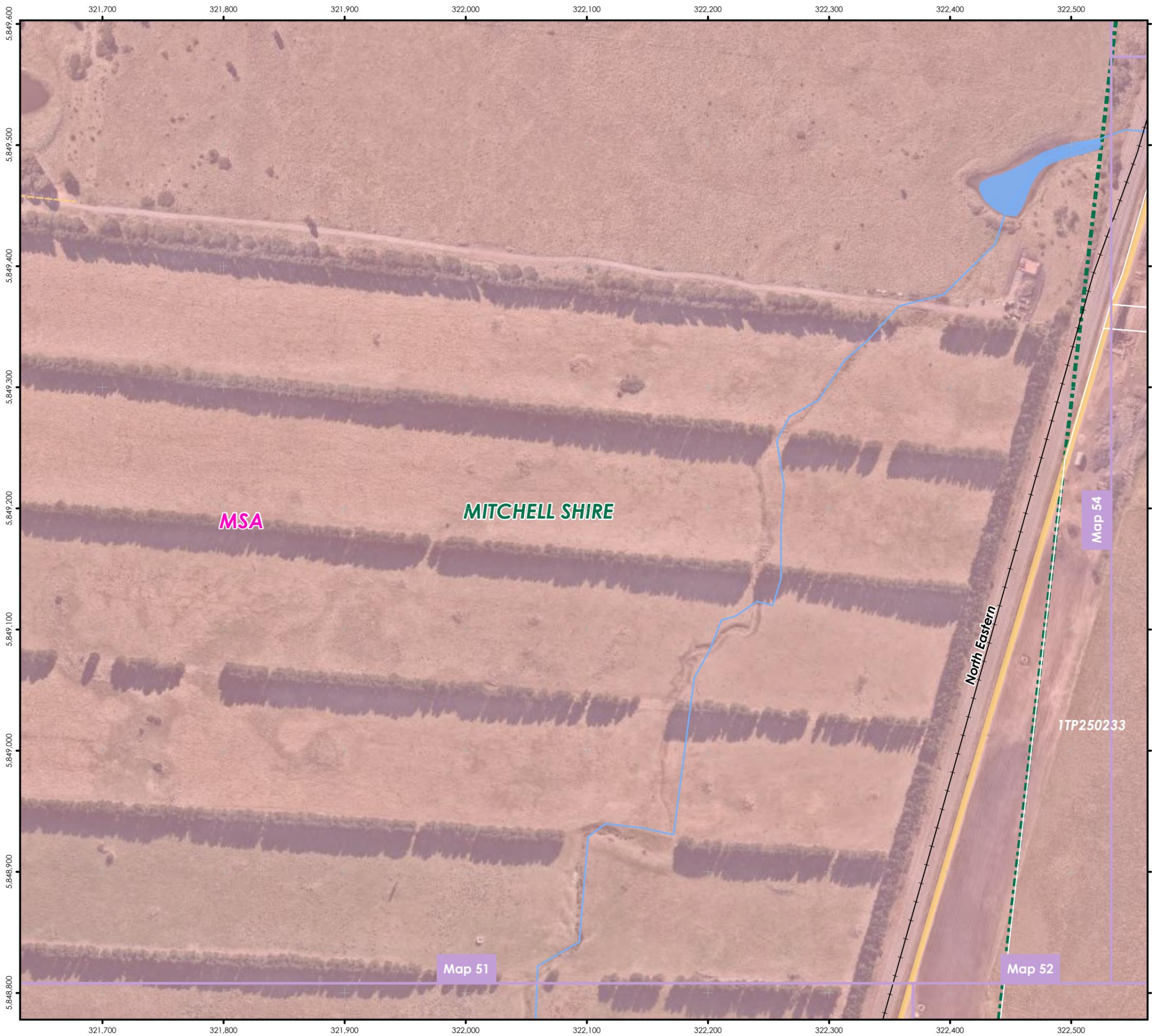
- Neighbouring Map
- Railway Track
- Parcel Boundary Along Pipeline Route (Survey Adjusted)
- Comp_Class**
- Access Options
- Municipal Boundary
- MSA
- Easement Status**
- Existing Pipeline Easement

SERIAL NUMBER: WPT-MAP-L-0165
DOCUMENT NUMBER: WPT.2373-MAP-L-0175.52_3_IFU

3.0	Issued for Use	ST			28/06/21
2.0	Issued for Use	ST	MG	BS	17/06/21
1.0	Issued for Use	ST	EH	BS	15/06/21
0.2	Draft	ST	EH	BS	9/06/21
0.1	Draft	ST	EH	BS	6/06/21
Revision	Description	Drawn	Checked/QC	Approved	Date



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.



APA Group
 Phone: 1800 951 444
 Web: www.apa.com.au
 Email: worm@apa.com.au

PROJECT: Western Outer Ring Main
TITLE: Pipeline Licence Application
SUBTITLE: Map 53 of 67
DATE: 28/06/2021

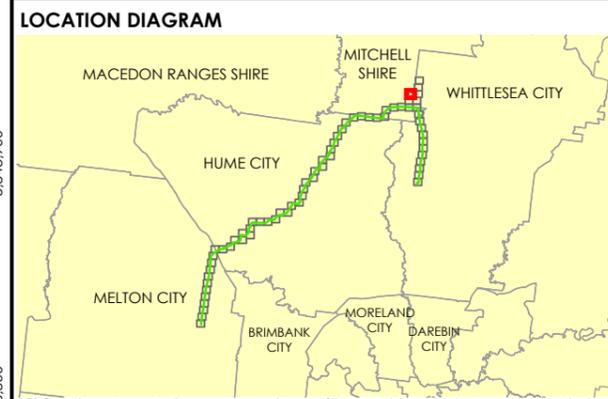
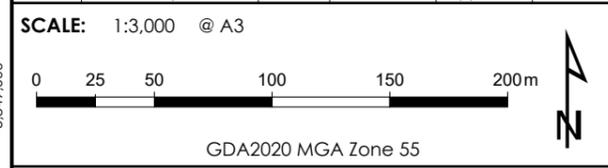
DATA SOURCE:
 Nearmap AU Image Service:
 © Geoscience Australia 2016 - Locations and Roads

LEGEND:

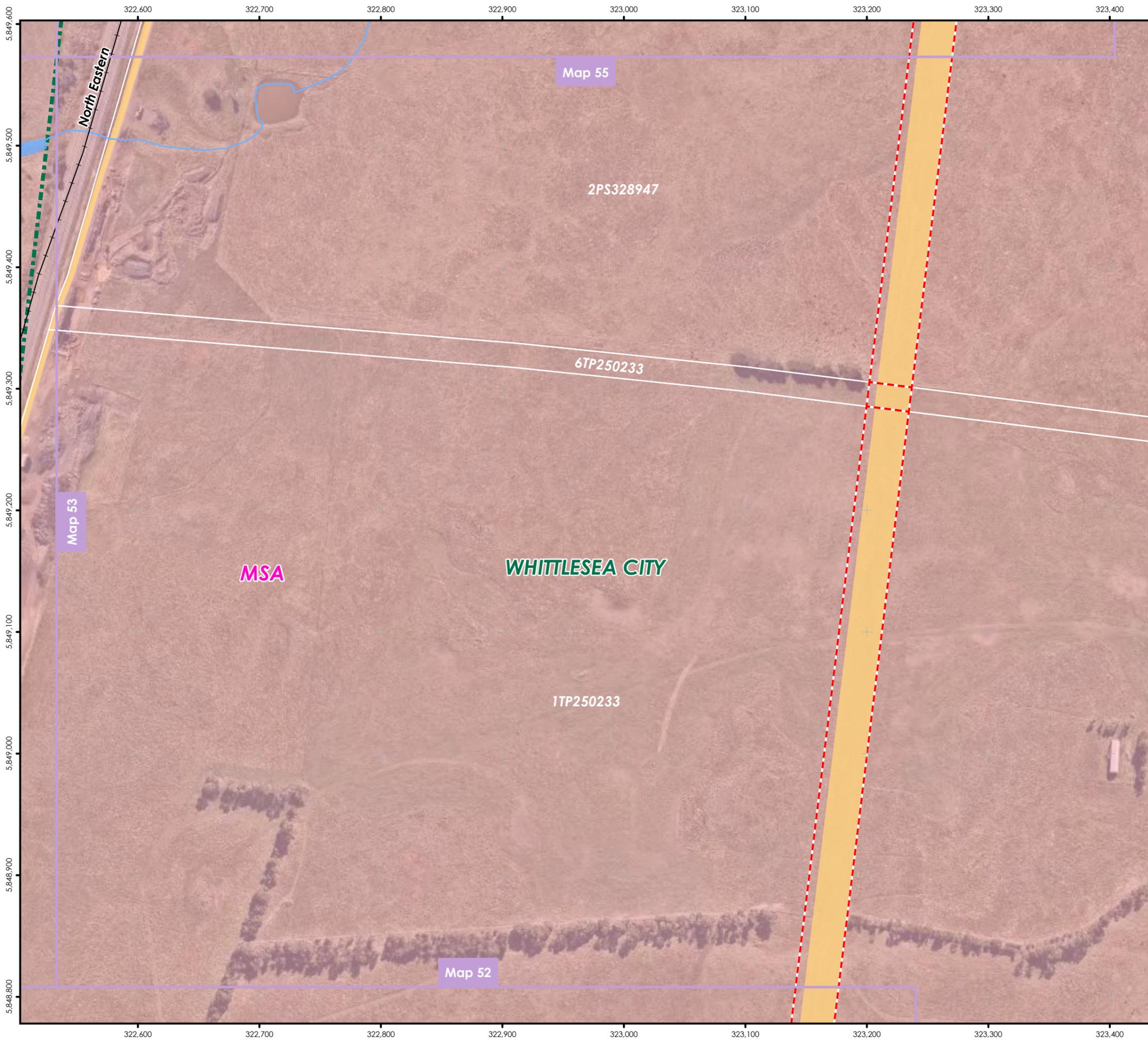
- Neighbouring Map
- Railway Track
- Water
- Drainage Line
- Parcel Boundary Along Pipeline Route (Survey Adjusted)
- Comp_Class**
- Access Options
- Municipal Boundary
- MSA
- Roads**
- Minor Road, Unsealed

SERIAL NUMBER: WPT-MAP-L-0165
DOCUMENT NUMBER: WPT.2373-MAP-L-0175.53_3_IFU

3.0	Issued for Use	ST		BS	28/06/21
2.0	Issued for Use	ST	MG	BS	17/06/21
1.0	Issued for Use	ST	EH	BS	15/06/21
0.2	Draft	ST	EH	BS	9/06/21
0.1	Draft	ST	EH	BS	6/06/21
Revision	Description	Drawn	Checked/QC	Approved	Date



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.



APA Group
 Phone: 1800 951 444
 Web: www.apa.com.au
 Email: worm@apa.com.au

PROJECT: Western Outer Ring Main
TITLE: Pipeline Licence Application
SUBTITLE: Map 54 of 67
DATE: 28/06/2021

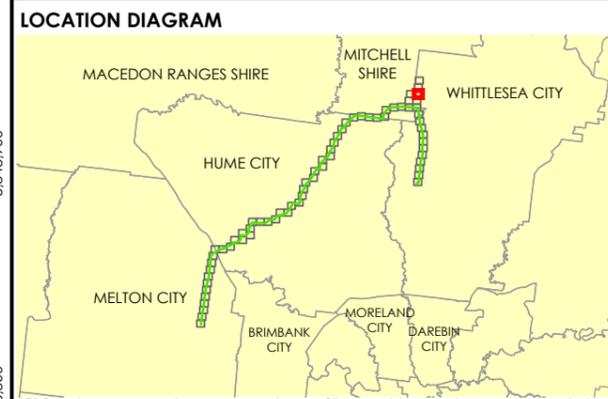
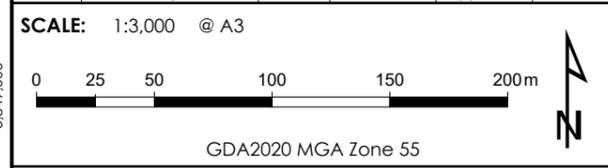
DATA SOURCE:
 Nearmap AU Image Service:
 © Geoscience Australia 2016 - Locations and Roads

LEGEND:

- Neighbouring Map
- Railway Track
- Water
- Drainage Line
- Parcel Boundary Along Pipeline Route (Survey Adjusted)
- Comp_Class**
- Access Options
- Municipal Boundary
- MSA
- Easement Status**
- Existing Pipeline Easement

SERIAL NUMBER: WPT-MAP-L-0165
DOCUMENT NUMBER: WPT.2373-MAP-L-0175.54_3_IFU

3.0	Issued for Use	ST			28/06/21
2.0	Issued for Use	ST	MG	BS	17/06/21
1.0	Issued for Use	ST	EH	BS	15/06/21
0.2	Draft	ST	EH	BS	9/06/21
0.1	Draft	ST	EH	BS	6/06/21
Revision	Description	Drawn	Checked/QC	Approved	Date



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.



APA Group
 Phone: 1800 951 444
 Web: www.apa.com.au
 Email: worm@apa.com.au

PROJECT: Western Outer Ring Main

TITLE: Pipeline Licence Application

SUBTITLE: Map 55 of 67

DATE: 28/06/2021

DATA SOURCE:

Nearmap AU Image Service:
 © Geoscience Australia 2016 - Locations and Roads

LEGEND:

- Neighbouring Map
- Railway Track
- Drainage Line
- Parcel Boundary Along Pipeline Route (Survey Adjusted)
- Comp_Class**
- Access Options
- Municipal Boundary
- MSA
- Easement Status**
- Existing Pipeline Easement

SERIAL NUMBER: WPT-MAP-L-0165

DOCUMENT NUMBER: WPT.2373-MAP-L-0175.55_3_IFU

3.0	Issued for Use	ST			28/06/21
2.0	Issued for Use	ST	MG	BS	17/06/21
1.0	Issued for Use	ST	EH	BS	15/06/21
0.2	Draft	ST	EH	BS	9/06/21
0.1	Draft	ST	EH	BS	6/06/21
Revision	Description	Drawn	Checked/QC	Approved	Date

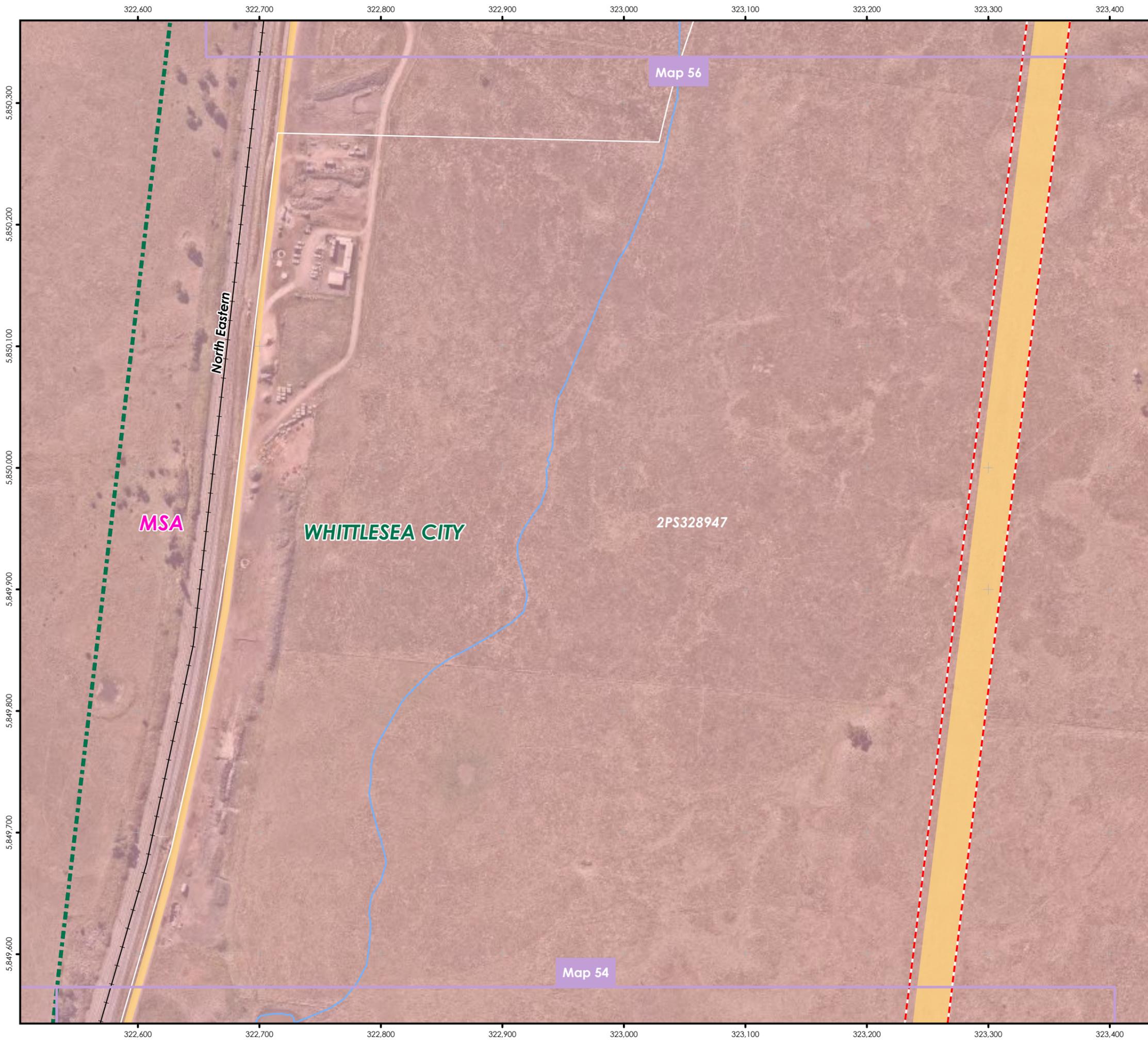
SCALE: 1:3,000 @ A3

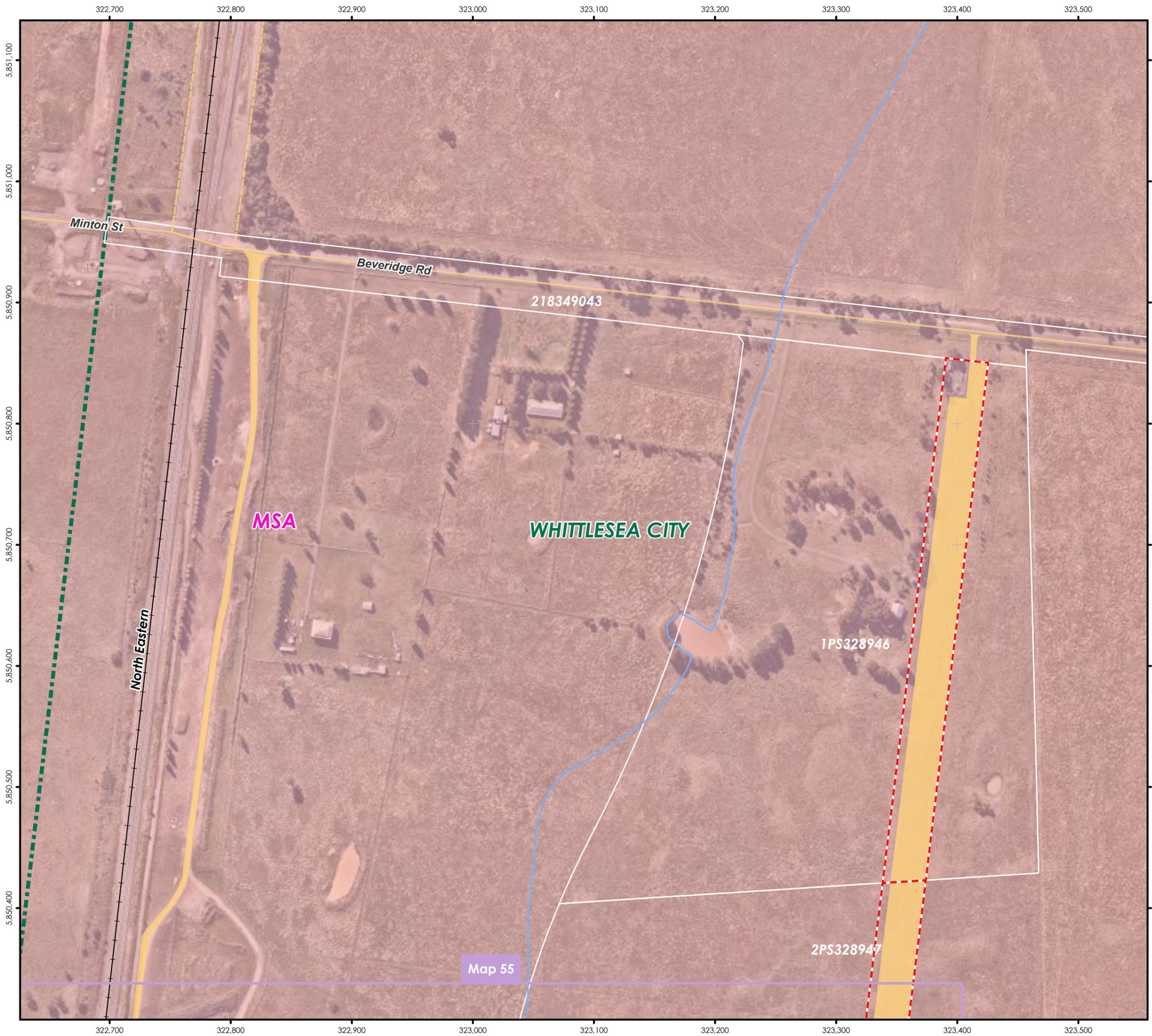


LOCATION DIAGRAM



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.





APA Group
 Phone: 1800 951 444
 Web: www.apa.com.au
 Email: worm@apa.com.au

PROJECT: Western Outer Ring Main

TITLE: Pipeline Licence Application

SUBTITLE: Map 56 of 67

DATE: 28/06/2021

DATA SOURCE:
 Nearmap AU Image Service:
 © Geoscience Australia 2016 - Locations and Roads

LEGEND:

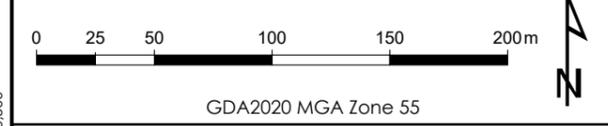
- Neighbouring Map
- Railway Track
- Drainage Line
- Parcel Boundary Along Pipeline Route (Survey Adjusted)
- Comp_Class**
- Access Options
- Municipal Boundary
- MSA
- Roads**
- Minor Road
- Minor Road, Unsealed
- Easement Status**
- Existing Pipeline Easement

SERIAL NUMBER: WPT-MAP-L-0165

DOCUMENT NUMBER: WPT.2373-MAP-L-0175.56_3_IFU

3.0	Issued for Use	ST			28/06/21
2.0	Issued for Use	ST	MG	BS	17/06/21
1.0	Issued for Use	ST	EH	BS	15/06/21
0.2	Draft	ST	EH	BS	9/06/21
0.1	Draft	ST	EH	BS	6/06/21
Revision	Description	Drawn	Checked/QC	Approved	Date

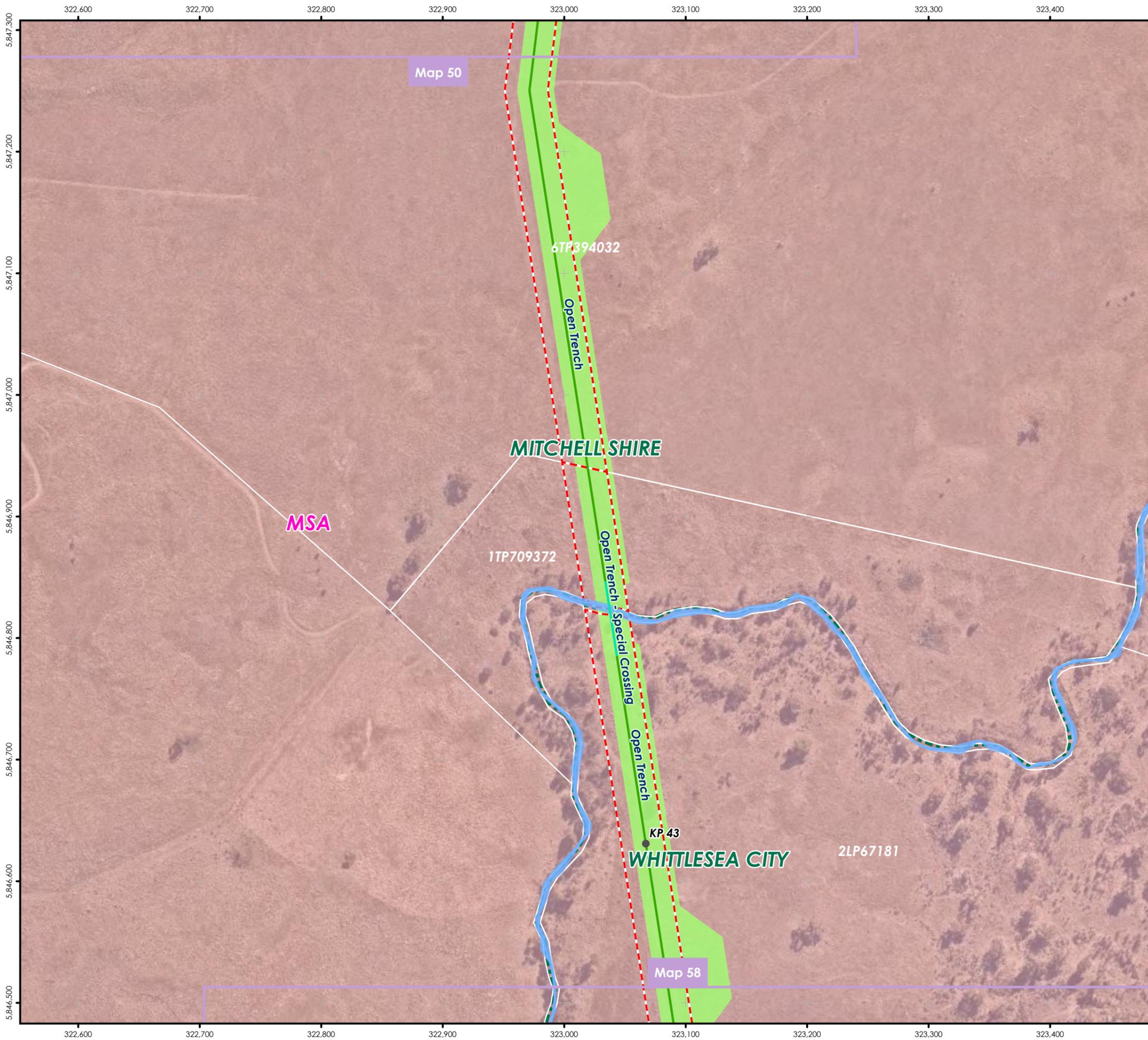
SCALE: 1:3,000 @ A3



LOCATION DIAGRAM



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.



APA Group
 Phone: 1800 951 444
 Web: www.apa.com.au
 Email: worm@apa.com.au

PROJECT: Western Outer Ring Main
TITLE: Pipeline Licence Application
SUBTITLE: Map 57 of 67
DATE: 28/06/2021

DATA SOURCE:
 Nearmap AU Image Service:
 © Geoscience Australia 2016 - Locations and Roads

LEGEND:

- Pipeline Kilometre Points
- Neighbouring Map
- Water
- Drainage Line
- Parcel Boundary Along Pipeline Route (Survey Adjusted)
- Pipeline Corridor
- Municipal Boundary
- MSA

Pipeline Route (Pipeline Construction Method)

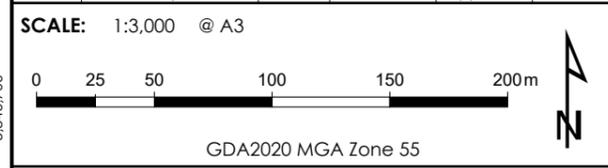
- Open Trench
- Open Trench - Special Crossing

Easement Status

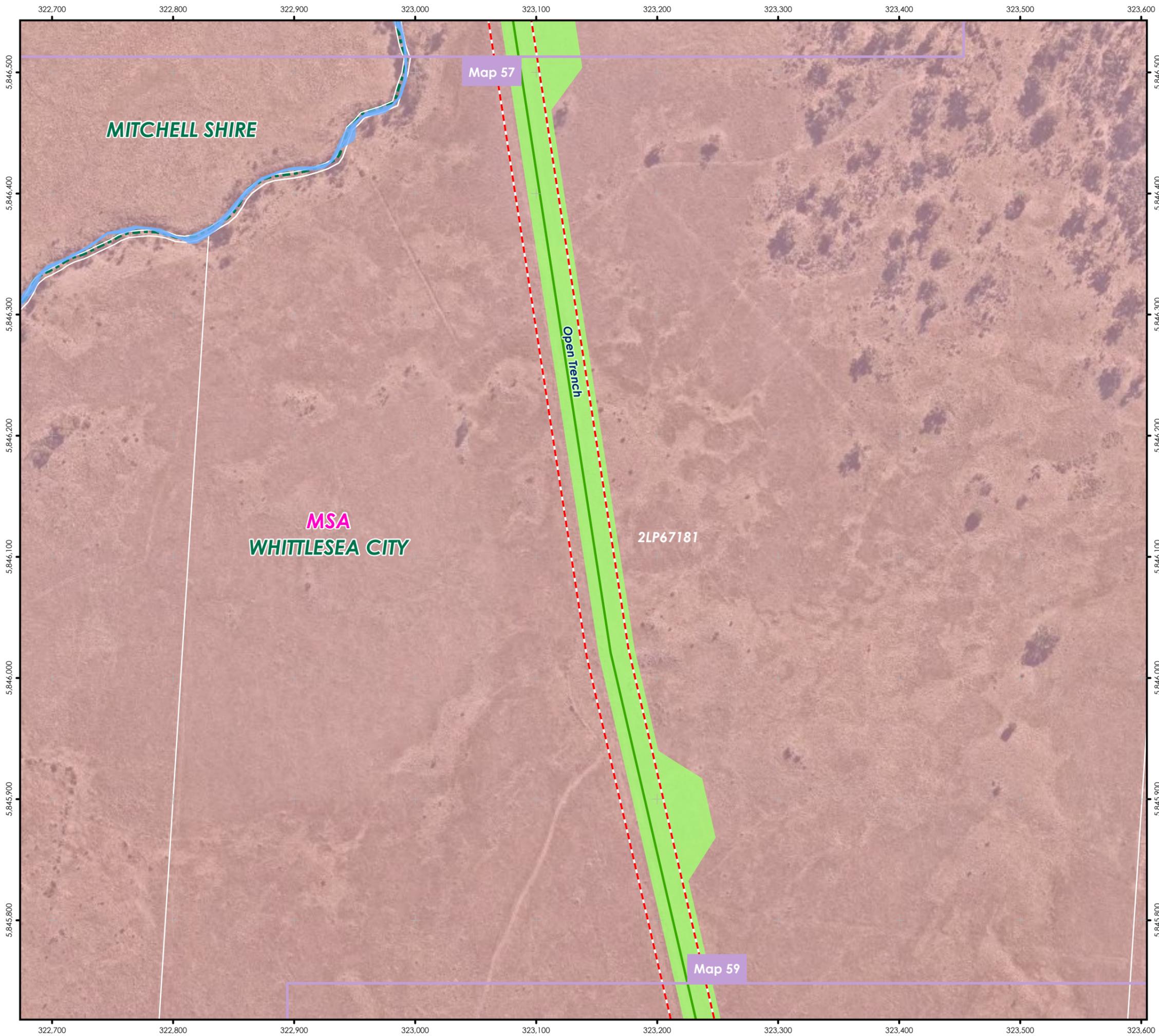
- - - Existing Pipeline Easement

SERIAL NUMBER: WPT-MAP-L-0165
DOCUMENT NUMBER: WPT.2373-MAP-L-0175.57_3_IFU

3.0	Issued for Use	ST	MG	BS	28/06/21
2.0	Issued for Use	ST	EH	BS	17/06/21
1.0	Issued for Use	ST	EH	BS	15/06/21
0.2	Draft	ST	EH	BS	9/06/21
0.1	Draft	ST	EH	BS	6/06/21
Revision	Description	Drawn	Checked/QC	Approved	Date



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.



APA Group
 Phone: 1800 951 444
 Web: www.apa.com.au
 Email: worm@apa.com.au

PROJECT: Western Outer Ring Main
TITLE: Pipeline Licence Application
SUBTITLE: Map 58 of 67
DATE: 28/06/2021

DATA SOURCE:
 Nearmap AU Image Service:
 © Geoscience Australia 2016 - Locations and Roads

LEGEND:

- Neighbouring Map
- Water
- Drainage Line
- Parcel Boundary Along Pipeline Route (Survey Adjusted)
- Pipeline Corridor
- Municipal Boundary
- MSA

Pipeline Route (Pipeline Construction Method)

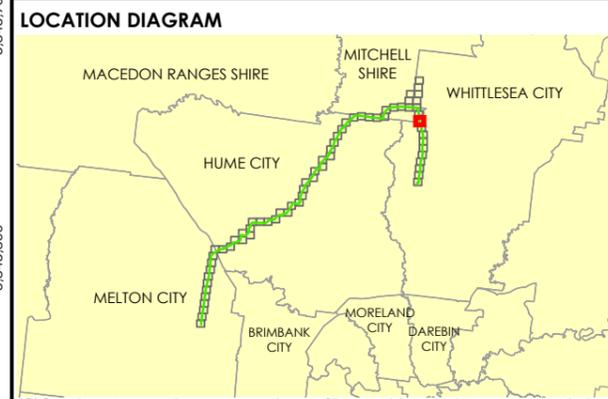
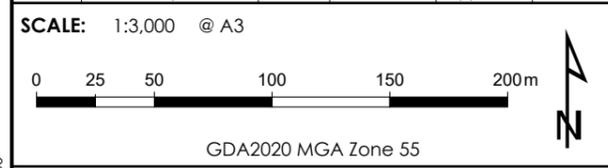
- Open Trench

Easement Status

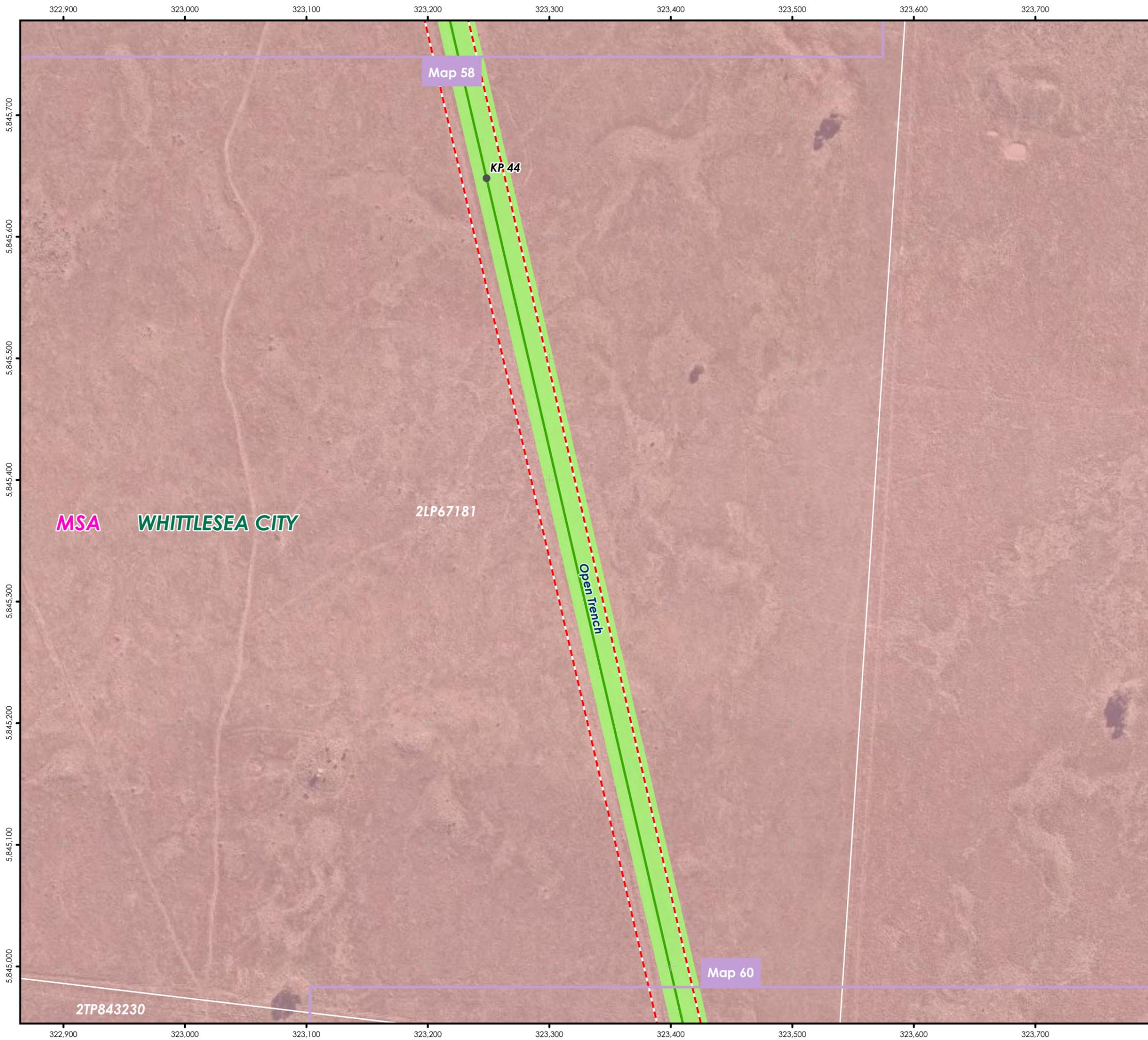
- Existing Pipeline Easement

SERIAL NUMBER: WPT-MAP-L-0165
DOCUMENT NUMBER: WPT.2373-MAP-L-0175.58_3_IFU

Revision	Description	Drawn	Checked/QC	Approved	Date
3.0	Issued for Use	ST			28/06/21
2.0	Issued for Use	ST	MG	BS	17/06/21
1.0	Issued for Use	ST	EH	BS	15/06/21
0.2	Draft	ST	EH	BS	9/06/21
0.1	Draft	ST	EH	BS	6/06/21



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.



APA Group
 Phone: 1800 951 444
 Web: www.apa.com.au
 Email: worm@apa.com.au

PROJECT: Western Outer Ring Main
TITLE: Pipeline Licence Application
SUBTITLE: Map 59 of 67
DATE: 28/06/2021

DATA SOURCE:
 Nearmap AU Image Service:
 © Geoscience Australia 2016 - Locations and Roads

LEGEND:

- Pipeline Kilometre Points
- Neighbouring Map
- ▭ Parcel Boundary Along Pipeline Route (Survey Adjusted)
- ▭ Pipeline Corridor
- ▭ Municipal Boundary
- ▭ MSA

Pipeline Route (Pipeline Construction Method)

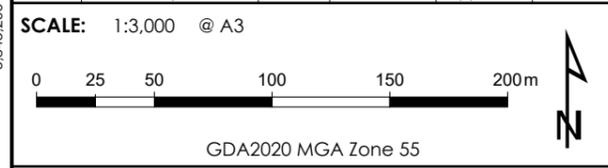
- Open Trench

Easement Status

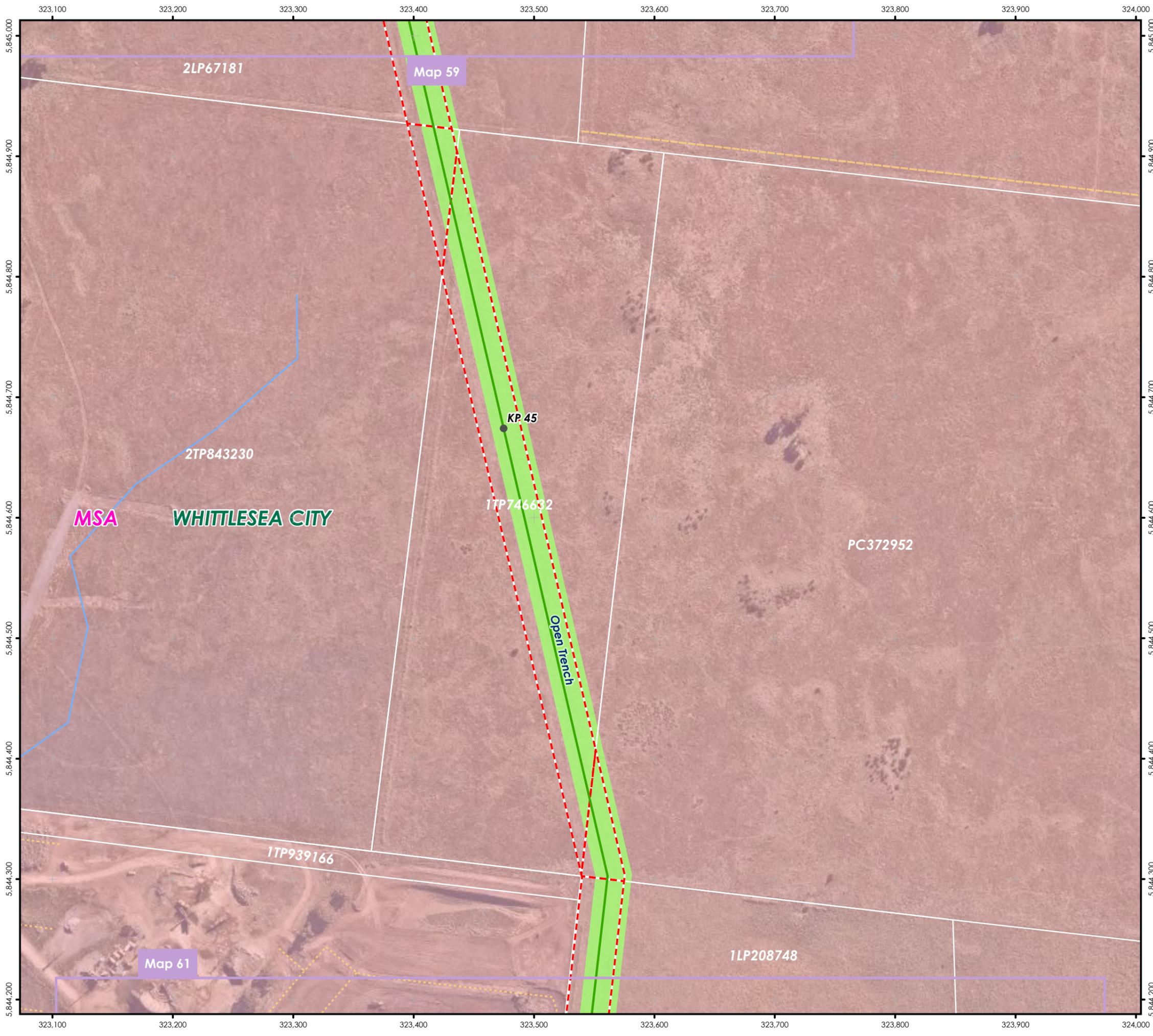
- - - Existing Pipeline Easement

SERIAL NUMBER: WPT-MAP-L-0165
DOCUMENT NUMBER: WPT.2373-MAP-L-0175.59_3_IFU

Revision	Description	Drawn	Checked/QC	Approved	Date
3.0	Issued for Use	ST			28/06/21
2.0	Issued for Use	ST	MG	BS	17/06/21
1.0	Issued for Use	ST	EH	BS	15/06/21
0.2	Draft	ST	EH	BS	9/06/21
0.1	Draft	ST	EH	BS	6/06/21



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.



APA Group
 Phone: 1800 951 444
 Web: www.apa.com.au
 Email: worm@apa.com.au

PROJECT: Western Outer Ring Main
TITLE: Pipeline Licence Application
SUBTITLE: Map 60 of 67
DATE: 28/06/2021

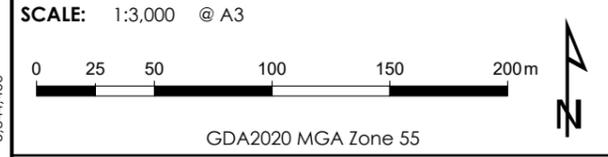
DATA SOURCE:
 Nearmap AU Image Service:
 © Geoscience Australia 2016 - Locations and Roads

LEGEND:

- Pipeline Kilometre Points
- Neighbouring Map
- Drainage Line
- ▭ Parcel Boundary Along Pipeline Route (Survey Adjusted)
- ▭ Pipeline Corridor
- ▭ Municipal Boundary
- ▭ MSA
- Roads**
 - Minor Road, Unsealed
 - Future Road
- Pipeline Route (Pipeline Construction Method)**
 - Open Trench
- Easement Status**
 - - - Existing Pipeline Easement

SERIAL NUMBER: WPT-MAP-L-0165
DOCUMENT NUMBER: WPT.2373-MAP-L-0175.60_3_IFU

3.0	Issued for Use	ST			28/06/21
2.0	Issued for Use	ST	MG	BS	17/06/21
1.0	Issued for Use	ST	EH	BS	15/06/21
0.2	Draft	ST	EH	BS	9/06/21
0.1	Draft	ST	EH	BS	6/06/21
Revision	Description	Drawn	Checked/QC	Approved	Date



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.



APA Group
 Phone: 1800 951 444
 Web: www.apa.com.au
 Email: worm@apa.com.au

PROJECT: Western Outer Ring Main

TITLE: Pipeline Licence Application

SUBTITLE: Map 61 of 67

DATE: 28/06/2021

DATA SOURCE:
 Nearmap AU Image Service:
 © Geoscience Australia 2016 - Locations and Roads

LEGEND:

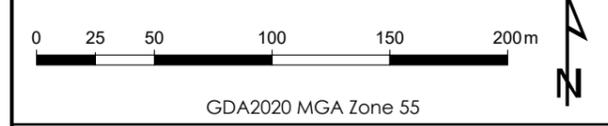
- Pipeline Kilometre Points
- Neighbouring Map
- ▭ Parcel Boundary Along Pipeline Route (Survey Adjusted)
- ▭ Pipeline Corridor
- ▭ Municipal Boundary
- ▭ MSA
- Roads**
- Minor Road
- Future Road
- Pipeline Route (Pipeline Construction Method)**
- Open Trench
- Easement Status**
- ▭ Existing Pipeline Easement

SERIAL NUMBER: WPT-MAP-L-0165

DOCUMENT NUMBER: WPT.2373-MAP-L-0175.61_3_IFU

3.0	Issued for Use	ST			28/06/21
2.0	Issued for Use	ST	MG	BS	17/06/21
1.0	Issued for Use	ST	EH	BS	15/06/21
0.2	Draft	ST	EH	BS	9/06/21
0.1	Draft	ST	EH	BS	6/06/21
Revision	Description	Drawn	Checked/QC	Approved	Date

SCALE: 1:3,000 @ A3



LOCATION DIAGRAM



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.

323,100 323,200 323,300 323,400 323,500 323,600 323,700 323,800 323,900 324,000

5.843,400
5.843,300
5.843,200
5.843,100
5.843,000
5.842,900
5.842,800
5.842,700



APA Group
Phone: 1800 951 444
Web: www.apa.com.au
Email: worm@apa.com.au

PROJECT: Western Outer Ring Main

TITLE: Pipeline Licence Application

SUBTITLE: Map 62 of 67

DATE: 28/06/2021

DATA SOURCE:
Nearmap AU Image Service:
© Geoscience Australia 2016 - Locations and Roads

LEGEND:

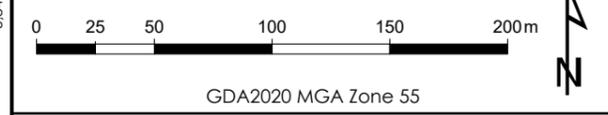
- Pipeline Kilometre Points
- Neighbouring Map
- Water
- Parcel Boundary Along Pipeline Route (Survey Adjusted)
- Pipeline Corridor
- Municipal Boundary
- MSA
- Roads
 - Secondary Road
 - Minor Road
 - Future Road
- Pipeline Route (Pipeline Construction Method)
 - Horizontal Bore - Special Crossing
 - Open Trench
- Easement Status
 - Existing Pipeline Easement

SERIAL NUMBER: WPT-MAP-L-0165

DOCUMENT NUMBER: WPT.2373-MAP-L-0175.62_3_IFU

3.0	Issued for Use	ST	MG	BS	28/06/21
2.0	Issued for Use	ST	EH	BS	17/06/21
1.0	Issued for Use	ST	EH	BS	15/06/21
0.2	Draft	ST	EH	BS	9/06/21
0.1	Draft	ST	EH	BS	6/06/21
Revision	Description	Drawn	Checked/QC	Approved	Date

SCALE: 1:3,000 @ A3



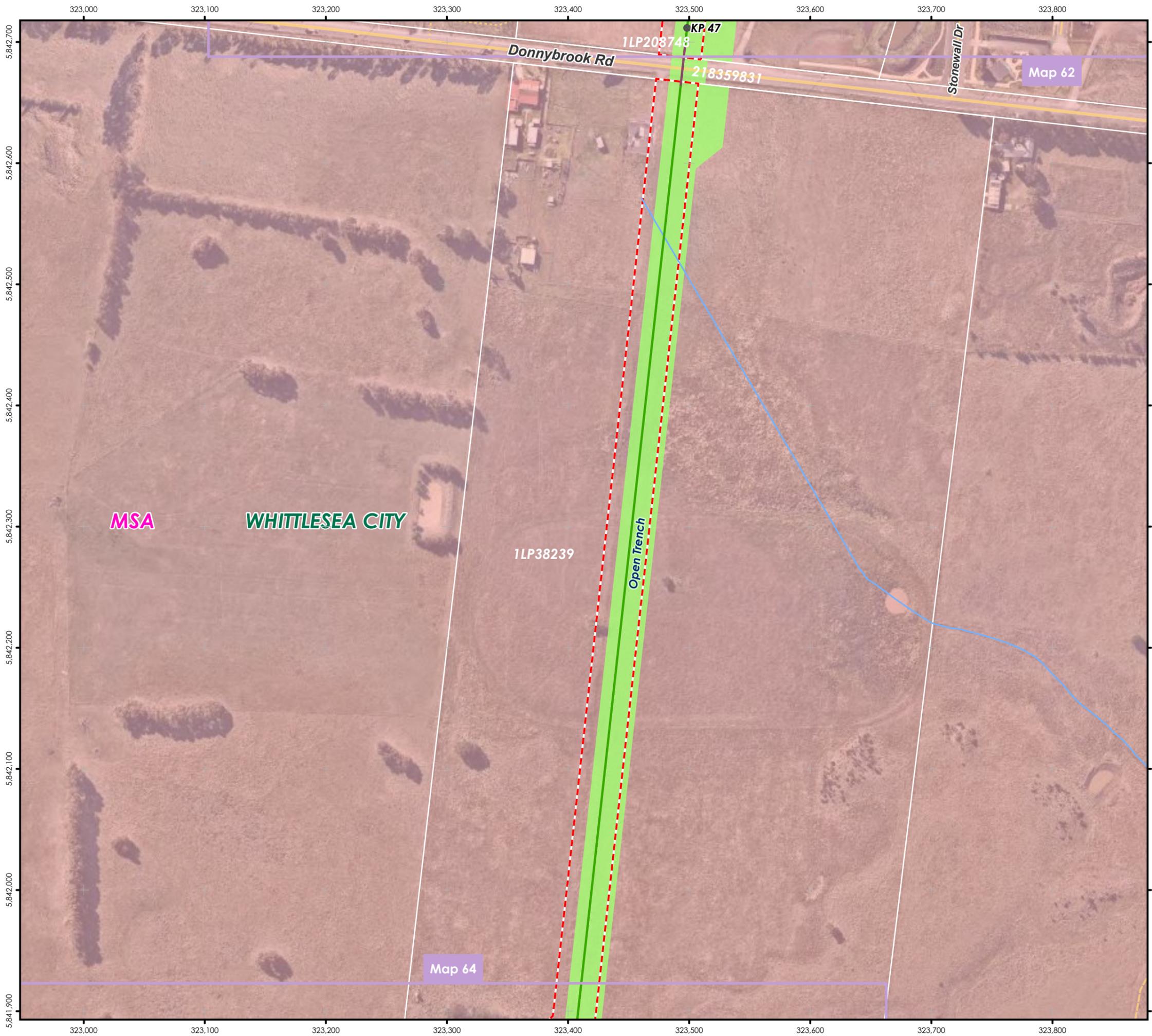
LOCATION DIAGRAM



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.

323,100 323,200 323,300 323,400 323,500 323,600 323,700 323,800 323,900 324,000

Y:\Projects\WORM\ArcPro\WORM_Rev8_Layers\WORM_Rev8_Layers.aprx - 28 Jun 2021 - simll



APA Group
 Phone: 1800 951 444
 Web: www.apa.com.au
 Email: worm@apa.com.au

PROJECT: Western Outer Ring Main
TITLE: Pipeline Licence Application
SUBTITLE: Map 63 of 67
DATE: 28/06/2021

DATA SOURCE:
 Nearmap AU Image Service:
 © Geoscience Australia 2016 - Locations and Roads

LEGEND:

- Pipeline Kilometre Points
- ▭ Neighbouring Map
- Drainage Line
- ▭ Parcel Boundary Along Pipeline Route (Survey Adjusted)
- ▭ Pipeline Corridor
- ▭ Municipal Boundary
- ▭ MSA

Roads

- Secondary Road
- Minor Road
- Minor Road, Unsealed
- Future Road

Pipeline Route (Pipeline Construction Method)

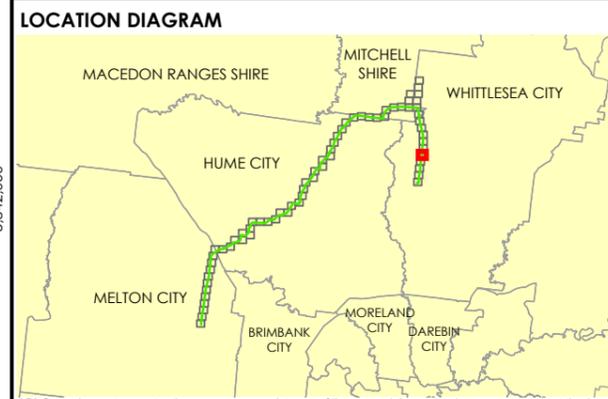
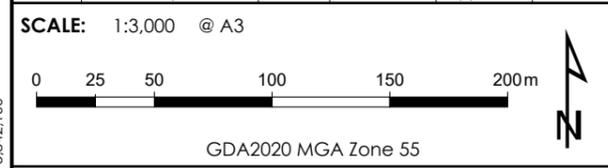
- Horizontal Bore - Special Crossing
- Open Trench

Easement Status

- - - Existing Pipeline Easement

SERIAL NUMBER: WPT-MAP-L-0165
DOCUMENT NUMBER: WPT.2373-MAP-L-0175.63_3_IFU

3.0	Issued for Use	ST			28/06/21
2.0	Issued for Use	ST	MG	BS	17/06/21
1.0	Issued for Use	ST	EH	BS	15/06/21
0.2	Draft	ST	EH	BS	9/06/21
0.1	Draft	ST	EH	BS	6/06/21
Revision	Description	Drawn	Checked/QC	Approved	Date



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.



APA Group
 Phone: 1800 951 444
 Web: www.apa.com.au
 Email: worm@apa.com.au

PROJECT: Western Outer Ring Main
TITLE: Pipeline Licence Application
SUBTITLE: Map 64 of 67
DATE: 28/06/2021

DATA SOURCE:
 Nearmap AU Image Service:
 © Geoscience Australia 2016 - Locations and Roads

LEGEND:

- Pipeline Kilometre Points
- Neighbouring Map
- Water
- Drainage Line
- Parcel Boundary Along Pipeline Route (Survey Adjusted)
- Pipeline Corridor
- Municipal Boundary
- MSA

Pipeline Route (Pipeline Construction Method)

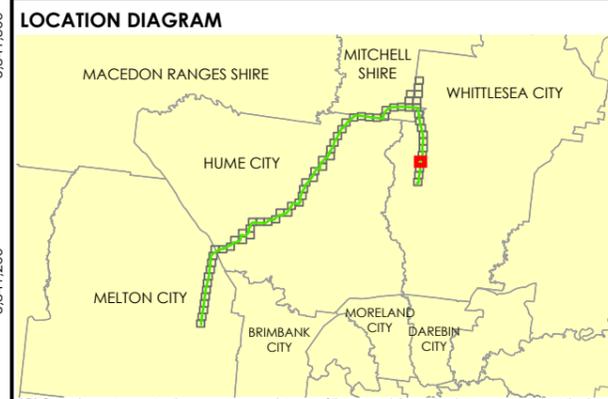
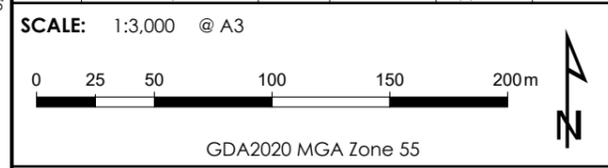
- Open Trench

Easement Status

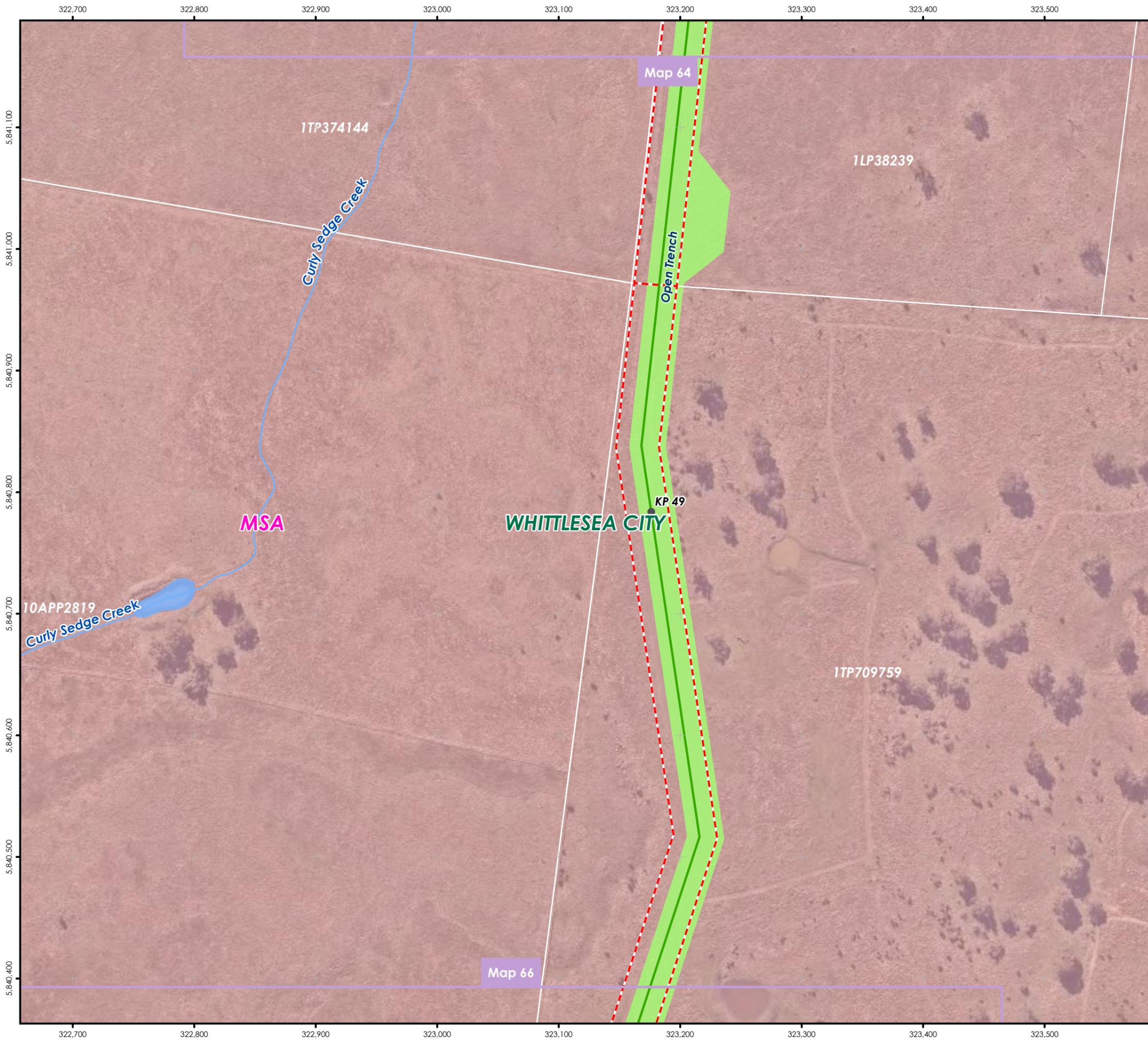
- - - Existing Pipeline Easement

SERIAL NUMBER: WPT-MAP-L-0165
DOCUMENT NUMBER: WPT.2373-MAP-L-0175.64_3_IFU

Revision	Description	Drawn	Checked/QC	Approved	Date
3.0	Issued for Use	ST			28/06/21
2.0	Issued for Use	ST	MG	BS	17/06/21
1.0	Issued for Use	ST	EH	BS	15/06/21
0.2	Draft	ST	EH	BS	9/06/21
0.1	Draft	ST	EH	BS	6/06/21



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.



APA Group
 Phone: 1800 951 444
 Web: www.apa.com.au
 Email: worm@apa.com.au

PROJECT: Western Outer Ring Main
TITLE: Pipeline Licence Application
SUBTITLE: Map 65 of 67
DATE: 28/06/2021

DATA SOURCE:
 Nearmap AU Image Service:
 © Geoscience Australia 2016 - Locations and Roads

LEGEND:

- Pipeline Kilometre Points
- Neighbouring Map
- Water
- Drainage Line
- Parcel Boundary Along Pipeline Route (Survey Adjusted)
- Pipeline Corridor
- Municipal Boundary
- MSA

Pipeline Route (Pipeline Construction Method)

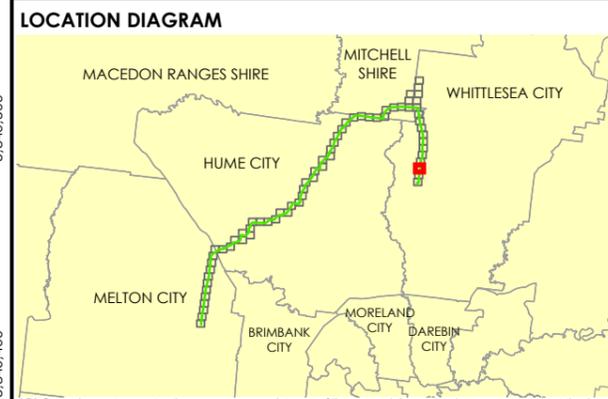
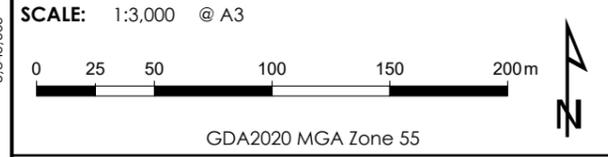
- Open Trench

Easement Status

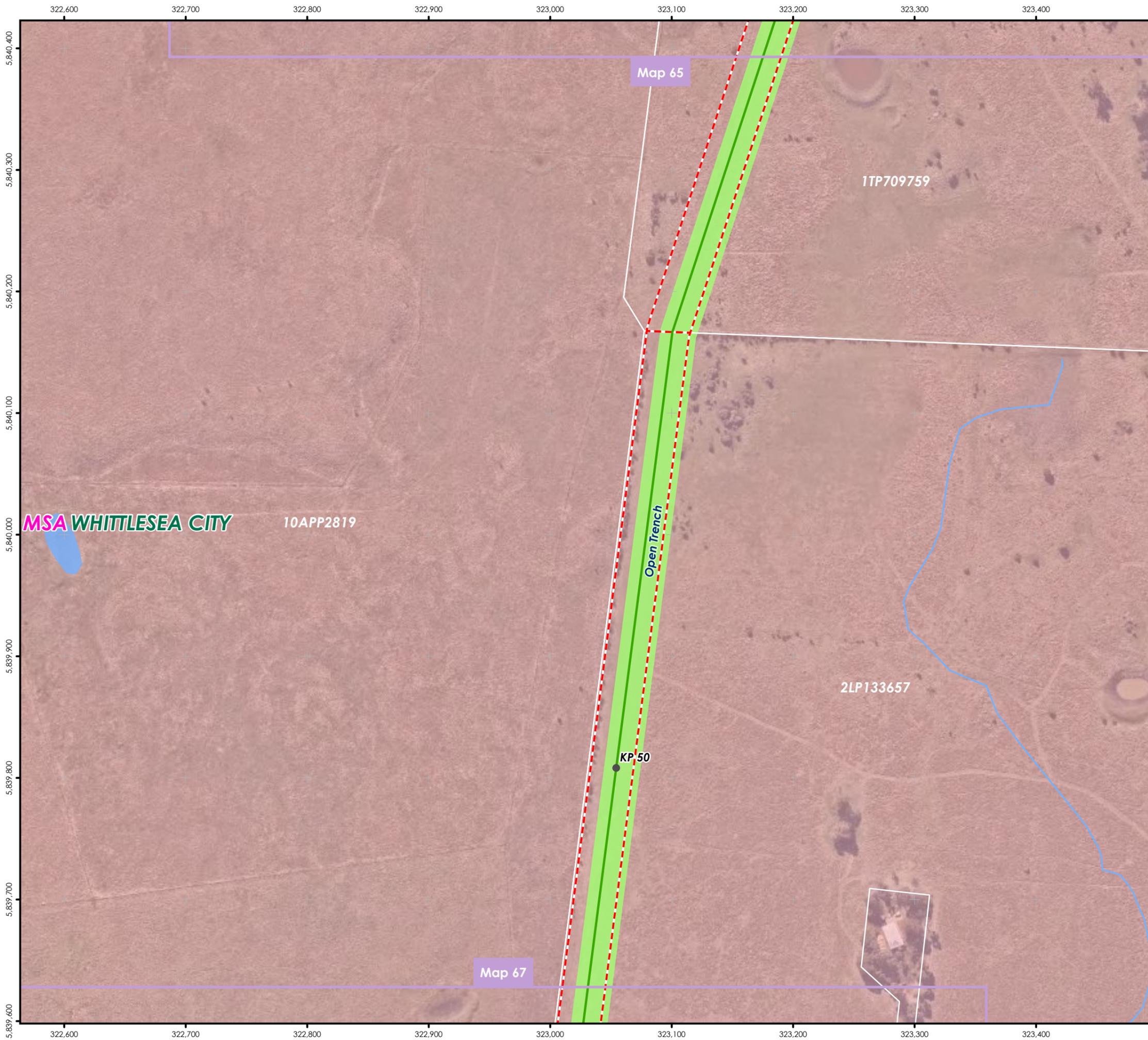
- - - Existing Pipeline Easement

SERIAL NUMBER: WPT-MAP-L-0165
DOCUMENT NUMBER: WPT.2373-MAP-L-0175.65_3_IFU

3.0	Issued for Use	ST			28/06/21
2.0	Issued for Use	ST	MG	BS	17/06/21
1.0	Issued for Use	ST	EH	BS	15/06/21
0.2	Draft	ST	EH	BS	9/06/21
0.1	Draft	ST	EH	BS	6/06/21
Revision	Description	Drawn	Checked/QC	Approved	Date



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.



APA Group
 Phone: 1800 951 444
 Web: www.apa.com.au
 Email: worm@apa.com.au

PROJECT: Western Outer Ring Main
TITLE: Pipeline Licence Application
SUBTITLE: Map 66 of 67
DATE: 28/06/2021

DATA SOURCE:
 Nearmap AU Image Service:
 © Geoscience Australia 2016 - Locations and Roads

LEGEND:

- Pipeline Kilometre Points
- Neighbouring Map
- Water
- Drainage Line
- Parcel Boundary Along Pipeline Route (Survey Adjusted)
- Pipeline Corridor
- Municipal Boundary
- MSA

Pipeline Route (Pipeline Construction Method)

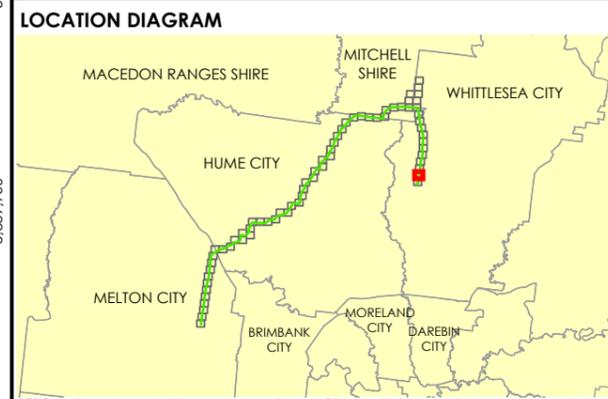
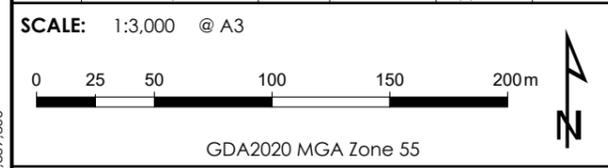
- Open Trench

Easement Status

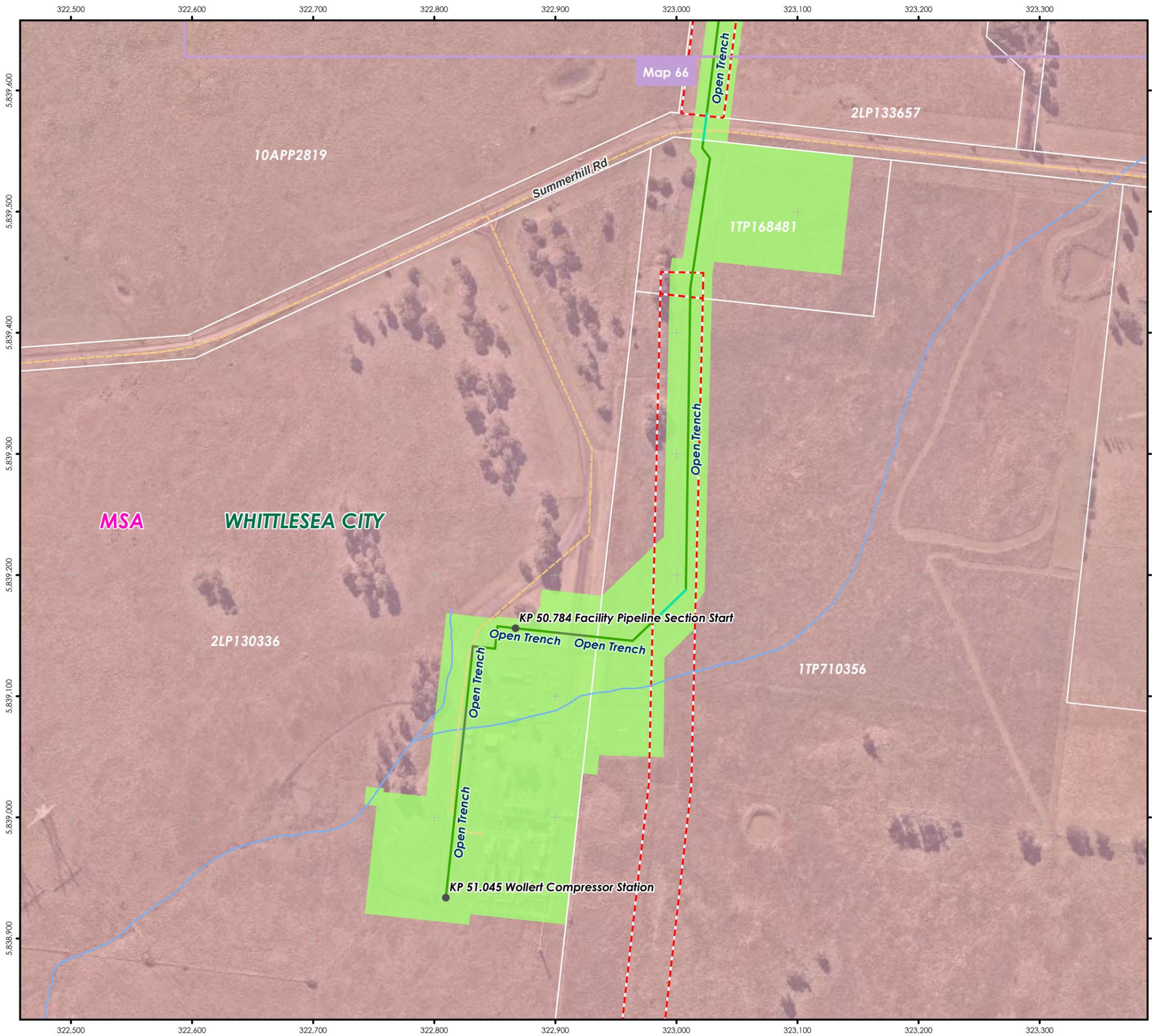
- - - Existing Pipeline Easement

SERIAL NUMBER: WPT-MAP-L-0165
DOCUMENT NUMBER: WPT.2373-MAP-L-0175.66_3_IFU

3.0	Issued for Use	ST			28/06/21
2.0	Issued for Use	ST	MG	BS	17/06/21
1.0	Issued for Use	ST	EH	BS	15/06/21
0.2	Draft	ST	EH	BS	9/06/21
0.1	Draft	ST	EH	BS	6/06/21
Revision	Description	Drawn	Checked/QC	Approved	Date



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.




 APA Group
 Phone: 1800 951 444
 Web: www.apa.com.au
 Email: worm@apa.com.au

PROJECT: Western Outer Ring Main
TITLE: Pipeline Licence Application
SUBTITLE: Map 67 of 67
DATE: 28/06/2021

DATA SOURCE:
 Nearmap AU Image Service:
 © Geoscience Australia 2016 - Locations and Roads

LEGEND:

- Pipeline Kilometre Points
- Neighbouring Map
- Drainage Line
- ▭ Parcel Boundary Along Pipeline Route (Survey Adjusted)
- ▭ Pipeline Corridor
- ▭ Municipal Boundary
- ▭ MSA

Roads

- Minor Road, Unsealed

Pipeline Route (Pipeline Construction Method)

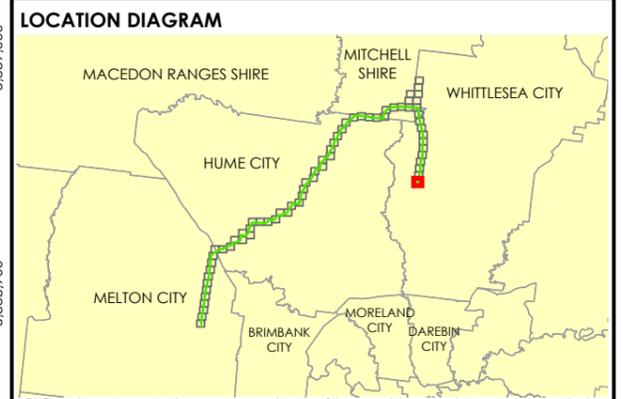
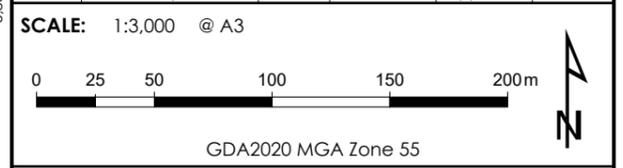
- Open Trench
- Open Trench - Special Crossing
- Open Trench - Special Section within WCS

Easement Status

- - - Existing Pipeline Easement

SERIAL NUMBER: WPT-MAP-L-0165
DOCUMENT NUMBER: WPT.2373-MAP-L-0175.67_3_IFU

Revision	Description	Drawn	Checked/QC	Approved	Date
3.0	Issued for Use	ST		BS	28/06/21
2.0	Issued for Use	ST	MG	BS	17/06/21
1.0	Issued for Use	ST	EH	BS	15/06/21
0.2	Draft	ST	EH	BS	9/06/21
0.1	Draft	ST	EH	BS	6/06/21



APA Group does not guarantee the accuracy or completeness of the map and does not make any warranty about the data. APA is not under any liability to the user for any loss or damage (including consequential loss or damage) which the user may suffer resulting from the use of this map. This map is confidential and the information and details contained in it are and remain the property of APA Group. © APA Group 2021.

Attachment 2 – Construction Environmental Management Plan

Privacy Statement

Any personal information about you or a third party in your correspondence will be protected under the provisions of the Privacy and Data Protection Act 2014. It will only be used or disclosed to appropriate Ministerial, Statutory Authority, or departmental staff in regard to the purpose for which it was provided, unless required or authorised by law. Enquiries about access to information about you held by the Department should be directed to the Privacy Coordinator, Department of Environment, Land, Water and Planning, PO Box 500, East Melbourne, Victoria 8002



PLAN

CONSTRUCTION ENVIRONMENT MANAGEMENT PLAN
Western Outer Ring Main Project



Project No					
Document No		18035-PL-HSE-0004 Construction Environment Management Plan			
Rev	Date	Status	Originated	Checked	Approved
0	May 2021	Issued for exhibition	[REDACTED]	[REDACTED]	[REDACTED]

© Copyright APA 2018

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



TABLE OF HOLDS

Hold No.	Section	Description

DRAFT



Table of contents

ABBREVIATIONS AND TERMINOLOGY 7

1. INTRODUCTION..... 10

1.1 Purpose 10

1.2 Scope..... 10

1.3 Project Objectives 11

1.4 Document references 11

2. PROJECT OVERVIEW 13

2.1 Location..... 13

2.2 Project components..... 14

2.3 Pipeline and mainline valves specifications 15

2.4 Timeframe..... 16

2.5 Pipeline construction activities 17

2.5.1 Construction methodology overview 17

2.5.2 Access to the construction corridor and facilities sites 21

2.5.3 Establishment of temporary construction support worksites 21

2.5.4 Traffic management and consent for works within road reserves 21

2.5.5 Installation of temporary gateways and parallel fencing 21

2.5.6 Clear and grade 22

2.5.7 Trenching..... 22

2.5.8 Trenchless construction methods..... 25

2.5.8.1 Thrust Boring 26

2.5.8.2 HDD..... 26

2.5.8.3 Pipe jacking and microtunneling..... 28

2.5.8.4 Shallow horizontal boring..... 29

2.5.9 Pipe stringing and welding 30

2.5.10 Lowering-in 30

2.5.11 Backfilling 31

2.5.12 Pipe cleaning..... 31

2.5.13 Pipeline testing and commissioning 31

2.6 Wollert compressor station upgrades 33

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



2.7	Rehabilitation	36
2.8	Operation and maintenance	37
3.	ENVIRONMENTAL SETTING	39
3.1	Regional setting	39
3.2	Environmental features overview.....	39
3.3	Land use	39
3.3.1	Section 1 – Plumpton to Calder Highway (KP 0-9)	40
3.3.2	Section 2 – Calder Highway to Mickelham Road (KP 9-28)	40
3.3.3	Section 3 – Mickelham to Donnybrook (KP 28-46.9)	41
3.3.4	Section 4 - Donnybrook to Wollert Compressor Station (KP 46.9-51.045)	42
3.4	Soils and terrain	42
3.4.1	Geology	42
3.4.2	Soil type	43
3.4.3	Acid sulfate soils.....	43
3.4.4	Contaminated soils	44
3.5	Hydrology	47
3.5.1	Surface water	47
3.5.2	Groundwater	51
3.6	Air quality	52
3.6.1	Meteorology	52
3.6.2	Background air quality and air pollution indicators.....	52
3.7	Biodiversity	52
3.7.1	Flora	52
3.7.2	Fauna.....	53
3.7.3	Aquatic ecology	54
3.7.4	Conservation areas (MSA)	55
3.7.5	Matters of national environmental significance	55
3.8	Cultural heritage	56
4.	REGULATORY SETTING	58
5.	ENVIRONMENTAL FRAMEWORK	64

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



6.	ORGANISATIONAL STRUCTURE AND RESPONSIBILITY.....	66
6.1	APA.....	66
6.2	Contractor management.....	71
7.	ENVIRONMENTAL RISK ASSESSMENT FRAMEWORK.....	73
7.1	Risk assessment.....	73
7.2	Risk analysis and evaluation	73
7.3	Likelihood.....	74
7.4	Consequence	74
7.5	Risk ratings.....	75
8.	PERFORMANCE OBJECTIVES AND STANDARDS.....	76
9.	CONTINGENCY AND OTHER PLANS	77
9.1	Contingency plans	77
9.2	Other plans.....	77
9.2.1	APA management plans.....	77
9.2.2	Contractor management plans.....	78
10.	EMERGENCY PREPAREDNESS AND RESPONSE.....	79
11.	TRAINING AND COMMUNICATION	81
11.1	Training and awareness	81
11.2	Communication.....	82
11.2.1	Consultation.....	82
11.2.2	Internal communications and reporting.....	82
11.3	Regulatory reporting	83
11.3.1	DELWP.....	83
11.3.2	Other regulatory authorities	84
12.	ASSURANCE	85
12.1	Audits	85
12.1.1	APA audits.....	85
12.1.2	External audits.....	85
12.1.3	Contractor audits	85
12.2	Performance monitoring.....	86
12.3	Environment reporting notification	101

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



12.3.1	General	101
12.3.2	Pollution events.....	103
12.3.3	Other incidents	103
12.3.4	Contacts.....	104
12.4	Complaints procedure.....	104
12.5	Corrective actions	104
12.6	Records	104
12.7	Review.....	105
13.	REFERENCES.....	107
APPENDIX A	PIPELINES REGULATIONS (2017) REQUIREMENTS.....	108
APPENDIX B	APA HSE POLICY	112
APPENDIX C	REPORTABLE INCIDENT NOTIFICATION TEMPLATE	114
APPENDIX D	COMPLAINT MANAGEMENT PROCESS.....	115
APPENDIX E	CEMP RISK ASSESSMENT	116
APPENDIX F	MANAGEMENT PLANS.....	117
APPENDIX G	ENVIRONMENTAL LINE LIST.....	120
APPENDIX H	PERFORMANCE OBJECTIVES AND STANDARDS.....	121

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



Abbreviations and terminology

AASS	Actual Acid Sulfate Soils
APZ	Asset Protection Zone
AQ	Air Quality
ASC NEPM	National Environment Protection (Assessment of Site Contamination) Measure 1999
ANZECC	Australian and New Zealand Environment and Conservation Council
API	American Petroleum Institute
AV	Aboriginal Victoria
B	Biodiversity
BPEM	Best Practice Environmental Management
BTEX	benzene, toluene, ethylbenzene, xylene
C	Contamination
CaLP Act	<i>Catchment and Land Protection Act 1994</i>
CEMP	Construction Environment Management Plan
CHMP	Cultural Heritage Management Plan
CM	Commissioning
Cth	Commonwealth of Australia
DELWP	Victorian Department of Environment, Land, Water and Planning
DSS	Drainage Services Scheme
D & SH	Demobilisation & site rehab
EES	Environment Effects Statement
ELL	Environmental Line List
EMMs	Environmental Management Measures
EOLSS	End of line scraper station
EPA	Environment Protection Authority
EPBC	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
ESC	Erosion and Sediment Control
ESV	Energy Safe Victoria
EVCs	Ecological Vegetation Classes
FFG	<i>Flora and Fauna Guarantee Act 1988</i>
FMRP	Flood Management and Response Plan

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



GED	General Environmental Duty
GEWVV	Grassy Eucalypt Woodland of the Victorian Volcanic Plain
GM	Ground movement and land stability
HDD	Horizontal directional drilling
HSE	Health, Safety and Environment
HSEMS	Health, Safety and Environment Management System
ICCP	impressed current cathodic protection system
IECA	International Erosion Control Association
IWR regulations (or IWRGs)	Industrial Waste Resource Regulations or Guidelines
LMS	Learning Management System
LV	Landscape and visual
MLV	Mainline valves
MSA	Melbourne Strategic Assessment
M&SE	Mobilisation and site establishment
MWC	Melbourne Water Corporation
NEPM	National Environment Protection Measure
NTA	Native Title Act
NTGVVP	Natural Temperate Grassland of the Victorian Volcanic Plain
NV	Noise and Vibration
OEMP	Operating Environmental Management Plan
OCP	organochlorine pesticides
PAH	polycyclic aromatic hydrocarbons
PASS	Potential Acid Sulfate Soil
PFAS	per- and polyfluorinated alkyl substances
Pipelines Act	<i>Pipelines Act 2005 (Vic)</i>
PIW	Prescribed industrial waste
Pipelines Regulations	<i>Pipelines Regulations 2017 (Vic)</i>
Project activities/works	All activities proposed by APA to undertake the required scope of work
PSP	Precinct Structure Plan
P&E	Pipe construction
ROW	Right of Way

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



Site	The defined workspace areas for the construction activities
SEPP	State Environment Protection Policies
SG+	Safeguard+, APA incident reporting system
TECs	Threatened Ecological Communities
TMP	Traffic Management Plan
VAHR	Victorian Aboriginal Heritage Register
VHI	Victorian Heritage Inventory
VHR	Victorian Heritage Register
Vic	Victoria
VTS	Victorian Transmission System
WICA	Works in Conservation Area
WCS UP	Wollert compressor station upgrade
WoNS	Weeds of National Significance
WORM	Western Outer Ring Main
WWCHAC	Wurundjeri Woi Wurrung Cultural Heritage Aboriginal Corporation

DRAFT

1. Introduction

1.1 Purpose

The purpose of this Construction Environment Management Plan (CEMP) is to establish and maintain effective environmental management processes for the construction phase of the Western Outer Ring Main Project (WORM). APA VTS (Operations) Pty Ltd (APA) is the proponent for the Project and will be the licensee of the Pipeline Licence. APA is Australia's largest natural gas infrastructure business.

This CEMP has been prepared under the provisions of the *Pipelines Act 2005* and the *Pipelines Regulations 2017*. The CEMP is prepared by APA to establish the processes and methods by which the environmental aspects of the Project will be managed.

This CEMP identifies aspects of the pipeline construction activities that have the potential to impact on the physical, biological, social and cultural aspects of the environment. A cross-reference to the requirements of the Pipelines Regulations is contained within **Appendix A** for reference.

1.2 Scope

This CEMP applies to all construction activities proposed as part of the Project works as well as to any construction or rectification activities required during the rehabilitation monitoring period. The works covered by the CEMP are summarised in Section 2. All operation activities will be managed through the APA VTS Operating Environmental Management Plan (OEMP) (320-PL-HEL-0015, 0016, 0017 & 0018).

The CEMP identifies actions required to comply with the requirements of all applicable legislation, licences, Australian Standards and Industry Codes of Practice. All activities performed in accordance with this CEMP must comply with the relevant acts, regulations, standards and codes of practice of all regulatory authorities having jurisdiction over the activities. When conflict exists between various applicable documents, the following order of preference applies, in decreasing order of precedence:

- Acts of law or other legislation
- Government licenses and permits
- APA Standards
- Local standards

Where APA requirements are more stringent, they will take precedence. Any identified discrepancies in this CEMP are to be reported to the document owner for remedy. If you are reading a hard copy of this document, please consider it uncontrolled.

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



This CEMP outlines requirements that must be met by APA and the nominated construction contractor(s) for the project. The construction contractor(s) must prepare their own CEMP, which must be fully compliant with this CEMP and also include site-specific environmental management documentation, inclusive of procedures, protocols and Safe Work Method statements (SWMS).

APA is committed to responsible environmental management and has formalised this commitment in a Health, Safety and Environment Policy (refer to Appendix B).

The scope of activities covered by the CEMP includes:

- Environmental performance objectives, standards and monitoring requirements
- Measurement and evaluation including auditing and reporting of progress against the environmental objectives
- Statutory requirements – licences and subsequent approvals required
- Organisational structure and responsibility for environmental management of the Project
- Training of personnel in environmental awareness
- Requirements for emergency preparedness and response
- Complaints procedure, incident reporting and corrective actions for non-conformance
- Reporting and notifications to appropriate authorities and affected stakeholders
- Review and transition to management of activities under the VTS OEMP at the conclusion of the rehabilitation monitoring period.

1.3 Project Objectives

The key objectives of the project are:

- Improve system resilience and security of gas supply
- Increase the amount of natural gas that can be stored for times of peak demand
- Improve network performance and reliability
- Provide opportunities for natural gas supply to new growth areas in the northwest, including Sunbury South, Lindum Vale, Merrifield and Kalkallo
- Address potential gas shortages as forecasted by AEMO in the March 2021 Victorian Gas Planning Report update

1.4 Document references

All work performed in accordance with this CEMP must conform with the current issue, including amendments, of these national and international standards, codes of practice, guidelines and APA documents listed in Table 1.1.

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



Table 1.1 APA reference documents

Item	Definition
N/A	Western Outer Ring Main Environmental Effects Statement
PL-HEL-0015, 0016, 0017 & 0018	Victorian Operating Environment Management Plan
APA HSE EP 13.01.03	Management Plan Process and Design (Environmental Procedure)
APA HSE GP 06.01 T01	Workplace Risk Assessment and Control Tool
APA HSE GP 07.01	Incident Reporting Procedure
APA HSE GP 07.02	Incident Investigation and Analysis Procedure
18035-PL-A-0005	WORM Project Management Plan
WPT.2373-DBM-A-0001	WORM Project Design Basis Manual
18035-PL-HSE-0003	WORM Project Health & Safety Management Plan
18035-PL-LH-0001	WORM Project Consultation Plan
CHMP 16593	WORM Project Cultural Heritage Management Plan for the area from KP8 to KP51
CHMP 16594	WORM Project Cultural Heritage Management Plan for the area from KP0 to KP8.2

2. Project overview

2.1 Location

The Western Outer Ring Main (WORM) gas pipeline project (the Project) is a buried 600 millimetre nominal diameter high pressure gas transmission pipeline (the Pipeline) between APA's existing Plumpton Regulating Station (approx. 38 kilometres north west of Melbourne's CBD) and Wollert Compressor Station (approx. 26 kilometres north east of Melbourne's CBD). The Pipeline provides a high-pressure connection between the eastern and western pipeline networks of the Victorian Transmission System (VTS).

The Project includes a new buried pipeline, three above-ground mainline valves along the pipeline alignment, and an additional compressor unit and regulating station at the existing APA Wollert Compressor Station. The Project has been designed to provide critical infrastructure for Victoria's gas supply, distribution, and consequent security, efficiency and affordability.

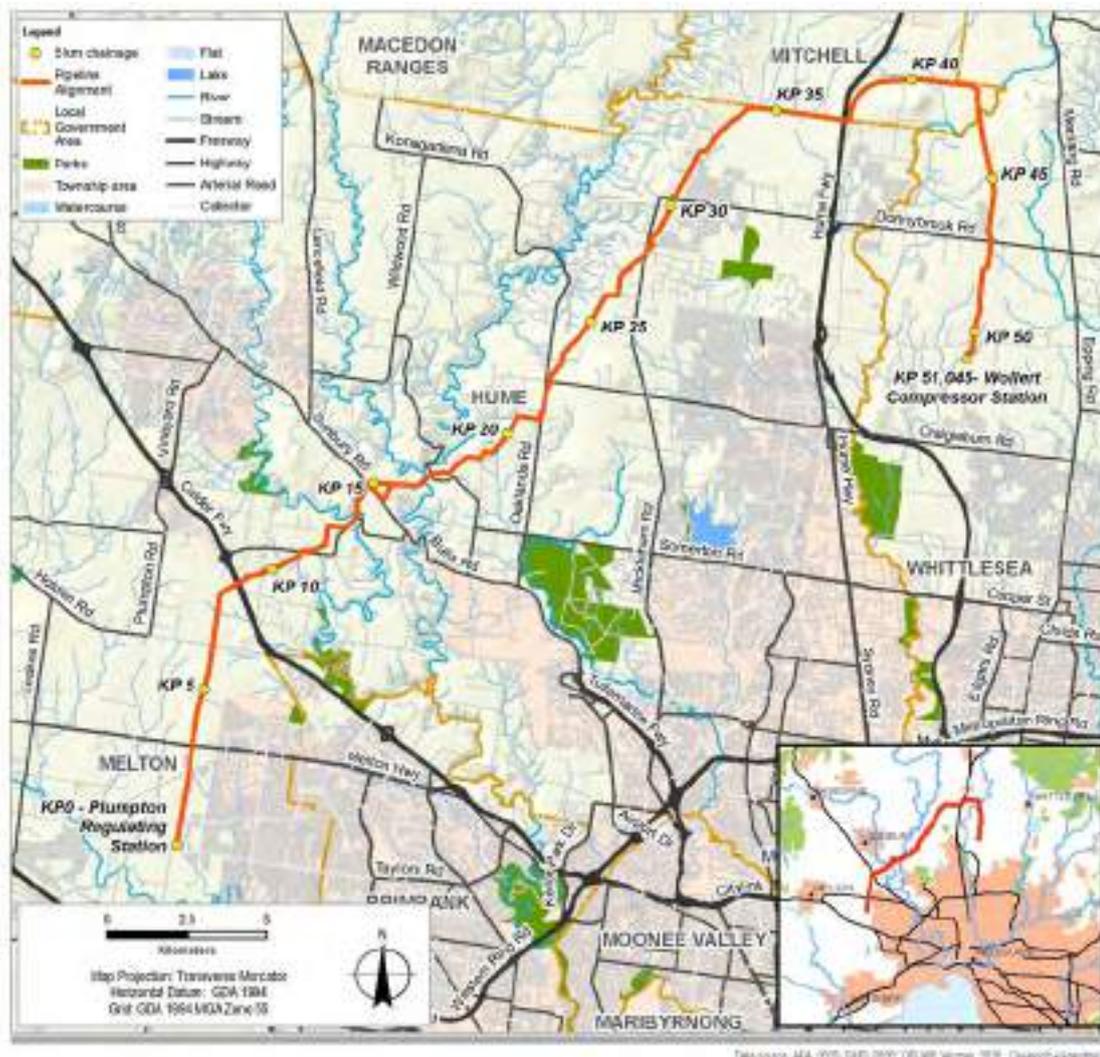
A schematic illustration of the project context is shown in Figure 2.1.

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



Figure 2.1 Western Outer Ring Main overview



2.2 Project components

The Project includes the following key components:

- New pipeline: The pipeline will be approximately 51 kilometres in length within a nominal 15 metre wide permanent easement and be buried for its entire length (easement width will vary from 10 metres to 15 metres for new easements. There are also existing easements for the Wollert to Wondong and Sunbury Pipelines that the pipeline will be placed in). Where existing easements exist, APA will not request additional easement.
- Mainline valves: Three mainline valves (MLV) will be located along the pipeline alignment. The mainline valves are spaced at intervals of approximately 15 kilometres, and located at approximately KP 6, KP 22 and KP 35.
- Wollert Compressor Station upgrade: The installation of a new Solar Centaur 50 compressor, an end of line scraper station and a pressure regulating station within the existing APA facility at Wollert.



2.3 Pipeline and mainline valves specifications

The pipeline will comprise of an approximately 51 kilometres long DN600 underground high pressure gas transmission pipeline to transport gas from APA’s existing Plumpton Regulating Station and Wollert Compressor Station. The pipeline will be buried for its entire length to a minimum depth of cover of 750 millimetres (with the final depth determined as an outcome of the Safety Management Study). The pipeline will occupy an operational easement of nominally 15 metres wide and 10 metres wide where it is located within the PAO reserved for the Outer Metropolitan Ring Transport Corridor. The pipeline’s corrosion protection system will consist of external coating and an impressed current cathodic protection system (ICCP). Pipeline marker signs will be installed along the length of the pipeline.

Table 2.1 Summary of key data for the underground pipelines and mainline valves

Underground pipeline/valves key data	
Pipe length	51.045 km
Pipe material	American Petroleum Institute (API) Specification 5L X52 high strength steel pipe. Internally lined with epoxy and externally coated with dual layer fusion bonded epoxy with field applied joint coating
Nominal diameter	600 mm
Monomial capacity	Approximately 750 TJ/day
Pipe wall thickness	10.31 mm standard wall thickness 12.7 mm heavy wall thickness
Pipe segment length	18 m
Depth of cover (depth below ground surface)	Minimum of 750 mm to the top of the pipeline (deeper at crossing of third-party infrastructure, road crossings and waterways). The final depth will be determined as an outcome of the Safety Management Study Where the pipeline crosses the OMR/E6 PAO, the following depth of cover would apply: <ul style="list-style-type: none"> • Range from 1.2 metres to 5 metres from the surface level to the obvert level of the pipe. • Depth requirements will be determined during detailed design with due consideration to location specific matters such as future transport and drainage infrastructure requirements.
Easement	Nominally 15 m wide
Design principles	Strictly in accordance with the latest version of <i>AS2885 Pipelines – Gas and liquid petroleum</i>
Design life	60 years

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



Underground pipeline/valves key data	
Mainline valves (MLV)	Three remotely actuated MLVs located along the pipeline alignment within the proposed easement, to allow for isolation of the pipeline in an emergency. Three MLVs are proposed for the length of the pipeline, spaced at intervals of approximately 15 kilometres, and located within the proposed easement area (MLV1 at KP6, MLV2 at KP22 and MLV3 at KP35). Locations are subject to confirmation following confirmation of design and consultation with landholders.
Scraper station	End of line scraper station (EOLSS) located at APA's existing Wollert Compressor Station.

2.4 Timeframe

Construction works will be undertaken across an approximately 9-month works programme commencing in Quarter (Q) 1 2022 and targeting completion by the end of Quarter (Q) 4 2022.

Following completion of construction a 12-24 month rehabilitation monitoring period will apply during which any defects will be rectified in accordance with this CEMP.

The proposed schedule for the Project construction activities is detailed in Table 2.2.

Table 2.2 Indicative Project schedule

Construction activity	Work period	Approximate duration
Pipeline mobilisation	Q1 2022	1 month
Pipeline construction	Q1 2022 to Q3 2022	5 months
Pipeline rehabilitation	Q3 2022 to Q4 2022	3 months
Pipeline commissioning	Q4 2022	1 month
Pipeline demobilisation	Q4 2022	1 month
Wollert Compressor Station upgrade construction	Q1 2022 to Q4 2022	Approximately 9 months
Overall timeframe	Q1 2022 to Q4 2022	Approximately 9 months



2.5 Pipeline construction activities

The pipeline will be constructed and operated in accordance with the requirements of the Australian Standard 'AS2885: Pipelines – Gas and Liquid Petroleum'. The pipeline will be bi-directional, to allow gas to flow in both directions as required.

The pipeline will be constructed of high strength steel line pipe, fully welded. Heavy wall pipes will be used where the pipeline traverses near urban environments, sensitive locations, special crossings and possible future urban development as an additional protection measure.

At locations where the pipeline is potentially exposed to increased erosional forces, such as watercourse crossings and floodplains, additional protection will be provided, including burying the pipeline deeper. The pipeline will also be buried deeper beneath road and railway crossings. The pipeline would be buried for its entire length to a minimum depth of cover of 750 millimetres (with the final depth determined as an outcome of the Safety Management Study).

Where feasible, major watercourses and environmentally sensitive areas will be crossed using horizontal directional drilling (HDD) or horizontal boring methods to protect surface environmental values, as identified in Table 2.3.

The pipeline construction sequence starts with survey works and continues with site establishment, establishment of office compound and laydown area, clearing and grading, pipe stringing, pipe bending, welding and coating, trenching, lowering pipe into trench and backfilling, hydrostatic testing, commissioning, and finally rehabilitation.

2.5.1 Construction methodology overview

The construction sequence and activities for pipeline construction are outlined in Table 2.3 and described further in the sections below.

Table 2.3 Pipeline construction sequence

Construction sequence	Activity	Description
1	Surveying	Preliminary survey works will be undertaken to mark the extent of the construction area. Markers will be placed along the alignment to identify the pipeline centreline, the boundaries of the construction area, any additional work spaces and access roads/tracks, where required.
2	Site establishment and access	Preliminary activities will be undertaken to facilitate construction of the pipeline, including but not limited to: <ul style="list-style-type: none"> • Setting up environmental management measures

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



Construction sequence	Activity	Description
		<ul style="list-style-type: none"> • Proving of existing third party assets • Use of existing access tracks (where feasible) • Installation of temporary access points from existing roads, ancillary areas, and temporary gateways at fence crossings • Relocation of any infrastructure within the construction area.
3	Offsite compound	One temporary site compound, laydown and storage area (nominally 200 m x 200 m) will be established for the pipeline construction. This will be located where the activity is permitted under the relevant Planning Scheme, most likely within an existing industrial area. Or alternatively, approvals for the use and development of the compound site for the Project would be sought separately to (and in parallel with) the EES.
4	Clearing and grading	Clearing and grading of the area to provide a safe and efficient area for construction. Clearing will be required to remove trees, shrubs, surface rocks and groundcover vegetation. Temporary access tracks over watercourses and access points to local roads will be constructed during this phase.
5	Pipe stringing, bending and welding	Distribution of pipe segments along the corridor in preparation for welding.
6	Pipe bending	Where required, pipe lengths will be bent using a hydraulic bending machine to match changes in either elevation or direction of the alignment.
7	Welding, non-destructive testing, and joint coating	Pipe segments will be welded in strings. All welding is tested to ensure quality. Areas of the weld are cleaned and pipe joints are coated to prevent corrosion.

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



Construction sequence	Activity	Description
8	Trenching	Specialised trenching machines and excavators will excavate the trench to a depth of approximately two metres and approximate width of one metre. Spoil generated will be stockpiled separate from vegetation and topsoil stockpiled earlier in the construction program. Rock breaking processes such as rock saws/hammers and/or blasting is expected to be required to excavate the trench in areas of rock.
9	Lowering pipe into trench and backfilling	The pipe will be lowered into the trench with suitable bedding and padding material. The trench is backfilled with the previously excavated subsoil material. In areas of rock excavation, imported bedding and padding material may be required where the previously excavated subsoil is unsuitable for use. Care is taken to maintain separation between topsoil and subsoil during this process. Subsoils are compacted to limit settlement of the trench through the operational life of the pipeline. Any excess spoil is removed from the site.
10	Testing, commissioning and connections	The pipeline will be pressure tested (in accordance with AS/NZS 2885.5) prior to commissioning to ensure the pipeline passes strength and leak tests. This is done through hydrostatic testing where sections of the pipeline (test sections) are filled with water and then pressurised. Following completion of hydrostatic testing and Consent to Operate from Energy Safe Victoria the pipeline will be purged with gas and commissioned. In order to connect the new pipeline to the existing VTS, some tie-in works will be required into the existing pipeline at Plumpton.

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



Construction sequence	Activity	Description
11	Rehabilitation and monitoring	<p>Rehabilitation of the construction area will be undertaken in accordance with Project environmental management measures and CEMP with a view to returning land to its previous use within a reasonable timeframe, subject to seasonal constraints. Activities will include:</p> <ul style="list-style-type: none"> • Re-establishing topsoil cover (approximately 1 kilometre per day) • Installation of pipeline signage • Reinstating roadways and road reserves in accordance with the requirements of local councils • Reinstating fencing and access tracks in accordance with the requirements of land owners • Reinstating natural drainage patterns • Application of seed and/or vegetation, where appropriate • Installing any erosion control measures in prone areas • Reinstating waterways to meeting Catchment Management Authority requirements • Final site clean up • Monitoring and reinstating rehabilitation works if required • Vegetation control, weed management, erosion and subsidence monitoring. <p>Refer to Section 2.7</p>

2.5.2 Access to the construction corridor and facilities sites

Access will occur via the existing road network. Temporary access points from existing roads will be required to provide safe entry/exit for construction traffic during construction works. Where possible and feasible existing private access tracks will be utilised. Access tracks (upgrade of existing and construction of new), will be less than 10 metres wide and usually constructed out of gravel if required. Temporary access points to declared arterial roads will require approval from the Department of Transport and application of consent for works. No construction access will be required/available from freeway reserves. Access to land owned by the State/Crown Land will follow conditions of the relevant State government agencies, including the Department of Transport.

Where construction is to occur on private land, access will be negotiated with the Landholders. Access to Council land and road reserves will follow conditions of Council access agreements and road opening requirements.

2.5.3 Establishment of temporary construction support worksites

Two temporary construction support sites will be established for construction.

One offsite compound will be established for pipeline works, nominally 200 metres x 200 metres, including laydown and storage areas. This will be located on a site where the activity is permitted under the relevant Planning Scheme, most likely within an existing industrial area. Or alternatively, approvals for the use and development of the compound site for the Project would be sought separately to (and in parallel with) the EES.

The second temporary laydown area and construction offices will be established for the Wollert Compressor Station construction works. The construction offices and site laydown area for the compressor station equipment will be located within the existing compressor site area at Wollert.

2.5.4 Traffic management and consent for works within road reserves

Traffic management plans for the project will be developed by an accredited traffic management agency for the Construction Contractor and will be submitted to the relevant local Council (Hume, Melton, Mitchell or Whittlesea) or Department of Transport for review and acceptance prior to the commencement of construction. Consent for works within existing road reserves will follow the coordinating road authority's requirements.

2.5.5 Installation of temporary gateways and parallel fencing

Fences to be cut will be marked by the surveyors. Temporary strainer assemblies, gateways, and any applicable fencing will be installed in agreement with the landowner's requirements. Where applicable, this will provide continued security for livestock while construction progresses along the construction corridor.

2.5.6 Clear and grade

The clear and grade process will involve the removal of surface cover (such as the vegetation strip and topsoil) from the construction corridor to allow trenching to proceed.

In vegetated areas, clear and grade will involve the grading of up to 100 mm of topsoil in private property and pasture, depending on the soil profile. The topsoil will be stockpiled in a separate ribbon along the edge of the construction corridor to permit safe and practical construction access whilst preserving the topsoil in separate windrows for later reinstatement.

Where potential sedimentation of water courses may occur, erosion and sediment control measures will be installed on stockpiles and spoil at these locations. Erosion and sediment control measures will be inspected and maintained on a regular basis and following rain events for the entire construction period.

Wherever practicable, roadside vegetation clearing will be minimised. Trimming overhanging branches may be necessary. Vegetation cleared from the construction corridor will be stockpiled separately from the excavated trench material to ensure successful reinstatement of the construction corridor following construction. Cleared vegetation will be stockpiled and preserved for use during construction corridor restoration.

Clear and grade activities will occur at approximately 1 kilometre per day.

2.5.7 Trenching

The majority of the pipeline route will be open trenched. The list of bored road and water feature crossings are detailed in Section 2.5.8 below.

Specialised trenching machines and excavators will excavate the trench to a depth of approximately two metres and approximate width of one metre. Spoil generated will be stockpiled separate from vegetation and topsoil stockpiled earlier in the construction program. Rock breaking processes such as rock saws/hammers and/or blasting is expected to be required to excavate the trench in areas of rock.

Construction is expected to progress at a rate of approximately 700 metres per day for open trenching, however, HDD and bored crossings are likely to have lower daily progress rates and will progress at a slower rate within urban areas and where the Right of Way (ROW) is constrained.

Where required due to groundwater levels, trenches will be dewatered. Dewatering of excavated trenches/bell holes will be managed to minimise sedimentation, including the use of sediment control devices to remove suspended solids and dissipate flow. Sediment control devices will be listed in the CEMP. Dewatering of trenches due to rainfall will be collected and treated prior to discharge into the waterways (e.g. grass filtration) if turbidity exceeds requirements in accordance with State Environment Protection Policy (SEPP) (Waters) as part of the CEMP.

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



The time that trenches and bell holes remain open will be minimised as far as reasonably possible. In most cases, trenches are not expected to remain open for longer than three months. However, excavations associated with main line valves, hydrate test sections and at all tie in locations may remain open for a longer period.

When trenching through waterways (including Jacksons Creek and Merri Creek), diversion dams will be constructed of appropriate materials to minimise watercourse sedimentation, such as steel plates, sand bags or inflatable dams.

Figure 2.1 and Figure 2.2 illustrate the construction process for open cut watercourses and provide an indication of the working area and equipment set up.

Two types of set up are proposed for construction:

- Figure 2.1 - no or minimal flow watercourse (Merri Creek)
- Figure 2.2 - higher flow watercourse (Jacksons Creek)

To prepare sites for construction, the following will be undertaken:

- Strip top soil for construction area, leaving a certain distance away from the creek bank
- Stockpile away from creek banks
- Install sediment fencing
- Install vehicle crossing point across the creek (through access is required to walk the pipe in and enable a simpler construction process, rather than bringing equipment/pipe from either side)
- Depending on watercourse flow, start preparing the creek banks, or install diversion as per Figure 2.2

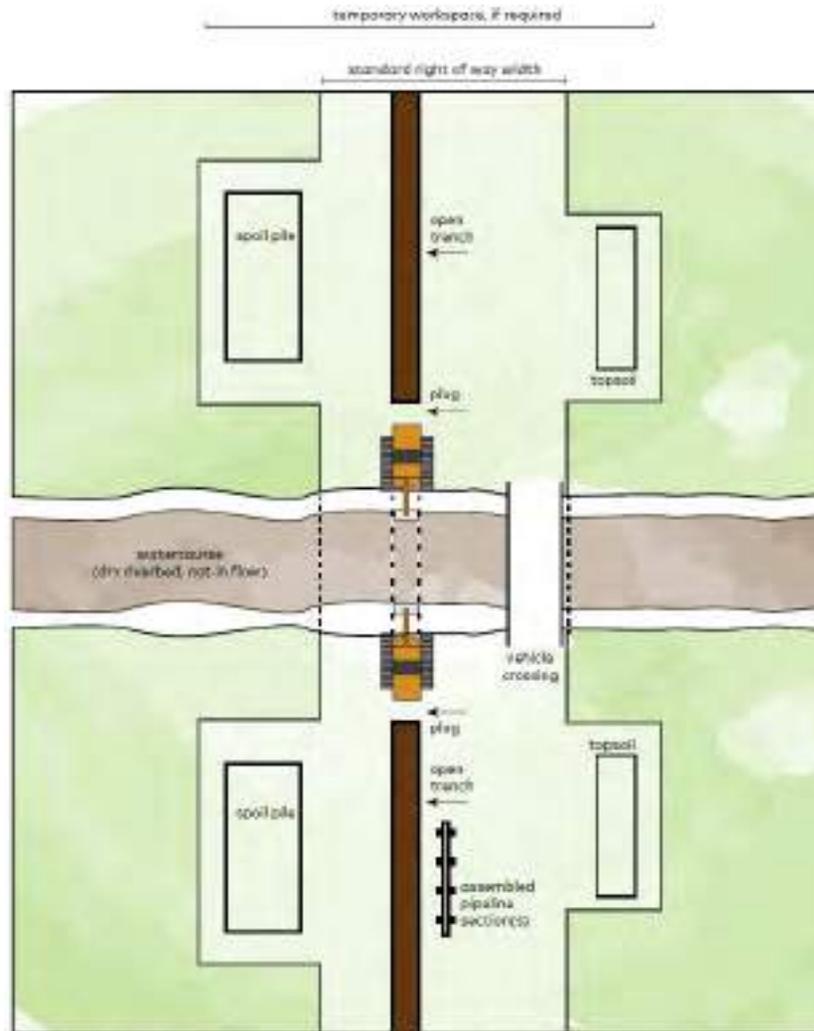
Rehabilitate the site following completion of creek trenching, as per the following steps:

- Backfill and prepare underlying bed and batters for rock beaching placement (where applicable)
- Place graded rock beaching to stabilise the creek bed and lower banks
- Place erosion matting protection on bed and bank areas not protected by rock beaching (e.g. minor waterways, upper batters on Jacksons Creek)
- Place topsoil and reseed around banks and surrounding disturbed areas.

PLAN

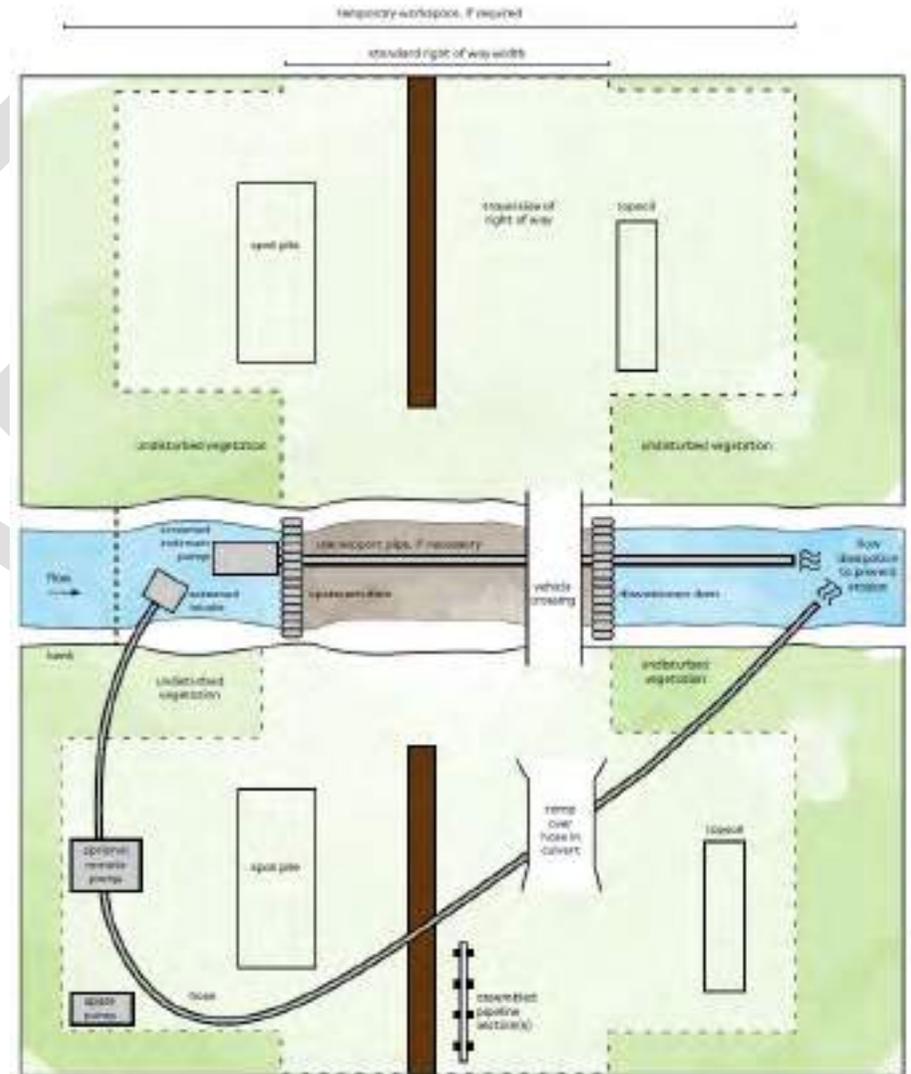
Western Outer Ring Main Project – Construction Environment Management Plan

Figure 2.1 Open cut construction methodology within watercourses (no or minimal flow watercourse)



Plan View
(not to scale)

Figure 2.2 Open cut construction methodology within watercourses (high flow watercourse)



Plan View
(not to scale)



2.5.8 Trenchless construction methods

The construction area intersects several roads and watercourses. In some cases, due to the presence of areas of high ecological significance, existing assets or other constraints, the pipeline will be constructed using trenchless construction techniques such as horizontal directional drilling (HDD) or shallow horizontal boring, to avoid construction disturbance within the sensitive area.

Table 2.4 lists crossings where these trenchless construction methods will be used.

Table 2.4: Locations where trenchless construction methods are proposed

#	Road / Creek Name	Approx location (KP)	Likely construction method at crossing
1	Beatty's Road	2.2	Bored/Mini HDD
2	Holden Road	6.4	Bored
3	Morefield Ct	10.9	Bored
4	Bulla-Diggers Rest Road	11.2	Bored
5	Wildwood Rd	17.0	Bored
6	St Johns Rd	19.0	Bored
7	Oaklands Rd	21.6	Bored
8	Craigieburn Rd	22.7	Bored
9	Mt Ridley Rd	26.4	Bored
10	Parkland Cr	26.4	Bored or open trench
11	Mickleham Rd	28.0	Bored
12	Donnybrook Rd	30.2	Bored
14	Donnybrook Rd	46.8	Bored
15	Bendigo Rail Line reserve	8.2	Bored (Pipe jacking)
16	North Eastern Rail Line reserve	40.9	Bored (Pipe jacking)
17	Sunbury Road	14.9	Mini HDD
18	Deep Creek	16.8	HDD
19	Calder Freeway	8.6	HDD
20	Hume Freeway	36.9	HDD
21	Melton Highway	3.1	HDD

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



2.5.8.1 Thrust Boring

Thrust boring involves excavation of pits either side of the obstacle. The thrust boring machine is located within the entry pit, which uses a hydraulic ram to jack the pipe section, behind a cutting head, in a straight line through the ground to the receiving pit. Boring below sealed bitumen roads will be used to minimise disruption to traffic movements and prevent any reduction in road surface integrity.

2.5.8.2 HDD

HDD involves drilling beneath the obstacle using trenchless technology. It requires the excavation of an exit pit (approximately 3 m x 3 m x 3 m) on the opposite side to where the drilling rig is set up to contain drilling fluids used in the drilling process. A smaller entry pit approximately half the size of the exit pit is excavated on the drilling rig side.

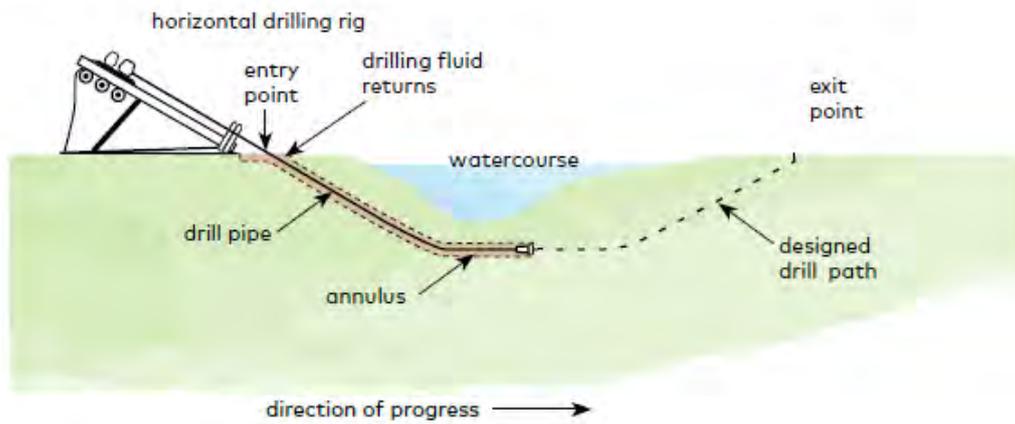
A bore hole is then drilled along the designed path of the pipeline from one side to the other and the pipe pulled back through the bore hole. The drilling fluids are monitored through the logging of fluid inputs and returns. The HDD process is graphically shown in Figure 2.2.

DRAFT

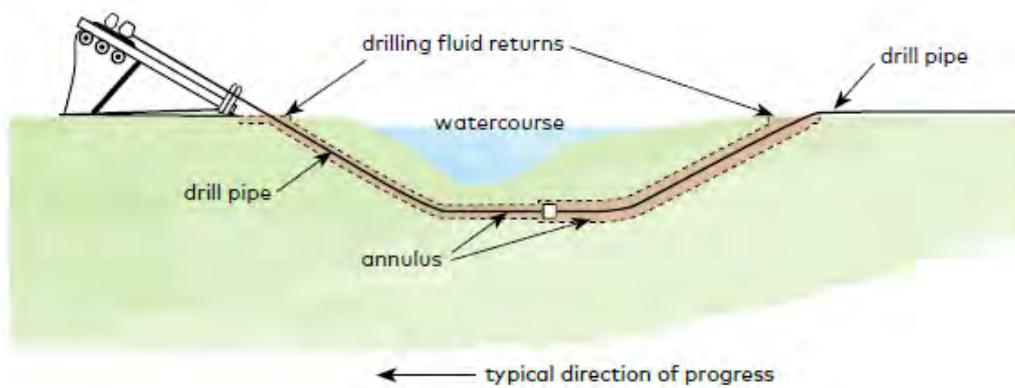
PLAN

Figure 2.2: Typical HDD process

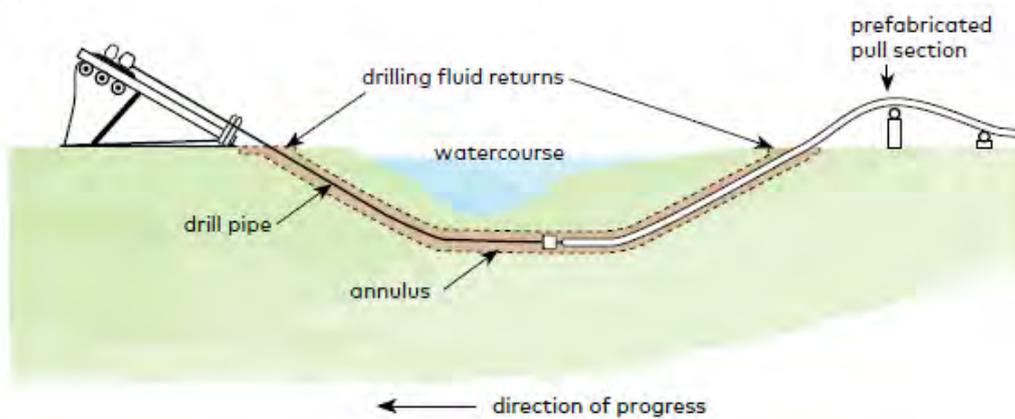
pilot hole



pre-reaming



pullback



Drilling fluids are used to assist the process and fluid use needs to be monitored through the logging of fluid inputs and returns. A volumetric drilling fluid tracking procedure will be implemented to monitor fluid use during drilling operations.

Geotechnical assessment will be undertaken prior to construction to confirm suitability for drilling and assist in the design of the proposed works and HDD crossing design. In addition, the potential for loss of fluids through fractures in the overlying strata will be minimised by a review of geology and selection of a drill profile and depth that controls this potential risk.

Drilling fluid components will use only benign materials, with the most common additive being bentonite, a naturally occurring clay. To ensure compliance with the EPA Publication IWRG 631 Solid Industrial Waste Hazard Categorisation and Management (Victoria), the drilling fluids and cuttings will be tested and disposed of according to the waste categorisation.

2.5.8.3 Pipe jacking and microtunneling

Pipe jacking and microtunneling is a non-disruptive method of installing tunnels for gas pipelines and other utilities. The specific machinery and methods to achieve the certified design are yet to be finalised with the contractor, however, a general overview is provided below and illustrated in Figure 2.3.

Two pits are dug either side of the rail crossing at the required depth and distance away from the rail assets. In the larger pit, a microtunneling boring machine with hydraulic jack is placed and correctly aligned within the launch/thrust pit. As the boring progresses, sections of concrete pipe are inserted into the bore with the hydraulic jack. This is done progressively as each section is being drilled. The microtunneling machine is then recovered through the receiver pit and the full bore is then filled with jacking pipe. The small annulus between the bored rock tunnel and the concrete jacked pipe is then grouted as per the design.

After the grout cures, the gas pipeline will be inserted through the tunnel of jacked pipe and kept in place with spacers. The annulus between the exterior of the pipe and the concrete jacked pipe will then also be grouted.

The bore pits are backfilled with excavated material and compacted in layers to a level consistent with surrounding soils and to a relative density sufficient to prevent further settlement under natural moisture and load conditions. Either side of the railway crossing is then rehabilitated to pre-construction condition or as otherwise agreed with the relevant landholder(s).

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



Figure 2.3 Typical pipe jacking arrangement



2.5.8.4 Shallow horizontal boring

The methodology for shallow horizontal boring (referred to as thrust boring or micro-tunnelling) involves constructing a horizontal bore hole for installing the pipeline beneath sensitive surface features, rails, roads and underground services or where access is required on a 24-hour basis. A typical set up for a thrust bored crossing is shown in Figure 2.4.

Bell holes are excavated on both sides of the sensitive feature to the depth of the adjacent trench and graded to match the slope of the pipeline. Bell holes would be approximately eight metres long and, four metres wide. The depth would be to match the adjacent trench and graded to match the proposed slope of the pipeline.

A boring machine operates within this bell hole to tunnel under the relevant constraint. The boring machine is located within the entry pit, which uses a hydraulic ram to jack the pipe section, behind a cutting head, in a straight line through the ground to the receiving pit.

The method is not suitable for boring under features where a greater depth is required, such as a major waterway. In these instances, HDD construction methodology would be used.

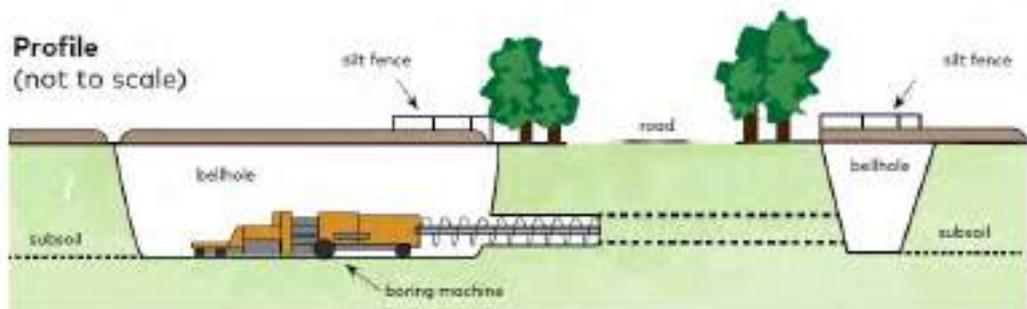
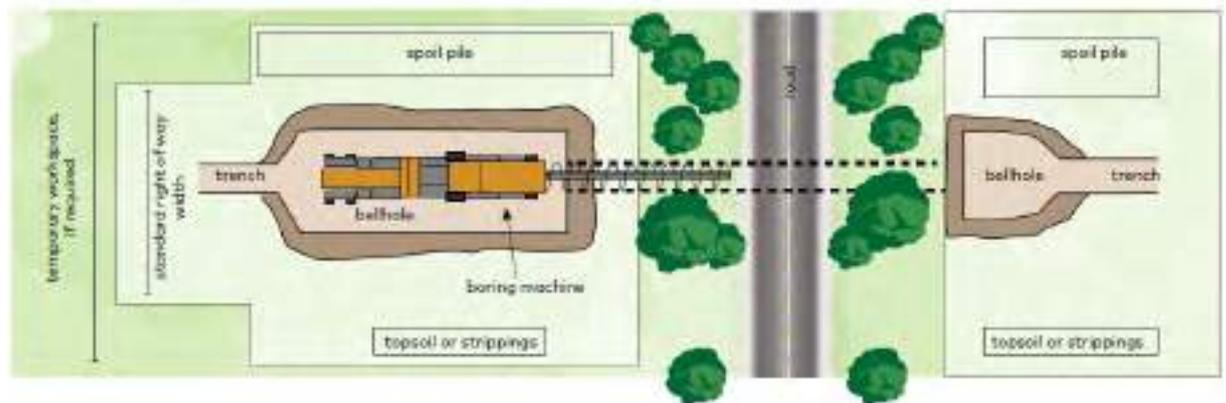
PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



Figure 2.4 Typical thrust bore site set up

Plan View
(not to scale)



2.5.9 Pipe stringing and welding

Pipe stringing and welding involves the delivery of pipe to the construction corridor. The individual pipes will be removed from the semi-trailer and laid end-to-end alongside the trench on raised timber skids and sandbags to protect the pipe from damage and enable it to be welded into continuous lengths, or "pipe strings". All welds will then be examined by radiography to ensure compliance with AS2885.2. The areas of the weld are cleaned and pipe joints are coated to prevent corrosion. The joints will then be cleaned by grit blasting and a field joint coating will be applied by hand or spray application.

2.5.10 Lowering-in

Before lowering in, it may be necessary to de-water the trench where rain or groundwater has accumulated. The welded and coated pipe strings will be lowered into the trench by side-boom tractors, which gradually move along the construction corridor, progressively lowering in the pipe string.

2.5.11 Backfilling

Stockpiled trench spoil excavated during trenching will be returned to the trench and compacted following the lowering-in of the pipe. Special care will be taken to ensure that excavated spoil and soil profiles are re-established to avoid soil inversion. In the event that the excavated material cannot be reused, the spoil will be lawfully disposed of according to the requirements of this CEMP and in accordance with the EPA Victoria's waste classification and transport requirements.

Where necessary trench breakers (either side of creek) will be used during construction in the excavated trench.

Where the pipeline crosses the OMR/E6 PAO, the following specific backfill requirements would apply:

- The backfill material(s), construction methodology and quality assurance adopted by APA shall comply with DoT minimum requirements
- APA will provide all the necessary documentation associated with its proposed work including, but not limited to, contract specifications and Issued for Construction drawings that would detail how the works will be carried out in accordance with DoT standards and requirements.

These requirements have been incorporated into a draft Coordination Deed to be executed by APA and DoT prior to the commencement of construction. Further, it is recognised there may be additional changes to the WORM Project such as to the pipeline alignment and/or construction methodology that may alter DoT's position or require DoT's approval prior to construction. APA will construct the pipeline within the OMR/E6 PAO in accordance with the Coordination Deed agreed to with DoT.

2.5.12 Pipe cleaning

Prior to hydrostatic testing, the pipeline will be pre-cleaned with foam and/or brush pigs to remove weld debris, dust and surface scale. Pipe cleaning includes flushing the pipe with water which is usually done as part of filling the pipe section with water. The water is introduced using pigs to separate the water sections into "slugs" the first slug is the cleaning slug.

2.5.13 Pipeline testing and commissioning

The pipeline coating would be tested to ensure it is of a satisfactory standard before and after installation. If the pipeline fails a coating integrity test after installation, the pipeline would be excavated and repaired.

The pipeline would be pressure tested before commissioning to ensure it passes strength and leak tests in accordance with AS 2885.5. This is done via hydrostatic testing where test sections of the pipeline are filled with water and then pressurised.

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



Each pipeline test section would be cleaned internally by pigs propelled by compressed air or water. The test section would be filled with water and pressurised, and the pressure increased for approximately four hours to assess the strength of the test section. The pipeline would then be subjected to a leak test for a minimum of 24 hours to determine the section is leak-free. The hydrostatic testing process would take approximately eight to ten days for a single test section, with the majority of that time required to fill the test section with water.

It is anticipated the pipeline would be hydrostatically tested in a minimum of four and possibly up to eight sections of variable lengths. The exact sequence and timing of hydrostatic testing would depend on the final schedule for construction, availability of water and the final hydrostatic test design of the pipeline.

Hydrostatic testing would require approximately 10 megalitres of water in total and assumes reuse between two adjacent test sections. Break tanks would be used to transfer water between test sections. Depending on the final configuration of hydrostatic test sections and the availability of water, it is possible that chemicals to control biological growth and corrosion may be added to the hydrostatic test water.

Water for hydrostatic testing would be sourced from existing dams or existing water mains where suitable supply exists near the pipeline alignment. This water would be obtained subject to agreements and/or licences/permits with relevant landholders and authorities.

Water can be pumped into the pipe at either end of two test sections or from a central location between two test sections. This provides a high degree of flexibility in testing locations with the main consideration being the availability of water. This allows for testing locations to be selected to minimise potential amenity impacts by avoiding areas near sensitive receptors where practicable.

At the conclusion of testing, and subject to confirmation of the water quality, the water would be released into dams where water was sourced or onto adjoining land with appropriate slope, soil and groundcover characteristics. Water release would occur through a dewatering structure designed to slow the flow of water. When the dewatering process was complete, the pipeline would be dried using compressed air. Water unable to be disposed of onto adjoining land would be disposed of in accordance with relevant legislation and policy requirements.

Following pipeline testing and drying, the pipeline would be gauged using a geometry pig capable of measuring the internal surface of the pipe. Any defects would be located, assessed and rectified.

The pipeline would be commissioned following completion of hydrostatic testing and the tie-in of the MLVs. Commissioning would proceed sequentially from the point where commissioning gas was available and on completion of the sections.

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



Commissioning would be in accordance with the Pipelines Act and regulations and would include as a minimum the following activities:

- Instrument calibration
- Control system functionality
- Safety system testing
- Purging of air and gas filling
- Pressurisation
- Testing and commissioning of stations and valves.

Gas flow through the pipeline would occur following a Consent to Operate issued from Energy Safe Victoria.

2.6 Wollert compressor station upgrades

The Project includes the addition of a Solar Centaur 50 compressor to the site, along with an end of line scraper station and regulating station, associated valves and pipework as shown in Figure 2.5.

The Wollert compressor station upgrades will be contained within a fenced area to exclude members of the public.

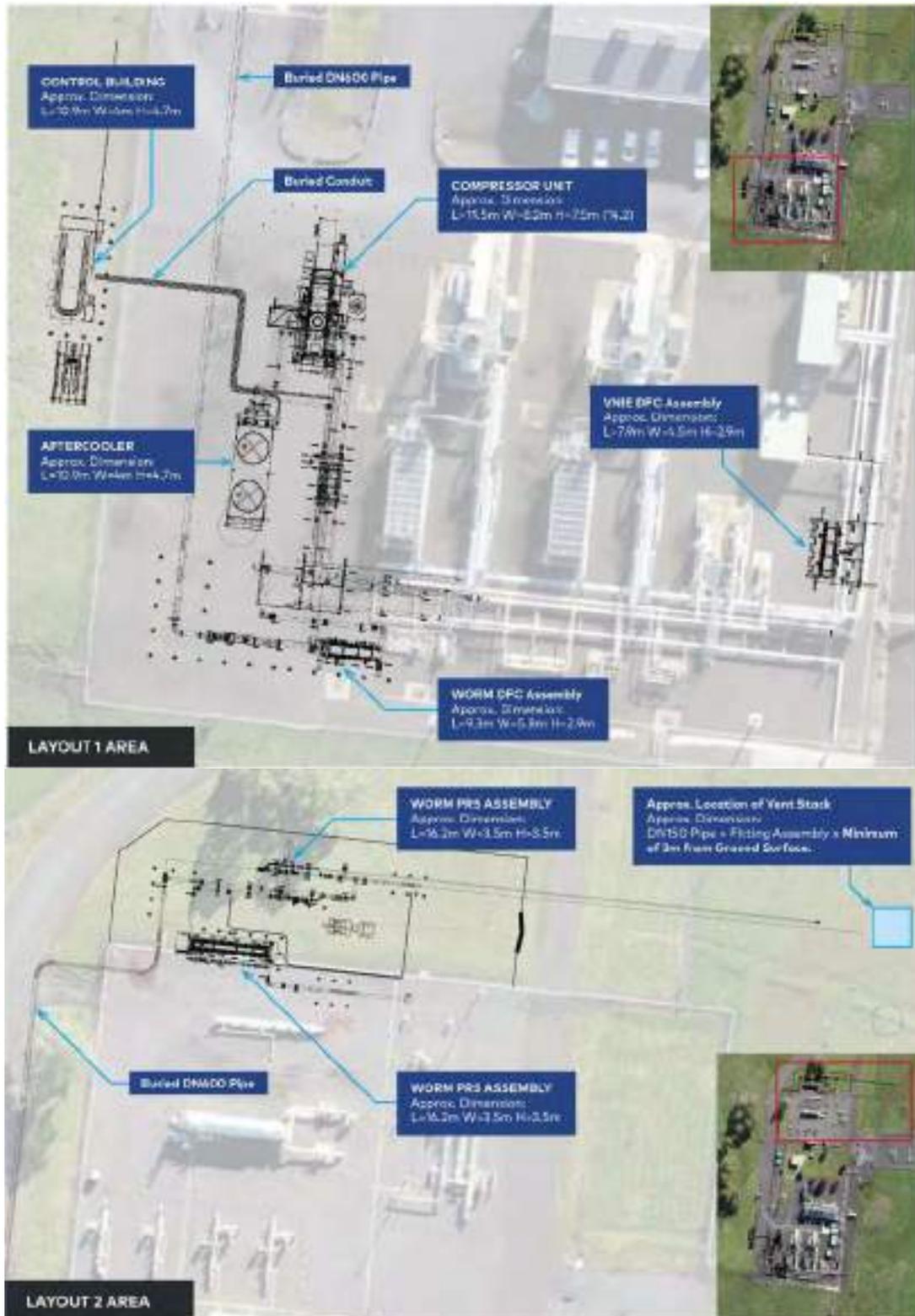
The construction sequence and activities for all works at the Wollert compressor station are outlined in Table 2.5.

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



Figure 2.5 Wollert compressor site and location of additional facilities



PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



Table 2.5 Construction methodology to install the Solar Centaur compressor

Construction sequence	Activity	Description
1	Surveying	Preliminary survey works will be undertaken to mark the extent of the construction footprint.
2	Site establishment	Preliminary activities will be undertaken to facilitate the construction of the compressor, including but not limited to: <ul style="list-style-type: none">• Setting up environmental management measures• Vegetation removal• Establishment of a temporary site laydown area and construction offices• Proving of any existing assets• Use of temporary access roads within the APA site
3	Bulk earthworks	Excavation and removal of existing soil material or rock from specified areas of the construction footprint.
4	Civil works	Excavations will cut into the existing surface material to facilitate construction of a concrete slab and footings to provide a firm base for the compressor and any other equipment.
5	Mechanical works	Various components of the compressor are assembled offsite and are assembled together onsite. Cranes are used to lift the compressor into place with all connecting pipework fitted.
6	Electrical and instrumentation works	Electrical components are connected together on site via cables that are installed in above ground cable trays and underground conduits and electrical pits.
7	Hydrostatic testing and commissioning	The station piping will be pressure tested via hydrostatic testing (in accordance with ASME B31.3 and APA standard piping specifications), prior to commissioning, to ensure that the station piping passes strength and leak tests.

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



Construction sequence	Activity	Description
8	Pre-commissioning and commissioning activities	Following completion of hydrostatic testing and Consent to Operate from Energy Safe Victoria the station piping will be purged with gas. Pre-commissioning and commissioning activities will be undertaken, which includes function testing and performance testing of all installed equipment before the facilities are commissioned.
9	Site completion and fencing	A hardstand area will be established around the compressor site. Installation of permanent fencing around the facility to maintain ongoing site security. Final site clean up.

2.7 Rehabilitation

Rehabilitation of the construction corridor will aim to minimise adverse impacts of the pipeline on existing land uses and control the occurrence and extent of soil erosion. The rehabilitation of the construction area and all temporary facilities, temporary access tracks and extra work areas will begin as soon as practicable after the completion of the construction activities, with the aim of restoration of ground cover within six months. Rehabilitation of the construction footprint will be undertaken in accordance with good pipeline construction principles to reinstate existing topography and appropriate vegetation in consultation with the landholder.

Key rehabilitation activities will include:

- Re-establishing topsoil cover
- Installation of pipeline signage
- Reinstating roadways and road reserves in accordance with the requirements of local councils
- Reinstating fencing and access tracks in accordance with the requirements of land owners
- Reinstating natural drainage patterns
- Application of seed and/or vegetation, where appropriate
- Installing any erosion control measures in prone areas
- Reinstating waterways to meet Catchment Management Authority requirements

In areas of soil containing vegetative cover, revegetation of the construction corridor where it previously contained established pasture, will generally be based on conventional pasture restoration procedures in consultation with landholders. In areas of soil previously containing native vegetative cover, revegetation of the construction corridor will include plantings of native and indigenous grasses as far as reasonably practicable. Shallow-rooted vegetation and grass will be re-established across the construction area where appropriate with its land use and in consultation with landowners. Tall and deep-rooted vegetation (such as mature trees) generally cannot be reinstated, due to the potential to interfere with the pipeline coating and impede operational access requirements. Where trees within the approved construction area are lost and affect public places or existing screening of residences, where practicable, trees will be replaced where reasonably requested and in consultation with the affected landholder. Tree plantings will need to meet the requirements of the Asset Protection Zone and relevant bushfire management overlays.

Within roadways, surfaces will be reinstated in accordance with the requirements of the local Council. Vegetated road reservations will also be restored in consultation with the local Council. Waterways will be reinstated to meet Catchment Management Authority requirements.

Monitoring within the construction corridor will be undertaken for 12-24 months post-construction and will include easement surveillance and reinstating rehabilitation works if required. In particular, the following would be undertaken:

- Inspection of native vegetation coverage
- Inspection of pasture establishment
- Inspection of weeds
- Inspection of subsidence or gully erosion
- Observations of watercourse re-establishment
- Monitoring post any major flooding event
- Any specific requirements agreed upon with the landowner.

2.8 Operation and maintenance

The pipeline will commence operations from Q4 2022 and this CEMP will remain in place for the first 12-24 months of operational activity. During this 12-24 month period the completed pipeline construction and rehabilitation works will be monitored to identify and correct defects. After this 12-24 month period the continued operation of the pipeline will be undertaken in accordance and maintenance with the VTS OEMP.

These activities are summarised below for context only.

Maintenance and inspections of the MLVs and the Wollert Compressor Station will be conducted periodically in accordance with APA procedures. The activities usually include vegetation management, valve and compressor operation and corrective maintenance.

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



The key operation and maintenance phase activities include:

- Easement maintenance (vegetation control, weed management, erosion and subsidence monitoring)
- Pipeline, MLVs and compressor station maintenance
- Specialist pigging operations
- Cathodic protection surveys for mechanical and electrical preventative and corrective maintenance
- Monitoring and routine inspections and surveillance

DRAFT

3. Environmental setting

3.1 Regional setting

The Project Area (containing the construction corridor) is within the Port Phillip Basin and traverses sections of the Werribee River, Yarra River and Maribyrnong River catchments. It spans the Victorian Volcanic Plain bioregion and a small area of the Central Victorian Uplands. The Project Area traverses a landscape that has been highly fragmented by past land use including agricultural, infrastructure and urban development.

3.2 Environmental features overview

An Environmental Line List (ELL) was prepared for the proposed pipeline in December 2020 to record key environmental (including heritage and community) features based on the findings of the technical studies within the EES. This is contained in Appendix G– Environmental Line List.

The purpose of the ELL is to identify community facilities, sensitive receptors, heritage values and threatened flora and fauna that may occur along the pipeline route and that require management measures to mitigate potential risks during pipeline construction, operation and maintenance.

Environmental datasets were extracted for the pipeline alignment. The alignment was assessed using a 50 metre buffer on the pipeline, and a larger buffer for sensitive noise and air quality receptors. Key environment features that intersected with the pipeline or buffer were recorded.

The following sections present an overview of the environmental setting.

3.3 Land use

The Project is located to the north and west of Melbourne and lies between Plumpton and Wollert. The Project would traverse the local government areas of Melton City, Hume City, Mitchell Shire and Whittlesea City Councils.

All four municipalities are expected to experience significant population growth under state, regional and local planning policy directives, which will be largely accommodated through the incremental and planned development of residential growth areas (and associated employment precincts) within the western (Melton) and northern (Hume, Mitchell and Whittlesea) growth corridors.

The Project would also traverse two green wedges (the Western Plains North green wedge, and the Sunbury green wedge), which are predominantly home to rural and agricultural land uses, with some associated residential development, limited commercial uses, and some extractive industry operations.

Land uses in the Project area generally comprise a range of residential, agricultural, open space, commercial, industrial (including extractive industry such as quarries) and community facilities-based land uses. Broadly, land across all sections is generally within a growth area subject to a current or future Precinct Structure Plan (PSP), or within a green wedge.

The majority of the land subject to the pipeline is privately held, with Crown Land in the study area limited to waterways and roadways.

Land uses that apply to the Project are described further below in sections 3.3.1 to section 3.3.4. These land use description sections are divided into Plumpton to Calder Highway, Calder Highway to Mickelham Road, Mickelham to Donnybrook and Donnybrook to Wollert Compressor Station.

3.3.1 Section 1 – Plumpton to Calder Highway (KP 0-9)

This section is characterised by land within the urban growth boundary and the western growth corridor to the south of the Melton Highway, and land within the Western Plains North green wedge between the Melton Highway and the Calder Highway. Other features include the Melbourne-Bendigo rail corridor, managed by VicTrack. All land within this section is within the City of Melton and subject to the Melton planning scheme.

Despite the delineation between areas within the green wedge and land within the growth corridor, land uses within this section are currently uniformly agricultural and rural-residential in nature, with little to no commercial, industrial, open space land uses or community facilities. This uniformity is not anticipated to continue into the future, given the planned residential development within the western growth corridor, and the approval of the Koroit and Plumpton PSPs, while land within the green wedge is not currently projected to undergo further development in the future. The Koroit and Plumpton PSPs specifically account for the existing easement and the pipeline location was considered in terms of land uses provided for within the PSPs.

Land within this section is predominantly privately held, with the exception of public road reserves and the Melbourne-Bendigo rail reserve. Notably, this section of WORM will be constructed entirely within an existing APA gas pipeline easement.

3.3.2 Section 2 – Calder Highway to Mickelham Road (KP 9-28)

From the Calder Highway to Mickleham Road, the Project is located entirely within the Sunbury green wedge, though the Project does pass within 659 m of land within the Sunbury South PSP. This portion of green wedge is entirely within the City of Hume, who are currently preparing a Green Wedge Management Plan for the area (though this is not yet publicly available).

Land within this section is almost wholly included within the Green Wedge Zone. Exceptions to this are a small section to the east of Diggers Rest (Green Wedge A Zone), a section associated with the Sunbury South PSP (Rural Conservation Zone and Urban Growth Zone - Schedule 9) and an area included within a Special Use Zone, Schedule 1 (Earth and Energy Resources Industry), associated with the Oaklands Junction quarry.

Notably, the Melbourne Airport Environs Overlay, associated with Melbourne Airport to the southeast of the study area, also covers a large area within this section. The purpose of this overlay is to protect Melbourne Airport's operations from inappropriate development, and its application constrains further urban development within areas subject to this overlay.

Land within this section is somewhat undulating, with steep creek valleys associated with several waterways, some of which the Project crosses (Jacksons Creek and Deep Creek). Land uses are primarily rural and agricultural in nature, with some low-density residential uses located to the east of Diggers Rest, at the locality of Wildwood, and north of the township of Bulla. Industrial and extractive industry-based land uses are also present in close proximity to the Project in the form of refuse, recycling and waste transfer stations and quarries.

Land at this section is predominantly privately held, however there is some Crown land at various waterways and along designated roads. There is no existing APA easement in this section.

3.3.3 Section 3 – Mickelham to Donnybrook (KP 28-46.9)

The section from Mickleham to Donnybrook traverses the Hume, Mitchell and Whittlesea Councils. The route adjoins two green wedges (the Sunbury green wedge to the west, and the Whittlesea green wedge to the east), and is otherwise wholly within Melbourne's northern growth corridor. The Project also crosses the North Eastern rail line reserve and the Hume Freeway within Section 3.

At this location, the route is primarily located within or adjacent to the future OMR Road/E6 Transport corridor route, which is subject to a Public Acquisition Overlay. Reasonably foreseeable future land uses accounted for in the Donnybrook-Woodstock PSP took this existing easement into account and do not directly relate to the provision of the WORM.

Land uses in this section are currently predominantly rural and agricultural in nature, however they will gradually transition to urban residential in the future. A number of PSPs have been approved or are in development along the route within this section, including the Lindum Vale, Merrifield West, Merrifield North, Lockerbie North, Lockerbie, Donnybrook-Woodstock and Shenstone Park PSPs.

Land within this section is predominantly privately held, with the exception of a parcel of land north of Kalkallo, roadways, the North Eastern rail line reserve, and Merri Creek. In this section, around 74% (14 km) of the Project is not within an existing easement, with the remaining 26% (4.9 km) in an existing easement.

3.3.4 Section 4 - Donnybrook to Wollert Compressor Station (KP 46.9-51.045)

This section extends approximately 3.8 km from Donnybrook Road through to the terminus of the Project at Wollert, entirely within the City of Whittlesea local government area.

This section, while within the urban growth boundary, is not subject to any current PSPs, and is zoned Urban Growth Zone, Rural Conservation Zone – Schedule 1, Special Use Zone – Schedule 4, and Farming Zone. Land uses within the area are currently agricultural or extractive industry-based, with an absence of commercial, industrial, community and open space uses, along with the existing APA Wollert Compressor Station.

One PSP is currently in development for the area subject to the Urban Growth Zone.

Land within this section is entirely privately held, with the exception of roadways. At this section, the route is entirely within an existing gas pipeline easement or land where APA has existing tenure (Wollert Compressor Station).

3.4 Soils and terrain

3.4.1 Geology

The Project is located within the easternmost Western Plains geomorphic province of Victoria. Characterised by multiple Quaternary basalt volcanic eruption points that protrude above extensive lava plains produced by repeated volcanic episodes over long time periods. Within this predominantly volcanic setting, ranges of low hills protrude above the basalt plains, composed of pre-volcanic basement rocks and Neogene cover units.

The geology within the Project construction corridor is dominated by the Newer Volcanics basaltic flows and stony rises. Alluvium is present around Jacksons Creek and Deep Creek with colluvium and alluvial terraces in Mickleham. The bedrock beneath the younger geological units is comprised of the Humevale Siltstone. The presence of alluvium also presents the possibility for acid sulfate soil to be present.

A summary of the Project geological setting includes:

- Colluvium and high level Alluvium from the Quaternary period, most significantly near Gunns Gully Road
- Newer Volcanics basalt from the Late Tertiary to Quaternary period covering the majority of the study area
- Red Bluff sands / Bullengarook gravel from the Late Tertiary period underlying the Newer Volcanic in the western portion of the study area
- Werribee Formation from the Early Tertiary period only present in the south of the study area and thin (10 metres to 20 metres)
- Bulla Granodiorite from the Late Devonian period with limited outcrop near Deep Creek and a larger outcrop east of the Bulla-Sunbury Road

- Humevale Siltstone (located outside of the study area), Deep Creek Siltstone (west of the Project crossing of Deep Creek) and Springfield Sandstone (outside the north-west edge of the study area) from the Silurian to Devonian period

Further information on the topography, geology and hydrology of the construction corridor is provided in EES Chapter 8 *Water*.

3.4.2 Soil type

There is potential for dispersive (sodic) soils to be present along the construction corridor, particularly in areas containing residual basaltic soils. Through localised testing, dispersive (sodic) soils have been identified at select locations along the Project alignment, including near Jackson's Creek and Kalkallo Basin (refer to EES Technical report D and chapter 9 *Land stability and ground movement*).

Disturbance of dispersive soils can have adverse effects on water quality and waterway health. Construction activities and events such as excavation, removal of topsoil and ponding of rainwater will increase the risk of dispersivity of the soil. Runoff from areas with presence of dispersive soils are likely to contain large amounts of clay and form into dissolved slurry when exposed to rainwater. If runoff containing dispersive soil enters the waterway, this can lead to an increase in turbidity and decrease the water quality. As such, appropriate management measures, including sodic soil management measures will need to be implemented to protect the water quality and beneficial uses downstream. These are described in more detail in EMM GM4.

3.4.3 Acid sulfate soils

The presence of acid sulfate soils and acid sulfate rock can become a potential constraint to construction activities, requiring the implementation of controls to manage the spoil during excavation activities.

The construction corridor is largely underlain by basalt and alluvium in the creek beds. Of these, the alluvium poses the most likely risk of PASS, notably below the water table.

Two sampling events have been conducted in the Project area to assess acid sulfate soil:

- Construction Sciences (2020) completed an acid sulfate soil assessment on 49 samples from 13 locations along the construction corridor as part of the geotechnical investigation
- GHD collected eight samples from two soil bores in August 2020

Potential Acid Sulfate Soil (PASS) materials and Actual Acid Sulfate Soils (AASS) materials and AASS were not identified in the samples assessed but further sampling and analysis is required if excavating soils beneath the water table in alluvium such as at creek crossings at Jacksons Creek and Merri Creek.

3.4.4 Contaminated soils

Soil samples have been collected to assess the potential for contamination within the project footprint. Further soil sampling within the construction corridor between approximately KP 34.2 and KP 35.4 is required to characterise the soil quality at the Kalkallo retarding basin, including analysis of PFAS, in order to confirm categorisation of this soil prior to construction.

Soil samples have not been collected at other sites identified from desktop review as potential contamination sources, including the Diggers Rest property storing wrecked vehicles (KP 9.95 to KP 10.14), within or immediately adjacent to the railway reserves likely within shallow soils only (KP 8.3 and KP 41.1) and along the construction corridor opposite a possible former quarry (KP 37.5). Further site investigations are required to characterise soil quality at these locations and confirm categorisation of this soil prior to construction.

A summary of the potential sources of contamination, their locations in relation to the Project, how the potential contamination could be interacted with and the associated potential contaminants of concern is presented in Table 3.1.

Table 3.1 Summary of potential sources of contamination

Potential sources of contamination	Location	Distance /direction from construction corridor	Potential impact pathway	Potential contaminants of concern
Railway crossings / rail reserves	Sunbury Railway Line crossing in Diggers Rest (KP 8.3) Railway crossing in Beveridge (KP 41.1)	Pipeline runs beneath railway lines.	Excavation of shallow soil (unlikely to be realised based on construction method)	Metals, total recoverable hydrocarbons (TRH), benzene, toluene, ethylbenzene, xylene (BTEX), polycyclic aromatic hydrocarbons (PAH), organochlorine pesticides (OCP), asbestos
Rural property used to store hundreds of wrecked cars	140 Duncans Lane, Diggers Rest (KP 9.95-10.14)	Pipeline runs directly through the eastern portion of the property.	Excavation of soil Soil vapour migration Abstraction of groundwater (unlikely to be realised based on construction method)	Metals, TRHs, BTEX, PAHs and solvents.

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



Potential sources of contamination	Location	Distance /direction from construction corridor	Potential impact pathway	Potential contaminants of concern
Industrial waste dumped	205 Bulla-Diggers Rest Road, Diggers Rest (KP 11.3)	Approximately 30 m to the south of the construction corridor.	Abstraction of groundwater (unlikely to be realised based on construction method)	Metals, TRHs, BTEX, PAHs
Quarry and landfill site	Bulla Tip and Quarry – 500 Sunbury Road, Bulla (KP 14.85-15.85)	Approximately 20m to the east of the Project construction corridor.	Gas migration Abstraction of groundwater (unlikely to be realised based on construction method)	Landfill gas (methane, carbon dioxide, hydrogen sulphide and carbon monoxide), heavy metals, nutrients (ammonia, nitrate, phosphorous), TRHs, BTEX, PAHs, chlorinated hydrocarbons, per- and polyfluorinated alkyl substances (PFAS).
Landfill site	600 Sunbury Road, Bulla (KP 15)	Approximately 300m north of the construction corridor	Abstraction of groundwater (unlikely to be realised based on construction method)	Landfill gas (methane, carbon dioxide, hydrogen sulphide and carbon monoxide), heavy metals, nutrients (ammonia, nitrate, phosphorous), TRHs, BTEX, PAHs, chlorinated hydrocarbons, PFAS.
Unknown, but is known to have received a Clean Up Notice	40 Batey Court, Bulla (KP 16)	Approximately 25m to the east of the construction corridor.	Gas migration Abstraction of groundwater (unlikely to be realised based on construction method)	Unknown

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



Potential sources of contamination	Location	Distance /direction from construction corridor	Potential impact pathway	Potential contaminants of concern
			realised based on construction method	
Retarding basin	Kalkallo (KP 34-35.54)	Construction corridor runs along the northern boundary	Excavation of soil Abstraction of groundwater (unlikely to be realised based on construction method)	Contaminants dependent on surrounding land uses – potentially metals, TRHs, BTEX, PAHs, OCPs, asbestos, E.Coli and nutrients, PFAS
Former Quarry	300 Hume Hwy, Beveridge (KP 37.5)	30m to the west of the construction corridor	Excavation of soil Abstraction of groundwater (unlikely to be realised based on construction method)	Metals, TRHs, BTEX, PAHs, aesthetics, asbestos
Wollert Compressor Station	Wollert (KP 50.78 to KP51.045)	Forms part of the construction corridor	Excavation of soil Abstraction of groundwater (unlikely to be realised based on trenching construction method)	Metals, TRHs, BTEX, PAHs, solvents, OCPs.
Source unknown	Jacksons Creek (KP 13.6)	Jacksons Creek	Abstraction of shallow groundwater, surface water and sediments	Nutrients and PFAS
Potential Acid sulfate soils (PASS)	Unknown Creek / Tame Street Drain (KP 8.4) Jacksons Creek (KP 13.6) Merri Creek (approx. KP 42.8)	Jacksons Creek Unknown Creek / Tame Street Drain Merri Creek	Exposing sediments to oxygen from dewatering	PASS

3.5 Hydrology

3.5.1 Surface water

Twenty-three waterways intersect the construction corridor. There are six main waterways, which are summarised in Table 3.2 and shown in Figure 3.1 below.

Table 3.2 Waterways and catchments around the Project construction corridor

Waterway	Status	Location	Description	Broader catchment context
Tame Street Drain	MWC Main Drain Channel	KP 8.36	Tame Street Drain is a natural gully flow path within the Maribyrnong catchment that will be similar to surrounding undisturbed gully drainage lines but has been directly impacted by urbanisation.	The Maribyrnong catchment, outside of the urban fringe with the predominant land use being agricultural land.
Jacksons Creek	'Complex' waterway	KP 13.7	Jacksons Creek was formed on basaltic terrain in the upper plains of the Maribyrnong catchment. In response to volcanic activity and regional uplifting, the waterways in the catchment are typically incised into the basalt resulting in deep valleys and gorges.	The Maribyrnong catchment, outside of the urban fringe with the predominant land use being agricultural land.
Deep Creek	'Complex' waterway	KP 16.7	Deep Creek is a major waterway within the Maribyrnong River catchment typically flowing southerly towards the confluence with Jacksons Creek, where it becomes the Maribyrnong River. The pipeline crosses Deep Creek immediately downstream of its confluence with Emu Creek. Deep Creek in this reach flows through agricultural land and is becoming increasingly impacted by catchment urbanisation.	The Maribyrnong catchment, outside of the urban fringe with the predominant land use being agricultural land.

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



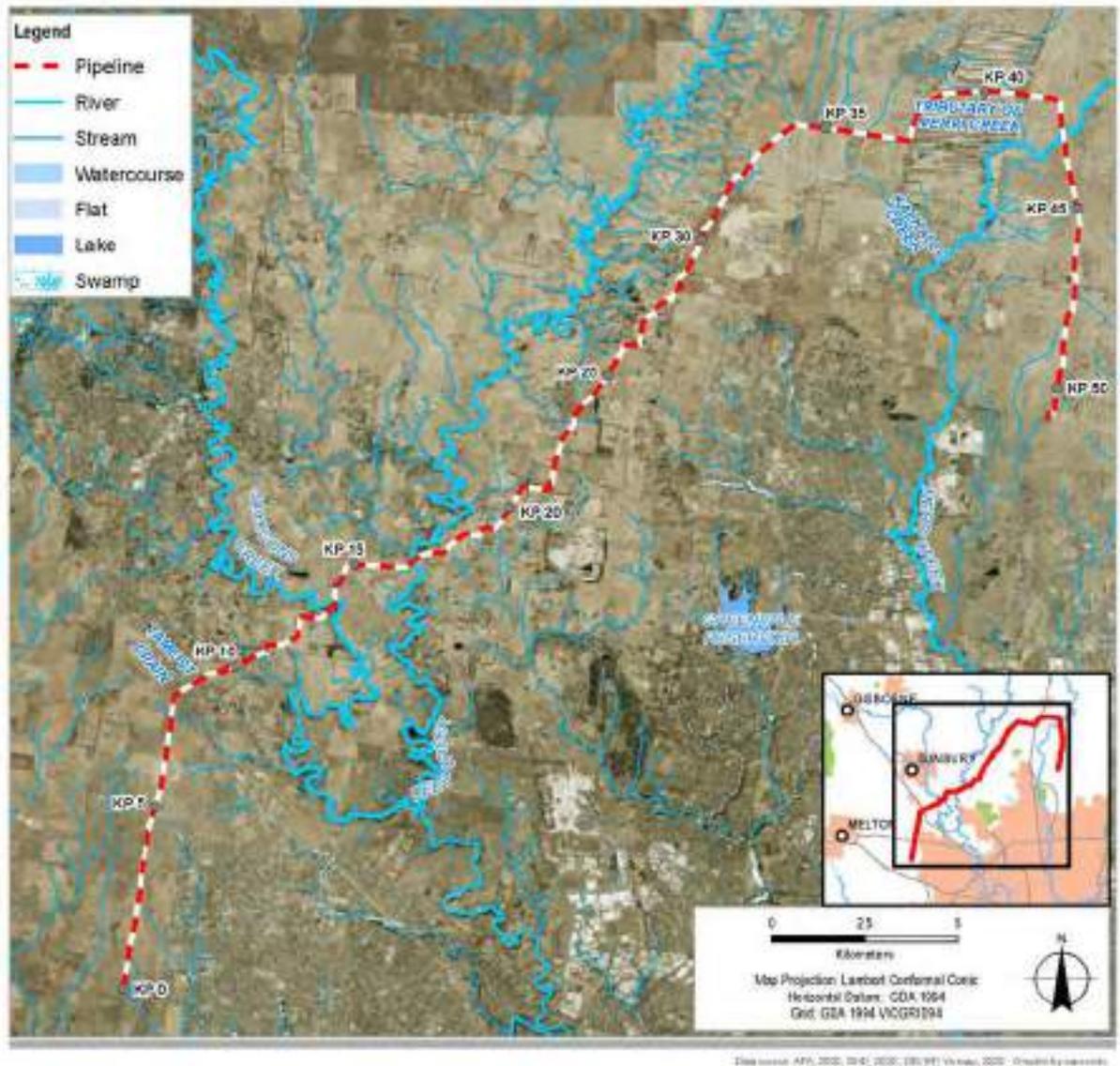
Waterway	Status	Location	Description	Broader catchment context
Kalkallo Creek	Channelised creek	KP 34.5	<p>Kalkallo Creek above the pipeline is one of several cut drains that have been formed to enable effective drainage of natural swamp areas in the flatter terrain within the catchment. Downstream of Kalkallo Creek, the Kalkallo retarding basin plays an important role in managing flooding as each of the cut drains in this area are directed into the retarding basin.</p> <p>The catchment is within a Drainage Services Scheme (DSS) and will be subject to ongoing future development with various Precinct Structure Plans within the area.</p>	The Yarra catchment consists of predominantly agricultural practices upstream from the pipeline, and urbanisation downstream.
Tributary to Merri Creek	Tributary	KP 40.8	<p>This tributary to the west of Merri Creek displays similar characteristics to the channelised systems to Kalkallo Creek. The catchment above the pipeline appears to be over similar flat terrain, and the flow path along the alignment that crosses the pipeline is indistinguishable.</p> <p>The catchment is within a Drainage Services Scheme (DSS) and will be subject to ongoing future development with various Precinct Structure Plans within the area.</p>	The Yarra catchment consists of predominantly agricultural practices upstream from the pipeline, and urbanisation downstream.
Merri Creek	'Complex' waterway	KP 42.9	<p>Merri Creek and its tributaries originated from the uplift of the underlying Silurian siltstones and mudstones that directed flow towards the south. Basalt plains that are characteristic of the catchments north of Melbourne were formed from subsequent lava flows. Whilst the upper Merri Creek has been moderately impacted by township scale urbanisation, it has retained its stream form and meandering characteristics through the reach potentially impacted by the Project.</p>	The Yarra catchment consists of predominantly agricultural practices upstream from the pipeline, and urbanisation downstream.

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



Figure 3.1 Main waterways



To assess existing water quality conditions, available water quality monitoring data from gauge sites was assessed against guideline water quality parameters under the *Water Act 1989* and the State Environment Protection Policy (SEPP) (Waters). The existing water quality was considered for Jacksons Creek, Deep Creek and Merri Creek. All other identified waterways are ephemeral waterways with no water quality data available. The majority of these waterways are tributaries to either Jacksons Creek, Deep Creek and Merri Creek.



A summary of the water quality information interpreted near the waterway locations is described in Table 3.3. For further details on the SEPP (Waters) guidelines and gauging data, refer to Section 5.5.4 and Section 6 of the EES Technical report B *Surface water*.

Based on this data, beneficial uses downstream of the project were identified as including water dependent ecosystems and species, agriculture and irrigation, water-based recreation (aesthetic enjoyment) and Traditional Owner cultural values.

Table 3.3 Water quality summary

Waterway	Water quality assessment
<p>Jacksons Creek</p>	<ul style="list-style-type: none"> Water quality samples upstream at Sunbury exceeded the SEPP (Waters) guideline values for turbidity, nitrate, oxidised nitrogen, filtered reactive phosphate, total phosphorous, chromium, copper, lead, nickel and zinc. Water quality samples at Organ Pipes National Park, approximately 11 km downstream, exceeded the guideline values for turbidity, nitrate, oxidised nitrogen, total nitrogen, filtered reactive phosphate, total phosphorous, chromium, copper, lead, nickel and zinc. In summary, Jacksons Creek upstream and downstream (including Maribyrnong River) exceeds the SEPP guideline values for the majority of water quality parameters.
<p>Deep Creek</p>	<ul style="list-style-type: none"> Water quality statistics from Deep Creek at Kinnear Road, Mickleham, approximately 18 km upstream of the Project, had elevated turbidity, nitrate, total nitrogen, phosphate, total phosphorus, chromium, copper, lead, nickel and zinc. Water quality downstream at the Deep Creek gauge at Bulla had elevated concentrations of nitrate, oxidised nitrogen, total nitrogen, phosphate, chromium, copper, lead, nickel, zinc, electrical conductivity and pH. In summary, Deep Creek upstream and downstream (including Maribyrnong River) exceeds the SEPP guideline values for the majority of water quality parameters.
<p>Merri Creek</p>	<ul style="list-style-type: none"> There is no stream gauge site upstream of the pipeline Water quality data downstream of the site was taken from Merri Creek at Summerhill Road, Craigieburn identified the pH at Merri Creek was slightly above the SEPP guideline value. Dissolved oxygen, electrical conductivity, turbidity, ammonia, nitrate, total nitrogen, phosphate, total phosphorus, chromium, copper and zinc exceed the guideline values. In summary, Merri Creek downstream exceeds the SEPP guideline values for the majority of water quality parameters.

3.5.2 Groundwater

The depth to water table varies considerably across the study area but it is considered to be generally greater than five metres below ground level. This is with the exception to the following areas as identified during recent hydrogeological investigations:

- Bendigo Railway and the Tame Street Drain (KP 8.25 to 8.64)
- Jacksons Creek (KP 13.68 to 13.79)
- Deep Creek (KP 16.32 to 16.87)
- Donovans Lane and the North East Rail reserve (KP 41.05 to 41.10)
- Merri Creek (KP 42.77 to 46.97)
- Donnybrook Road (east of Merrifield) (KP 46.97 to 47.03).

At these locations, it is anticipated that groundwater will be intercepted during excavation, and groundwater dewatering may be required to enable the trench excavations.

Groundwater salinity is expected to be generally brackish in the order of 2,000 mg/L to 10,000 mg/L with low to moderate yields. The depth to water table varies considerably across the study area from less than five metres to more than 50 metres below ground level based on regional information. The water table is expected to be much shallower in areas close to watercourses and deeper at higher elevations.

APA has established a groundwater monitoring network consisting of 17 bores to provide information on groundwater levels and quality. 12 of these bores were sampled and analysed in accordance with Victorian EPA publication 669 - Groundwater sampling guidelines as part of the EES. Section 6.3.2 of EES Technical Report E Contamination details the contaminants analysed.

Preliminary PFAS investigations were completed at Jacksons Creek and Deep Creek in October 2020 to assess the potential for migration of PFAS in groundwater from the Bulla Landfill and Hi-Quality Landfill. The preliminary PFAS sampling and results are discussed below:

- Surface water sample was initially collected near the Project crossing in October 2020. Further sampling was completed in February 2021 to confirm results and included sampling upstream, downstream and at the Project crossing
- All surface water samples at Jacksons Creek reported elevated concentration of perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS) (two different types of PFAS), with PFOS reported close to the laboratory limit of reporting and above the adopted criteria to assess water dependent ecosystems
- Surface water sampling at Deep Creek reported PFAS below the laboratory limit of reporting
- Groundwater sampling at groundwater wells, BH15 (targeting Jacksons Creek), BH22 and BH23a (targeting Deep Creek) reported below laboratory limit of reporting (less than 0.002 ug/L) in all three wells sampled

Further investigations are proposed at Jacksons Creek to inform the applicable disposal and management options for soil and groundwater and the contractor's CEMP.

Additional testing will be undertaken prior to construction to inform the mitigation measures adopted by the construction contractor in their CEMP.

3.6 Air quality

3.6.1 Meteorology

Understanding the local meteorology at representative locations near the construction corridor and Wollert Compressor Station informed modelling of potential off-site exposure to dust generated during construction of the pipeline and emissions from operation of the Wollert Compressor Station. In particular, the typical distribution of wind speed and wind direction can highlight key issues with distribution and concentration of emissions as they are dispersed from the source to receptor locations.

The Bureau of Meteorology (BoM) operated automatic weather station (AWS) at Melbourne Airport is considered representative of the Project area due to the weather station's proximity and similar exposure to prevailing winds.

Seasonal wind roses for 2015 to 2019 indicate that the overall predominant wind direction is from the north. The seasonal data shows the wind speed is generally highest from the north in winter, while autumn is generally the calmest season and wind is generally predominantly from the north in all seasons (with some southerly contributions during summer).

3.6.2 Background air quality and air pollution indicators

EPA Victoria air quality monitoring stations across metropolitan Melbourne provide ambient air quality data for the region. Within the pipeline construction corridor, existing ambient (background) sources of air emissions are expected from agricultural activities, motor vehicles emissions traversing along the main roads, industrial emissions (including from Melbourne Airport), sand and rock quarries, landfills, the existing compressor station and other light industry.

The consideration of background air quality has focused on the pollutants most likely to be changed by the construction or operation of the Project.

3.7 Biodiversity

3.7.1 Flora

The Project Area intersects six Ecological Vegetation Classes (EVCs) across two bioregions: Victorian Volcanic Plain and Central Victorian Uplands. The majority of the Project Area falls within the Victorian Volcanic Plain bioregion.

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



The quality of native vegetation within the Project Area is generally poor, and the ecological values present largely reflect the long history of urban land use in the surrounding landscape.

Key areas of remnant vegetation within the Project Area generally consist of riparian vegetation (Riparian Woodland) associated with Deep, Jacksons and Merri Creeks. Also recorded were four patches of good quality Plains Grassland or Plains Grassy Woodland, three of which also meet condition thresholds for EPBC Act-listed communities Natural Temperate Grassland of the Victorian Volcanic Plain and Grassy Eucalypt Woodland of the Victorian Volcanic Plain,

Two FFG Act-listed communities were mapped within the Project Area. Western (Basalt) Plains Grasslands Community was the more widespread of the two communities, occupying 10.11 ha. In total, 4.62 ha of floristic Community 55-04 Western Basalt Plains (River Red Gum) Grassy Woodland was mapped within the Project Area.

Two threatened ecological communities (TECs) were recorded during field surveys. In total, 4.16 ha of Natural Temperate Grassland of the Victorian Volcanic Plain (Critically Endangered) was mapped within the entire Project Area. Additionally, 2.26 ha of Grassy Eucalypt Woodland of the Victorian Volcanic Plain was mapped within the entire Project Area.

Botanical surveys identified three threatened flora within the Project Area:

- Matted Flax-lily *Dianella* among (one individual) listed as Endangered under the EPBC Act and threatened under the FFG Act; recorded on public land. Plant proposed to be avoided through implementation of HDD construction techniques.
- Tough Scurf-pea *Cullen tenax* (48 individuals), listed as threatened under the FFG Act were recorded in a single population on private land. The Project area has been reduced by 1.25 ha to avoid the population at Wollert Compressor Station
- Arching Flax-lily *Dianella longifolia* var. *grandis* (one individual) considered vulnerable on the Department of Environment, Land Water and Planning (DELWP) advisory list; recorded on private land. Land clearing during construction will impact one individual.

Eleven *Catchment and Land Protection Act 1994* (CaLP Act) listed noxious weed species were recorded within the Project Area. Most of these are extremely widespread and abundant both within and outside the construction corridor.

3.7.2 Fauna

The Project Area is dominated by pasture grasses and in some areas, extensive tracts of noxious weeds. Three main habitat types were identified within the Project Area: grassland, woodland and waterways/wetlands.

Targeted surveys documented four threatened terrestrial fauna species to occur within the Project Area:

- Striped Legless Lizard (six individuals) listed as Vulnerable under the EPBC Act, listed under the FFG Act and endangered on the DELWP Advisory list, were recorded on private land. The current Project Area intercepts 39.34 ha of confirmed habitat.

- Golden Sun Moth (90 individuals) listed as Critically Endangered under the EPBC Act, listed under the FFG Act and endangered on the DELWP Advisory list, were recorded from 12 parcels. The current Project Area intercepts a combined 19.93 ha of known and assumed habitat outside the MSA approvals
- Growling Grass Frog (three waterways, three dams and ephemeral paddock adjacent to one dam) listed as Vulnerable under the EPBC Act, listed under the FFG Act and endangered on the DELWP Advisory list, were heard. The species was heard at Deep Creek and presence has been assumed at Jacksons Creek and adjacent to a nearby dam
- Tussock Skink (93 individuals) listed as vulnerable on the DELWP Advisory list, were recorded from 10 grids

Habitats within the Project Area that support threatened terrestrial fauna are mainly confined to the higher quality grassland areas and waterways. Impacts to threatened fauna are expected to be largely limited to four species: Golden Sun Moth, Striped Legless Lizard, Growling Grass Frog and Tussock Skink. The Golden Sun Moth, Striped Legless Lizard and Tussock Skink are confined to the grassy and grassy woodland habitats.

3.7.3 Aquatic ecology

The Project Area is within the Werribee River, Yarra River and Maribyrnong River catchments although no waterways are crossed by the alignment in the Werribee catchment. In terms of waterway health, Merri Creek, Jacksons Creek and Deep Creek are considered to be in poor condition, based on physical form, riparian zone composition and 'aquatic life', as indicated by the aquatic macroinvertebrate community. The fish community in the Project Area for each waterway consists of common native species and exotic species. There is a low likelihood of Platypus being present in Deep Creek but there has been a recent sighting (2019) in Jacksons Creek around 200 metres downstream of the Project Area. It is unlikely that Platypus are present in the Merri Creek Project Area.

In the Maribyrnong catchment, the removal of barriers and upgrading of fishways in 2016 in the Maribyrnong River is likely to have improved fish passage through the Maribyrnong River and into Deep Creek and Jacksons Creek. Consequently, there is the potential that Australian Grayling will be able to navigate to these waterways as they are known to occur in the Maribyrnong River.

In terms of Jacksons Creek there is a low likelihood of Australian Grayling being present on site. Suitable habitat exists in the vicinity of the pipeline crossing. However, the current survey results, lack of previous records in Jacksons Creek and presence of the significant barrier downstream from the site indicate a low likelihood of presence.

With regards to Deep Creek, there is potential that Australian Grayling will pass through the site during its life cycle. Despite not being recorded from the 2020 survey, the habitat present on-site (i.e. a relatively diverse range of substrates, alternating pool-riffle sections, waterway size) and connection to the Maribyrnong River (where Australian Grayling have been recorded) suggest that Australian Grayling have a medium likelihood of occurring within the Project Area.

All other minor drains and waterways intersected by the Project Area were deemed highly unlikely to support EPBC Act or FFG Act-listed species based on desktop assessment.

3.7.4 Conservation areas (MSA)

The Project area traverses two Biodiversity Conservation Strategy conservation areas:

- Conservation Area 34a - Northern Growth Corridor: Growling Grass Frog Corridor (between KP 42 and KP 44)
- Conservation Area 28b - Summerhill Road (East), Wollert (between KP 48 and KP 50)

A Works in Conservation Area (WICA) approval is required for any works proposed in a Conservation Area.

3.7.5 Matters of national environmental significance

Eight EPBC Act listed species and ecological communities were found during assessments of the Project Area:

- Five are expected to be directly or indirectly impacted by the Project (Natural Temperate Grassland of the Victorian Volcanic Plain, Grassy Eucalypt Woodland of the Victorian Volcanic Plain, Golden Sun Moth, Striped Legless Lizard and Growling Grass Frog)
- Impacts to most species are expected to be minor with the project only expected to trigger a significant impact in relation to two species, the Striped Legless Lizard, based on the loss of 39.33 hectares of known and assumed habitat (including area where 6 individuals were found), and the Golden Sun Moth, based on the loss of 19.93 hectares of habitat (including area where 66 individuals were found)
- Two threatened ecological communities (Natural Temperate Grassland of the Victorian Volcanic Plain, Grassy Eucalypt Woodland of the Victorian Volcanic Plain) are also expected to be significantly impacted by construction of the Project based on three criteria for NTGVVP and five criteria for GEWV

3.8 Cultural heritage

Two CHMPs are currently being prepared for the project – CHMP 16593 (for KP 8.2 – 51) and CHMP 16594 (for KP 0 – 8.2).

Areas of cultural heritage sensitivity are defined in the *Aboriginal Heritage Regulations 2018* and relate to landforms and soil types where Aboriginal places are more likely to be located. These include land within 50 metres of registered Aboriginal cultural heritage places. Twelve Aboriginal cultural heritage sensitivity buffer zones associated with registered Aboriginal places transect the construction corridor.

A search of the Victorian Aboriginal Heritage Register (VAHR) identified 90 previously registered Aboriginal Places within the study area. Twenty-three previously registered Aboriginal cultural heritage places are present within (11), or within 50 metres of (12) the construction corridor. Testing for the CHMPs is still ongoing and so additional places may be identified. The assessment of potential impact to these places and required management measures will be finalised as part of preparation of and the approval process for CHMPs 16593 and 16594.

The CHMP process aims to mitigate impacts by determining the extent, nature and significance of any Aboriginal places within a study area and how the Project can be undertaken in a way that minimises harm. Once Aboriginal cultural heritage material is identified, further management and mitigation measures, such as a salvage are undertaken prior to construction works. These mitigation measures and management conditions will be agreed upon in consultation with Wurundjeri Woi Wurrung Cultural Heritage Aboriginal Corporation (WWCHAC) (CHMP 16593) and Aboriginal Victoria (AV) with Traditional Owner input (CHMP 16594), and become a legal requirement once the CHMP is approved.

All works must occur in accordance with the approved CHMPs 16593 and 16594.

CHMP 16593 (KP 8.2 - KP 51)

There are eight previously registered Aboriginal cultural heritage places within the construction corridor covered by this area, and more are expected to be registered as a result of the CHMP. Aboriginal cultural heritage places located within this section of the construction corridor would be impacted. The works would involve the removal and grading of 50-100 millimetres of topsoil, which would impact Aboriginal cultural heritage material.

The fieldwork for CHMP 16593 is ongoing, and the testing and assessment of impacts on Aboriginal places is therefore not yet finalised. Following the fieldwork component, any Aboriginal cultural heritage material identified will be registered as either a new Aboriginal place or added as a component of an existing Aboriginal place. Once the place is registered and its significance determined, the impacts of the Project on the places will be assessed and management conditions will be developed by WWCHAC.

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



CHMP 16594 (KP 0 - KP 8.2)

Aboriginal cultural heritage places located within this section of the construction corridor would be impacted. The works would involve the removal and grading of 50-100 millimetres of topsoil, which would impact Aboriginal cultural heritage material. The three places impacted by the construction include the previously registered site VAHR 7822-4185, and the places identified during the CHMP 16594 assessment, VAHR 7822-4439 and -4440.

Registered Aboriginal cultural heritage places within the construction corridor, potential impacts from construction and relevant mitigation are outlined in CHMP 16594.

Aboriginal cultural heritage places located outside the construction corridor, but within the 50 metre buffer zone, are not anticipated to be impacted by the construction of the Project.

DRAFT

4. Regulatory setting

Project approvals, legal requirements and other relevant requirements such as guidelines and codes of practice have been identified. A summary of key environmental legislation and its applicability to the Project is presented in Table 4.1.

Table 4.1: Key legislation and applicability

Legislation	Applicability
<i>Aboriginal Heritage Act 2006 (Vic) and Aboriginal Heritage Regulations 2018</i>	This Act provides for the protection of tangible and intangible Aboriginal cultural heritage in Victoria, and empowers traditional owners to protect and manage their heritage. The principal method of protecting cultural heritage under the Act is the preparation and implementation of a Cultural Heritage Management Plan (CHMP) (Section 49). CHMPs are being prepared for the Project.
<i>Crown Land (Reserves) Act 1978 (Vic)</i>	This Act provides for the reservation of Crown land for certain public purposes by the Governor in Council and sets out the administrative and legal framework for managing reserved Crown land and the processes for revoking Crown land reservation. Requirements, such as the need for any leases/licences under this Act, will be considered where relevant by APA in securing the easement.
<i>Country Fire Authority Act 1958 (Vic)</i>	A permit may be required for hot works within the Fire Danger Period and/or on a Total Fire Ban Day.
<i>Environment Effects Act 1978 (Vic)</i>	An Environment Effects Statement is currently being prepared for the Project. This CEMP will require updating to reflect the outcomes of this process.
<i>Environment Protection Act 1970 (Vic) and subordinate regulations, policies and EPA publications</i>	<p>This Act provides for the preparation of the State Environment Protection Policies (SEPPs) which are used to implement the policies outlined in the primary legislation to protect the environment. The SEPPs relate to emissions to air, water and land in Victoria, including contaminated soils. The Act also provides for Industrial Waste Management Policies and regulations relating to transport and handling of wastes.</p> <p>It is noted that the amended <i>Environment Protection Act 2017</i> will come into force in July 2021 and that the CEMP will require an update to reflect the new Act. The environmental management measures will also be reviewed and updated as required.</p>

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



Legislation	Applicability
<p><i>Environment Protection Act 2017 (Vic)</i></p> <p><i>Environment Protection Amendment Act 2018 (Vic)</i></p> <p>Environment Protection (Residential Noise) Regulations 2018 as well as other subordinate regulations, policies and EPA publications</p>	<p>This Act is expected to come into effect on 1 July 2021 and it will provide enhanced powers to the EPA to regulate pollution, waste and contamination in Victoria to prevent risks to the environment and human health.</p> <p>The general environmental duty (GED) is a centrepiece of the new laws in which you must take reasonably practicable steps to eliminate or minimise risk. The GED is criminally enforceable.</p> <p>Subordinate legislation will also be released including Regulations to support the Act and Environmental Reference Standards to replace SEPPs.</p> <p>The CEMP and the environmental management measures will be updated to reflect the new Act, Regulations, Environmental Reference Standard and EPA publications. This includes the GED, waste and contaminated land duties. All works must comply with the new Act and associated legislation and guidelines.</p>
<p><i>Flora and Fauna Guarantee Act 1988 (Vic)</i> and <i>Flora and Fauna Guarantee Regulations 2020</i></p>	<p>The Project will impact on two FFG-Act listed communities as well as FFG-Act listed threatened fauna and aquatic species.</p>
<p><i>Fisheries Act 1995 (Vic)</i> and <i>Fisheries Regulations 2019</i></p>	<p>FFG Act-listed aquatic biota are also protected under the <i>Fisheries Act 1995</i> and may not be taken, injured, damaged or destroyed (Section 71) or have their passage obstructed (Section 119) without authorisation. If salvage of fish is required during construction of the Project, a General Permit issued by the Victorian Fisheries Authority under Section 49 of the <i>Fisheries Act</i> may be required to catch and release, and includes requirements for animal ethics approval.</p>
<p><i>Gas Safety Act 1997 (Vic)</i> and <i>Gas Safety (Safety Case) Regulations 2018</i></p>	<p>An approved Safety Case is required for the project under the <i>Gas Safety Act 1997 (Vic)</i>. The Gas Safety Case must be prepared in accordance with the <i>Gas Safety (Safety Case) Regulations 2018</i> and requires approval from Energy Safe Victoria (ESV).</p>

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



Legislation	Applicability
<i>Heritage Act 2017 (Vic) and Heritage Regulations 2017</i>	<p>This Act provides for the protection and conservation of heritage in Victoria, including the establishment of the Victorian Heritage Register (VHR) for places and objects, and the Victorian Heritage Inventory (VHI) for archaeological sites.</p> <p>Any impacts to VHR or VHI sites as part of the Project will require a permit or permit exemption under the <i>Heritage Act 2017</i>.</p> <p>A Consent application under Section 124 is required from Heritage Victoria for the VHI site Holden Cobbled Stone Road (H7822-2283).</p>
<i>Land Acquisition and Compensation Act 1986 (Vic) and Land Acquisition and Compensation Regulations 2010</i>	<p>This Act allows for and manages the procedure for the acquisition of land in Victoria, and provides for the determination of the compensation payable where land is acquired.</p> <p>The Act allows for acquisition and compensation to occur as per Part 6 of the <i>Pipelines Act 2005</i>.</p>
<i>Pipelines Act 2005 (Vic) and Pipelines Regulations 2017</i>	<p>This Act is the primary Act governing the construction and operation of high transmission pipelines in Victoria. Under the <i>Pipelines Act 2005</i>, a licence to construct and operate a pipeline must be obtained by the proponent of a pipeline development. A pipeline licence application is currently being prepared for the Project.</p>
<i>Planning and Environment Act 1987 (Vic) and Planning and Environment Regulations 2015</i>	<p>This Act provides the framework for planning, land use and development within Victoria. Planning schemes prepared under the provisions of the Act apply to each municipality in Victoria. Planning and Environment Act matters are considered as part of the Pipeline Licence application process.</p>
<i>Rail Safety (Local Operations) Act 2006 (Vic)</i>	<p>A works permit is required for construction across or beneath a railway.</p>
<i>Road Management Act 2004 (Vic) and Road Management (General) Regulations 2016</i>	<p>Consent is required from the relevant road management authority to carry out works within road reserves.</p>

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



Legislation	Applicability
<p><i>Water Act 1989</i> (Vic) and <i>Water (General) Regulations 2021</i></p>	<p>This Act provides a legal framework for managing Victoria’s water resources, including water supply catchments and groundwater and is relevant as the Project crosses several waterways. Works on Waterways permits are required to undertake construction activities on or near all waterways.</p>
<p><i>Wildlife Act 1975</i> and <i>Wildlife Regulations 2013</i></p>	<p>A management authorisation is required to take or destroy (including removal or relocation) protected or threatened wildlife.</p>
<p><i>Environment Protection and Biodiversity Conservation Act 1999</i> (Cth)</p>	<p>Part of the Project is located within a Melbourne Strategic Assessment (MSA) area approved under Part 10 of the EPBC Act (approved MSA areas). For all projects within the approved MSA areas, no further approvals are required under the EPBC Act for the Project provided certain conditions are adhered to, including:</p> <ul style="list-style-type: none"> • The requirement to comply with the Biodiversity Conservation Strategy for Melbourne’s Growth Corridors (DEPI 2013a) (the BCS) which identifies nominated Conservation Areas which require protection for conservation within the MSA area and any applicable sub-regional species strategies • Any requirement to meet any MSA mitigation levy under the <i>Melbourne Strategic Assessment (Environmental Mitigation Levy) Act 2020</i> (Vic) to fund mitigation measures. It is noted that parts of the Project to be undertaken within privately owned land is exempt from this requirement under section 6(e) (i) and (ii) of the Act, which refers to the construction of prescribed minor infrastructure, including gas. <p>For the component of the Project located outside the MSA, a referral was submitted to the Commonwealth Department of Agriculture, Water and the Environment (DAWE). The Project was determined to be a controlled action under Section 75 of the EPBC Act. It requires assessment and approval under the EPBC Act, with the assessment process occurring through the bilateral agreement with Victoria. Any conditions of the EPBC Act approval once granted will need to be complied with.</p> <p>Works in Conservation Areas approval is required for any works within the Biodiversity Conservation Strategy conservation areas pursuant to the <i>Melbourne Strategic Assessment (Environmental Mitigation Levy) Act 2020</i> (Vic)</p>

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



Legislation	Applicability
<i>Native Title Act 1993 (Cth)</i>	The alignment impacts three Crown allotments where native title rights exist. The proposed pipeline has been determined to be a facility providing services to the general public. Given this, the issue of the proposed licence (and all related works) is a valid future act under section 24KA of the Native Title Act 1993 (NTA). APA are currently proceeding through the process required under S24KA of the NTA.

The key Victorian Government policies and guidelines are summarised in Table 4.2. They refer to environmental control guidelines that limit the impact of noise, dust, clearing of native vegetation, impact on waterways and impact on the environmental amenity of local businesses, residences and road users. The Environment Protection Amendment Act 2018 is expected to come into effect on 1 July 2021 and the EPA will release a framework of regulations, policies and guidelines to support the Act, for example waste duties will apply to Industrial Waste Resource Guidelines and Environment Reference Standard to replace SEPPs.

Table 4.2: Applicable policies and guidelines

Category	Title
State Environment Protection Policies	Air Quality Management 2001
	<i>Ambient Air Quality 1999</i>
	<i>Control of Noise from Commerce, Industry and Trade – No. N1 1989</i>
	<i>Prevention and Management of Contamination of Land 2002</i>
	<i>Waters 2018</i>
Environmental Reference Standard (to come into effect in 2021)	<i>Ambient Air, Ambient Sound, Land, Water</i>
EPA Publication	<i>1834 Civil construction, building and demolition guide (November 2020)</i>
DELWP	<i>Guidelines for the removal, destruction or lopping of native vegetation (2017)</i>
	<i>Biosecurity Guidelines for Movement of Equipment AG1171 (2009)</i>

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



Category	Title
Department of Environment (Commonwealth)	<i>Australian and New Zealand Environment and Conservation Council (ANZECC) Australia and New Zealand Guidelines for Fresh and Marine Water Quality (2000)</i>

This Project is to be constructed in accordance with the requirements of *Australian Standard AS2885–2012 Pipelines – Gas and liquid petroleum*. In addition, the performance objectives and standards have been developed to be consistent with the *Australian Pipelines and Gas Association Code of Environmental Practice – Onshore Pipelines, 2013*.

Where legislation requires a specific management action or response, these requirements are included within the CEMP as environmental controls, environmental limits, environmental monitoring programs, or within contingency plans (refer to Section 8).

Compliance with legal and other relevant requirements will be evaluated in accordance with the audit procedures (refer to Section 12.1), performance monitoring (refer to Section 12.2), regulatory incident reporting (refer to Section 12.3) and review of this CEMP.

DRAFT

5. Environmental framework

This CEMP describes the environmental management implementation strategy for this Project. This CEMP is part of APA's HSE Management System, known as Safeguard. Safeguard is designed to ensure that information on environmental requirements is provided to personnel in a relevant, accessible and understandable form.

The broad relationships and linkages between the Project's environmental management plans and APA's HSE Management System are represented diagrammatically in Figure 5.1. This CEMP sets out the plans, roles, responsibilities, and specific commitments required to carry out the proposed activities in accordance with APA's HSE Policy and the environmental management objectives and standards outlined for the Project (refer to Section 8).

Figure 5.1 Safeguard risk management system



As part of Safeguard, APA has an environmental procedure for Management Plan Process and Design (APA HSE EP 13.01.03), which defines the requirements for environmental management planning process and design.

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



APA business tools and systems used to manage and maintain all information relating to asset operations include:

- Maximo – Asset maintenance system (Work Order/Job Plan/Work Instruction)
- Safeguard+ (SG+) - Risk, auditing and reporting system
- Inspections
- Learning Management System (LMS) – Training system used to capture APA staff information and learning materials (e.g. localised and corporate inductions)

APA is committed to responsible environmental management and has formalised this commitment in a Health, Safety and Environment Policy (refer to Appendix B). All personnel are required to work in line with APA's HSE Policy which will be displayed in the site offices during the activities.

DRAFT

6. Organisational structure and responsibility

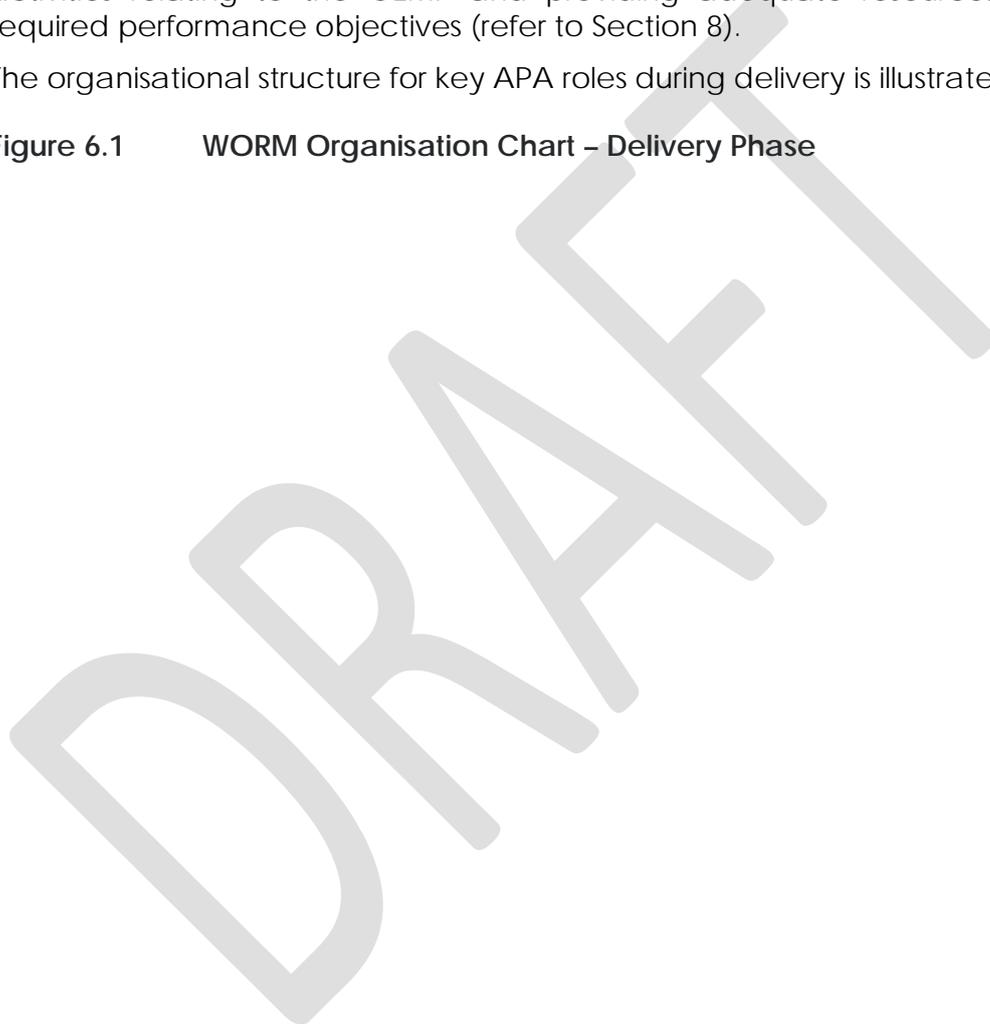
6.1 APA

APA is accountable for the implementation of this CEMP as the relevant licensee under the Pipelines Act and is responsible for communicating devolved responsibilities to the construction contractor.

The Project Managers are accountable for implementing the CEMP, coordinating all activities relating to the CEMP and providing adequate resources to meet the required performance objectives (refer to Section 8).

The organisational structure for key APA roles during delivery is illustrated in Figure 6.1.

Figure 6.1 **WORM Organisation Chart – Delivery Phase**

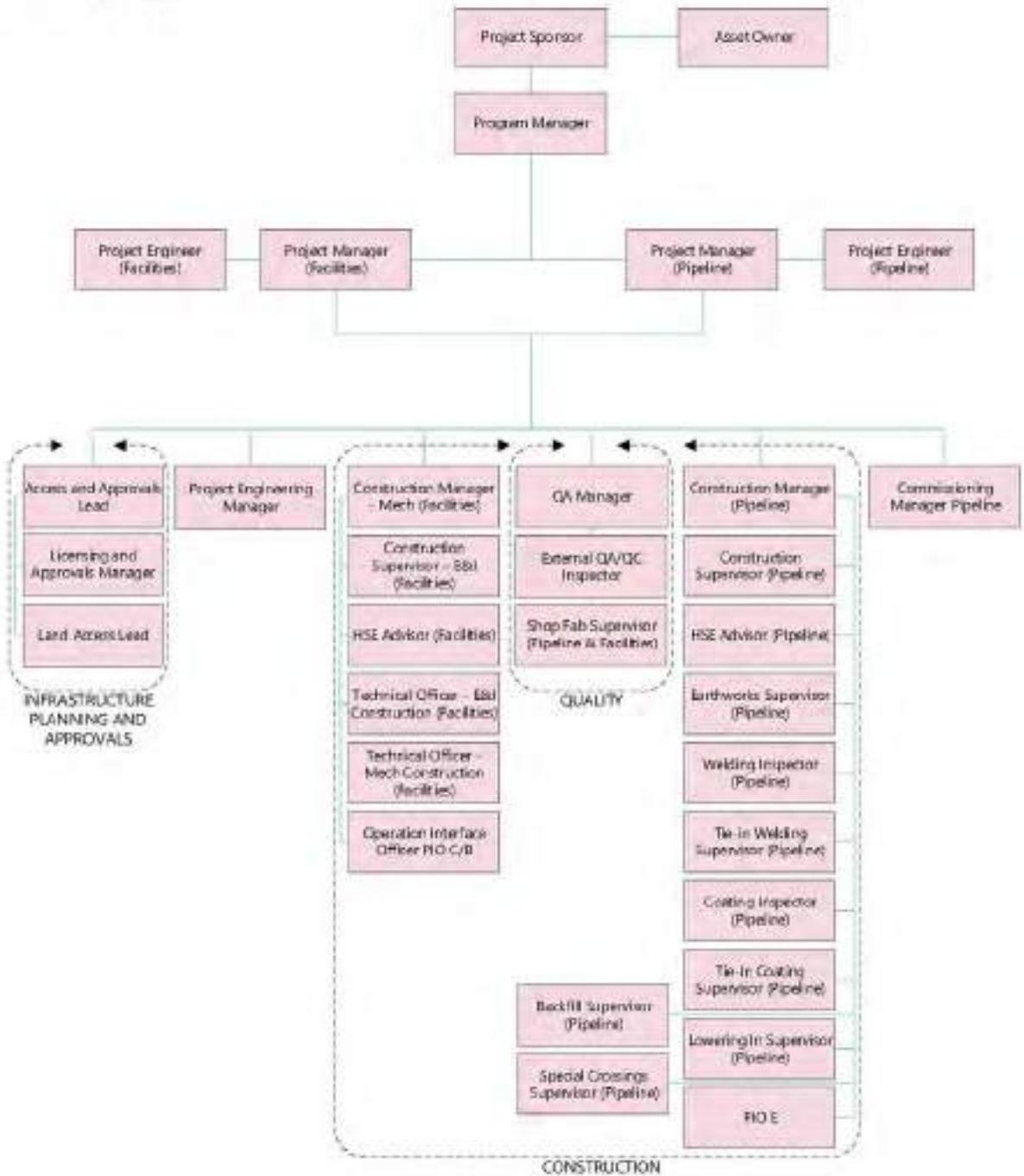


PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



Western Outer Ring Main (18035) Organisation Chart Delivery Stage



PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



The responsibilities of key APA personnel in relation to this CEMP are identified and illustrated in Table 6.1.

Table 6.1 APA Project Responsibilities

Position	General responsibilities	Specific CEMP responsibilities
APA		
<p>APA Project Manager(s)</p>	<p>Reports directly to APA senior management on environmental matters and compliance with the CEMP.</p> <p>Responsible for project management of the project construction works.</p> <p>Responsible for HSE on the project for APA including implementation of this CEMP.</p>	<ul style="list-style-type: none"> • Setting environmental performance standards for the Project • Monitoring the implementation of the CEMP • Ensure all APA personnel are inducted into the CEMP, and any visitors provided with the appropriate information and supervision • Ensure any training required for the CEMP is completed by relevant APA personnel • Ensure the environmental management responsibilities are assigned • Establish, review and maintain the CEMP risk register and subordinate risk assessments • Notify regulator and HSE Manager/HSE Advisor of reportable incidents and ensure incidents are investigated, followed up and actions closed. • Provide reports to HSE Manager on environmental performance. • Liaise with HSE manager in regard to any incidents under investigation by a statutory authority and / or client representation, including obtaining legal representation. • Ensure all community consultation is carried out • Ensures any non-conformances issued in relation to breaches of the CEMP are actioned in a prompt and timely manner

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



Position	General responsibilities	Specific CEMP responsibilities
<p>APA Construction Supervisor</p>	<p>Field based personnel responsible for inspecting and checking construction activities for compliance with construction contracts and project objectives.</p>	<ul style="list-style-type: none"> • Assisting the Project Manager with Implementation and maintenance of CEMP matters • Ensuring the environmental standards set in the CEMP are upheld and maintained • Showing visible leadership in implementation of the CEMP and leading by example • Ordering 'stop work' for any non-conformances with the CEMP and reports incidents to APA Project Manager. • Ensure all contractors are inducted into the CEMP prior to commencing work • Monitors and reports to the APA Project Manager on environmental matters. • Coordinates the environmental inspection and monitoring program. • Assesses contractor and APA compliance with CEMP procedures on an ongoing basis.

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



Position	General responsibilities	Specific CEMP responsibilities
APA Infrastructure Development HSE Manager	Provides assistance in the case of incidents and investigations	<ul style="list-style-type: none"> • Ensure environment standards set by the CEMP are upheld and maintained • Provide assistance during investigations • Participate in risk assessment activities related to the CEMP • Maintain a schedule of CEMP audits • Monitor the closure of significant environmental issues identified during inspections and audits • Attend meetings addressing CEMP items • Monitor the performance of all projects within the Infrastructure Development unit • Keep the project team up to date with relevant environmental alerts and updates • Initiate appropriate environmental educational programmes with the head of HSE • Maintain a sound knowledge of environmental legislation covering activities undertaken by the APA group and relevant to the CEMP.

PLAN



Position	General responsibilities	Specific CEMP responsibilities
<p>APA HSE Advisor</p>	<p>Provides specialist advice to the Construction Manager on HSE matters on a day to day basis (expected to be a full time role during construction).</p> <p>Arranges HSE induction training.</p> <p>Ensures personnel hold relevant experience and training.</p>	<ul style="list-style-type: none"> • Assist with implementing CEMP at major project sites • Reviews contractor environmental documentation and manages compliance with these systems. • Assist with addressing identified actions from regulatory audits • Conduct internal audits • Ensure Principal contractor management processes are followed on site • Liaise with Construction Supervisor for the resolution of environmental issues • Ensuring daily toolbox talks are conducted • Ensuring all personnel have undertaken the appropriate training and inductions • Maintain environmental related information and records • Contribute to weekly and monthly reports.

6.2 Contractor management

APA will engage contractors for the construction of the Project. Contractor responsibilities will be included as contractual conditions in the Project contracts.

Tender documentation used for the appointment of contractors will require that contractors demonstrate compliance with all requirements specified in the relevant statutory approvals and associated documentation and management plans. Contractors will be responsible for reporting compliance with statutory approvals conditions to APA. APA will be responsible for reporting compliance to all regulators as required.

Contractors will be required to prepare their own environmental management plans that comply with this CEMP. This will include preparation of detailed plans for management of specific sites, activities or issues. These are described further in section 9.2.2.

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



Contractor management plans will be reviewed by APA to check they are compliant with the obligations and requirements of relevant statutory approvals and the CEMP, prior to works covered by the plan commencing.

The responsibilities of construction contractor personnel in relation to this CEMP are identified and summarised in Table 6.2.

Table 6.2 Construction Contractor Responsibilities

Contractor		
Principal Contractor Project Manager(s)	APA's first point of contact and responsible for ensuring contractors uphold CEMP	<ul style="list-style-type: none"> • Being, or nominating, APA's first point of contact for all matters relating to the Contractor CEMP. • Develop a Contractor CEMP and supporting documents (i.e., required sub-plans, SWMS, etc.) that is consistent with the APA CEMP (18035-PL-HSE-0004) for endorsement by APA prior to the commencement of onsite works. • Carry out all work consistent with the APA CEMP, Contractor CEMP and approval conditions.
Principal Contractor HSE Advisor (s)	<p>Provides specialist advice to the Construction Manager(s) on HSE matters on a day to day basis.</p> <p>Liaises with the APA HSE Advisor on HSE induction training, reporting and audits.</p>	<ul style="list-style-type: none"> • Assist with implementing the Contractor CEMP at project sites • Assist in development of the Contractor CEMP and Contract supporting documents (i.e. required sub plans, SWMS, etc.) that is consistent with the APA CEMP (18035-PL-HSE-0004) for endorsement by APA prior to the commencement of onsite works. • Conduct audits and inspections to ensure compliance with the Contractor CEMP and APA CEMP (18035-PL-HSE-0004) • Provide support in relation to Environmental incident reporting, investigation and implementation of corrective actions.

7. Environmental risk assessment framework

7.1 Risk assessment

As part of the preparation of the EES and pipeline licence application, an environmental risk assessment was completed to screen issues to assist in identifying key matters for the technical studies to assess, and to assist in identifying management measures and measuring their ability to produce the desired outcome. This risk assessment is documented within the EES technical reports.

As part of this risk assessment process the technical studies considered stakeholder feedback that has been provided via a range of engagement activities as described in the EES Chapter 6 *Project communications and community engagement*.

An Environmental Risk Assessment was carried out to inform this CEMP (refer Appendix E). The risk assessment was informed by the outcomes of the technical studies and risk assessment process undertaken for the EES and Pipeline Licence application. Risk levels were set using the APA Workplace Risk Assessment and Control Tool (APA HSE GP 06.01 T01). Risk pathways and levels were discussed in a risk meeting and reviewed by APA personnel from the WORM project team including design, approvals, project and construction management participants.

This risk identification and assessment process considered potential impacts to relevant environmental, cultural and social values that were identified through the development of the Project and EES process.

The risk assessment methodology is consistent with *AS ISO 31000:2018: Risk Management – Principles and Guidelines* and *AS2885.1:2012: Pipelines-Gas and Liquid Petroleum-Design & Construction*. The risk register will be regularly evaluated by APA as part of the assurance processes identified in Section 12. In particular, the register will be reviewed in response to any changes in legislation, proposed changes to activities or construction methods, or in response to non-conformances or incidents.

Any proposed changes to the risk register will be reviewed and endorsed by the APA Project Manager and APA HSE Advisor and is subject to approval by the Minister for Energy, Environment and Climate Change prior to taking effect.

In addition to the risk assessment process, task-based risk assessments (e.g. Job Safety and Environment Assessments) will be undertaken by contractors to identify and control workplace hazards.

7.2 Risk analysis and evaluation

Risk analysis and evaluation were undertaken by a desktop risk assessment, based on the EES and similar pipeline projects. The assigned ratings will be reviewed by APA following the outcome of the EES process and amended accordingly in the finalised CEMP.

7.3 Likelihood

Each risk was assigned a likelihood rating from the APA Enterprise Risk Matrix, as shown in Table 7.1.

Table 7.1: APA Enterprise Risk Matrix likelihood ratings

Level	Descriptor	Description
5	Frequent – Many times in 1 year	Expected to occur on a regular basis and many times
4	Occasional – Every 2 years	May occur occasionally or in many circumstances
3	Unlikely – Every 5 years	Unlikely to occur but possible when certain circumstances prevail
2	Remote – Every 20 years	Not anticipated but may occur if certain abnormal circumstances prevail
1	Rare – Every 50 years	Conceivable, but has not been known to arise previously

7.4 Consequence

Each risk was assigned a consequence rating from the APA Enterprise Risk Matrix, as shown in Table 7.2.

Table 7.2: APA Enterprise Risk Matrix likelihood ratings

Level	Descriptor	Description
5	Catastrophic	<p>One or a combination of the following consequences:</p> <ul style="list-style-type: none"> • offsite and impact is widespread (>1ha) • unable to be remediated • impact is irreversible or lasts >10 yrs. <p>Permanent and irreparable impact or infringement to heritage.</p>
4	Major	<p>One or a combination of the following consequences:</p> <ul style="list-style-type: none"> • offsite and impacting > 1 ha • able to be remediated with difficulty • impact continues for <10 yrs. <p>Temporary but irreparable impact or infringement to heritage.</p>

PLAN



Level	Descriptor	Description
3	Significant	One or a combination of the following consequences: <ul style="list-style-type: none">• offsite and impacting < 1 ha• able to be remediated with some difficulty• impact continues for <5 yrs. Permanent but repairable impact or infringement to heritage.
2	Minor	One or a combination of the following consequences: <ul style="list-style-type: none">• onsite and impacting > 1 ha• able to be remediated easily• impact continues for <1 yr. Temporary and repairable impact or infringement to heritage.
1	Minimal	One or a combination of the following consequences: <ul style="list-style-type: none">• onsite and impacting < 1 ha• no remediation needed• impact continues for < 1 wk. Impact that causes negligible or no damage to heritage.

7.5 Risk ratings

A total of 31 risk pathways were identified as a part of the CEMP risk assessment workshop. Following application of mitigation measures and controls, ten risk pathways have a residual risk rating of moderate, all other pathways are rated as low or negligible.

The moderate risk pathways relate to construction traffic, spoil management, transportation and embedded emissions of pipeline materials, as well as construction activities impacting biodiversity values and Aboriginal Heritage. Moderate risk pathways also include impacts due to noise, vibration, lighting, odour and other amenity impacts. These also include risks associated with open trench excavation works impacting sites of special geological or geomorphological significance and watercourses.

The complete CEMP risk assessment is contained in Appendix E.

8. Performance objectives and standards

Performance standards have been identified to address the environmental risks, effects and legal requirements for the Project and are presented in Appendix H. The standards and the environmental controls are informed by the environmental management measures identified as a part of the EES.

The performance objectives and standards include requirements relevant to:

- Site access (Table 13.2)
- All activities for the project (Table 13.4 to Table 13.18)
- HDD and thrust boring (Table 13.19)
- Hot works (Table 13.20)
- Hydrostatic testing (Table 13.21)
- Site reinstatement (Table 13.22)

DRAFT

9. Contingency and other plans

9.1 Contingency plans

The following unexpected events that may result from the Project's construction activities, will be managed in accordance with the following APA procedures:

- APA HSE TB ENV 0009 Chemical Spill Management
- APA HSE ENV 0008 Heritage Stop Work Procedure

These procedures are to form part of the inductions and training of all personnel responsible for the tasks that relate to the implementation of these procedures (refer to Section 11.1).

The construction contractor will also develop contingency plans related to the performance standards in the tables in section 8 and include this information in their CEMP and/or, site specific management plans.

Contingency planning must be consistent with the incident reporting notification requirements of the CEMP (refer to Section 12.3).

9.2 Other plans

Other plans will be prepared by APA and the construction contractor as required by the Pipelines Act and the performance standards. A list of these management plans and the approving authority is provided in Appendix F.

9.2.1 APA management plans

APA will develop, seek approval for and implement the following management plans for the Project:

- Cultural Heritage Management Plans for approval by Aboriginal Victoria or the Registered Aboriginal Party:
 - CHMP 16594
 - CHMP 16593
- Flora and fauna management plan(s) for approval by DELWP including:
 - Kangaroo Management Plan
 - Species-specific management plans for Platypus, Growling Grass Frog, Golden Sun Moth, and Striped Legless Lizard
 - Threatened Species Handling and Relocation Protocol
- Tree Management Plan
- Safety Management Plan (18035-PL-HSE-0003)
- Offset Management Plan.

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



9.2.2 Contractor management plans

The construction contractor must develop, seek approval for and implement the following management plans for the Project:

- Contractor Construction Environmental Management Plan(s) that describes how the requirements of this CEMP will be complied with
- Contractor Construction Health Safety Management Plan(s) that describes how the requirements of the APA SMP (18035-PL-HSE-0003) will be complied with
- CEMP sub-plans including:
 - Blast Impact Study and Impact Management Plan
 - Construction Noise and Vibration Management Plan
 - Consultation Plan for construction activities
 - Emergency Response Plan
 - Flood Management and Response Plan
 - Sodic Soils Management Plan
 - Planting and remediation plan (applicable to screening trees directly impacted) Groundwater monitoring plan
 - Site-specific environmental management plan(s) (including Sediment and Erosion Control Plans, Environmental Monitoring Plans, Groundwater Disposal Management Plans, site maps, etc.)
 - Soil Management Plan (including Contaminated Soil and PASS Management Plan)
 - Traffic Management Plans
 - Tree Management Plan.

10. Emergency preparedness and response

Appropriate risk management and the prevention of emergency situations is fundamental to all Project activities.

The implementation of the Project CEMP is aimed at anticipating, preventing and mitigating foreseeable risks associated with this project. Potential emergency situations and environmental risks arising from these are identified in the CEMP Risk Assessment (Appendix E). Environmental emergency events could include fires, chemical and fuel spills, and flood events.

Part of the risk management strategy is also to ensure that, in the event of an emergency situation, plans have been developed so that pre-planned response, notification and recovery activities can be initiated.

APA's Project Health and Safety Management Plan 18035-PL-HSE-0003 and National Emergency Response Management Plan 320-PL-ER-0001 will be implemented for the project. The National Emergency Response Plan establishes the structure of emergency teams, the communication processes and the resources, which may be required for managing the emergency.

APA's Project Health and Safety Management Plan requires that an Emergency Response Plan is developed by the Principal Contractor based on the outcome of a risk assessment that systematically identifies all foreseeable site emergencies and assesses their HSE impacts. The objective of the Emergency Response Plan and procedures is to ensure that effective plans, system and appropriately trained personnel are in place to detect, mobilise, contain and recover from an emergency event during the work. The priorities in managing an emergency are safety of personnel (on and off-site), minimising impact on the environment and minimising impact on property and assets.

Emergency planning includes but is not limited to the following:

- Nomination of an emergency response controller(s), first aiders and emergency personnel
- Emergency procedures such as Health and Safety, Environmental, traffic and contact with services
- Emergency evacuation
- Assembly points
- Contact telephone numbers
- Dissemination of information
- Location of emergency equipment.

All applicable personnel shall be trained in the PC Emergency Response Plan to understand their roles and responsibilities, and the use of emergency response resources.

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



Resources required for the management of emergencies will be allocated and their adequacy reviewed.

The frequency at which emergency response exercises/drills are conducted shall be determined by the risk of exposure to a particular event and the severity of potential impact. Drills shall ensure that personnel are competent in specific components of the Emergency Response Plan. These drills may include, but not be limited to:

- Medical emergencies
- Site evacuation and mustering and rescue (APA Operations ER Plan may apply)
- Fire and the use of fire extinguishers and emergency equipment
- Bushfires
- Deployment of spill response kits
- Use of the communication system
- Checking of access ways and response times to and from emergency facilities.

Where works take place on or near existing APA assets, APA will produce an Emergency Response Bridging Plan in consultation with the Principal Contractor prior to those Works. The Emergency Response Bridging Plan will bridge any gaps between construction emergencies and APA Gas Emergencies.

DRAFT

11. Training and communication

11.1 Training and awareness

All project personnel, sub-contractors, consultants and visitors will receive inductions into the HSE Management System and key environmental obligations prior to commencing on site. This will include a standard APA HSE induction to cover overall business-wide requirements and a project specific induction.

The HSE/project induction will include:

- APA's HSE Management System, Safeguard
- Specific requirements of this CEMP, including but not limited to:
 - Native vegetation clearing and No Go Zone rules and locations
 - Awareness of FFG and EPBC Act-listed communities and species that may be present
 - Requirements for working near waterways, dewatering, soil management standards, dust management, weed/pathogen controls and general environmental management expectations
 - Monitoring requirements (as set out in Section 12.2)
 - Community awareness
 - Chemical and fuel management
 - Soil management and soil contamination awareness
 - Operating hours including criteria for noise and vibration
 - Vehicle operation rules – speed limits, inspections, hygiene
 - Smoking, hot works and fire hazard awareness
 - General and regulated waste management.

A separate cultural heritage induction will be delivered by representatives of Traditional Owners of the area and/or a cultural heritage advisor, as required by the CHMPs. The cultural heritage induction will include:

- The location and types of heritage features identified in the area
- The unexpected finds protocol to be followed if further heritage items are unearthed during construction
- Specific requirements of the CHMPs.

Specific awareness training (or toolbox talks) in the implementation of the contingency plans (refer to Section 9) will be undertaken for those personnel responsible for tasks where the contingency plans may be required to be implemented. Job specific competency training will be undertaken and be current prior to the mobilisation of personnel and equipment to the site. Records of the project personnel's experience, qualifications and training will be kept in line with the requirements of Section 12.6.

11.2 Communication

11.2.1 Consultation

APA has prepared a Consultation Plan (18035-PL-LH-0001) detailing the consultation to be undertaken with stakeholders, particularly owners, occupiers and managers of land, likely to be affected by the Pipeline Project.

The CEMP has been informed by engagement with stakeholders, regulators and the feedback from community consultation carried out during the preparation of the technical studies to support the Environment Effects Statement (EES) and Pipeline Licence Application. This has included review of the draft CEMP by the Technical Reference Group established as part of the EES process. Consultation carried out to support the EES is summarised in Chapter 6 *Project communications and community engagement* and Technical Report N *Community and stakeholder consultation report*.

A number of the performance standards also require consultation with relevant stakeholders. Relevant stakeholders are generally defined as stakeholders with a role as the responsible authority for the requirement specified, the manager, owner or occupier of an asset or land directly affected by the works or requirement, an emergency services agency or other relevant stakeholders identified by APA.

The purpose of continued and evolving consultation and engagement is to enable stakeholder views, requirements and relevant information held by the stakeholder to be considered when implementing the EMM. Consultation may include meetings, workshops and exchange of documentation and correspondence between APA or its contractors.

Where a performance standard is expressed as requiring or being subject to the agreement or requirements of a stakeholder, APA will use reasonable endeavours to reach agreement with that stakeholder. The extent and method of consultation will be documented and communicated to relevant stakeholders for each EMM. Consultation outcomes will be documented to demonstrate compliance with the EMMs. Consultation outcomes will be shared with the relevant stakeholder and feedback provided on how matters raised during consultation have been considered and, where appropriate and reasonable, addressed by APA.

11.2.2 Internal communications and reporting

Regular meetings will be held between APA and the Principle Contractor. Environmental management will be an agenda item at these meetings.

The Contractor shall provide monthly written reports to APA outlining the status of works, any issues and summary of conformance to the CEMP. This report shall include a summary of results from site inspections, external and internal audits, monitoring results, and complaints, incidents and non-conformances as well as corrective actions taken.

11.3 Regulatory reporting

11.3.1 DELWP

In order to inform DELWP as the regulatory authority for environmental compliance under the *Pipelines Act*, APA will report to DELWP in line with the reporting schedule identified in Table 11.1.

Table 11.1: Regulatory reporting requirements

Stage	Report	Timing
Pre-mobilisation requirements	Provide required information to DELWP as required by the CEMP and/or conditions of approvals.	Prior to timing requirement of the specific information requirement.
Notification of mobilisation to the site	Email confirmation of the planned date of mobilisation to Site.	10 business days prior to the event (3 business days of the event within this period if change to date following notification).
Weekly construction status	Email report of the status of construction, including (but not limited to) the following: <ol style="list-style-type: none"> 1. Summary of key activities undertaken in the reporting period (including photos as relevant); 2. Work status against planned schedule; 3. Summary of environmental incidents, complaints and non-conformances identified in the performance monitoring; and 4. Results of any audits and/or status of implementation of corrective actions identified in any corrective action plan. 	Weekly (Sunday to Sunday) during the construction period and to be provided within 2 days of the end of the reporting period. <i>Note: The construction period is defined as all activities from mobilisation to site to the site demobilisation.</i>
Construction audit reports	Independent audit reports (refer Section 12.1.2)	To be publicly available 30 days after completion of the audit

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



Stage	Report	Timing
Annual compliance report	Provide an annual report to the Minister and Energy Safe Victoria within 90 days of the end of each financial year on the performance in protecting the environment from the pipeline construction and operations.	Within 3 months of 30 June for each year.
Completion of Reinstatement	Email confirmation of the date which reinstatement activities are concluded and the period from which the rehabilitation monitoring period applies with an associated report of activities completed.	Within 1 month of the event.
End of rehabilitation monitoring period	Email confirmation of the end of the rehabilitation monitoring period and that residual environmental issues (if applicable) are to be addressed through the APA Operating Environmental Management Plan (320-PL-HEL-0015, 0016, 0017 & 0018).	Within 1 month of the event.

11.3.2 Other regulatory authorities

APA is responsible for external reporting to agencies in accordance with statutory requirements including approval and consent conditions.

Requirements for incident reporting are provided in section 12.3.

12. Assurance

12.1 Audits

12.1.1 APA audits

An APA HSE Advisor will assess the conformance of the activities to this CEMP. The timing of the audits will be coordinated with the APA Project Manager to maximise the coverage of the activities on-site during the audit. As a minimum, audits of the implementation of the CEMP will occur at commencement (i.e. at site establishment, prior to construction commencing), monthly during construction and during site reinstatement and rehabilitation monitoring period.

The audits will evaluate performance based on environmental management records, consultation with APA personnel and contractors, and direct observation of activities, as relevant. The audit findings will inform any requirement to review the CEMP.

A corrective action plan will be prepared to address the audit findings and any non-conformances identified within the audit report. The audit report and associated actions will be added to Safeguard+. Any non-conformances will then be addressed in line with the corrective action plan.

At a Group level, APA creates an audit schedule each year as per APA Procedure APA HSE GP 15.01 audit and self-assessment. As per the Procedure, the APA audit process involves the review of HSE management system documents and records of activities and actions taken as a result of implementing the system. Audit schedules are approved by the General Manager of HSE, prepared and maintained and are of sufficient scope to ensure that adequate HSE assessment is conducted on business activities.

12.1.2 External audits

APA will also appoint an independent auditor to the satisfaction of the regulator. The auditor appointment and the audit plan, schedule and scopes is subject to regulatory approvals under the Pipelines Act and as set out in the Performance Objectives and Standards. Reports on the audit will be publicly available 30 days after completion.

12.1.3 Contractor audits

The construction contractor must evaluate their own compliance via an internal audit programme with audits of the implementation of their CEMP to be completed at least monthly and detailed in audit reports. The contractor must prepare corrective action plans to address audit findings and non-conformances and make copies of audit reports and corrective actions available to APA or the external auditor on request.



12.2 Performance monitoring

The Contractor is required to develop and implement an environmental monitoring program considering the proposed environmental monitoring programs in the in the Environment Effects Statement (Chapter 19 Environmental management framework, Table 19-4), consistent with the performance standards in this CEMP, and the requirements listed in Appendix F. This monitoring program developed by the Contractor will be reviewed and approved by APA as part of the Contractor’s CEMP.

Monitoring of the work areas will be undertaken to demonstrate compliance with this CEMP and relevant statutory requirements. Specific monitoring requirements for relevant environmental aspects and construction activities are outlined in Table 12.1.

At a minimum, daily inspections of the works within the construction areas will be undertaken and include monitoring for:

- Site access compliance (e.g. works contained within Site boundaries and compliance with any landowner agreements)
- Adherence to work permits
- Maintenance of controls (e.g. fencing, sediment and erosion controls, etc.)
- Soil management and stockpiling
- Sediment control
- Dust and noise control
- Waste management
- Fauna and flora management
- Cultural heritage
- Air, noise and vibration monitoring
- Surface water.

The daily inspection reports will be undertaken by the contractor, recorded and the results of the inspections will include any corrective actions required as a result of the inspections.

The results of daily site inspections will be provided by the contractor to APA in weekly site reports.

Table 12.1 Proposed monitoring programs

Environmental aspect	Proposed monitoring
Air quality	Existing conditions for air quality are described in EES Chapter 11 <i>Air quality</i> and Section 6 - Existing conditions of Technical report G <i>Air quality</i> . Proposed monitoring of air quality is described in EES Chapter 11 <i>Air quality</i> and Section 10.1 - Environmental management measures of Technical report G <i>Air quality</i> . Construction dust monitoring <u>Objective:</u> Inform management and mitigation of construction dust impacts

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



Environmental aspect	Proposed monitoring															
	<p><u>Indicators/monitoring criteria:</u> In accordance with the Mining PEM¹, PM10 is the appropriate indicator for downwind sensitive receptor locations. The relevant criteria /indicators are identified below:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: #c00000; color: white;">Indicator</th> <th style="background-color: #c00000; color: white;">Criteria (µg/m³)</th> <th style="background-color: #c00000; color: white;">Averaging period</th> <th style="background-color: #c00000; color: white;">Source</th> </tr> </thead> <tbody> <tr> <td colspan="4" style="background-color: #e0e0e0;">Construction phase</td> </tr> <tr> <td rowspan="2" style="background-color: #e0e0e0;">PM10</td> <td style="background-color: #e0e0e0;">60</td> <td style="background-color: #e0e0e0;">24 hour average</td> <td style="background-color: #e0e0e0;">SEPP AQM/Mining PEM</td> </tr> <tr> <td style="background-color: #e0e0e0;">50</td> <td style="background-color: #e0e0e0;">24 hour average</td> <td style="background-color: #e0e0e0;">SEPP AAQ</td> </tr> </tbody> </table> <p>Real-time dust monitoring instruments that monitor fine dust particles (PM10) include an alarm sounded when 15 minute average PM10 levels exceed a trigger level of 100 ug/m³, as this is a forewarning that the daily 24-hour PM10 criterion above the NEPM (Ambient Air Quality) standard may be approached.</p> <p><u>Parameters:</u> PM10 monitoring using real-time dust monitoring instruments (with 15 minute averages).</p> <p><u>Locations:</u> Real-time dust monitoring instruments measuring PM10 particles will be used for each day where sensitive receptors (such as isolated rural residences or rows of housing that abut the construction corridor) are within 35m of construction activity. The location of these sensitive receptors are identified in the Environmental Line List attached to the Construction Environment Management Plan.</p> <p>Visual observation of dust levels is required at an overall site level and would occur when construction activities are being undertaken, at all locations along the construction corridor.</p> <p><u>Frequency:</u> Real-time dust monitoring each day where sensitive receptors are within 35 m of construction activity.</p> <p>Visual observations each day at construction sites.</p>	Indicator	Criteria (µg/m ³)	Averaging period	Source	Construction phase				PM10	60	24 hour average	SEPP AQM/Mining PEM	50	24 hour average	SEPP AAQ
Indicator	Criteria (µg/m ³)	Averaging period	Source													
Construction phase																
PM10	60	24 hour average	SEPP AQM/Mining PEM													
	50	24 hour average	SEPP AAQ													

¹EPA Victoria 2007, Protocol for Environmental Management: Mining and extractive industries. Publication 1191, December 2007

PLAN



Environmental aspect	Proposed monitoring
Biodiversity	<p>Existing conditions for botanical, fauna and aquatic ecology are described in EES Chapter 7 <i>Biodiversity</i> and Section 7 - Existing conditions of Technical report A <i>Biodiversity</i>.</p> <p>Proposed monitoring of biodiversity values and offsets and aquatic ecology values is described in EES Chapter 7 <i>Biodiversity</i> and Section 14 of Technical report A <i>Biodiversity</i>.</p> <p>Monitoring of biodiversity values on and near the construction corridor</p> <p><u>Objective</u>: Evaluate the residual impact of the Project on botanical values and the effectiveness of reinstatement and provide recommendations for management as required.</p> <p><u>Indicators/monitoring</u> criteria: Following reinstatement after Project construction and considering offsets, biodiversity values equal to or better than the baseline conditions (refer existing conditions in of Technical report A <i>Biodiversity</i>).</p> <p><u>Parameters</u>: A comprehensive body of survey data exists that would be used as a benchmark to evaluate the residual impact of the Project on botanical values. To monitor potential adverse residual effects on flora and vegetation, the monitoring program would:</p> <ul style="list-style-type: none"> • Set objectives for vegetation recovery using baseline data (reinstated vegetation should meet or exceed the condition of pre-construction vegetation) • Prior to construction, undertake an inspection to identify and mark out and fence off the location of the Tough Scurf-pea population at the Wollert Compressor Station site. The fencing will be maintained during construction. An inspection will occur post-construction to assess the population of Tough Scurf-pea at the Wollert Compressor Station site and determine the likelihood of any adverse impacts from construction, or any other changed conditions that may impact its survival • Prior to construction, undertake an inspection to identify and mark out and fence off the location of the Matted Flax-lily located at Craigieburn road reserve. The fencing will be maintained during construction. Following construction, an inspection will be carried out to confirm survival of Matted Flax-lily and evaluate the effectiveness of protection during construction. • Evaluate the progress of reinstatement.

PLAN



Environmental aspect	Proposed monitoring
	<p><u>Locations and frequency:</u> EMM B2 requires the evaluation of disturbed areas post-construction, and that remedial measures be implemented as required within a reasonable timeframe. Routine inspections of the easement and facilities would be undertaken in accordance with the OEMP VTS and in consultation with landowners (EMM B13). Inspection of Matted Flax-lily to occur at the conclusion of the construction works in the proceeding spring (when it is flowering and most visible). At the end of the reinstatement period evaluate whether monitoring should be extended (pending landowner agreement).</p> <p>Monitoring of biodiversity offsets to be established</p> <p><u>Objective:</u> Monitor offset condition and compliance with offset requirements</p> <p><u>Indicators/monitoring criteria:</u> As defined in the Offset Management Plan</p> <p><u>Parameters, locations and frequency:</u> An offset strategy has been prepared to address the EPBC Act Environmental Offsets Policy (DSEWPAC 2012) and the policy objectives of the Guidelines for the removal, destruction or lopping of native vegetation (DELWP, 2017a). The methods of monitoring, frequency and parameters would be outlined within the Offset Management Plan when it is developed:</p> <p>Independent annual monitoring to inform the annual compliance reports to be provided to DAWE by APA (unless otherwise advised by the Minister)</p> <p>Continuous monitoring undertaken by the offset landowner to understand general site conditions</p> <p>Audits will be undertaken by the approval holder (APA) as defined in the Offset Management Plan and agreed with DAWE.</p> <p>Aquatic ecology values</p> <p>Monitoring of waterways where open cut construction is planned would occur as per EMM SW5. Refer to the surface water discussion below for further detail.</p> <p>As per EMM B22 a survey for the presence of burrows within the Project Area on Jacksons Creek would be undertaken prior to open cut trenching.</p>

PLAN



Environmental aspect	Proposed monitoring
Contamination and waste management	<p>Existing conditions for contamination are described in EES Chapter 10 <i>Waste</i> and Section 6 - Existing conditions of Technical report E <i>Contamination</i>. Further testing would be undertaken prior to construction as described in Technical report E <i>Contamination</i>.</p> <p>Proposed monitoring requirements are described in EES Chapter 10 <i>Waste</i> and Section 10 of Technical report E <i>Contamination</i>.</p> <p>Management of solid and liquid waste</p> <p><u>Objective:</u> Minimise generation of wastes from the project during construction and operation.</p> <p><u>Indicators/monitoring criteria:</u> Implementation of waste management hierarchy and consideration of EPA requirements</p> <p><u>Parameters:</u> Manage wastes generated during the construction phase of the Project to consider waste elimination/ reduction and opportunities for the reuse and recycling of construction waste.</p> <p>Develop and implement a process for recording and tracking waste.</p> <p><u>Locations:</u> On-site designated facilities for waste management</p> <p><u>Frequency:</u> Construction: monthly visual inspections of designated facilities.</p> <p>Construction spoil management</p> <p><u>Objective:</u> Minimise potential impacts on human health and the environment associated with excavation of spoil during construction</p> <p><u>Indicators/monitoring criteria:</u> EPA Publication 1834 Civil construction, building and demolition guide and building and demolition guide and EPA Publication 1895 Managing Stockpiles. Spoil management measures must be developed in consultation with the EPA Victoria and include processes and measures to manage all spoil types.</p> <p><u>Parameters:</u> General spoil: during construction assess and record any material imported to the site for use as backfill in accordance with IWRG 621 and 702.</p> <p>Contaminated spoil: during construction record and tracking of contaminated soil and other waste. Includes trucking and destination tracking, and sampling results (EMM C1).</p> <p>Regular monitoring of weather conditions and planning works accordingly to avoid or minimise impact to sensitive receptors from works during adverse weather (i.e. runoff from rainfall).</p> <p><u>Locations and frequency:</u> Sites identified as potentially</p>

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



Environmental aspect	Proposed monitoring
	<p>contaminated soils are identified in the Environmental Line List attached to the Construction Environment Management Plan. Testing requirements defined in accordance with EPA IWRG 621 and 702.</p> <p>Acid sulfate soils</p> <p><u>Objective:</u> Minimise potential impacts from disturbance of acid sulfate soils during construction</p> <p><u>Indicators/monitoring criteria:</u> Compliance with EPA requirements including Industrial Waste Management Policy (Waste Acid Sulfate Soils), EPA Victoria Publication 655.1 Acid Sulfate Soil and Rock</p> <p><u>Parameters:</u> Undertake further investigations to determine presence of acid sulfate soils at Jacksons and Merri Creek. Incorporate mitigation measures to minimise any potential impacts from disturbance of acid sulfate soils during construction.</p> <p><u>Locations:</u> Jacksons Creek and Merri Creek.</p> <p><u>Frequency:</u> Prior to construction commencing at Jacksons Creek and Merri Creek (once off if investigation provides sufficient information).</p> <p>Landfill gas and vapour</p> <p><u>Objective:</u> Minimise potential impacts during construction from vapour and ground gas intrusion</p> <p><u>Indicators/monitoring criteria:</u> The spoil management measures must include requirements for assessment, monitoring and management of intrusive vapour, including potentially flammable or explosive conditions, in enclosed spaces within 500 metres of the Bulla Landfill (approx. KP 15-KP 16) and Diggers Rest (KP 9.95- KP 10.14) property and trenches in those areas.</p> <p><u>Parameters, locations and frequency:</u> Monitoring and management in enclosed spaces within 500 metres of the Bulla Landfill (KP 154-KP 16) must consider the following:</p> <ul style="list-style-type: none"> • Continuous monitoring of landfill gas conditions when any person is in the trench or during hot works or works that could potentially produce a spark within the trench. • Setting of applicable trigger values that require action within areas being trenched (KP 15.4- KP16) and including any temporary structures utilised for construction within the vicinity of the landfill. These must be developed in

PLAN



Environmental aspect	Proposed monitoring
	<p>accordance with relevant sections of the EPA Victoria Publication 788 Best Practice Management; Siting, design, operation and rehabilitation of landfills (landfill BPEM) for monitoring and relevant occupational health and safety regulations and compliance codes</p> <ul style="list-style-type: none"> Contingencies to address any breaches of trigger values including temporary cessation of work until a reappraisal of risks is conducted, additional monitoring at a higher frequency, implementation of additional safety measures and/or vapour extraction systems in response to the risk assessment. <p>Monitoring and management relevant to the Diggers Rest property (approx. KP 9.95- KP 10.14):</p> <ul style="list-style-type: none"> Investigation of soils within the construction corridor to assess for the presence contamination including metals, TRHs, BTEX, PAHs and solvents If volatile contamination is identified a risk assessment to determine the risk from vapours to construction workers during open cut trench construction may be required. <p>Management of chemicals, fuels and hazardous materials</p> <p><u>Objective:</u> Prevent adverse environmental and human health effects associated with the use of chemicals, fuels and materials during construction and operation:</p> <p><u>Indicators/monitoring criteria:</u> During construction, compliance with relevant guidelines as detailed in EMM C6.</p> <p><u>Parameters:</u> During construction, as required by EMM C6: Creating and maintaining a dangerous goods register Contingency and emergency response procedures to handle fuel and chemical spills, including availability of on-site hydrocarbon spill kits</p> <p><u>Locations:</u> Construction corridor and designated laydown areas.</p> <p><u>Frequency:</u> daily inspections.</p>
Aboriginal and historic heritage	<p>Existing conditions for Aboriginal and historic heritage are described in EES Chapter 13 <i>Heritage</i> and Section 6 - Existing conditions of Technical report I <i>Aboriginal and historic heritage</i>. Proposed monitoring requirements are described in EES Chapter 13 <i>Heritage</i> and Section 9.1 of Technical report I <i>Aboriginal and historic heritage</i>.</p>

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



Environmental aspect	Proposed monitoring
	<p>Aboriginal and historic heritage monitoring requirements</p> <p><u>Objective:</u> Minimise risk of harm to heritage values</p> <p><u>Indicators/monitoring criteria:</u> Compliance with CHMP and Heritage Consent conditions.</p> <p><u>Parameters, locations and frequency:</u></p> <ul style="list-style-type: none"> • Relevant monitoring, recording and contingencies would be documented in and carried out in accordance with the conditions of the CHMP under the Aboriginal Heritage Act and Consent application under the Heritage Act. • The unexpected finds protocol in the CHMP requirements would be followed should an unknown historic heritage site, value or object be discovered during construction.
Greenhouse gas	<p>Existing conditions for greenhouse gas are described in EES Chapter 10 <i>Waste</i> and Section 6 - Existing conditions of Technical report H <i>Greenhouse gas</i>.</p> <p>The proposed monitoring requirements are required by EMMs GG1 and GG2.</p> <p>Proposed monitoring requirements are described in EES Chapter 10 <i>Waste</i> and Section 9.1 of Technical report H <i>Greenhouse gas</i>.</p> <p>Greenhouse gas audit and assurance processes</p> <p><u>Objective:</u> Assess amount of greenhouse gas emissions generated by the Project</p> <p><u>Indicators/monitoring criteria:</u> CO2-e emissions monitored via reporting of data.</p> <p><u>Parameters:</u> CO2-e emissions (NGER data) during construction and operation at Wollert Compressor Station.</p> <p><u>Frequency:</u> NGER data would be provided by the contractor to APA monthly.</p> <p>Other measures required include:</p> <ul style="list-style-type: none"> • Provision of construction greenhouse gas data as per NGER requirements (Scope 1 emissions) to APA by contractors • Quarterly audits during the construction period to assess compliance with the Project’s CEMP. Quarterly audits will be undertaken by APA HSE Advisors • An audit at the end of the construction period (undertaken by APA) to confirm NGER Reporting requirements.

PLAN



Environmental aspect	Proposed monitoring
Groundwater	<p>Existing conditions for groundwater are described in EES Chapter 8 <i>Water</i> and Section 6 - Existing conditions of Technical report C <i>Groundwater</i>. To inform the groundwater impact assessment (Technical report C <i>Groundwater</i>) a groundwater monitoring program was set up which included:</p> <ul style="list-style-type: none"> • Six monitoring bores were set up at Jacksons Creek (one bore), Deep Creek (two bores), Gunns Gully Road (one bore), Merri Creek (two bores). Groundwater gauging, sampling and aquifer testing was undertaken. • Automated dataloggers were installed in June 2020 at the six monitoring bores. The dataloggers were deployed in order to start capturing groundwater level information at regular intervals. • An additional 11 monitoring bores were installed at selected locations along the alignment in July – August 2020 to collect groundwater level and quality information and slug testing. The network generally focused on the areas where groundwater depth was expected to be less than 5 metres and therefore where there may be interaction with the pipeline. Locations are identified in Table 22 of Technical report C <i>Groundwater</i>. <p>Further groundwater monitoring would be undertaken prior to construction as follows:</p> <ul style="list-style-type: none"> • Quarterly groundwater monitoring at areas of groundwater impact along the Project alignment. This includes sites listed in the section below (refer 'locations'). <p>Groundwater quality and level monitoring</p> <p><u>Objective:</u> Manage groundwater discharge in accordance with SEPP (Waters) and minimise the risk of impacts to groundwater during construction.</p> <p><u>Indicators/monitoring criteria:</u> Groundwater quality and levels as set out in the groundwater monitoring plan in accordance with SEPP (Waters). The information from the groundwater monitoring program undertaken prior to construction would provide a baseline for consideration of construction impacts.</p> <p><u>Parameters:</u> During construction, a groundwater monitoring plan would be developed as part of the CEMP and implemented to:</p> <ul style="list-style-type: none"> • Assess any impacts from construction activities (i.e. from drawdown during construction and recovery) which includes measuring groundwater levels and quality at key groundwater interaction areas when construction works are

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



Environmental aspect	Proposed monitoring
	<p>progressing in the immediate area (locations identified below), particularly the open trench creek crossings (Jacksons and Merri Creek).</p> <ul style="list-style-type: none"> • Monitor groundwater quality during construction. Any dewatering to comply with the site-specific groundwater disposal management plan and SEPP (Waters) requirements. Monitoring to assess any site variability of the groundwater quality (e.g. from the baseline investigations and there is no variations that require additional management measures such as changing pH or salinity). Parameters to be measured include: groundwater levels, salinity, pH, EC, major ions, ammonia, nitrate, nitrite, total nitrogen and total kjeldahl nitrogen). <p><u>Locations:</u> At locations of dewatering and Sites that are identified as areas of groundwater impact along the Project alignment in Technical report C <i>Groundwater</i>. This includes:</p> <ul style="list-style-type: none"> • Bendigo rail: KP 8.288 - 8.326 • Unknown Creek/Tame St drain: KP 8.406 - 8.411 • Jacksons Creek: 13.863 - 13.898 • Deep Creek: 16.828 - 16.85 • Donovans Lane: 40 – 41 • North east Rail reserve: 40.925 - 40.959 • Merri Creek: 42.639 - 42.655 • Donnybrook Road: 46.5 - 47.5 <p><u>Frequency:</u> When dewatering occurs at locations identified above, monitoring of groundwater levels and quality would be required for the duration of dewatering works as defined in the groundwater monitoring plan.</p>
Land stability and ground movement	<p>Existing conditions for land stability and ground movement are described in EES Chapter 9 <i>Land stability and ground movement</i> and Section 6 - Existing conditions of Technical report D <i>Land stability and ground movement</i>.</p> <p>Proposed monitoring requirements are described in EES Chapter 9 <i>Land stability and ground movement</i> and Section 9.2 of Technical report D <i>Land stability and ground movement</i>.</p> <p>Monitoring of land stability and ground movement</p> <p><u>Objective:</u> Minimise risk of trench collapse or slope failure.</p> <p><u>Indicators/monitoring criteria and parameters:</u> For ground movement, application of EMM GM1 requires the construction contractor to identify and prove all third party services potentially impacted, prior to construction and liaise with asset</p>

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



Environmental aspect	Proposed monitoring
	<p>owners to confirm asset clearance and other mitigation, protection or contingency requirements, including possible settlement monitoring at the railway crossings.</p> <p>For land stability during construction:</p> <ul style="list-style-type: none"> The contractor would be required to meet performance criteria in the contractor CEMP for the installation of trench support based on the prevailing conditions during construction (EMM GM3) as well as meeting the Safe Work Australia (2018) requirements for trench excavation. Performance criteria would require the contractor to install support where necessary so that the impact associated with trench instability or slope failure is avoided. The contractor's CEMP is also to include methods for contingency response in the case of trench or slope failure that may include, for example, requirements for temporary shoring (e.g. wall support) and rehabilitation of the disturbed soil (EMM GM3) Develop, document within the CEMP and implement minimum requirements to be put in place to manage dispersive/sodic soils during construction and operation. Management measures may be proportional to the level of risk identified by the additional site investigations and in general accordance with the guidelines contained within Best Practice Erosion and Sediment Control, Appendix P (IECA, 2008) where applicable. <p><u>Locations:</u> During construction, settlement monitoring at rail crossings where required as per discussions with the asset owners. Land stability measures to be employed where potentially unstable ground may compromise the stability of the trench as assessed by a suitably qualified geotechnical engineer (EMM GM3).</p> <p><u>Frequency:</u> As required to be determined in the contractors CEMP.</p>
Land use and site rehabilitation	<p>Existing conditions for land use are described in EES Chapter 15 <i>Land use</i> and Section 6 - Existing conditions of Technical report K <i>Land use</i>.</p> <p>Proposed monitoring requirements are described in EES Chapter 15 <i>Land use</i> and Section 9.2 of Technical report K <i>Land use</i>.</p> <p>Monitoring of rehabilitation</p> <p><u>Objective:</u> Assess the success of rehabilitation and implement corrective action where required</p>

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



Environmental aspect	Proposed monitoring
	<p><u>Indicators/monitoring criteria:</u> CEMP requirements for rehabilitation. APA would work with local councils to build awareness of the Landscaping Guidelines within APA easements.</p> <p><u>Locations:</u> Within construction corridor.</p> <p><u>Frequency:</u> APA would monitor the success of rehabilitation between 12- 24 months following rehabilitation activities.</p>
Landscape and visual	<p>Existing conditions for landscape and visual are described in EES Chapter 14 <i>Landscape and visual</i> and Section 6 - Existing landscape and visual environment of Technical report J <i>Landscape and visual</i>.</p> <p>Proposed monitoring requirements are described in EES Chapter 14 <i>Landscape and visual</i> and Section 12.1 of Technical report J <i>Landscape and visual</i>.</p> <p>Monitoring of planting and remediation</p> <p><u>Objective:</u> To communicate any removal of screening trees on private property with landowners and confirm remediation requirements for the planting and remediation plan.</p> <p><u>Indicators/monitoring criteria:</u> As defined in the Planting and Remediation Plan</p> <p><u>Parameters, location and frequency:</u> The planting and remediation plan (EMM LV7) would include requirements for monitoring the effectiveness of planting and remediation post construction and implementing corrective actions where required. This would include details of the parameters, location and frequency of monitoring.</p>
Noise and vibration	<p>Existing conditions for noise and vibration are described in EES Chapter 12 <i>Noise and vibration</i> and Section 6 - Existing conditions of Technical report F <i>Noise and vibration</i>.</p> <p>Proposed monitoring requirements are described in EES Chapter 12 <i>Noise and vibration</i> and Section 9.4 of Technical report F <i>Noise and vibration</i>.</p> <p>Construction noise and vibration monitoring</p> <p><u>Objective:</u> Inform measures to minimise noise and vibration impacts during construction</p> <p><u>Indicators/monitoring criteria:</u> Noise and vibration criteria as defined in <i>EMM NV10</i>.</p> <p><u>Parameters:</u> Noise: dB(A), LAeq and LA90, Vibration: vibration velocity (PPV) in mm/s</p>

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



Environmental aspect	Proposed monitoring
	<p><u>Locations and frequency:</u> The requirements for and locations of noise monitoring will be informed by construction methods, proximity to sensitive receptors and scheduling of works (including any works outside of normal working hours) and will be detailed in the construction contractors Construction Noise and Vibration Plan. At a minimum, monitoring of noise will be undertaken:</p> <ul style="list-style-type: none">• Daily at the nearest noise sensitive receptor (or group of sensitive receptors) where works are undertaken outside of normal working hours (as defined by EPA Publication 1834) to confirm compliance with the project noise criteria as identified in EMM NV10.• In the event of a complaint regarding noise in relation to an ongoing activity if required in accordance with the complaint management procedure in Construction Noise and Vibration Plan. <p>Monitoring of vibration from intensive construction operations (such as plant and equipment (e.g. dozer) used during the clear and grade and trenching phase causing high levels of vibration), will at a minimum include:</p> <ul style="list-style-type: none">• Initial monitoring of a vibration intensive activity at the nearest sensitive receptor (or group of sensitive receptors) that is within 100 metres of that activity. Should the results from the initial monitoring determine that the vibration intensive activity is below the project vibration criteria as identified in EMM NV10, then further monitoring at that particular location for that activity would not be required. If the results from the initial monitoring determine that the vibration from that activity is the same as or exceeds the project vibration criteria as identified in EMM NV10, then additional mitigation measures would be required (EMM NV2, NV4, NV6 and NV7) and follow up monitoring would be undertaken to confirm compliance.• In the event of a complaint regarding vibration in relation to an ongoing activity (if required in accordance with the complaint management procedure in Construction Noise and Vibration Plan).

PLAN



Environmental aspect	Proposed monitoring
	<p>Monitoring of blasting will at a minimum include:</p> <ul style="list-style-type: none"> Initial monitoring at the nearest sensitive receptor (or group of sensitive receptors) if the detailed blast study identifies locations where the air blast or vibration may be the same as or exceed the human comfort or structural damage criteria as detailed in Table 12-6 of Chapter 12 Noise and vibration. Should the results from the initial monitoring determine that the blasting is below the criteria as identified in Table 12-6 of Chapter 12 Noise and vibration, then further monitoring at that particular location would not be required. If the results from the initial monitoring determine that the air blast or vibration is the same as or exceeds the criteria as identified in Table 12-6 of Chapter 12 Noise and vibration, then control management measures identified in the blast impact management plan will be implemented.
<p>Safety (including emergency management)</p>	<p>Existing conditions for safety are described in EES Chapter 17 Safety and Section 6 - Existing conditions of Technical report M Safety.</p> <p>Proposed monitoring requirements are described in EES Chapter 17 Safety and Section 11.2 of Technical report M Safety.</p> <p>Safety monitoring</p> <p><u>Objective:</u> Assess compliance with the Health and Safety Management Plan and implement controls or additional measures as required.</p> <p><u>Indicators/monitoring criteria:</u> Safety Management Plan (during construction)</p> <p><u>Parameters:</u> The Health and Safety Management Plan (construction) outlines monitoring requirements (attached to the Pipeline Licence Application). This includes:</p> <ul style="list-style-type: none"> HSE workplace inspections, as defined in the Health and Safety Management Plan including planned inspections and observations performed by a competent and experienced person. Inspections to follow an agreed format, timeframes and be documented. Project audits: regular HSE assessments conducted by APA and the construction contractor. Audits to verify compliance against the Health and Safety Management Plan. Performance reporting: data collected by the construction contractor for monthly reports. <p>An automated process control system would monitor operation,</p>

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



Environmental aspect	Proposed monitoring
	<p>with the capability of initiating an emergency shutdown, local alarms and remote alarms (EMM SA2).</p> <p><u>Frequency:</u> The frequency of workplace inspections would be predetermined prior to construction. Project data to be collected and provided on a monthly basis.</p>
Social (including traffic)	<ul style="list-style-type: none"> Existing conditions for social are described in EES Chapter 16 <i>Social</i> and Section 6 and 7 - Existing conditions of Technical report L <i>Social</i>. Proposed monitoring requirements are described in EES Chapter 16 <i>Social</i> and Section 11.2 of Technical report L <i>Social</i>. Monitoring of social impacts would be informed by the other monitoring programs described in this table and the EMMs. Complaints data collected in accordance with EMM S6 would be collated and reported as part of monthly Project reporting process and used to inform a review of the efficacy of existing management and mitigation measures. A general compliance report will be made available publicly on our Project website (www.apa.com.au/worm). This may be in the form of a tally table with general categories and record of complaints or incidents.
Surface water	<p>Existing conditions for surface water are described in EES Chapter 8 <i>Water (surface water and groundwater)</i> and Section 6 - Existing conditions of Technical report B <i>Surface water</i>.</p> <p>Proposed monitoring requirements are described in EES Chapter 8 <i>Water (surface water and groundwater)</i> and Section 9.1.1 of Technical report B <i>Surface water</i>.</p> <p>Surface water monitoring requirements</p> <p><u>Objective:</u> To protect waterway health and biodiversity values during construction</p> <p><u>Indicators/monitoring criteria:</u> Physical and chemical, toxicant and biodiversity indicators in accordance with SEPP (Waters) and Australian and New Zealand Guidelines (ANZG) for Fresh and Marine Water Quality (2018).</p> <p><u>Parameters and frequency:</u> As required by EMM SW5, monitor the performance of management measures in protection of the waterway health and biodiversity values. This will require monitoring to be undertaken before, during and after construction. This requires:</p> <p>Water quality monitoring:</p>



Environmental aspect	Proposed monitoring
	<ul style="list-style-type: none"> Water quality indicators to be monitored will include physical and chemical stressors (PC) and toxicants as per ANZG (2018). Specific parameters for these water quality indicators will need to be selected appropriately with consideration of site conditions and potential impacts due to the works (e.g. turbidity, nutrients, dissolved oxygen, pH, temperature, toxicants water and toxicant sediments). Water quality monitoring will occur immediately prior to construction to establish background conditions. Monitoring will be repeated post-construction to identify any potential impacts from the construction and rehabilitation works. This will include both in-situ monitoring (i.e. turbidity, temperature, dissolved oxygen, pH, salinity) and laboratory testing (i.e. nutrients and heavy metals). During construction activities directly in the watercourse, daily in-situ monitoring will occur for indicators such as turbidity, temperature, dissolved oxygen, pH, and salinity upstream and downstream from works. Comparisons of upstream and downstream conditions will be used to infer if there are downstream impacts. <p>Biodiversity monitoring</p> <ul style="list-style-type: none"> Biodiversity response indicator to be monitored will include macroinvertebrate communities as per ANZG (2018). The biodiversity monitoring will occur immediately prior to construction to establish background conditions, subject to available flows. Monitoring will be repeated post-construction to identify any potential impacts from the construction and rehabilitation works. <p><u>Locations:</u> Jacksons Creek and Merri Creek, upstream and downstream (up to approximately 200 metres of construction). Water quality monitoring should consider potential variability within the upstream and downstream locations. This may require multiple recordings within each location to ensure results are representative of the overall waterway condition.</p>

12.3 Environment reporting notification

12.3.1 General

In accordance with Regulation 20 of the Pipelines Regulations, APA will notify the Minister (or his/her delegate) and Energy Safe Victoria of reportable environmental incidents arising out of a pipeline operations that:

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



- Causes substantial damage to the environment; or
- Has significant potential impact on the environment

Notification will be undertaken of all reportable environmental incidents no later than 2 hours after the incident occurs or 2 hours after APA becomes aware of the incident. Notification will be made in writing to esvreports@energysafe.vic.gov.au and by telephone to:

- ESV Duty Controller 1800 671 337

Notification will also be made to the Pipeline Regulation Unit on:

- Incident reporting phone number: 0439 799 598.
- Email: pipeline.regulation@delwp.vic.gov.au

A written report on the incident will be provided to the Minister and Energy Safe Victoria within 7 days of the date of occurrence of the incident.

Incident reporting will conform with the process and incident reporting requirements identified in APA's Incident Reporting Procedure (APA HSE GP 07.01).

Reportable incidents can include (but are not limited to) the following:

- Any spill, including drilling fluids, to a watercourse, including drains as defined under the *Water Act 1989*
- Loss of hydrocarbons or chemicals greater than 20 L in volume to land
- Spills or releases, including soil movement, which has moved offsite and has a negative impact
- Unauthorised impact to native vegetation
- Death or injury of livestock, wildlife or fauna of any kind caused by the construction activities (excluding off-site incidents)
- Unauthorised impact to cultural heritage, refer to CHMP 16593 and CHMP 16594
- Interference with any previously undetected sites of cultural significance without obtaining the appropriate approval
- Transfer of known noxious weeds as a result of pipeline construction activities
- Fires
- Release of drilling fluids to land greater than 200 L
- Loss of any radioactive equipment, source or material
- Damage to property outside the site
- Unresolved landowner issues whereby agreement on the solution plan cannot be reached
- Any other environmental hazard, meaning a state of danger to human beings or the environment whether imminent or otherwise resulting from the location, storage or handling of any substance having toxic, corrosive, flammable, explosive, infectious or otherwise dangerous characteristics

A template for notifying reportable incidents to DELWP and Energy Safe Victoria in writing is included in **Appendix C**. Where verbal notification is provided, the level of information must be consistent with this reporting template.

All reportable incidents will be investigated in line with APA's *Incident Investigation and Analysis Procedure* (APA HSE GP 07.01 – Incident Reporting).

Following an incident notification and investigation, a written report will be submitted to the Minister (or his/her delegate) and Energy Safe Victoria as soon as practicable (but no later than 7 days after the incident) and include the following information:

- The date, time and place of the incident
- A description of the incident
- Any known or suspected cause of the incident
- Details of any corrective action that has been taken, or is proposed to be taken to prevent a similar incident

12.3.2 Pollution events

There will be a requirement under the new *Environment Protection Act 2017* to notify the EPA of a pollution event if it causes or threatens 'material harm.' This means that:

- there is an adverse effect on human health or the environment
- there is an adverse effect on an area of high conservation value or of special significance
- the clean up or management of the pollution would cost \$10,000 or more.

Pollution incidents can be reported to the EPA by calling 1300 EPA VIC (1300 372 842).

12.3.3 Other incidents

Incidents will also be reported to other statutory authorities as required by legislation and conditions of statutory approvals. This includes:

- Notifications to the Registered Aboriginal Party and Aboriginal Victoria, if a potential Aboriginal site or artefact is identified
- Notification to Heritage Victoria and DELWP if a heritage artefact is discovered.

12.3.4 Contacts

A current listing of key project contacts, regulatory agencies and emergency services details will be kept in a prominent location in the site office for reporting of incidents and emergency situations.

The Contractor must report all incidents to APA in accordance with APA prescribed methods and timelines for reporting of incidents. The Contractor must have procedures in place that provided contact protocols (responsibility for reporting to APA) and assign responsibility for reporting and for the maintenance of records of records associated with reporting.

12.4 Complaints procedure

In the event of a complaint, the APA Project Manager will ensure the matter is recorded in Safeguard+ and further investigation will be undertaken in line with the complaint management process. The complaint management process for the Project is outlined in **Appendix D**.

APA will notify, if necessary, the EPA and other relevant authorities in accordance with statutory requirements.

12.5 Corrective actions

Where corrective or preventative action is required based on monitoring, incident reports/investigations or work site inspections, these actions will be documented in Safeguard+.

The APA Project Manager will issue a request for corrective action to the Construction Contractor Project Manager who will action the request as appropriate and provide updates on progress in addressing the issue at contractor meetings or as requested by the APA Project Manager to meet relevant reporting requirements (refer to Section 11.3).

12.6 Records

A copy of this CEMP and any relevant approvals/permits obtained for the Project will be kept at the site office for the duration of construction and rehabilitation works, until the date that the site offices are demobilised.

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



Specific records relating to the systems, practices and procedures adopted to achieve compliance with the CEMP, as well as quantitative records of emissions and waste discharges will be maintained and will include as a minimum (where they occur):

- Induction records
- Daily inspection records, records of environmental monitoring, details of all reportable and non-reportable environmental incidents (including emergency situations) and notifications and relevant regulatory reporting (including information required to support reporting in accordance with section 11.3)
- Complaints and corrective action registers
- Records of meetings and interaction with external parties (e.g. regulatory authorities and owners/occupiers of land)
- Implementation of the emergency response procedures, emergency response testing, compliance with the emergency response plan and in the case of an emergency situation, effectiveness of the emergency response plan in eliminating as far as reasonably practicable any harm to the environment
- Records of Cultural Heritage unexpected finds
- Permitted clearing of native vegetation records
- Vehicle and machinery inspection and maintenance records
- EPA waste transport certificates for the transport of contaminated soil, solid wastes, spent absorbent materials, oils and lubricants and sullage and other wastes
- Landfill / receiving facility disposal acceptance approvals
- Letter / Certification of imported sands and crushed rock from approved natural source
- Agreements entered into with landowners/occupiers
- Register and copies of all safety data sheets
- Register of spill containment kits.

In maintaining records of compliance with the CEMP, information is to be kept digitally and data is preferably to be recorded spatially where relevant (in GDA 94/AHD). All relevant documentation demonstrating compliance with the CEMP is to be provided to the APA Operations and Environment Teams at the conclusion of the works.

Records shall be retained and disposed of in accordance with APA's Information and Records Management Policy and regulatory requirements.

12.7 Review

The CEMP is a controlled document that is subject to an approval process for any revisions. The need for changes to the CEMP will be reviewed and, if required, the CEMP updated in response to proposed or actual events including, but not limited to:

- Alteration of Project schedule
- Modification of work methods within approved scope
- Adjustment of environmental monitoring response levels
- Changes to Project description or work methods
- Environmental incidents, non-conformances or audit findings
- Identified opportunities for continuous improvement.

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



The CEMP and subsequent revisions require approval by the Minister for Energy, Environment and Climate Change.

All contractor plans and documentation will be prepared and approved by APA prior to any works commencing, with any changes also requiring APA approval. The contractor's CEMP will be reviewed and, if required updated in response to approval conditions for the Pipeline Licence, EPBC approval or the events listed above.

DRAFT

PLAN

Western Outer Ring Main Project – Construction Environment
Management Plan



13. References

APA (2021) Western Outer Ring Main Project Environment Effects Statement

DRAFT



APPENDIX A PIPELINES REGULATIONS (2017) REQUIREMENTS

Part 7 – Environmental Management Plans

Pipelines Regulations 2017		Reference to this CEMP
44.	The Environment Management Plan must-	
	(a) describe the pipeline operation, including details and timing of activities involved in the construction and ongoing operation of the pipeline; and	Section 2
	(b) describe the existing environment that may be affected by the pipeline operation; and	Section 3
	(c) identify the particular relevant values and sensitivities (if any) of that environment.	Section 3
45.	The Environment Management Plan must-	
	a) identify the risks to the environment arising directly or indirectly from the pipeline operation; and	Refer Appendix E
	(b) assess the environmental risks identified under paragraph (a).44	Refer Appendix E
46.	The Environment Management Plan must contain-	
	(a) environmental performance objectives and standards, against which the performance by the licensee to eliminate or minimise the risks identified in accordance with regulation 45 so far as reasonably practicable are to be measured, that address—	
	i) the environmental legislative requirements that apply to carrying out the pipeline operation; and	Section 4 and 8
	(ii) any other environmental requirements that the licensee intends to comply with in carrying out the pipeline operation; and	Section 8
	(b) a list of the environmental legislative requirements and any other non-legislative requirements referred to in paragraph (a); and	Section 4
	(c) a statement of the licensee's environmental policy.	Appendix B

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



Pipelines Regulations 2017		Reference to this CEMP
47.	The Environment Management Plan must contain a report on all consultation carried out between the licensee and all relevant entities in the course of developing the Environment Management Plan.	Section 11.2.1 and Refer to WORM Project Consultation Plan (18035-PL-LH- 0001)
48.	(1) The Environment Management Plan must contain an implementation strategy for the pipeline operation.	Section 5
	(2) The implementation strategy must specify the systems, practices and procedures to be used to ensure that—	
	(a) any environmental risks identified in accordance with regulation 45(a) are eliminated or minimised so far as reasonably practicable; and	Section 7 Refer Appendix E
	(b) the environmental performance objectives and standards specified in accordance with regulation 46(a) are met.	Section 8
	(3) The implementation strategy must include measures to enable assessment of the effectiveness of the systems, practices and procedures in subregulation (2).	Section 11 and 12
	(4) The implementation strategy must provide for—	
	(a) monitoring, auditing and management of compliance with the requirements of subregulation (2); and	Section 12.1, 0 and 12.5
	(b) assessment by the licensee of the licensee's performance in relation to compliance with the requirements of subregulation (2); and	Section 12.1
	(c) the keeping of quantitative records of emissions and discharges of substances from the pipeline.	Section 12.6
	(5) The implementation strategy must provide for the establishment and maintenance of an emergency response plan that—	

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



Pipelines Regulations 2017		Reference to this CEMP
	(a) identifies all potential emergency situations that may arise in relation to the pipeline operation; and	Section 10
	(b) identifies and assesses the environmental risks arising from the potential emergency situations identified in paragraph (a); and	Section 10
	(c) includes response arrangements for minimising any harm to the environment arising from potential emergency situations identified in paragraph (a).	Section 10
	(6) The implementation strategy must include procedures to ensure that the response arrangements in the emergency response plan are tested—	
	(a) when the response arrangements are introduced; and	Section 10
	(b) when the response arrangements are significantly amended; and	Section 10
	(c) not later than 12 months after the most recent test.	Section 10
	(7) The implementation strategy must include arrangements for consultation by the licensee with all relevant entities in relation to the pipeline operation and the licensee's performance in protecting the environment, during the life of the pipeline operation.	Section 11.2.1 and 11.3
	(8) The implementation strategy must establish a clear chain of command, setting out the roles and responsibilities of personnel in relation to the implementation, management and review of the Environment Management Plan.	Section 6
49.	The Environment Management Plan must contain details of arrangements to record and keep—	
	(a) information about the systems, practices and procedures that the licensee has adopted to meet the obligations in the Environment Management Plan; and	Section 12.6
	(b) information about the licensee's performance in relation to compliance with regulation 11(1)(b); and	Section 1.2.2 and 12.6

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



Pipelines Regulations 2017		Reference to this CEMP
	(c) details of all reportable and non-reportable environmental incidents, including emergency situations; and	Section 12.3 and 12.6
	(d) details of the emergency response testing undertaken in accordance with the requirements of regulation 48(6); and	Section 10 and 12.6
	(e) in the case of any emergency situation, information on the effectiveness of the emergency response plan in eliminating or minimising as far as reasonably practicable any harm to the environment.	Section 10 and 12.6
50.	For the purposes of reporting to the Minister under regulation 11(1)(b), the Environment Management Plan must contain details of arrangements for reporting on the licensee's performance in protecting the environment from the pipeline operation.	Section 11.3 and 12.6

DRAFT

PLAN

Western Outer Ring Main Project – Construction Environment
Management Plan



APPENDIX B **APA HSE POLICY**

DRAFT

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



Health, Safety and Environment (HSE) Policy

At APA Health, Safety and Environment are essential to our core business values. We are committed to providing a zero harm work environment for our employees, contractors and visitors, managing our operating risk and protecting the environment from harm. We are also committed to the effective implementation of this HSE Policy and continual improvement in our HSE performance.

To achieve this APA Group will:

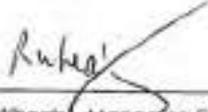
- Provide leadership and direction to drive accountability for our HSE performance.
- Document, implement and maintain an appropriate HSE Management System. Our system is called "Safeguard".
- Comply with applicable HSE legislation and, where applicable, adopt best practice requirements.
- Establish and regularly monitor measurable objectives and targets to ensure continued improvement against established standards.
- Communicate HSE commitments and information to employees, contractors and applicable stakeholders.
- Recognise and reward excellence in HSE performance.
- Proactively seek to identify hazards and reduce the risk of injury, uncontrolled harmful substance release and environmental harm by investigating all reported accidents, incidents and near misses promptly and taking appropriate actions to prevent a recurrence.
- Provide appropriate training, supervision, specialist support and other resources to HSE matters.
- Consult and engage with our employees and other stakeholders to build relationships based on our values to assist in meeting the goals of our HSE Policy.
- Partner with companies having similar HSE standards and values as APA Group.
- Ensure processes are in place to protect the environment from harm.
- Manage the operating risks and the critical controls that prevent or mitigate major incident events.

General Responsibilities for Health, Safety & Environment

All employees including contractors have an obligation to look after their own health and safety, the safety of those who may be affected by their acts or omissions, and to prevent incidents arising from APA's operations and activities. We must all comply with APA Group's HSE policies and procedures, including safe work procedures, directions about safety, and environmental requirements and local site rules. All incidents, near misses and hazards must be reported.

All managers and supervisors are responsible for managing HSE in accordance with the Group Policy and our HSE Management System as an integral and mandatory duty of their position.

APA's HSE Policy is issued and approved by the HSE Committee of APA's Board and signed by APA's Managing Director / CEO.


Rob Wheat, Managing Director / CEO

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



APPENDIX C REPORTABLE INCIDENT NOTIFICATION TEMPLATE

ENVIRONMENTAL INCIDENT – REPORTABLE INCIDENT	
Date of incident:	
Time of incident:	
Incident location (address, location within Site boundary):	
Reporting person (name, position, company):	
Site supervisor (name, position, company)	
Brief description of incident:	
Reason for externally reportable:	
External party involvement:	
Immediate actions taken (including notification of police/ emergency services):	
Known/ suspected cause (immediate contributing factors):	

APPENDIX D COMPLAINT MANAGEMENT PROCESS



Notes:

1. Complaints to be acknowledged within 24hrs of receipt.
2. Complaint investigations, including the investigation timeframes, are to conform to APA’s Incident Investigation and Analysis Procedure (APA HSE GP 07.02). Monitoring to be undertaken as relevant in accordance with source of nuisance/complaints. APA will keep the complainant informed as to the progress of the investigation if the investigation be prolonged.

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



APPENDIX E CEMP RISK ASSESSMENT

DRAFT

Obligations Register

ERA Reference List A - This register reflects legislation considered as part of the environmental risk assessment process for the draft CEMP. It should be reviewed and further populated where required post the Minister's Assessment on the EES process.

Jurisdiction	Statute (Leg/Reg)	Approval/ Permit/ Licence/ Aus Stnrd/ Code (name and number)	Primary Enviro Area	Doc Section (ref point)	Requirement
e.g. VIC	e.g. Environment Protection Act 1970	e.g. Section 20 Licence - 73892	APA HSE EP 13.03.01 Gas, Dust & Light Emission Management	e.g. LI_G1	e.g. Waste from the premises must not be discharged to the environment except in accordance with this licence.
VIC	Aboriginal Heritage Act 2006 and Aboriginal Heritage Regulations 2018	Cultural Heritage Management Plan	APA HSE EP 13.07.02 Aboriginal Cultural Heritage Management	CEMP Appendix H	The principal method of protecting cultural heritage under the Act is the preparation and implementation of a Cultural Heritage Management Plan (CHMP) (Section 49). Two CHMPs are being prepared for the Project.
VIC	Crown Land (Reserves) Act 1978	General compliance / land access	APA HSE EP 13.01.02 Land Route Selection & Design		This Act provides for the reservation of Crown land for certain public purposes by the Governor in Council and sets out the administrative and legal framework for managing reserved Crown land and the processes for revoking Crown land reservation. Requirements, such as the need for any leases/licences under this Act, will be considered where relevant by APA in securing the easement.
VIC	Country Fire Authority Act 1958	Hot works permit	APA HSE EP 13.01.03 Management Plan Process & Design	CEMP Appendix H	A permit may be required for hot works within the Fire Danger Period and/or on a Total Fire Ban Day.
VIC	Environment Effects Act 1978	Minister's Assessment	APA HSE EP 13.01.01 Environment Approvals Process	CEMP Appendix H	An Environment Effects Statement is currently being prepared for the Project. The draft CEMP will require updating to reflect the outcomes of this process.

Jurisdiction	Statute (Leg/Reg)	Approval/ Permit/ Licence/ Aus Stnrd/ Code (name and number)	Primary Enviro Area	Doc Section (ref point)	Requirement
VIC	<i>Environment Protection Act 1970</i> and subordinate regulations, policies and EPA publications	General compliance	APA HSE EP 13.01.03 Management Plan Process & Design	CEMP Appendix H	This Act provides for the preparation of the State Environment Protection Policies (SEPPs) which are used to implement the policies outlined in the primary legislation to protect the environment. The SEPPs relate to emissions to air, water and land in Victoria, including contaminated soils. The Act also provides for Industrial Waste Management Policies and regulations relating to transport and handling of wastes. It is noted that the amended <i>Environment Protection Act 2017</i> will come into force in July 2021 and that the CEMP will require update to reflect the new Act.
VIC	<i>Environment Protection Act 2017</i> <i>Environment Protection Amendment Act 2018</i> Environment Protection (Residential Noise) Regulations 2018 as well as other subordinate regulations, policies and EPA publications	General compliance	APA HSE EP 13.01.03 Management Plan Process & Design	CEMP Appendix H	This Act is expected to come into effect on 1 July 2021 and it will provide enhanced powers to the EPA to regulate pollution, waste and contamination in Victoria to prevent risks to the environment and human health. The CEMP will need to be updated to reflect the new Act, Regulations, Environmental Reference Standard and EPA publications. This includes the GED, waste and contaminated land duties. All works must comply with the new Act and associated legislation and guidelines.
VIC	<i>Flora and Fauna Guarantee Act 1988</i> (FFG Act) and Flora and Fauna Guarantee Regulations 2020	General compliance and a permit under the Act	APA HSE EP 13.02.01 Native Vegetation Management	CEMP Appendix H	The Project will be required to comply with the FFG Act as a result of the potential impact on two FFG-Act listed communities as well as FFG-Act listed threatened fauna and aquatic species.

Jurisdiction	Statute (Leg/Reg)	Approval/ Permit/ Licence/ Aus Stnrd/ Code (name and number)	Primary Enviro Area	Doc Section (ref point)	Requirement
VIC	<i>Fisheries Act 1995 and Fisheries Regulations 2019</i>	General compliance and a permit under the Act	APA HSE EP 13.02.02 Fauna Management	CEMP Appendix H	FFG Act-listed aquatic biota are also protected under the Fisheries Act 1995 and may not be taken, injured, damaged or destroyed (Section 71) or have their passage obstructed (Section 119) without authorisation. If salvage of fish is required during construction of the Project, a General Permit issued by the Victorian Fisheries Authority under Section 49 of the Fisheries Act may be required to catch and release, and includes requirements for animal ethics approval.
VIC	<i>Gas Safety Act 1997 and Gas Safety (Safety Case) Regulations 2018</i>	Gas Safety Case	APA HSE EP 13.03.01 Gas, Dust & Light Emission Management	Safety Management Plan and CEMP Appendix H	An approved Safety Case is required for the Project under the Gas Safety Act 1997 (Vic). The Gas Safety Case must be prepared in accordance with the Gas Safety (Safety Case) Regulations 2018 and requires approval from Energy Safe Victoria (ESV).
VIC	<i>Heritage Act 2017 and Heritage Regulations 2017</i>	A Consent for works in the VHI site Holden Cobbled Stone Road (H7822-2283).	APA HSE EP 13.07.01 Natural and Built Heritage Management	CEMP Appendix H	This Act provides for the protection and conservation of heritage in Victoria, including the establishment of the Victorian Heritage Register (VHR) for places and objects, and the Victorian Heritage Inventory (VHI) for archaeological sites. Any impacts to VHR or VHI sites as part of the Project will require a permit or permit exemption under the Heritage Act 2017. Consent under Section 124 is required from Heritage Victoria for the VHI site Holden Cobbled Stone Road (H7822-2283).
VIC	<i>Land Acquisition and Compensation Act 1986 and Land Acquisition and Compensation Regulations 2010</i>	General compliance and land access	APA HSE EP 13.01.01 Environment Approvals Process	CEMP Appendix H	This Act allows for and manages the procedure for the acquisition of land in Victoria, and provides for the determination of the compensation payable where land is acquired. The Act allows for acquisition and compensation to occur as per Part 6 of the <i>Pipelines Act 2005</i> .

Jurisdiction	Statute (Leg/Reg)	Approval/ Permit/ Licence/ Aus Stnrd/ Code (name and number)	Primary Enviro Area	Doc Section (ref point)	Requirement
VIC	<i>Pipelines Act 2005</i> and <i>Pipelines Regulations 2017</i>	Pipeline Licence	APA HSE EP 13.01.01 Environment Approvals Process	Pipeline Licence Application	This Act is the primary Act governing the construction and operation of high transmission pipelines in Victoria. Under the <i>Pipelines Act 2005</i> , a licence to construct and operate a pipeline must be obtained by the proponent of a pipeline development. A pipeline licence application is currently being prepared for the Project.
VIC	<i>Planning and Environment Act 1987</i> and <i>Planning and Environment Regulations 2015</i>	General compliance	APA HSE EP 13.01.01 Environment Approvals Process	CEMP Appendix H	This Act provides the framework for planning, land use and development within Victoria. Planning schemes prepared under the provisions of the Act apply to each municipality in Victoria. Planning and Environment Act matters are considered as part of the Pipeline Licence application process.
VIC	<i>Rail Safety (Local Operations) Act 2006</i>	A works permit	APA HSE EP 13.01.01 Environment Approvals Process	CEMP Appendix H	A works permit is required for construction across or beneath a railway.
VIC	<i>Road Management Act 2004</i> and <i>Road Management (General) Regulations 2016</i>	Consent is required to carry out works within road reserves.	APA HSE EP 13.01.01 Environment Approvals Process	CEMP Appendix H	Consent is required from the relevant road management authority to carry out works within road reserves.
VIC	<i>Water Act 1989</i> and <i>Water (General) Regulations 2021</i>	Works on waterways permits	APA HSE EP 13.06.02 Watercourse Management	CEMP Appendix H	This Act provides a legal framework for managing Victoria's water resources, including water supply catchments and groundwater and is relevant as the Project crosses several waterways. Works on Waterways permits are required to undertake construction activities on or near all waterways.
VIC	<i>Wildlife Act 1975</i> and <i>Wildlife Regulations 2013</i>	A management authorisation is required to take or destroy protected or threatened wildlife.	APA HSE EP 13.02.02 Fauna Management	CEMP Appendix H	A management authorisation is required to take or destroy (including removal or relocation) protected or threatened wildlife.

Jurisdiction	Statute (Leg/Reg)	Approval/ Permit/ Licence/ Aus Stnrd/ Code (name and number)	Primary Enviro Area	Doc Section (ref point)	Requirement
CTH	<i>Environment Protection and Biodiversity Conservation Act 1999</i>	Controlled action under the EPBC Act	APA HSE EP 13.02.01 Native Vegetation Management	CEMP Appendix H	<p>Part of the Project is located within a Melbourne Strategic Assessment (MSA) area approved under Part 10 of the EPBC Act (approved MSA areas). For all projects within the approved MSA areas, no further approvals are required under the EPBC Act for the Project provided certain conditions are adhered to. These are noted in Section 4 of the CEMP.</p> <p>For the component of the Project located outside the MSA, a referral was submitted to the Commonwealth Department of Agriculture, Water and the Environment (DAWE). The Project was determined to be a controlled action under Section 75 of the EPBC Act. It requires assessment and approval under the EPBC Act, with the assessment process occurring through the bilateral agreement with Victoria. Any conditions of the EPBC Act approval once granted will need to be complied with.</p> <p>Works in Conservation Areas approval is required for any works within the Biodiversity Conservation Strategy conservation areas pursuant to the Melbourne Strategic Assessment (Environmental Mitigation Levy) Act 2020 (Vic).</p>
CTH	<i>Native Title Act 1993</i>	Section 24KA	APA HSE EP 13.07.02 Aboriginal Cultural Heritage Management	CEMP Appendix H	<p>The alignment impacts three Crown allotments where native title rights exist. The proposed pipeline has been determined to be a facility providing services to the general public. Given this, the issue of the proposed licence (and all related works) is a valid future act under section 24KA of the Native Title Act 1993 (NTA). APA are currently proceeding through the process required under S24KA of the NTA.</p>

RISK ASSESSMENT MATRIX

APA uses a 5x5 risk matrix to assign likelihood and consequence ratings to risk items outlined below

The official Enterprise Risk Matrix for your session can be accessed via the link below

<https://thehub.apa.com.au/WorkArea/Book/Toolbox/Forms/Guidance/erw.aspx>

NOTE: DO NOT DELETE OR MODIFY THIS MATRIX

		Consequence				
		Minimal	Minor	Significant	Major	Catastrophic
		1	2	3	4	5
Frequent	5	Low	Moderate	High	Extreme	Extreme
Occasional	4	Low	Low	Moderate	High	Extreme
Unlikely	3	Negligible	Low	Moderate	High	High
Remote	2	Negligible	Negligible	Low	Moderate	High
Rare	1	Negligible	Negligible	Negligible	Moderate	Moderate

Final Risk Rating	Negligible	
	Low	
	Moderate	
	High	
	Extreme	

Level	Descriptor	Description*	Descriptor	Description	
5	Frequent- Many times in 1yr	Expected to occur on a regular basis and many times	Catastrophic	One or a combination of the following consequences: - offsite and impact is widespread (>1ha) - unable to be remediated - impact is irreversible or lasts >10 yrs	Permanent and irreparable impact or infringement to heritage
4	Occasional - Every 2yrs	May occur occasionally or in many circumstances	Major	One or a combination of the following consequences: - offsite and impacting > 1 ha - able to be remediated with difficulty - impact continues for <10 yrs	Temporary but irreparable impact or infringement to heritage
3	Unlikely - Every 5yrs	Unlikely to occur but possible when certain circumstances prevail	Significant	One or a combination of the following consequences: - offsite and impacting < 1 ha - able to be remediated with some difficulty - impact continues for <5 yrs	Permanent but repairable impact or infringement to heritage
2	Remote - Every 20yrs	Not anticipated but may occur if certain abnormal circumstances prevail	Minor	One or a combination of the following consequences: - onsite and impacting > 1 ha - able to be remediated easily - impact continues for <1 yr	Temporary and repairable impact or infringement to heritage
1	Rare - Every 50yrs	Conceivable, but has not been known to arise previously	Minimal	One or a combination of the following consequences: - onsite and impacting < 1 ha - no remediation needed - impact continues for < 1 wk	Impact that causes negligible or no damage to heritage



Area	Details
Environment Areas	APA HSE EP 13.01.01 Environment Approvals Process
	APA HSE EP 13.01.02 Land Route Selection & Design
	APA HSE EP 13.01.03 Management Plan Process & Design
	APA HSE EP 13.02.01 Native Vegetation Management
	APA HSE EP 13.02.02 Fauna Management
	APA HSE EP 13.02.03 Pest, Disease & Weed Management
	APA HSE EP 13.03.01 Gas, Dust & Light Emission Management
	APA HSE EP 13.03.02 Noise and Vibration Management
	APA HSE EP 13.04.01 Chemical Spill Management
	APA HSE EP 13.04.02 Contaminated Land Management
	APA HSE EP 13.05.01 Regulated Waste Management
	APA HSE EP 13.05.02 General Waste Management
	APA HSE EP 13.05.03 Wastewater Management
	APA HSE EP 13.06.01 Soil and Land Management
	APA HSE EP 13.06.02 Watercourse Management
	APA HSE EP 13.07.01 Natural and Built Heritage Management
	APA HSE EP 13.07.02 Aboriginal Cultural Heritage Management
	APA HSE EP 13.08.01 Energy and Emissions Reporting
Environment Impact Type	Legal
	Technical
	Reputational
Risk Frequency Descriptors	1
	2
	3
	4
	5
Risk Consequence Descriptors	1
	2
	3
	4
	5
Risk Level + Score	Negligible 0.75
	Negligible 1
	Negligible 1.5
	Negligible 2
	Negligible 2.25
	Low 3
	Low 3.75
	Low 4
	Intermediate 5
	Intermediate 6
	Intermediate 8
	High 10
	High 12
	High 15
	High 16
	Extreme 20
Extreme 25	

ERA #	Type: 1. ENVFEAT 2. ASSETHAZ 3. RISKACTIV	Aspect or Activity (Hazard) RISKACTIV (e.g. trenching, filter change)	Event/Cause of harm (Risk) (e.g. chemical spill)	Environment Impact (e.g. soil contamination, death of fauna, nuisance to community)	Pre-Control (inherent)			Management					Mitigating				Post-Control (residual)			RnRs			
					Likelihood	Consequence	Risk Level	Competency Controls		Inherent controls	Site Setup Controls			Reactive controls			Assurance Control	Likelihood	Consequence		Risk Level		
								Training + Awareness	Engineering design		Traffic and access	Site compounds, (facilities, storages, set-down areas, stockpiles)	Engineered (physical) controls (barriers, fences, barricades, flagged areas, signage)	Administrative (documented) controls - procedures, plans, maps, etc.	Other	Incident and Emergency Response Controls (reactive)						Approval (Inc. condition ref) or Communication	Other
1	ASSETHAZ	Construction work sites, including temporary infrastructure, equipment laydown areas and construction offices	Chemical spills, sewage or domestic waste, fuel spills, inappropriate storage of industrial/regulator waste	(C) Contamination of land (SW) surface water (GW) groundwater (W) Waste	3	2	Low	APA National HSE Induction, APA National Environmental Awareness Induction, CEMP Induction, location specific inductions, toolbox talks, spill response training	Existing and planned geotechnical and hydrogeological investigations as the basis of design (GM2)	Establish site access points and traffic movements (directions, speeds, signage, etc) as per traffic management plan	Implement management measures to minimise risks from waste in site design and set up (C7) Management of fuel and chemicals as per environmental controls F1 - F8 Waste management as per environmental controls for waste (W1 - W7)	Water carts to control dust and covering of loads (A01) Consideration to environmental controls for surface water (SW) and groundwater (GW) to address applicable requirements before commencement of work Erosion and sediment controls and stockpile placement and management as per environmental controls (SW, GW, GM) Spill kits present on site	Construction drawings and site plans delineating site boundary, access points, site facilities, sensitive areas (A4) Spoil management measures, management of potential sources of prescribed industrial waste and/or vapour and gases as per environmental line lists, site management plans, maps (C1, C3, C5) Groundwater management measures (C4) Management of potential PFAS (C5)	Additional environmental controls and requirements as detailed in the CEMP.	APA HSE GP 11.01 Emergency Management, Emergency response plans, APA HSE EP 13.04.01 Chemical Spill Management, APA HSE GP 07.01 Incident Reporting, Emergency Response Plans will be developed and implemented for the construction phase of the Project (SA4)	Approval (Inc. condition ref) or Communication	Other	Supporting Documents (e.g. Work Instruction; Tech Guide)	Inspection + Monitoring, Compliance Records or Evidence	3	2	Low	APA/Contractor
2	ASSETHAZ	Pipeline	Construction of the pipeline in growth areas where the alignment has not been planned for within PSPs	(LU) Land use Construction of the pipeline in growth areas where the alignment has not been planned for within PSPs means planned land uses (i.e. residential, commercial, community) cannot proceed as planned.	3	3	Medium	APA National HSE Induction, APA National Environmental Awareness Induction, CEMP Induction, location specific inductions, Toolbox talks, spill response training	Locate the pipeline as per LM1 including design of the pipeline in accordance with AS 2885 and providing for future uses along the pipeline in accordance with APA Site Planning and Landscape National Guidelines (APA 2020)				Additional environmental controls and requirements as detailed in the CEMP.	APA HSE GP 07.01 Incident Reporting, APA HSE GP 07.02 Incident Investigation & Analysis		Rehabilitate land as per LU2	APA Site Planning and Landscape National Guidelines (APA 2020)	As per CEMP including work site inspections, environmental audits, incident reports	2	3	Low	APA/Contractor	
3	RISKACTIV	Mobilisation, site establishment and access (Access to construction corridor/facility sites, clear and grade)	Interruptions to existing land use, environmental damage during site access and movement around site, spread of weeds and disease tree & vegetation buffer removal)	(A) Site Access (S) Social (LU) Land use (B) Biodiversity (Community impacts, complaints, spread of weeds/disease, damage to flora and fauna, interruptions to existing land use and impacts on land use including agri-business and property productivity)	3	2	Low	APA National HSE Induction, APA National Environmental Awareness Induction, CEMP Induction, location specific inductions, toolbox talks, trained and competent contractors used for weed/pest management environmental control B3 Contractor awareness	Construction methodology and alignment to avoid impact in sensitive areas Horizontal directional drilling rather than open trenching to minimise impact in some sensitive areas - as per project description	Implement pest plant, animal and pathogen control measures as per B2. All vehicles and construction equipment, including third parties, will be clean prior to arrival to the site consistent with A Guide for Machinery Hygiene for Civil Construction (Civil Contractor's Federation, 2011).	Utilise designated stockpile/laydown areas only	Establish required no-go zone areas to protect native vegetation and habitat values (B1 - B23) Biosecurity signage from landholders	Comply with existing project specific biosecurity plans. Construction drawings will clearly delineate the site, access points and sensitive areas (e.g. native vegetation) in or adjacent to the site - exclusion zones for retained vegetation on site maps and plans and delineated onsite	Additional environmental controls and requirements as detailed in the CEMP.	Complaints management process - APA HSE GP 07.01 Incident Reporting, Requirements for assessment and reporting of accidental damage to vegetation (B16)	Notification of access to property landholders 560-PR-QM-001 Landholder Engagement Procedure Environmental controls for Social Stakeholder consultation (S1) Site access and property management (S3) Community and residential accessibility (S4) Landholder communication (S5)	Environmental controls for biodiversity, landscape and visual, and social: All fauna (B9) Threatened fauna (B9) Fauna Mitigation - Platypus (B22) Visual impacts during construction (tree removal, construction sites) (LV1) Vegetation buffers (LV4) Reduce community disruption (S1) Environmental controls for access (A1 to A12)	land parcel information, noxious weed information, APA HSE EP 13.02.03 Post Disease and Weed Management, APA ENV GDE 003 Biosecurity Vehicle Hygiene Guideline, APA HSE EP 13.02.02 Fauna Management, APA HSE EP 13.03.01 - Environmental Procedure - Gas, Dust and Light Emission Management, APA HSE EP 13.06.01 Soil and Land Management, APA HSE GP 08.04 Workplace Inspections and Hazard Reporting	Weed and seed inspections are to be completed for all vehicles and plant on arrival with a record of the inspection to remain with the vehicle. Vehicles/plant are to be free of soil clumps and sods prior to exit from site. Routinely inspect for weeds around the easement and facilities (B13)	3	2	Low	APA/Contractor
4	RISKACTIV	Mobilisation, site establishment and access (Access to construction corridor/facility sites)	Movement on landholders sites outside of agreed easement(S)/access points Movement on existing land uses (parkland, recreational)	(S) Social (Complaints) (LU) Land Use (B) Biodiversity (CH) Cultural heritage (Damage to properties or vegetation, cultural heritage, amenity impacts, Impact on continuation of existing land uses and agri-business and property productivity)	3	2	Low	APA National HSE Induction, APA National Environmental Awareness Induction, CEMP Induction, location specific inductions, toolbox talks, trained and competent contractors used for weed/pest management Environmental control B3 Contractor awareness	Approved construction corridor (within CEMP). All activities and works to occur within the approved Cultural Heritage Management Plan (CHMP) Activity areas.	Site access points clearly delineated in Traffic Management Plan and site-specific plans and maps. No access by APA or construction contractors is to be gained to properties outside of the site boundary (A5)		Block (i.e., close) unauthorised access points, no access. Site set up and boundaries to be clearly delineated and established within CHMP Activity areas.	Delineation of CHMP Activity area boundary on site maps/plans. Comply with existing project specific biosecurity plans	Additional environmental controls and requirements as detailed in the CEMP.	Complaints management process - APA HSE GP 07.01 Incident Reporting, Investigation & Analysis, APA HSE TB ENV 008 Unexpected finds protocol, Comply with CHMP contingency protocols Requirements for assessment and reporting of accidental damage to vegetation (B16)	Notification of access to property landholders 560-PR-QM-001 Landholder Engagement Procedure Landowners will be informed of the construction commencement, and details of the proposed construction programme, in accordance with the Project Consultation Plan (18035-PL-LH-0001). Agreements with relevant landowners are to be in place prior to the mobilisation to Site Environmental controls for Social Stakeholder consultation (S1) Site access and property management (S3) Community and residential accessibility (S4) Landholder communication (S5)	PSP areas (LU1) Continuation of existing land uses (LU2) Transport land uses (LU4) Reduce community disruption (S1) Environmental controls for access (A1 to A12) Vegetation damage outside Project Area (B16)	Land parcel information, Noxious weed information, Weed Management, APA ENV GDE 003 Biosecurity Vehicle Hygiene Guideline.	Work site inspections, environmental audits, incident reports	2	2	Negligible	APA/Contractor
5	RISKACTIV	Mobilisation and site establishment / Pipeline construction / Work compressor station upgrade (Access to construction corridor/facility sites, clear and grade, site establishment)	Clearing vegetation or trees adjacent permitted construction footprint - habitat loss, loss of protected flora and fauna)	(B) Biodiversity (GG) Greenhouse gas (LV) Landscape and Visual (S) Social (Damage to flora and fauna, compliance with regulatory requirements, impacts, damage to properties, changes to landscape character and visual amenity impacts (e.g. loss of buffers))	3	2	Low	APA National HSE Induction, APA National Environmental Awareness Induction, CEMP Induction, location specific inductions, toolbox talks Environmental control B3 Contractor awareness	Alignment chosen to minimise native vegetation impact Post-construction planting and remediation (L7)	Access environmental controls (A1-A12) Set boundaries for vegetation removal (B1)		All vegetation clearing works will be confined to the defined construction areas (B1). Onsite fencing and delineation of areas	Vegetation removal to be reduced as far as reasonably practicable (B1, LV1 / GG1.d.) Arborist reports on the potential impacts to native trees to be undertaken prior to construction (B1, B23, LV1, LV2) Site plans showing no-go zones	Additional environmental controls and requirements as detailed in the CEMP.	APA HSE GP 07.01 Incident Reporting, APA HSE GP 07.02 Incident Investigation & Analysis, Requirements for assessment and reporting of accidental damage to vegetation (B16) Requirements for reinstatement of native vegetation (B15)	Notification of access to property landholders 560-PR-QM-001 Landholder Engagement Procedure Environmental controls for Social Stakeholder consultation (S1) Site access and property management (S3) Community and residential accessibility (S4) Landholder communication (S5)	Land clearance and vegetation loss (B1) Invasive weeds, pathogens, pests and waste (construction) (B2) Site rehabilitation (B7) Topsoil management (B8) Genetic diversity (B15) Unplanned clearing (B16) Environmental controls for greenhouse gas - GG1: (d) Vegetation removal reduction (g) Mulching vegetation	Engagement of environmental team for approval support on clearing APA HSE EP 13.02.01 Native Vegetation Management, Flora and Fauna management measures and plans as required by CEMP, Planting and remediation plan (as per LV7)	Site inspections and maintenance of controls Inspection/audit of cleared areas versus permits and site maps as part of periodic audits by APA Monitoring and reporting as per GG1	2	1	Negligible	APA/Contractor
6	RISKACTIV	Mobilisation, site establishment and access (Establish temp construction support work sites - Transport/storage of chemicals and fuels)	Chemical and fuel use and spills	(C) Contamination of land (SW) surface water (GW) groundwater (W) Waste (GHG) Greenhouse gas (Spills resulting in contamination of land, water, groundwater as well as usage/spills resulting in generation of waste and greenhouse emissions)	3	2	Low	APA National HSE Induction, APA National Environmental Awareness Induction, CEMP Induction, location specific inductions, toolbox talks, Chem Cert training, spill response training Environmental control B3 Contractor awareness		Storage of fuels onsite in small quantities and banded. Minor refuelling using temporary bund/containment (i.e. tarp) to prevent spills) Manage chemicals, fuels and hazardous material (C6) Diesel to be stored in tanks in accordance with AS 1940 (SA3) Environmental controls for fuels and chemicals (F1 to F8)		Fuel and chemical storage and use requirements as per contamination management measures in CEMP Spill kit material to be disposed of as regulated waste	Additional environmental controls and requirements as detailed in the CEMP.	APA HSE GP 11.01 Emergency Management, Emergency Response Plans will be developed and implemented for the construction phase of the Project (SA4) Emergency Response Protocol, APA HSE EP 13.04.01 Chemical Spill Management, Leaks or spills (C6) Spill kits (C9)	Environmental controls for contamination (C1 to C9) Environmental controls for fuels and chemicals (F1 to F8)	APA HSE EP 13.05.01 - Regulated Waste Management	Prestart checks of plant, regular maintenance and servicing of plant	3	2	Low	APA/Contractor		

7	RISKACTIV	Mobilisation, site establishment and access (Access to construction corridor/facility sites - Vehicle/machinery movements, spoil stockpiling and removal and transport of spoil)	Construction traffic to and from public roads impact on roads (mud), dust, amenity impacts, road safety impacts)	(A) Site Access (AQ) Air Quality (NV) Noise (W) Waste (SA) Safety (S) Social (Dust, traffic hazards, complaints, falling materials, reputational impact, safety impacts (injury/death) impacts on property access. Amenity impacts may affect residences as well as community facilities)	~	~	Moderate	APA National HSE Induction, APA National Environmental Awareness Induction, CEMP Induction, location specific inductions, Toolbox talks Environmental control B3 Contractor awareness	Minimise the depth of cover over the pipeline (minimising the amount of spoil) Designated access points and routes to occur within the construction area.	Removal of soil and mud from machinery before leaving site to public roads. Clean mud from roads where necessary (A9), Traffic Management Plan (S3, S46)	Establishment of site compounds and stockpile areas away from sensitive receptors for dust	Management of dust as per AQ1. Utilise a wind barrier (such as shade cloth to slow down winds) as outlined in EPA Publication 1834 along upwind boundary when next to residences. Suitable controls applied (developed by contractor by approval by APA) for minimising the dust and mud that is tracked from site onto public roads. Water carts when required to minimise airborne dust. Erosion and sediment controls as per ESCP	Locations of stockpiles on site maps Environmental controls for noise and vibration (NV1 to NV9) Construction Noise and Vibration Management measures as required by CEMP, Traffic Management Plan as required by CEMP	Time activity abutting residential locations during the wetter winter months where practicable(AQ1) Additional environmental controls and requirements as detailed in the CEMP.	Complaints management process - APA HSE GP 07.01 Incident Reporting Investigation & Analysis	560-PR-QM-0001 Landholder Engagement CEMP complaints process Environmental controls for Social Stakeholder consultation (S1) Site access and property management (S3) Community and residential accessibility (S4) Landholder communication (S5)	Reduce community disruption (S1) Traffic Management Plan (L14, S3, S46) Soil Management Plan as required by CEMP	Traffic Management Plan APA HSE EP 13.03.01 - Environmental Procedure - Gas, Dust and Light Emission Management.	Vehicle inspections and mud removal before leaving site Monitoring as per Traffic Management Plan Dust monitoring (AQ1) Noise and vibration management and monitoring as per NV1 to NV9	~	~	Moderate	APA/Contractor
8	RISKACTIV	Mobilisation and site establishment (Access to construction corridor/facility sites - Transport of materials for pipeline construction (crushed rock, steel pipe))	Construction traffic to and from public roads impact on roads (mud), dust, amenity impacts, road safety impacts)	(A) Site Access (AQ) Air Quality (NV) Noise (W) Waste (SA) Safety (S) Social (Dust, traffic hazards, complaints, falling materials, reputational impact, safety impacts (injury/death))	~	~	Moderate	APA National HSE Induction, APA National Environmental Awareness Induction, CEMP Induction, location specific inductions, Toolbox talks Environmental control B3 Contractor awareness	Removal of soil and mud from machinery before leaving site to public roads. Clean mud from roads where necessary (A9), Traffic Management Plan (S3, S46)	Establishment of site compounds and stockpile areas away from sensitive receptors for dust	Management of dust as per AQ1 Suitable controls applied (developed by contractor by approval by APA) for minimising the dust and mud that is tracked from site onto public roads. Erosion and sediment controls as per ESCP. Water carts when required to minimise airborne dust	Environmental controls for noise and vibration (NV1 to NV9) Construction Noise and Vibration Management measures as required by CEMP, Traffic Management Plan as required by CEMP	Time activity abutting residential locations during the wetter winter months where practicable(AQ1) Additional environmental controls and requirements as detailed in the CEMP.	Complaints management process - APA HSE GP 07.01 Incident Reporting Investigation & Analysis	560-PR-QM-0001 Landholder Engagement CEMP complaints process Environmental controls for Social Stakeholder consultation (S1) Site access and property management (S3) Community and residential accessibility (S4) Landholder communication (S5)	Reduce community disruption (S1) Traffic Management Plan (L14, S3, S46) Environmental controls for Waste Management (W1 to W7)	Traffic Management Plan APA HSE EP 13.03.01 - Environmental Procedure - Gas, Dust and Light Emission Management.	Vehicle inspections and mud removal before leaving site Monitoring as per Traffic Management Plan Dust monitoring (AQ1) Noise and vibration management and monitoring as per NV1 to NV9	~	~	Moderate	APA/Contractor	
9	ENVFEAT	Mobilisation and pipeline construction (all)	Site access & construction works causing disturbance to EPBC or FFG Act listed threatened species, native vegetation and native fauna.	(B) Biodiversity Additional disturbance (beyond that approved) to EPBC or FFG Act listed threatened community or F&F species, or injury to fauna including threatened fauna due to works (e.g. Striped Legless Lizard), habitat fragmentation and barriers to fauna movement	~	~	High	APA National HSE Induction, APA National Environmental Awareness Induction, CEMP Induction, location specific inductions, Toolbox talks Environmental control B3 Contractor awareness	Alignment chosen to minimise native vegetation impact. Develop and implement a tree management plan informed by arborist assessment (B23)	Access environmental controls (A1-A12) Set boundaries for vegetation removal (B1)	Establish required exclusion areas to protect trees, native vegetation and habitat values (B1 - B23) Lighting, noise and vibration controls (B5, B6, NV1, NV2) Biosecurity signage from landholders	Works to manage biosecurity risks and address Catchment and Land Protection Act 1994 (CaLP Act) obligations (B2) Exclusion zones for retained vegetation on site maps and plans and delineated onsite Construction drawings will clearly delineate the site, access points and sensitive areas (e.g. native vegetation) in or adjacent to the site.	Implement biodiversity controls (B1 to B23). Additional environmental controls and requirements as detailed in the CEMP.	APA HSE GP 07.01 Incident Reporting Investigation & Analysis Requirements for assessment and reporting of accidental damage to vegetation (B16)	A Works in Conservation Area (WICA) approval will be required for any works proposed in a Conservation Area. EPBC approval Notification of access to property landholders 560-PR-QM-0001 Landholder Engagement Procedure Environmental controls for Social Stakeholder consultation (S1) Site access and property management (S3) Community and residential accessibility (S4) Landholder communication (S5)	Implement biodiversity management requirements including but not limited to: land clearance and vegetation loss (B1) Invasive weeds, pathogens, pests and waste (B2) Site rehabilitation (B7) Topsoil management (B8) Fauna management (B9) Surface water sedimentation and runoff impacts to ecological values (B10) Golden Sun Moth (B19) Striped Legless Lizard (B20) Growing Grass Frog (B21) Platypus (B22) Genetic diversity (B15) Site-specific mitigation (B18)	Engagement of environmental team for approval support on clearing Management Offset strategy	As per CEMP including work site inspections, environmental audits, incident reports	~	~	Moderate	APA/Contractor	
12	RISKACTIV	Pipeline construction / Wollert compressor station upgrade (clear and grade, trenching, bulk earthworks, civil works)	Damage or destruction of Aboriginal Heritage and historic heritage items / sites during works	(CH) Cultural Heritage Impacts additional to those impacts approved through the CHMPs and Heritage Victoria consents, e.g. damage to registered and unidentified Aboriginal cultural heritage places, impacts on intangible heritage values, impacts on archaeologically sensitive landforms, damage to listed historic heritage sites, and unlisted historic heritage sites)	~	~	High	APA National HSE Induction, APA National Environmental Awareness Induction, CEMP Induction, location specific inductions, Toolbox talks Environmental control B3 Contractor awareness	Construction activities and alignment to occur within approved CHMP Activity area	Limit access to authorised areas, tracks, set down areas etc.	Erect barriers and controls around heritage places if and when required by CHMP/Heritage Consent/cultural heritage advisor. Implement CHMPs 16593 and 16594 including salvage works to mitigate loss of heritage places Site set up and boundaries to be clearly delineated and established within CHMP Activity area.	Implementation of CHMPs and Cultural Heritage Environmental Controls (CH1 - CH4) Delineation of CHMP Activity area boundary on site maps/plans.	Additional environmental controls and requirements as detailed in the CEMP.	APA HSE GP 07.01 Incident Reporting Investigation & Analysis APA HSE TB ENV 008 Unexpected finds protocol CHMP Contingency protocols	In the event of an unexpected find or suspected item, work would cease in the affected area and the area would be secured. Relevant approval authority would be contacted for advice on how to proceed. Works would cease in that area until instruction to proceed is received.	Approval of CHMP 16593 and CHMP 16594 prior to works Consent from Heritage Victoria to impact Holden Cobble road (VH 7822-2283)	Environmental controls for Cultural Heritage (CH1 to CH4)	APA HSE TB ENV 008 Unexpected finds protocol. APA HSE EP 13.07.02 Aboriginal Cultural Heritage Management, APA HSE EP 13.07.01 Natural and Built Heritage CHMP 16593 and CHMP 16594 Cultural Heritage Management Plans (CH1) Archaeologically sensitive landforms (CH2) Listed and unlisted historic heritage sites (CH3 and CH4)	Inspections, monitoring and assessment of compliance with CHMP requirements and Heritage Victoria consent	~	~	Moderate	APA/Contractor
14	RISKACTIV	Pipeline Construction / Wollert Compressor Station Upgrade (Construction outside normal hours)	Noise, vibration and lighting	(NV) Noise and Vibration (LV) Landscape and visual (S) Social Nuisance noise and vibration, fauna impacts, night-time lighting impacts, community impact (noise), reputational impact	~	~	High	APA National HSE Induction, APA National Environmental Awareness Induction, CEMP Induction, location specific inductions, Toolbox talks Environmental control B3 Contractor awareness	Construction methods and locations to minimise noise and vibration as far as practicable	Access environmental controls, including vehicle inspections and working hours (A1-A12)	LV4 and B5: Light generated during night construction activities such as HDD, will be managed in general accordance with the requirements in Australian Standard AS/NZS 4282:2019 Control of the obtrusive effects of outdoor lighting. Generally, lighting would be designed to minimise off-site light spill.	Noise and vibration controls (NV2, B6) Noise limiters around sensitive habitats and fauna (B14)	Construction noise and vibration will be managed with reference to EPA Publication 1254 and EPA Publication 1834 (NV1). Implement controls for Striped Legless Lizard (B20). Additional environmental controls and requirements as detailed in the CEMP.	Complaints management process - APA HSE GP 07.01 Incident Reporting	Normal working hours will be 7 am - 6 pm, with a 5.5 day working week. Construction may occur up to 24 hours a day, 7 days a week where required for specific tasks, only with prior approval by APA and notification of affected residents. 560-PR-QM-0001 Landholder Engagement Environmental controls for Social Stakeholder consultation (S1) Site access and property management (S3) Community and residential accessibility (S4) Landholder communication (S5)	Lighting impacts (LV4) lighting impacts to fauna (B5) Noise impacts to fauna (B6) Access dust, noise and lighting (B14) Construction noise and vibration (out of hours) (NV2) Vibration safe working distances (NV4) Receptor mitigation (NV5) Off-site measures (NV7) Reduce community disruption (S1) Environmental controls for air quality (AQ1 to AQ4)	Out of hours work approval process and communication plan APA HSE EP 13.03.01 - Environmental Procedure - Gas, Dust and Light Emission Management, Construction Dust Management (AQ1) Construction and Noise and Vibration Management as required by CEMP (NV1 to NV10)	Prestart checks of plant, regular maintenance and servicing of plant	~	~	Moderate	APA/Contractor	

16	RISKACTIV	Pipeline construction (trenching)	Open trench excavations, construction in proximity to existing slopes, construction near sites of special geological or geomorphological significance	(GM) Ground movement (Open trench excavations in unstable ground (granular material) leading to potential instability and collapse or material disturbing nearby land and native vegetation. Open trench excavations in stable ground (cohesive material) leading to potential elastic movements within the soil subjecting nearby sensitive receptors to unacceptable strains. Open trench excavations leading to ground movement, erosion and potential slope instability.)	2	4	Moderate	APA National HSE Induction, APA National Environmental Awareness Induction, CEMP Induction, location specific inductions, toolbox talks, licensed fauna handlers Environmental control B3 Contractor awareness	Prove third party assets prior to works and agree and implement protection requirements (GM1) Design to be informed by geotechnical and hydrogeological conditions (GM2)			Trench excavation works are to be managed as per GM3, including minimising the time trenches are open as far as reasonably practicable. Implement measures to manage soil dispersion, erosion, consolidation and swelling risks as per GM4 Implement sodic soil management measures as per GM7.		APA HSE GP 07.01 Incident Reporting APA HSE GP 07.02 Incident Investigation & Analysis	Dial before you dig. Confirm third party asset owner requirements for protection as per GM1	Ground movement requirements GM1 to GM7	Monitor ground movement, settlement and land stability as required by the CEMP	1	4	Moderate	APA/Contractor	
17	RISKACTIV	Pipeline Construction (trenching - open cut trenching through water courses (e.g. Jacksons Creek, Merri Creek))	Open cut trenching through watercourse	(SW) Surface Water (S) Social (GM) Ground movement (B) Biodiversity Disturbance to the waterway or floodplain function, potential for river bed or bank erosion at Jacksons Creek Permanent changes to the waterway or floodplain function Increased riverbed or bank erosion impacting river health or surrounding property and infrastructure Loss or degradation of aquatic habitat, barriers to passage for threatened and non-threatened aquatic species	3	4	High	APA National HSE Induction, APA National Environmental Awareness Induction, CEMP Induction, location specific inductions, toolbox talks Environmental control B3 Contractor awareness	Implement site specific management and rehabilitation measures as per SW4, SW7 and SW8 Third party asset management (GM1) Design and construction to be informed by geotechnical and hydrogeological conditions (GM2)	Form discrete stockpile segments. Provide regular gaps in stockpiles. Avoid stockpiling material near waterways. Material will be located away from the top of banks.	Manage trench excavation support and duration as per GM3 Implement measures to manage soil dispersion, erosion, consolidation and swelling risks as per GM4 and SW4	Minimise time required for works at Jacksons creek and carry out works as per B17, B21, B22 Develop and implement sodic soil management measures as per GM7	Additional environmental controls and requirements as detailed in the CEMP.	APA HSE GP 07.01 Incident Reporting APA HSE GP 07.02 Incident Investigation & Analysis Flood Management and Response Plan (SW9) Emergency Response Plans will be developed and implemented for the construction phase of the Project (SA4)	Trenched construction across a watercourse may only occur with APA approval and in accordance with works on waterway permit requirements. Environmental controls for Social Stakeholder consultation (S1) Site access and property management (S3) Community and residential accessibility (S4) Landholder communication (S5)	Land clearance and vegetation loss (B1) Site rehabilitation (B7) Invasive weeds, pathogens, pests and waste (construction) (B2) Surface water sedimentation and runoff impacts to ecological values (B10) Surface water contamination (B11) Disturbance of existing contamination (C1) Leaks or spills (C6) River bed or bank erosion (SW4) Site specific rehabilitation for Jackson's Creek (SW8) Floating silt curtains and water quality monitoring (B10) Works on waterways creating a barrier that impedes fish passage and / or migration (B17)	Follow CEMP and Site Rehabilitation Plan (SW3) Follow site specific rehabilitation measure (SW3 and 4) and for Jacksons Creek (SW8)	Implement visual monitoring as per SW6 and surface water and biological monitoring program as per SW5	2	4	Moderate	APA/Contractor
19	RISKACTIV	Pipeline Construction / Wicket Compressor Station Upgrade (Blasting activities)	Blasting activities producing vibration and flyrock	(NV) Noise and Vibration (AC) Air Quality (GHG) Greenhouse gas (S) Social (SA) Safety Vibration impacts to property/assets/buildings and amenity, noise, dust and amenity impacts to surrounding land uses, consumption of fossil fuel based explosives, safety impacts on workers and public from flyrock	2	5	High	APA National HSE Induction, APA National Environmental Awareness Induction, CEMP Induction, location specific inductions, toolbox talks Environmental control B3 Contractor awareness	Construction methods and locations to minimise dust, noise and vibration as far as practicable Blasting informed by blast impact study and management plan (NV3)	Exclusion zones will be established and monitored during blasting activities.	Construction noise and vibration management plan and blast impact study and management plan as required by CEMP (NV3) Use of PPE Environmental controls for noise and vibration (NV1 to NV9) Environmental controls for air quality (AQ1 to AQ5)	Additional environmental controls and requirements as detailed in the CEMP.	Complaints management process - APA HSE GP 07.01 Incident Reporting Emergency Response Plans will be developed and implemented for the construction phase of the Project (SA4)	560-PR-QM-0001 Landholder Engagement Letters to affected dwellings (NV6) Environmental controls for Social Stakeholder consultation (S1) Site access and property management (S3) Community and residential accessibility (S4) Landholder communication (S5)	Environmental control GG1 - (e) Fossil fuel based explosives Environmental controls for noise and vibration (NV1 to NV10) Environmental controls for air quality (AQ1 - AQ5) Dilapidation surveys if required to qualify impacts from vibration to receptors	Out of hours work approval process and communication plan Construction Dust Management (AQ1) Personnel to wear PPE (minimum of hardhats, high visibility clothing, eye protective wear, steel toe boots)	Prestart checks of plant, regular maintenance and servicing of plant Monitoring and reporting as per GG1	3	5	Low	APA/Contractor	
20	RISKACTIV	Pipeline construction (trenchless construction methods - e.g. Horizontal Directional Drilling, thrust bore, pipe jack under railway)	trenchless construction leading to ground movement impacts, release of contaminated materials to waterway / drain / land, or impacts on river bed or bank erosion affecting river health or surrounding property and infrastructure	(C) Contamination (SW) Surface water (GM) Ground movement (S) Social (LU) Land use (B) Biodiversity Soil/water contamination, river bed or bank erosion, volume loss associated with trenchless pipe installation, ground deformation resulting from horizontal boring or HDD in unstable soils subjecting nearby assets and features to unacceptable strains, encountering poor ground conditions, unanticipated asset damage, HDD blow out, release of drilling fluids, degradation of aquatic habitat	3	2	Low	APA National HSE Induction, APA National Environmental Awareness Induction, CEMP Induction, location specific inductions, toolbox talks Environmental control B3 Contractor awareness	The sump pit will be positioned (during site planning) so as all runoff from the drilling compound will flow into it and provide a buffer for drilling fluid returns. Drilling fluids are to be selected as per C10 third party asset management (GM1) Design and construction to be informed by geotechnical and hydrogeological conditions (GM2) Trenchless bore support (GM5) Confirmation of ground risk (GM6)	All facilities utilised in the surface mud handling (mixing, cleaning and pumping) will be bunded. Environmental controls for contamination (C1 to C9)	Implement controls as per SW1 to mitigate trenchless construction risks for surface water.	Manage and dispose of drilling fluids as per C10 Manage contaminated groundwater as per C4	Additional environmental controls and requirements as detailed in the CEMP.	APA HSE GP 07.01 Incident Reporting APA HSE GP 07.02 Incident Investigation & Analysis Emergency Response Plans will be developed and implemented for the construction phase of the Project (SA4)	Dial before you dig. Confirm third party asset owner requirements for protection as per GM1	Land clearance and vegetation loss (B1) Site rehabilitation (B7) Invasive weeds, pathogens, pests and waste (construction) (B2) Surface water sedimentation and runoff impacts to ecological values (B10) Surface water contamination (B11) Environmental controls for contamination (C1 to C9) River bed or bank erosion (SW4)	HDD SWMS APA HSE EP 13.06.02 -Watercourse Management APA HSE EP 13.06.01 Soil and Land Management Drilling fluids requirements (GW5)	An Inspection and Test Plan will be developed to ensure quality control during the HDD activities A volumetric drilling fluid tracking program will be implemented to monitor fluid use Monitor ground movement, settlement and land stability as required by the CEMP	3	2	Low	APA/Contractor
21	RISKACTIV	Pipeline construction / Commissioning (Pipe stringing and welding, pipe cleaning (grit blasting of pipe))	Waste generation including from cleaning and preparation of weld joints	(C) Contamination (W) Waste (S) Social (AQ) Air Quality (Soil/water contamination, waste management, community impact (dust))	3	2	Low	APA National HSE Induction, APA National Environmental Awareness Induction, CEMP Induction, location specific inductions, toolbox talks, Asbestos management plan, Asbestos removal licence, Asbestos awareness training, staff deemed competent to operate plant Environmental control B3 Contractor awareness		Wastes and hazardous material to be bundled and contained in line with guideline requirements for waste classification.	Manage waste streams as per C8	Take waste to waste management facility - ticket on delivery, bagging of pipeline coating removed for disposal at an approved facility. Environmental controls for contamination (C1 to C9) Environmental controls for Air Quality - Dust Management (AQ1, AQ2)	Additional environmental controls and requirements as detailed in the CEMP.	APA HSE GP 07.01 Incident Reporting APA HSE GP 07.02 Incident Investigation & Analysis	560-PR-QM-0001 Landholder Engagement Environmental controls for Social Stakeholder consultation (S1) Site access and property management (S3) Community and residential accessibility (S4) Landholder communication (S5)	Environmental controls for contamination (C1 to C9) Environmental controls for air quality (AQ1 to AQ4) Environmental controls for Waste (W1 to W6)	APA HSE EP 13.05.01 - Regulated Waste Management	Site inspections and monitoring as per CEMP and C1 to C9	3	2	Low	APA/Contractor

22	RISKACTIV	Pipeline construction / Commissioning (Pipe stringing and welding, pipe cleaning)	Use of fuels and chemicals during application of joint coating by hand (overspray)	(C) Contamination (Soil/water contamination)	3	2	Low	APA National HSE Induction, APA National Environmental Awareness Induction, CEMP Induction, location specific inductions, toolbox talks, staff deemed competent to operate plant Environmental control B3 Contractor awareness		Manage chemicals, fuels and hazardous material (C4)	Methods for controlled spraying Testing, containment and classification for disposal in accordance with EPA guidelines. Containers disposed of at appropriate waste facility	Additional environmental controls and requirements as detailed in the CEMP.	Spill Kits APA HSE GP 11.01 Emergency Management, Emergency response protocol. APA HSE EP 13.04.01 Chemical Spill Management Emergency Response Plans will be developed and implemented for the construction phase of the Project (SA4)	Environmental controls for contamination (C1 to C9)	No spraying in windy conditions, wind meters, SDS, APA HSE GP 08.02 Job Risk Assessment	Chem Cert or third party used to supervise spraying	3	2	Low	APA/Contractor		
23	RISKACTIV	All activities with specific focus on pipeline construction / Worklet Compressor Station Upgrade (Pipe stringing and welding, mechanical / electrical works)	Fire/ignition source - fire starts from project related activities and spreads offsite, or fire starts off-site and burns into the project area where above-ground assets or workers may be.	(AC) Air Quality (B) Biodiversity (C) Contamination (LU) Land Use (S) Social (SA) Safety (Fire - causing health risks due to burns, heat and smoke, potential contamination, and loss of habitat)	2	4	Moderate	APA National HSE Induction, APA National Environmental Awareness Induction, CEMP Induction, location specific inductions, toolbox talks, Qualified welders Environmental control B3 Contractor awareness	Vehicles will be checked daily to ensure that combustible materials such as grass and debris do not build up in areas where ignition may occur (A12) Fire extinguishers in all construction vehicles (A11)	Set up of site compounds and storages away from sensitive receptors (i.e., residences, significant fauna habitat areas, vegetated areas) Fire protection measures (SA3)	Documented procedures for use of ignition sources and limitations based on locations and weather conditions (i.e., fire ratings) EMM SAS - Bushfire Management Plan EMM C6 - Manage chemicals, fuels and hazardous materials	No hot work on days of extreme fire danger Additional environmental controls and requirements as detailed in the CEMP.	Fire extinguishers (complying with relevant Australian Standards) are to be provided and validated in all construction vehicles. Isolation plans, Containment, APA HSE GP 11.01 Emergency Management, emergency response plans - engage RFS/CFA, IOC Health and Safety Management Plan (SA3), Bushfire Management Plan (SA5) and Emergency Response Plans will be developed and implemented for the construction phase of the Project (SA4)	CFA approval on high risk fire days, permit to work	Hot works procedure 037, APA HSE GP 08.02 Job Risk Assessment, Permits designated hot work areas, 320-PR-HS-0018 Fire Prevention and Control SWMS for fire prevention control	Permit to work review process, FM global audits (insurer) Vehicles will be checked daily to ensure that combustible materials such as grass and debris do not build up in areas where ignition may occur. Monitor weather forecasts and fire restrictions/bans and existing fires Monitoring as required by relevant management plans	1	4	Moderate	APA/Contractor		
24	RISKACTIV	Pipeline Construction / Worklet Compressor Station Upgrade (Pipe stringing and welding, Civil works - Raw material consumption)	Embedded emissions associated with the production of raw materials	(GG) Greenhouse gas emissions	5	2	Moderate	APA National HSE Induction, APA National Environmental Awareness Induction, CEMP Induction, location specific inductions, toolbox talks Environmental control B3 Contractor awareness	Environmental control GG1 - (a) Low embodied energy materials (c) Locally sourced materials Low embodied energy materials (e.g. substituting concrete mixes) will be considered and used where practicable.		Additional environmental controls and requirements as detailed in the CEMP.	APA HSE GP 07.01 Incident Reporting APA HSE GP 07.02 Incident Investigation & Analysis			Monitor and report on greenhouse gas generation as per GG1		5	2	Moderate	APA/Contractor		
30	RISKACTIV	All activities (Machinery movement and operation, general construction/commissioning/rehabilitation works)	Construction activities resulting in amenity impacts, e.g. noise and vibration, dust, odour, visual amenity	(NV) Noise and Vibration (AC) Air Quality (B) Biodiversity (S) Social (LV) Landscape and visual (LU) Land use (Nuisance noise, vibration and dust, and odour. Includes fauna impacts. Visual impacts from presence of works. Impacts on residences as well as community facilities)	4	3	Moderate	APA National HSE Induction, APA National Environmental Awareness Induction, CEMP Induction, location specific inductions, toolbox talks Environmental control B3 Contractor awareness	Construction methods and locations to minimise noise and vibration as far as practicable	Access environmental controls, including vehicle inspections and working hours (A1-A12)	Set up of site compounds and storages away from sensitive receptors (i.e., residences, significant fauna habitat areas, vegetated areas) Remove machinery, materials and temporary infrastructure from site when no longer required (LV3)	Wind barrier (such as shade cloth to slow down winds) as outlined in EPA Publication 1834 along upwind boundary when next to residences, dust Management (AQ1) Implement noise and dust measures around sensitive habitats and fauna (B14)	Noise and vibration control (NV1-10, B6)	Construction noise and vibration will be managed with reference to EPA Publication 1254 and EPA Publication 1834 (NV1) Implement controls for Striped Legless Lizard (B20) Additional environmental controls and requirements as detailed in the CEMP.	560-PR-QM-0001 Landholder Engagement Notification letters (NV6) Environmental controls for Social Stakeholder consultation (S1) Site access and property management (S3) Community and residential accessibility (S4) Landholder communication (S5)	Construction noise and vibration (daytime) (NV1) Construction noise and vibration (out of hours) (NV2) Vibration safe working distances (NV4) Receptor mitigation (NV5) Off-site measures (NV7) Reduce community disruption (S1) Environmental controls for air quality (AQ1 to AQ4)	Out of hours work approval process and communication plan Construction Dust Management (AQ1)	Prestart checks of plant, regular maintenance and servicing of plant Monitoring as per AQ1 and to assess compliance with NV1 to NV10	4	3	Moderate	APA/Contractor
31	RISKACTIV	All activities (Refueling, use of plant / machinery, use of chemicals and fuels)	Fuel leak or spill, Regulated waste from spill clean-up, fuel usage	(C) Contamination (W) Waste (GW) Groundwater (SW) Surface water (GG) Greenhouse gas (SA) Safety (Soil/water contamination, waste management, greenhouse gas emissions, impact on human health)	3	2	Low	APA National HSE Induction, APA National Environmental Awareness Induction, CEMP Induction, location specific inductions, toolbox talks, spill response training Environmental control B3 Contractor awareness	Storage of fuels onsite in small quantities and banded. Storage of fuels, oils and chemicals outside of sensitive areas (i.e., waterways, native vegetation, exclusion areas, etc.) and storage offsite wherever possible Minor refueling using temporary bund/containment (i.e. tarp) to prevent spills Environmental controls for contamination (C1 to C9) Environmental controls for fuels and chemicals (F1 to F8)	Use of signage for storage areas, provision of bunding for quantities stored, storage as per Global Harmonised System requirements	Environmental controls for contamination (C1 to C9) Environmental controls for fuels and chemicals (F1 to F8) Spill kit material disposed of as regulated waste	Additional environmental controls and requirements as detailed in the CEMP.	APA HSE GP 07.01 Incident Reporting APA HSE GP 07.02 Incident Investigation & Analysis Spill Kits kept with all refuelling equipment (C9) Leaks or spills (C8) Emergency Response Plans will be developed and implemented for the construction phase of the Project (SA4)	Environmental controls for contamination (C1 to C9) GG1 - Greenhouse gas emissions during construction (GG1) Environmental controls for Waste (W1 to W6)	SOP for all equipment, Mobile plant protocol, SWMS APA HSE EP 13.05.01 - Regulated Waste Management APA HSE GP 08.04 Workplace Inspections and Hazard Reporting	Prestart checks of plant, regular maintenance and servicing of plant Environmental control GG1 - (b) Fuel efficiency targets Environmental control C6 - Manage chemicals, fuels and hazardous materials Implement surface water and biological monitoring program as per EMM SW5	3	2	Low	APA/Contractor		



APPENDIX F MANAGEMENT PLANS

Management plans must be developed, approved and implemented as required in the table below consistent with the requirements of permits, approvals, EES (including relevant specialist studies) legislation, regulations and applicable guidelines and standards. Specific environmental management measures (EMM) from the EES referenced in Section 8 that must be addressed in the preparation of the management plans are also listed. Where APA is responsible for preparing a management plan, the construction contractor is responsible for implementing those plans within their scope.

Management Plans

Management Plan	EMM ref (section 8)	Responsibility	Approval
Contractor CEMP and sub plans			
Contractors CEMP	ALL	Construction contractor	APA
Blast Impact Study and Impact Management Plan	NV3, NV8	Construction contractor	APA
Construction Noise and Vibration Management Plan	NV1 – NV9	Construction contractor	APA
Emergency Response Plan (construction)	SA3, SA4	Construction contractor	APA
Environmental monitoring plan	As per section 1.2.2 and EMMs, particularly AQ1, C1, C5, C7, CH3, GG1, GW3, GM1, GM4, GM5, LV7, NV1, NV2, SA3, S22, SW1, SW3, SW4, SW5, and SW8	Construction contractor	APA
Flood Management and Response Plan	SW9	Construction contractor	APA

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



Management Plan	EMM ref (section 8)	Responsibility	Approval
Ground Movement Management Plan (including sodic soils)	GM1 – GM7	Construction contractor	APA
Planting and remediation plan	LV7, S21	Construction contractor	APA
Site-specific environmental management plan(s) including sediment and erosion control plans, site maps, etc.	All, and particularly SW7, SW8, GM4	Construction contractor	APA
Soil Management Plan (including contaminated soil and PASS)	C1 – C9	Construction contractor	APA
Traffic management plan(s)	LU4, SA6, S3	Construction contractor	Relevant road management authority
Flora and Fauna Management Plan			
Flora and Fauna Management Plan including Kangaroo Management Plan, Platypus Contingency Plan, Threatened Species Handling and Relocation Protocol, Golden Sun Moth Management Plan, Striped Legless Lizard Management Plan and Growling Grass Frog Salvage and Translocation Plan	B9, B20, B21, B22	APA	APA/DELWP Pipelines
Tree Management Plan	B4, B23	APA	APA
Cultural Heritage Management Plans			
CHMP 16593	CH1 – CH4	APA Construction contractor to implement	Wurundjeri Woi Wurrung Cultural Heritage Aboriginal Corporation
CHMP 16594	CH1 – CH4	APA Construction contractor to implement	Aboriginal Victoria

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



Management Plan	EMM ref (section 8)	Responsibility	Approval
Other plans			
Project Construction Health and Safety Management Plan	Pipelines Act, SA3, SA4	APA (18035-PL-HSE-0003)	Minister for Energy, Environment and Climate Change
National Emergency Response Management Plan 320-PL-ER-0001	Pipelines Act, SA3, SA4	APA (320-PL-ER-0001)	APA
Bushfire Management Plan	SA5	Construction Contractor	APA

DRAFT

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



APPENDIX G ENVIRONMENTAL LINE LIST

DRAFT

Environmental Line List

ID	Approx KP* start	Approx KP* end	Flora/Fauna	Watercourse	Soil	Weed/ Pest	Groundwater	Cultural heritage	Landholder	Road and Rail	Constraint type	Description	Comment	Distance to construction footprint (approx metres)
1	0.00	0.00							X		Sensitive Noise Receptor	C001	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	102
2	0.00	0.00							X		Sensitive Noise Receptor	C002	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	521
3	0.00	0.00							X		Sensitive Noise Receptor	C003	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	573
4	0.00	0.00							X		Sensitive Noise Receptor	C004	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	729
5	0.00	0.00							X		Sensitive Noise Receptor	C005	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	918
6	0.00	0.00							X		Sensitive Noise Receptor	C006	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	749
7	0.01	0.01							X		Sensitive Noise Receptor	C007	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	748
8	0.05	0.05							X		Sensitive Noise Receptor	C008	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	747
9	0.12	0.12							X		Sensitive Noise Receptor	C009	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	751
10	0.18	0.18							X		Sensitive Noise Receptor	C010	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	761
11	0.24	0.24							X		Sensitive Noise Receptor	C011	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	764
12	0.28	0.28							X		Sensitive Noise Receptor	C012	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	761
13	0.43	0.43							X		Sensitive Noise Receptor	C013	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	761
14	0.53	0.53							X		Sensitive Noise Receptor	C014	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	762
15	0.54	0.54							X		Sensitive Noise Receptor	C015	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	137
16	0.59	0.59							X		Sensitive Noise Receptor	C016	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	369
17	0.60	0.60							X		Sensitive Noise Receptor	C017	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	761
18	0.64	0.64							X		Sensitive Noise Receptor	C018	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	760
19	0.73	0.73							X		Sensitive Noise Receptor	C019	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	760
20	0.80	0.80							X		Sensitive Noise Receptor	C020	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	760
21	0.91	0.91							X		Sensitive Noise Receptor	C021	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	745
22	0.96	0.96							X		Sensitive Noise Receptor	C022	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	739
23	0.96	0.96	X								Community Facility	Kororoit Creek	Open space and natural area - KP# Located in existing easement	
24	1.00	1.00							X		Sensitive Noise Receptor	C023	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	737
25	1.11	1.11							X		Sensitive Noise Receptor	C024	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	732
26	1.14	1.14							X		Sensitive Noise Receptor	C025	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	754
27	1.17	1.17							X		Sensitive Noise Receptor	C026	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	779
28	1.21	1.21							X		Sensitive Noise Receptor	C027	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	800
29	1.23	1.23							X		Sensitive Noise Receptor	C028	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	801
30	1.25	1.34						X			Heritage	Aboriginal Cultural Sensitivity	KP# Located in existing easement	
31	1.25	1.25							X		Sensitive Noise Receptor	C029	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	748
32	1.28	1.28							X		Sensitive Noise Receptor	C030	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	771
33	1.32	1.32							X		Sensitive Noise Receptor	C031	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	741
34	1.34	1.34							X		Sensitive Noise Receptor	C032	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	796
35	1.36	1.36							X		Sensitive Noise Receptor	C033	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	855
36	1.38	1.38							X		Sensitive Noise Receptor	C034	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	873
37	1.41	1.50						X			Heritage	Aboriginal Cultural Sensitivity	KP# Located in existing easement	
38	1.42	1.42							X		Sensitive Noise Receptor	C035	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	862
39	1.43	1.43							X		Sensitive Noise Receptor	C036	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	75
40	1.45	1.45							X		Sensitive Noise Receptor	C037	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	851
41	1.46	1.46							X		Sensitive Noise Receptor	C038	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	812
42	1.48	1.48							X		Sensitive Noise Receptor	C039	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	841

Environmental Line List

43	1.51	1.51							X	Sensitive Noise Receptor	C040	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	831
44	1.55	1.55							X	Sensitive Noise Receptor	C041	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	815
45	1.60	1.74						X		Heritage	Aboriginal Cultural Sensitivity	KP# Located in existing easement	
46	1.60	1.60							X	Sensitive Noise Receptor	C042	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	797
47	1.62	1.62							X	Sensitive Noise Receptor	C043	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	792
48	1.65	1.65							X	road	FARRIER BOULEVARD	KP# Located in existing easement	
49	1.68	1.68							X	Sensitive Noise Receptor	C044	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	778
50	1.72	1.72							X	Sensitive Noise Receptor	C045	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	760
51	1.73	1.73							X	road	JOURNEY DRIVE	KP# Located in existing easement	
52	1.75	1.75							X	Sensitive Noise Receptor	C046	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	493
53	1.76	1.76							X	Sensitive Noise Receptor	C047	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	764
54	1.80	1.80							X	Sensitive Noise Receptor	C048	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	747
55	1.83	1.83							X	Sensitive Noise Receptor	C049	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	737
56	1.87	1.87							X	Sensitive Noise Receptor	C050	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	728
57	1.87	2.11						X		Heritage	Aboriginal Cultural Sensitivity	KP# Located in existing easement	
58	1.89	1.89							X	Sensitive Noise Receptor	C051	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	727
59	1.92	1.92							X	Sensitive Noise Receptor	C052	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	726
60	1.96	1.96							X	Sensitive Noise Receptor	C053	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	717
61	1.99	1.99							X	Sensitive Noise Receptor	C054	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	720
62	2.05	2.05							X	Sensitive Noise Receptor	C055	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	715
63	2.10	2.10							X	Sensitive Noise Receptor	C056	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	723
64	2.13	2.13							X	Sensitive Noise Receptor	C057	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	721
65	2.16	2.16							X	Sensitive Noise Receptor	C058	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	721
66	2.18	2.25						X		Heritage	Aboriginal Cultural Sensitivity	KP# Located in existing easement	
67	2.20	2.20							X	Sensitive Noise Receptor	C059	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	720
68	2.25	2.25							X	Sensitive Noise Receptor	C060	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	1
69	2.25	2.25							X	Sensitive Noise Receptor	C061	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	222
70	2.26	2.26							X	Sensitive Noise Receptor	C062	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	717
71	2.28	2.34						X		Heritage	Aboriginal Cultural Sensitivity	KP# Located in existing easement	
72	2.29	2.29							X	Sensitive Noise Receptor	C063	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	712
73	2.29	2.29							X	Sensitive Noise Receptor	C064	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	706
74	2.31	2.31							X	road	BEATTYS ROAD	KP# Located in existing easement	
75	2.32	2.32							X	road	BEATTYS ROAD	KP# Located in existing easement	
76	2.33	2.33							X	road	MODENA ROAD	KP# Located in existing easement	
77	2.33	2.33							X	Sensitive Noise Receptor	C065	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	702
78	2.36	2.36							X	Sensitive Noise Receptor	C066	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	692
79	2.41	2.41							X	Sensitive Noise Receptor	C067	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	697
80	2.44	2.44							X	Sensitive Noise Receptor	C068	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	695
81	2.49	2.49							X	Sensitive Noise Receptor	C069	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	697
82	2.53	2.53							X	Sensitive Noise Receptor	C070	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	710
83	2.59	2.59							X	Sensitive Noise Receptor	C071	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	720
84	2.63	2.63							X	Sensitive Noise Receptor	C072	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	729
85	2.68	2.68							X	Sensitive Noise Receptor	C073	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	730
86	2.72	2.72							X	Sensitive Noise Receptor	C074	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	732
87	2.76	2.76							X	Sensitive Noise Receptor	C075	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	726
88	2.77	2.77							X	Sensitive Noise Receptor	C076	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	811
89	2.78	2.78							X	Sensitive Noise Receptor	C077	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	742

Environmental Line List

90	2.82	2.82							X	Sensitive Noise Receptor	C078	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	806
91	2.83	2.83							X	Sensitive Noise Receptor	C079	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	838
92	2.86	2.86							X	Sensitive Noise Receptor	C080	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	875
93	2.91	2.91							X	Sensitive Noise Receptor	C081	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	841
94	2.93	2.93							X	Sensitive Noise Receptor	C082	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	815
95	2.95	2.95							X	Sensitive Noise Receptor	C083	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	791
96	2.98	2.98							X	Sensitive Noise Receptor	C084	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	761
97	2.99	2.99							X	Sensitive Noise Receptor	C085	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	812
98	3.00	3.00							X	Sensitive Noise Receptor	C086	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	802
99	3.01	3.01							X	Sensitive Noise Receptor	C087	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	731
100	3.03	3.03							X	Sensitive Noise Receptor	C088	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	774
101	3.03	3.03							X	Sensitive Noise Receptor	C089	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	722
102	3.07	3.07							X	Sensitive Noise Receptor	C090	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	729
103	3.08	3.08							X	Sensitive Noise Receptor	C091	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	513
104	3.11	3.11							X	Sensitive Noise Receptor	C092	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	336
105	3.11	3.11							X	Sensitive Noise Receptor	C094	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	183
106	3.12	3.12							X	Sensitive Noise Receptor	C093	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	723
107	3.14	3.14							X	Sensitive Noise Receptor	C095	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	394
108	3.15	3.17	X							Native veg	Victorian Volcanic Plains - Plains Grassland	NTGVVP and FFG - KP# located in existing easement	
109	3.17	3.17							X	Sensitive Noise Receptor	C096	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	727
110	3.17	3.17							X	Sensitive Noise Receptor	C097	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	756
111	3.17	3.17							X	Sensitive Noise Receptor	C098	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	797
112	3.17	3.17							X	Sensitive Noise Receptor	C099	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	837
113	3.18	3.18							X	road	MELTON HIGHWAY	KP# Located in existing easement	
114	3.18	3.18	X							Native veg	Victorian Volcanic Plains - Plains Grassland	FFG - KP# located in existing easement	
115	3.26	3.26							X	Sensitive Noise Receptor	C101	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	744
116	3.26	3.26							X	Sensitive Noise Receptor	C100	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	352
117	3.28	3.28							X	Sensitive Noise Receptor	C102	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	456
118	3.28	3.28							X	Sensitive Noise Receptor	C103	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	729
119	3.31	3.31							X	Sensitive Noise Receptor	C104	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	715
120	3.34	3.34							X	Sensitive Noise Receptor	C105	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	682
121	3.35	3.35							X	Sensitive Noise Receptor	C106	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	722
122	3.36	3.36							X	Sensitive Noise Receptor	C107	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	738
123	3.37	3.37							X	Sensitive Noise Receptor	C108	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	760
124	3.39	3.39							X	Sensitive Noise Receptor	C109	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	722
125	3.42	3.42							X	Sensitive Noise Receptor	C110	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	726
126	3.44	3.44							X	Sensitive Noise Receptor	C111	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	730
127	3.46	3.46							X	Sensitive Noise Receptor	C112	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	732
128	3.48	3.48							X	Sensitive Noise Receptor	C113	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	735
129	3.51	3.51							X	Sensitive Noise Receptor	C114	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	733
130	3.53	3.53							X	Sensitive Noise Receptor	C115	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	743
131	3.55	3.55							X	Sensitive Noise Receptor	C116	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	735
132	3.57	3.57							X	Sensitive Noise Receptor	C117	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	738
133	3.59	3.59							X	Sensitive Noise Receptor	C118	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	742
134	3.62	3.62							X	Sensitive Noise Receptor	C119	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	745
135	3.64	3.64							X	Sensitive Noise Receptor	C120	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	737
136	3.66	3.66							X	Sensitive Noise Receptor	C121	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	740
137	3.68	3.68							X	Sensitive Noise Receptor	C122	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	741

Environmental Line List

188	5.83	5.88	X												Native veg	Victorian Volcanic Plains - Plains Grassland	NTGVVP and FFG - KP# located in existing easement	
189	6.01	6.02	X												Native veg	Victorian Volcanic Plains - Plains Grassland	NTGVVP and FFG - KP# located in existing easement	
190	6.40	6.42							X		X				Heritage Inventory	HOLDEN COBBLED STONE ROAD	KP# Located in existing easement	
191	6.41	6.41									X				road	HOLDEN ROAD	KP# Located in existing easement	
192	6.80	6.80							X						Sensitive Noise Receptor	C173	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	965
193	7.17	7.17							X						Sensitive Noise Receptor	C174	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	985
194	7.43	7.48	X												Native veg	Victorian Volcanic Plains - Plains Grassland	NTGVVP and FFG - KP# located in existing easement	
195	7.50	7.50		X											watercourse_stream		KP # Located in proposed easement	
196	8.26	8.33								X					Heritage	Aboriginal Cultural Sensitivity	KP# Located in existing easement	
197	8.26	8.44						X							Groundwater	Areas of groundwater impact	KP# Located in existing easement	
198	8.29	8.31			X						X				Contamination	Railway crossing / rail reserves	KP# Located in existing easement	
199	8.30	8.30									X				railway	BENDIGO LINE	KP # Located in proposed easement	
200	8.39	8.39		X											Community Facility	Tame Street Drain	Open space and natural area - KP# Located in proposed easement	
201	8.40	8.42			X										Contamination	Potential Acid sulphate soils (PASS)	KP# Located in existing easement	
202	8.41	8.41		X											watercourse_drain	TAME STREET DRAIN	KP # Located in proposed easement	
203	8.54	8.54	X												Threatened Fauna	Flax-lily - Dianella longifolia var. grandis	KP # Located in proposed easement	
204	8.69	8.69									X				road	CALDER FREEWAY	KP # Located in proposed easement	
205	8.71	8.71							X						Sensitive Noise Receptor	C175	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	762
206	8.75	8.75									X				road	CALDER FREEWAY	KP # Located in proposed easement	
207	8.78	8.79	X												Native veg	Victorian Volcanic Plains - Plains Grassland	FFG - KP# located in proposed easement	
208	8.81	8.81									X				road	DILLON COURT	KP # Located in proposed easement	
209	8.81	8.81							X						Sensitive Noise Receptor	C176	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	799
210	8.83	8.83							X						Sensitive Noise Receptor	C177	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	237
211	8.85	8.85							X						Sensitive Noise Receptor	C178	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	519
212	8.93	8.93							X						Sensitive Noise Receptor	C179	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	197
213	8.99	8.99							X						Sensitive Noise Receptor	C180	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	677
214	9.09	9.09							X						Sensitive Noise Receptor	C183	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	642
215	9.09	9.09							X						Sensitive Noise Receptor	C182	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	621
216	9.09	9.09							X						Sensitive Noise Receptor	C181	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	467
217	9.22	9.22							X						Sensitive Noise Receptor	C184	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	544
218	9.37	9.37							X						Sensitive Noise Receptor	C185	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	453
219	9.37	9.42	X												Native veg	Central Victorian Uplands - Plains Grassland	NTGVVP - KP# located in proposed easement	
220	9.39	9.39							X						Sensitive Noise Receptor	C186	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	833
221	9.43	9.43							X						Sensitive Noise Receptor	C187	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	86
222	9.46	9.46							X						Sensitive Noise Receptor	C188	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	25
223	9.46	9.46							X						Air quality sensitive receptor	AQ_R465	Sensitive receptor outside of easement	40

Environmental Line List

224	9.52	9.52							X		Sensitive Noise Receptor	C189	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	479
225	9.57	9.60	X								Native veg	Central Victorian Uplands - Plains Grassland	NTGVVP - KP# located in proposed easement	
226	9.61	9.61							X		road	DUNCANS LANE	KP # Located in proposed easement	
227	9.61	9.61							X		Sensitive Noise Receptor	C190	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	311
228	9.63	9.63							X		Sensitive Noise Receptor	C191	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	170
229	9.63	9.63							X		Sensitive Noise Receptor	C192	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	613
230	9.66	9.66							X		Sensitive Noise Receptor	C193	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	56
231	9.68	9.69	X								Native veg	Victorian Volcanic Plains - Plains Grassland	FFG - KP# located in proposed easement	
232	9.74	9.77	X								Native veg	Victorian Volcanic Plains - Plains Grassland	FFG - KP# located in proposed easement	
233	9.75	9.75							X		Sensitive Noise Receptor	C200	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	609
234	9.75	9.75							X		Sensitive Noise Receptor	C198	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	874
235	9.75	9.75							X		Sensitive Noise Receptor	C197	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	310
236	9.75	9.75							X		Sensitive Noise Receptor	C196	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	451
237	9.75	9.75							X		Sensitive Noise Receptor	C195	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	662
238	9.75	9.75							X		Sensitive Noise Receptor	C194	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	157
239	9.75	9.75							X		Sensitive Noise Receptor	C199	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	823
240	9.84	9.84							X		Sensitive Noise Receptor	C201	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	235
241	9.85	9.85	X								watercourse_stream		KP # Located in proposed easement	
242	9.94	9.95	X								Native veg	Victorian Volcanic Plains - Plains Grassland	FFG - KP# located in proposed easement	
243	9.94	9.94							X		Sensitive Noise Receptor	C202	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	674
244	9.95	10.13		X					X		Contamination	Rural property storing wrecked cars	KP # Located in proposed easement	
245	10.00	10.00							X		Sensitive Noise Receptor	C203	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	83
246	10.08	10.08							X		Sensitive Noise Receptor	C204	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	454
247	10.10	10.10							X		Sensitive Noise Receptor	C205	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	644
248	10.17	10.17							X		Sensitive Noise Receptor	C206	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	508
249	10.17	10.17							X		Sensitive Noise Receptor	C207	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	427
250	10.24	10.24							X		Sensitive Noise Receptor	C208	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	888
251	10.26	10.34	X								Native veg	Victorian Volcanic Plains - Plains Grassland	NTGVVP and FFG - KP# located in proposed easement	
252	10.28	10.28							X		Sensitive Noise Receptor	C209	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	428
253	10.33	10.33							X		Sensitive Noise Receptor	C210	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	271
254	10.34	10.34							X		Air quality sensitive receptor	AQ_R458	Sensitive receptor outside of easement	52
255	10.34	10.34							X		Sensitive Noise Receptor	C211	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	47
256	10.41	10.46	X								Native veg	Central Victorian Uplands - Plains Grassland	KP # Located in proposed easement	
257	10.43	10.43							X		Sensitive Noise Receptor	C212	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	163
258	10.44	10.44							X		Sensitive Noise Receptor	C213	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	715
259	10.47	10.47							X		Sensitive Noise Receptor	C214	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	461
260	10.49	10.49							X		Sensitive Noise Receptor	C215	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	38
261	10.50	10.50							X		Air quality sensitive receptor	AQ_R456	Sensitive receptor outside of easement	45
262	10.54	10.54	X								watercourse_stream		KP # Located in proposed easement	

Environmental Line List

304	12.86	12.86								X	Sensitive Noise Receptor	C248	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	235
305	12.90	12.90								X	Sensitive Noise Receptor	C249	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	179
306	13.01	13.01								X	Sensitive Noise Receptor	C250	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	405
307	13.09	13.23	X								Native veg	Victorian Volcanic Plains - Plains Grassland	NTGVVP and FFG - KP# located in proposed easement	
308	13.17	13.17								X	Sensitive Noise Receptor	C251	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	101
309	13.23	13.25	X								Native veg	Victorian Volcanic Plains - Plains Grassland	NTGVVP and FFG - KP# located in proposed easement	
310	13.25	13.25								X	road	UNNAMED	KP # Located in proposed easement	
311	13.32	13.33	X								Native veg	Victorian Volcanic Plains - Plains Grassland	NTGVVP and FFG - KP# located in proposed easement	
312	13.33	13.33								X	Sensitive Noise Receptor	C252	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	117
313	13.34	13.35	X								Native veg	Victorian Volcanic Plains - Plains Grassland	NTGVVP and FFG - KP# located in proposed easement	
314	13.35	13.35	X								Native veg	Victorian Volcanic Plains - Plains Grassland	NTGVVP and FFG - KP# located in proposed easement	
315	13.36	13.37	X								Native veg	Victorian Volcanic Plains - Plains Grassland	NTGVVP and FFG - KP# located in proposed easement	
316	13.37	13.38	X								Native veg	Victorian Volcanic Plains - Plains Grassland	NTGVVP and FFG - KP# located in proposed easement	
317	13.38	13.46	X								Native veg	Victorian Volcanic Plains - Plains Grassland	NTGVVP and FFG - KP# located in proposed easement	
318	13.47	13.50	X								Native veg	Victorian Volcanic Plains - Plains Grassland	NTGVVP and FFG - KP# located in proposed easement	
319	13.47	13.98								X	Heritage	Aboriginal Cultural Sensitivity	KP # Located in proposed easement	
320	13.52	13.62	X								Native veg	Victorian Volcanic Plains - Plains Grassland	NTGVVP and FFG - KP# located in proposed easement	
321	13.68	13.83								X	Groundwater	Areas of groundwater impact	KP # Located in proposed easement	
322	13.72	13.75	X								Native veg	Victorian Volcanic Plains - Riparian Woodland	KP # Located in proposed easement	
323	13.73	13.75								X	Contamination	PFAS impacts - source unknown	KP # Located in proposed easement	
324	13.73	13.73	X								watercourse_stream	JACKSONS CREEK	KP # Located in proposed easement	
325	13.74	13.74	X								watercourse_stream	JACKSONS CREEK	KP # Located in proposed easement	
326	13.75	13.75	X								Community Facility	Jackson Creek	Open space and natural area - KP# Located in proposed easement	
327	13.86	13.86	X								watercourse_stream		KP # Located in proposed easement	
328	13.97	13.97	X								watercourse_stream		KP # Located in proposed easement	
329	14.65	14.65								X	Sensitive Noise Receptor	C253	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	63
330	14.65	14.65								X	Air quality sensitive receptor	AQ_R423	Sensitive receptor outside of easement	64
331	14.74	14.74								X	Sensitive Noise Receptor	C254	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	727
332	14.74	14.74								X	Sensitive Noise Receptor	C255	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	638
333	14.80	14.80								X	road	SUNBURY ROAD	KP # Located in proposed easement	
334	14.83	14.87	X								Native veg	Victorian Volcanic Plains - Plains Grassy Woodland	FFG - KP# located in proposed easement	

Environmental Line List

335	15.04	15.04							X		Sensitive Noise Receptor	C256	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	61
336	15.11	15.32	X								Native veg	Victorian Volcanic Plains - Plains Grassy Woodland	FFG - KP# located in proposed easement	
337	15.41	15.64	X								Native veg	Victorian Volcanic Plains - Plains Grassy Woodland	FFG - KP# located in proposed easement	
338	15.56	15.56							X		Sensitive Noise Receptor	C257	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	261
339	15.65	15.65							X		road	UNNAMED	KP # Located in proposed easement	
340	15.80	15.80							X		Sensitive Noise Receptor	C258	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	239
341	15.97	15.97							X		Sensitive Noise Receptor	C259	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	249
342	15.98	15.98							X		Sensitive Noise Receptor	C260	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	231
343	16.27	16.27							X		Sensitive Noise Receptor	C261	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	205
344	16.48	16.92						X			Heritage	Aboriginal Cultural Sensitivity	KP # Located in proposed easement	
345	16.69	16.74	X								Native veg	Central Victorian Uplands - Riparian Woodland	KP # Located in proposed easement	
346	16.70	16.70	X								Community Facility	Deep Creek	Open space and natural area - KP# Located in proposed easement	
347	16.70	16.70	X								watercourse_stream	DEEP CREEK	KP # Located in proposed easement	
348	16.70	16.70	X								Threatened Fauna	Growling Grass Frog	KP # Located in proposed easement	
349	16.93	16.93							X		Sensitive Noise Receptor	C262	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	128
350	16.95	16.95							X		Sensitive Noise Receptor	C263	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	44
351	16.95	16.95							X		Air quality sensitive receptor	AQ_R418	Sensitive receptor outside of easement	57
352	16.96	16.96							X		road	WILDWOOD ROAD	KP # Located in proposed easement	
353	16.96	16.96							X		Sensitive Noise Receptor	C264	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	828
354	17.12	17.12							X		Sensitive Noise Receptor	C265	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	398
355	17.14	17.14							X		Sensitive Noise Receptor	C266	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	652
356	17.25	17.25							X		Sensitive Noise Receptor	C267	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	720
357	17.25	17.25							X		Sensitive Noise Receptor	C268	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	402
358	17.32	17.34	X								Native veg	Victorian Volcanic Plains - Plains Grassland	NTGVVP and FFG - KP# located in proposed easement	
359	17.49	17.49							X		Sensitive Noise Receptor	C269	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	900
360	17.54	17.54							X		Sensitive Noise Receptor	C270	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	595
361	17.65	17.65							X		Sensitive Noise Receptor	C271	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	825
362	18.29	18.29							X		road	UNNAMED	KP # Located in proposed easement	
363	18.31	18.31							X		Sensitive Noise Receptor	C272	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	784
364	18.46	18.46							X		Sensitive Noise Receptor	C273	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	165
365	18.62	18.62							X		Sensitive Noise Receptor	C274	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	620
366	18.64	18.64							X		Sensitive Noise Receptor	C275	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	494
367	18.71	18.71							X		Sensitive Noise Receptor	C277	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	162
368	18.71	18.71							X		Sensitive Noise Receptor	C276	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	394
369	18.71	18.71							X		Sensitive Noise Receptor	C278	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	706
370	18.95	18.95							X		Sensitive Noise Receptor	C279	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	337
371	18.95	18.95							X		Sensitive Noise Receptor	C280	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	509
372	18.97	18.97							X		road	ST JOHNS ROAD	KP # Located in proposed easement	
373	18.98	19.17	X								Native veg	Victorian Volcanic Plains - Plains Grassland	NTGVVP and FFG - KP# located in proposed easement	
374	19.05	19.05							X		Sensitive Noise Receptor	C281	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	85
375	19.08	19.08							X		Sensitive Noise Receptor	C282	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	201
376	19.21	19.21							X		Sensitive Noise Receptor	C283	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	172

Environmental Line List

377	19.23	19.23								X	Sensitive Noise Receptor	C284	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	48
378	19.23	19.23								X	Air quality sensitive receptor	AQ_R411	Sensitive receptor outside of easement	57
379	19.24	19.24								X	Sensitive Noise Receptor	C285	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	36
380	19.24	19.24								X	Air quality sensitive receptor	AQ_R410	Sensitive receptor outside of easement	46
381	19.47	19.47								X	Sensitive Noise Receptor	C286	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	298
382	19.48	19.48	X								watercourse_stream		KP # Located in proposed easement	
383	19.53	19.55	X								Native veg	Victorian Volcanic Plains - Plains Grassland	FFG - KP# located in proposed easement	
384	19.63	19.69	X								Native veg	Victorian Volcanic Plains - Plains Grassland	FFG - KP# located in proposed easement	
385	19.73	19.73								X	Sensitive Noise Receptor	C287	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	382
386	19.77	19.80	X								Native veg	Victorian Volcanic Plains - Plains Grassland	FFG - KP# located in proposed easement	
387	19.81	19.86	X								Native veg	Victorian Volcanic Plains - Plains Grassland	FFG - KP# located in proposed easement	
388	19.87	19.94	X								Native veg	Victorian Volcanic Plains - Plains Grassland	FFG - KP# located in proposed easement	
389	19.96	20.00	X								Native veg	Victorian Volcanic Plains - Plains Grassland	FFG - KP# located in proposed easement	
390	19.99	19.99	X								watercourse_channel_drain		KP # Located in proposed easement	
391	20.02	20.04	X								Native veg	Victorian Volcanic Plains - Plains Grassland	FFG - KP# located in proposed easement	
392	20.05	20.10	X								Native veg	Victorian Volcanic Plains - Plains Grassland	FFG - KP# located in proposed easement	
393	20.14	20.19	X								Native veg	Victorian Volcanic Plains - Plains Grassland	FFG - KP# located in proposed easement	
394	20.21	20.41	X								Native veg	Victorian Volcanic Plains - Plains Grassland	FFG - KP# located in proposed easement	
395	20.41	20.55	X								Native veg	Victorian Volcanic Plains - Plains Grassland	FFG - KP# located in proposed easement	
396	20.63	20.73	X								Native veg	Victorian Volcanic Plains - Plains Grassland	FFG - KP# located in proposed easement	
397	20.68	20.68								X	Sensitive Noise Receptor	C288	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	223
398	20.75	20.75								X	Sensitive Noise Receptor	C289	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	178
399	20.92	20.92								X	Sensitive Noise Receptor	C290	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	162
400	21.15	21.15								X	Sensitive Noise Receptor	C292	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	132
401	21.15	21.15								X	Sensitive Noise Receptor	C291	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	689
402	21.34	21.34								X	Sensitive Noise Receptor	C293	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	496
403	21.38	21.41	X								Native veg	Victorian Volcanic Plains - Plains Grassy Woodland	FFG - KP# located in proposed easement	
404	21.45	21.55	X								Native veg	Victorian Volcanic Plains - Plains Grassy Woodland	FFG - KP# located in proposed easement	
405	21.60	21.60								X	road	OAKLANDS ROAD	KP # Located in proposed easement	

Environmental Line List

406	22.10	22.65	X												Native veg	Victorian Volcanic Plains - Plains Grassy Woodland	GEWVVP and FFG - KP# located in proposed easement	
407	22.14	22.14	X												Threatened Fauna	Golden Sun Moth	KP # Located in proposed easement	
408	22.19	22.19	X												Threatened Fauna	Golden Sun Moth	KP # Located in proposed easement	
409	22.20	22.20	X												Threatened Fauna	Golden Sun Moth	KP # Located in proposed easement	
410	22.21	22.21	X												Threatened Fauna	Golden Sun Moth	KP # Located in proposed easement	
411	22.31	22.31	X												Threatened Fauna	Golden Sun Moth	KP # Located in proposed easement	
412	22.32	22.32	X												Threatened Fauna	Golden Sun Moth	KP # Located in proposed easement	
413	22.34	22.34	X												Threatened Fauna	Golden Sun Moth	KP # Located in proposed easement	
414	22.37	22.37	X												Threatened Fauna	Golden Sun Moth	KP # Located in proposed easement	
415	22.39	22.39	X												Threatened Fauna	Golden Sun Moth	KP # Located in proposed easement	
416	22.44	22.44	X												Threatened Fauna	Golden Sun Moth	KP # Located in proposed easement	
417	22.48	22.48	X												Threatened Fauna	Golden Sun Moth	KP # Located in proposed easement	
418	22.49	22.49	X												Threatened Fauna	Golden Sun Moth	KP # Located in proposed easement	
419	22.51	22.51	X												Threatened Fauna	Golden Sun Moth	KP # Located in proposed easement	
420	22.53	22.53	X												Threatened Fauna	Golden Sun Moth	KP # Located in proposed easement	
421	22.54	22.54	X												Threatened Fauna	Golden Sun Moth	KP # Located in proposed easement	
422	22.54	22.54	X												Threatened Fauna	Golden Sun Moth	KP # Located in proposed easement	
423	22.56	22.56	X												Threatened Fauna	Golden Sun Moth	KP # Located in proposed easement	
424	22.59	22.59							X						Groundwater	Borehole - 302688	Non-groundwater - KP# located in proposed easement	
425	22.61	22.61	X												Threatened Fauna	Golden Sun Moth	KP # Located in proposed easement	
426	22.65	22.65											X		road	CRAIGIEBURN ROAD	KP # Located in proposed easement	
427	22.66	22.66	X												Threatened Fauna	Matted Flax-lily - Dianella ameona	KP # Located in proposed easement	
428	22.66	22.67	X												Native veg	Victorian Volcanic Plains - Plains Grassy Woodland	GEWVVP and FFG - KP# located in proposed easement	
429	22.67	22.87	X												Native veg	Victorian Volcanic Plains - Plains Grassy Woodland	GEWVVP and FFG - KP# located in proposed easement	
430	22.79	22.79								X					Sensitive Noise Receptor	C295	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	780
431	22.87	22.93	X												Native veg	Victorian Volcanic Plains - Plains Grassy Woodland	GEWVVP and FFG - KP# located in proposed easement	
432	22.90	22.90									X				Sensitive Noise Receptor	C294	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	57
433	22.90	22.90									X				Air quality sensitive receptor	AQ_R401	Sensitive receptor outside of easement	58
434	22.98	22.98									X				Sensitive Noise Receptor	C296	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	419
435	23.04	23.04								X					Groundwater	Borehole - 302670	Non-groundwater - KP# located in proposed easement	
436	23.48	23.48	X												watercourse_stream		KP # Located in proposed easement	
437	23.63	23.63										X			Sensitive Noise Receptor	C298	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	450
438	23.63	23.63										X			Sensitive Noise Receptor	C297	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	296
439	23.93	23.93										X			Sensitive Noise Receptor	C299	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	883
440	24.53	24.96	X												Native veg	Victorian Volcanic Plains - Plains Grassland	FFG - KP# located in proposed easement	
441	24.96	25.11	X												Native veg	Victorian Volcanic Plains - Plains Grassland	NTGVVP and FFG - KP# located in proposed easement	
442	25.11	25.14	X												Native veg	Victorian Volcanic Plains - Plains Grassland	FFG - KP# located in proposed easement	
443	25.14	25.14	X												Native veg	Victorian Volcanic Plains - Plains Grassland	FFG - KP# located in proposed easement	

Environmental Line List

486	26.98	26.98								X	Sensitive Noise Receptor	C331	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	563
487	26.98	26.98								X	Sensitive Noise Receptor	C332	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	798
488	26.98	26.98								X	Sensitive Noise Receptor	C327	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	343
489	26.98	26.98								X	road	PARKLAND CRESCENT	KP # Located in proposed easement	
490	27.00	27.00								X	Sensitive Noise Receptor	C333	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	451
491	27.04	27.04								X	Sensitive Noise Receptor	C334	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	35
492	27.05	27.05								X	Air quality sensitive receptor	AQ_R384	Sensitive receptor outside of easement	47
493	27.09	27.09	X								Threatened Fauna	Golden Sun Moth	KP # Located in proposed easement	
494	27.14	27.15	X								Native veg	Victorian Volcanic Plains - Plains Grassland	FFG - KP# located in proposed easement	
495	27.16	27.16	X								Native veg	Victorian Volcanic Plains - Plains Grassland	FFG - KP# located in proposed easement	
496	27.19	27.19								X	Sensitive Noise Receptor	C335	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	567
497	27.21	27.21								X	Sensitive Noise Receptor	C336	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	466
498	27.21	27.21								X	Air quality sensitive receptor	AQ_R380	Sensitive receptor outside of easement	74
499	27.21	27.21								X	Sensitive Noise Receptor	C338	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	223
500	27.21	27.21								X	Sensitive Noise Receptor	C337	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	56
501	27.36	27.36								X	Sensitive Noise Receptor	C339	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	305
502	27.47	27.47								X	Sensitive Noise Receptor	C340	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	765
503	27.47	27.47								X	Sensitive Noise Receptor	C341	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	919
504	27.54	27.54								X	Sensitive Noise Receptor	C342	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	755
505	27.58	27.58								X	Sensitive Noise Receptor	C343	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	586
506	27.69	27.69								X	Sensitive Noise Receptor	C344	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	497
507	27.71	27.71								X	Sensitive Noise Receptor	C345	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	355
508	27.79	27.79								X	Sensitive Noise Receptor	C346	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	176
509	27.79	27.79								X	Sensitive Noise Receptor	C347	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	798
510	27.98	27.98								X	Sensitive Noise Receptor	C348	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	128
511	27.99	28.01	X								Native veg	Victorian Volcanic Plains - Plains Grassy Woodland	FFG - KP# located in proposed easement	
512	28.02	28.02								X	road	MICKLEHAM ROAD	KP # Located in proposed easement	
513	28.03	28.05	X								Native veg	Victorian Volcanic Plains - Plains Grassy Woodland	FFG - KP# located in proposed easement	
514	28.09	28.12	X								Native veg	Victorian Volcanic Plains - Plains Grassy Woodland	FFG - KP# located in proposed easement	
515	28.10	28.10								X	Sensitive Noise Receptor	C349	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	27
516	28.11	28.11								X	Air quality sensitive receptor	AQ_R378	Sensitive receptor outside of easement	37
517	28.27	28.27					X				Groundwater	Borehole - 79258	Stock - KP# located in proposed easement	
518	28.68	28.68								X	Sensitive Noise Receptor	C351	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	94
519	28.68	28.68								X	Sensitive Noise Receptor	C350	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	261
520	28.81	28.81								X	Sensitive Noise Receptor	C352	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	419
521	28.85	29.15								X	Heritage	Aboriginal Cultural Sensitivity	KP # Located in proposed easement	
522	28.92	28.92								X	Sensitive Noise Receptor	C354	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	481
523	28.92	28.92								X	Sensitive Noise Receptor	C353	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	85
524	28.99	28.99								X	road	POPPY STREET	KP # Located in proposed easement	
525	29.07	29.07								X	Sensitive Noise Receptor	C355	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	238
526	29.10	29.10								X	Sensitive Noise Receptor	C356	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	255
527	29.10	29.10								X	Sensitive Noise Receptor	C358	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	293

Environmental Line List

629	31.20	31.20							X	Sensitive Noise Receptor	C458	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	202
630	31.20	31.20							X	Sensitive Noise Receptor	C459	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	156
631	31.21	31.21							X	Sensitive Noise Receptor	C460	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	217
632	31.22	31.22							X	Sensitive Noise Receptor	C461	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	248
633	31.22	31.22							X	Sensitive Noise Receptor	C462	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	259
634	31.23	31.23							X	Sensitive Noise Receptor	C463	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	241
635	31.25	31.25							X	Sensitive Noise Receptor	C464	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	224
636	31.27	31.27							X	Sensitive Noise Receptor	C465	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	222
637	31.31	31.31							X	Sensitive Noise Receptor	C466	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	223
638	31.34	31.34							X	Sensitive Noise Receptor	C467	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	221
639	31.38	31.38							X	Sensitive Noise Receptor	C468	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	194
640	31.39	31.39							X	Sensitive Noise Receptor	C469	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	322
641	31.41	31.41							X	Sensitive Noise Receptor	C470	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	193
642	31.42	31.42							X	Sensitive Noise Receptor	C471	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	220
643	31.45	31.45							X	Sensitive Noise Receptor	C472	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	224
644	31.46	31.46							X	Sensitive Noise Receptor	C473	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	239
645	31.47	31.47							X	Sensitive Noise Receptor	C474	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	203
646	31.49	31.49							X	Sensitive Noise Receptor	C475	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	165
647	31.49	31.49							X	Sensitive Noise Receptor	C476	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	193
648	31.50	31.71	X							Native veg	Victorian Volcanic Plains - Plains Grassland	FFG - KP# located in proposed easement	
649	31.51	31.51							X	Sensitive Noise Receptor	C477	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	220
650	31.52	31.52							X	Sensitive Noise Receptor	C478	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	192
651	31.55	31.55							X	Sensitive Noise Receptor	C480	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	216
652	31.55	31.55							X	Sensitive Noise Receptor	C479	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	150
653	31.55	31.55							X	Sensitive Noise Receptor	C481	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	193
654	31.58	31.58							X	Sensitive Noise Receptor	C482	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	215
655	31.59	31.59							X	Sensitive Noise Receptor	C484	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	190
656	31.60	31.60							X	Sensitive Noise Receptor	C483	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	215
657	31.60	31.60	X							watercourse_stream		KP # Located in proposed easement	
658	31.61	31.61							X	Sensitive Noise Receptor	C485	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	213
659	31.62	31.62							X	Sensitive Noise Receptor	C486	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	193
660	31.62	31.62							X	Sensitive Noise Receptor	C487	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	149
661	31.63	31.63							X	Sensitive Noise Receptor	C488	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	195
662	31.67	31.67							X	Sensitive Noise Receptor	C489	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	194
663	31.72	31.72	X							watercourse_stream		KP # Located in proposed easement	
664	31.76	31.76	X							watercourse_stream		KP # Located in proposed easement	
665	31.82	31.82							X	Sensitive Noise Receptor	C490	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	94
666	31.99	31.99							X	Sensitive Noise Receptor	C491	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	350
667	31.99	31.99							X	Sensitive Noise Receptor	C492	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	466
668	31.99	31.99							X	Sensitive Noise Receptor	C495	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	791
669	31.99	31.99							X	Sensitive Noise Receptor	C493	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	564
670	31.99	31.99							X	Sensitive Noise Receptor	C494	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	602
671	32.18	32.28	X							Native veg	Victorian Volcanic Plains - Plains Grassland	FFG - KP# located in proposed easement	
672	32.23	32.23	X							Threatened Fauna	Golden Sun Moth	KP # Located in proposed easement	
673	32.41	32.46						X		Heritage	Aboriginal Cultural Sensitivity	KP # Located in proposed easement	
674	32.55	32.55	X							watercourse_stream		KP # Located in proposed easement	
675	32.91	32.91							X	Sensitive Noise Receptor	C496	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	811

Environmental Line List

676	32.98	32.98							X	Sensitive Noise Receptor	C497	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	779
677	33.43	35.54		X						Contamination	Retarding basin	KP # Located in proposed easement	
678	33.58	33.62	X							Native veg	Victorian Volcanic Plains - Plains Grassland	FFG - KP# located in proposed easement	
679	33.60	33.60	X							watercourse_channel_drain		KP # Located in proposed easement	
680	33.61	33.61	X							watercourse_channel_drain		KP # Located in proposed easement	
681	33.82	33.82	X							watercourse_channel_drain		KP # Located in proposed easement	
682	33.91	33.91	X							watercourse_channel_drain		KP # Located in proposed easement	
683	33.99	33.99	X							watercourse_channel_drain		KP # Located in proposed easement	
684	34.17	34.17							X	Sensitive Noise Receptor	C498	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	424
685	34.27	34.71						X		Heritage	Aboriginal Cultural Sensitivity	KP # Located in proposed easement	
686	34.47	34.47	X							watercourse_channel_drain	KALKALLO CREEK	KP # Located in proposed easement	
687	34.48	34.48	X							Community Facility	Kalkallo Creek	Open space and natural area - KP# Located in proposed easement	
688	34.61	34.61							X	Sensitive Noise Receptor	C499	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	118
689	34.80	34.80	X							watercourse_channel_drain		KP # Located in proposed easement	
690	34.97	35.05	X							Native veg	Victorian Volcanic Plains - Plains Grassland	NTGVVP and FFG - KP# located in proposed easement	
691	35.08	35.34	X							Native veg	Victorian Volcanic Plains - Plains Grassland	FFG - KP# located in proposed easement	
692	35.34	35.34	X							Community Facility	Broadhanger Equestrian	Open space and natural area - KP# Located in proposed easement	
693	35.47	35.47	X							watercourse_channel_drain		KP # Located in proposed easement	
694	35.51	35.51							X	Sensitive Noise Receptor	C500	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	313
695	35.60	35.60							X	road	UNNAMED	KP # Located in proposed easement	
696	35.61	35.61							X	Sensitive Noise Receptor	C501	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	125
697	35.84	35.84							X	road	UNNAMED	KP # Located in proposed easement	
698	36.08	36.08	X							watercourse_channel_drain		KP # Located in proposed easement	
699	36.36	36.36							X	Sensitive Noise Receptor	C502	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	193
700	36.50	36.50							X	road	UNNAMED	KP # Located in proposed easement	
701	36.51	36.51							X	Sensitive Noise Receptor	C503	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	38
702	36.51	36.51							X	Sensitive Noise Receptor	C504	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	80
703	36.53	36.53							X	Air quality sensitive receptor	AQ_R014	Sensitive receptor outside of easement	68
704	36.63	36.63							X	Sensitive Noise Receptor	C505	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	134
705	36.65	36.65							X	Sensitive Noise Receptor	C506	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	116
706	36.66	36.72	X							Native veg	Victorian Volcanic Plains - Plains Grassland	NTGVVP and FFG - KP# located in proposed easement	
707	36.91	36.91							X	Sensitive Noise Receptor	C507	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	290
708	37.03	37.03							X	Sensitive Noise Receptor	C508	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	71
709	37.09	37.09							X	road	GUMS LANE	KP # Located in proposed easement	
710	37.13	37.13							X	road	HUME FREEWAY	KP # Located in proposed easement	
711	37.14	37.14							X	road	GUMS LANE	KP # Located in proposed easement	
712	37.17	37.17							X	road	HUME FREEWAY	KP # Located in proposed easement	
713	37.28	37.28							X	Sensitive Noise Receptor	C509	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	369
714	37.79	37.79				X				Groundwater	Borehole - 79167	Domestic - KP# located in proposed easement	
715	38.31	38.31							X	Sensitive Noise Receptor	C510	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	14
716	38.37	38.37							X	road	UNNAMED	KP # Located in proposed easement	
717	38.40	38.40							X	Sensitive Noise Receptor	C511	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	471
718	39.18	39.18							X	Sensitive Noise Receptor	C512	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	292
719	39.72	39.72							X	road	UNNAMED	KP # Located in proposed easement	

Environmental Line List

720	40.02	40.02							X		Sensitive Noise Receptor	C513	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	105
721	40.15	41.18				X					Groundwater	Areas of groundwater impact	KP# Located in proposed easement	
722	40.43	40.43							X		road	UNNAMED	KP# Located in existing easement	
723	40.82	40.82	X								watercourse_stream		KP# Located in existing easement	
724	40.91	40.91							X		Sensitive Noise Receptor	C514	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	287
725	40.99	41.02	X								Native veg	Victorian Volcanic Plains - Stony Knoll Shrubland	KP# Located in proposed easement	
726	41.04	41.04	X								watercourse_stream	NORTH EASTERN	KP# Located in existing easement	
727	41.10	41.12		X					X		Contamination	Railway crossing / rail reserves	KP# Located in proposed easement	
728	41.11	41.11							X		railway	NORTH EASTERN	KP# Located in existing easement	
729	41.12	41.19	X								Native veg	Victorian Volcanic Plains - Plains Grassy Woodland	FFG - KP# located in proposed easement	
730	42.10	42.10	X								Threatened Fauna	Golden Sun Moth	KP# Located in existing easement	
731	42.37	42.37	X								Threatened Fauna	Golden Sun Moth	KP# Located in existing easement	
732	42.58	42.71							X		Heritage	Aboriginal Cultural Sensitivity	KP# Located in existing easement	
733	42.71	42.89							X		Heritage	Aboriginal Cultural Sensitivity	KP# Located in existing easement	
734	42.75	42.85				X					Groundwater	Areas of groundwater impact	KP# Located in existing easement	
735	42.78	42.82	X								Native veg	Victorian Volcanic Plains - Riparian Woodland	KP# Located in existing easement	
736	42.79	42.81		X							Contamination	Potential Acid sulphate soils (PASS)	KP# Located in existing easement	
737	42.80	42.80	X								connector_stream	MERRI CREEK	KP# Located in existing easement	
738	42.80	42.80	X								Community Facility	Merri Creek	Open space and natural area - KP# Located in existing easement	
739	42.89	42.92							X		Heritage	Aboriginal Cultural Sensitivity	KP# Located in existing easement	
740	42.92	43.14							X		Heritage	Aboriginal Cultural Sensitivity	KP# Located in existing easement	
741	43.14	43.30							X		Heritage	Aboriginal Cultural Sensitivity	KP# Located in existing easement	
742	43.35	43.70							X		Heritage	Aboriginal Cultural Sensitivity	KP# Located in existing easement	
743	44.87	44.87	X								Threatened Fauna	Golden Sun Moth	KP# Located in existing easement	
744	46.27	46.27							X		Sensitive Noise Receptor	C515	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	560
745	46.64	47.66				X					Groundwater	Areas of groundwater impact	KP# Located in existing easement	
746	46.64	46.64							X		Sensitive Noise Receptor	C516	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	242
747	46.72	46.72							X		Sensitive Noise Receptor	C517	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	780
748	46.72	46.72							X		Sensitive Noise Receptor	C518	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	801
749	46.80	46.80							X		Sensitive Noise Receptor	C519	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	70
750	47.03	47.03							X		road	DONNYBROOK ROAD	KP# Located in existing easement	
751	47.06	47.06							X		Sensitive Noise Receptor	C520	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	101
752	47.06	47.06							X		Sensitive Noise Receptor	C521	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	218
753	47.07	47.07							X		Sensitive Noise Receptor	C522	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	371
754	47.17	47.17	X								watercourse_stream		KP# Located in existing easement	

Environmental Line List

755	47.21	47.21						X		Sensitive Noise Receptor	C523	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	804
756	47.22	47.22	X							Community Facility	Darebin Creek	Open space and natural area - KP# Located in existing easement	
757	48.29	48.38	X							Native veg	Victorian Volcanic Plains - Plains Grassland	NTGVVP and FFG - KP# located in existing easement	
758	48.42	48.52						X		Heritage	Aboriginal Cultural Sensitivity	KP# Located in existing easement	
759	49.14	50.15					X			Groundwater	Areas of groundwater impact	KP# Located in existing easement	
760	49.41	49.51						X		Heritage	Aboriginal Cultural Sensitivity	KP# Located in existing easement	
761	49.57	49.67						X		Heritage	Aboriginal Cultural Sensitivity	KP# Located in existing easement	
762	49.73	49.73					X			Groundwater	Borehole - 68906	Not known - KP# located in existing easement	
763	50.09	50.09	X							Threatened Fauna	Golden Sun Moth	KP# Located in existing easement	
764	50.10	50.10						X		Sensitive Noise Receptor	C524	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	176
765	50.15	50.16					X			Groundwater	Areas of groundwater impact	KP# Located in existing easement	
766	50.16	50.66					X			Groundwater	Areas of groundwater impact	KP# Located in existing easement	
767	50.24	50.24							X	road	SUMMERHILL ROAD	KP# Located in existing easement	
768	50.26	50.26							X	road	SUMMERHILL ROAD	KP# Located in existing easement	
769	50.34	50.34							X	road	UNNAMED	KP# Located in existing easement	
770	50.45	50.45						X		Sensitive Noise Receptor	C525	Sensitive receptor outside of easement - refer to Technical report F - Noise and vibration for detail	463
771	50.55	50.55	X							Threatened Fauna	Golden Sun Moth	KP# Located in existing easement	
772	50.82	50.82	X							Threatened Fauna	Golden Sun Moth	KP# Located in existing easement	
773	50.89	50.89	X							Community Facility	Curly Sedge Creek	Open space and natural area - KP# Located in existing easement	
774	50.90	50.90	X							watercourse_stream		KP# Located in existing easement	
775	50.90	50.90							X	road	UNNAMED	KP# Located in existing easement	
776	50.97	50.97							X	road	UNNAMED	KP# Located in existing easement	
777	51.04	51.04	X							Threatened Fauna	Golden Sun Moth	KP# Located in existing easement	
778	51.04	51.04	X							Threatened Fauna	Golden Sun Moth	KP# Located in existing easement	
779	0.00	8.29							X	Heritage	CHMP 16594 - Aboriginal Victoria and the Traditional Owners		
780	8.29	51.04							X	Heritage	CHMP 16593 - Registered Aboriginal Party Wurundjeri Woi wurrung Cultural Heritage Aboriginal Corporated (WWCHAC)		

APPENDIX H PERFORMANCE OBJECTIVES AND STANDARDS

13.1 Site access

Table 13.1 Performance standards (site access)

Performance standard – overview	
Objective	To plan for and manage environmental impacts associated with site access.
Target	Conformance with the relevant limits and controls specified in this performance standard.
Application	Access to site

Table 13.2 Performance standards (site access)

SITE ACCESS		
Ref.	Environmental controls	Project phase
A3	Any requirements noted in landowner agreements with APA must be met.	Construction
A4	Construction drawings must clearly delineate the site, access points and sensitive areas (e.g. native vegetation) in or adjacent to the site. A Site plan must form part of the site induction and be available to site supervisors at all times during construction.	Construction
A5	No access by APA or construction contractors is to be gained to properties outside of the site boundary.	Construction
A6	All vehicles and construction equipment, including third parties, must be free of weeds, seeds and soil material prior to arrival to the site consistent with <i>A Guide for Machinery Hygiene for Civil Construction</i> (Civil Contractor's Federation, 2011). Weed and seed inspections must be completed for all vehicles and plant on arrival, with a record of the inspection to remain with the vehicle.	Construction

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



SITE ACCESS		
Ref.	Environmental controls	Project phase
A7	Normal working hours: 7 am – 6 pm Monday to Friday, 8 am to 1 pm Saturday. Construction may occur up to 24 hours a day, 7 days a week where required for specific tasks, only with prior approval by APA and notification of affected residents prior to changing normal working hours.	Construction
A8	Appropriate measures (to be developed by the construction contractor for approval by APA prior to commencement) must be used to protect sealed road surfaces at tracked plant/vehicle crossings.	Construction
A9	Vehicles/plant must be free of soil clumps and sods prior to exit from site.	Construction
A10	Appropriate receptacles must be provided and used for cigarette butt disposal.	Construction

13.2 General requirements

Table 13.3 Performance standards (general)

Performance standard – overview	
Objective	To plan for, manage and minimise environmental impacts associated with the proposed construction activities.
Target	Conformance with the relevant limits and controls specified in this performance standard.
Application	The duration of the proposed works across all areas, unless otherwise stated.

13.3 Environmental management measures

13.3.1 Noise and vibration

Table 13.4 Environmental management measures (Noise and vibration management)

NOISE AND VIBRATION MANAGEMENT		
Ref.	Environmental controls	Project phase
NV1	<p>Manage construction noise and vibration in accordance with Chapter 4 (Noise and vibration) of EPA Publication 1834 Civil Construction, building and demolition guide.</p> <p>Prepare and implement a Construction Noise and Vibration Plan that includes the following general good practice measures:</p> <ul style="list-style-type: none"> • Use the lowest-noise and vibration work practices and equipment that meet the requirements of the job • Use broadband reversing alarms on construction vehicles and machinery in preference to 'beeper' reversing alarms. The site will be planned to minimise the need for reversing of vehicles. • Turn off equipment and vehicles when not being used • Take care not to drop spoil and construction materials that cause peak noise events • Ensure equipment is operated in accordance with manufacturers requirements • Limit works to the 'normal working hours' (as defined in EPA Publication 1834) as far as reasonably practicable • Minimise use of loud equipment, generation of unnecessary noise and vibration, and the movement of vehicles on the construction corridor as far as reasonably practicable • Outline designated vehicle routes, parking locations and delivery hours to minimise noise impact on sensitive receptors • Undertake all reasonable and practicable actions to comply with the construction noise and vibration criteria as identified in EMM NV10. 	Construction

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



NOISE AND VIBRATION MANAGEMENT		
Ref.	Environmental controls	Project phase
NV2	<p>Where the construction noise and/or vibration levels are predicted or measured to exceed applicable criteria (as identified in EMM NV10) after implementing the general noise mitigation practices, further mitigation measures must be considered and implemented as far as reasonably practicable. These measures may include:</p> <ul style="list-style-type: none"> • Adopting engineering noise controls at the source (e.g. silencer, mufflers, enclosures) by all practical means using current technology • Selection of quieter equipment • Installation of onsite barriers such as hoardings or temporary screens to provide a noise barrier between any particularly noisy construction works and the residences • Restricting the hours that the very noisy activities can occur (respite periods). 	Construction
NV3	<p>Develop a detailed blast study and impact management plan in accordance with AS 2187.2 – 2006 <i>Explosives- storage and use</i> and other relevant documents to confirm blasting impacts and implement any further management measures required.</p>	Construction
NV4	<p>As far as reasonably practicable, increase the distance between a sensitive receptor and the noise/vibration source to reduce impacts. This can be achieved through strategic placement of stationary equipment (e.g. generators used for specific works) within the construction corridor to maximise the distance between source and receptor.</p>	Construction
NV5	<p>As far as reasonably practicable limit works to the 'normal working hours' (as defined in EPA Publication 1834). Identify activities required to be undertaken outside of normal working hours.</p> <p>The Construction Noise and Vibration Plan must include a clear rationale for defining works as 'low-noise', 'managed impact', or 'unavoidable' (as defined in EPA Publication 1834) and response strategies to mitigate the impacts of these works.</p>	Construction

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



NOISE AND VIBRATION MANAGEMENT		
Ref.	Environmental controls	Project phase
NV6	<p>Where the residual noise and vibration impact (after mitigation measures are being implemented) exceeds the recommended construction noise and vibration criteria or construction works are planned close to the sensitive receptors, notify residents in advance about upcoming construction works.</p> <p>Send notification letters to residents of noise affected dwellings prior to the commencement of works which include information on:</p> <ul style="list-style-type: none"> • Date and time of the noise intensive works • Expected durations of the noisiest activities • Use and provision of individual protective measures such as earplugs (for short duration impacts of 1 to 2 nights only and on a case-by case basis) <p>Implement a complaints management register that documents:</p> <ul style="list-style-type: none"> • Name of persons receiving complaint • Name of person making the complaint • Date and time of complaint • Nature of the complaint • Actions taken to rectify the issue • Actions to minimise risk of repeated occurrence • Name of person responsible for undertaking the required actions • Communication of response to the complaint <p>Implement a complaint system that includes the following measures:</p> <ul style="list-style-type: none"> • Establish a community liaison phone number and permanent site contact number so that noise related complaints can be received and addressed in a timely manner • Determine whether any unusual activities were taking place at the time of the complaint that may have generated higher noise levels than usual and whether they may be attributed to the construction site activities • Implement additional mitigation measures where required and reasonably practicable. 	

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



NOISE AND VIBRATION MANAGEMENT		
Ref.	Environmental controls	Project phase
NV7	<p>Where the residual impact is predicted to exceed the recommended noise or vibration criterion for an extended period (after other mitigation measures have been implemented), discuss information on the impact with affected residents.</p> <p>Depending on the circumstances, off-site measures to minimise noise impact must be considered including alternative temporary accommodation or other respite option.</p>	Construction
NV8	Where required, condition/dilapidation surveys may be offered to owners of buildings where high blast charges are required and the detailed blast study and impact management plan identifies possible impact to buildings.	Construction
NV9	Liaise with the Melbourne Water Bald Hill to Yan Yean pipeline and Major Road Projects Victoria Sunbury Road upgrade project teams to assess cumulative construction noise impacts. Implement additional noise mitigation measures if required.	Construction
NV10	Undertake all reasonable and practicable actions to comply with the construction noise criteria:	
	Sensitive receptor	Period
	Residential	EPA normal working hours
	Educational institutions	hours:
	Parks and recreational areas	Mon-Fri: 7am - 6pm Sat: 7am - 1pm
	Community and commercial buildings	
	Residential	Evening and weekend Mon-Fri: 6pm - 10pm Sat: 1pm - 10pm Sundays and public holidays 7 am to 10 pm
Residential	Night-time Mon-Sun: 10pm - 7am	
	Noise criteria, LAeq	
		75
		60
		65
		70
		Noise level at any residential premises not to exceed background (LA90, dB) noise by: <ul style="list-style-type: none"> 10 dBA or more for up to 18 months
		Noise inaudible within a habitable room of any residential premises.

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



NOISE AND VIBRATION MANAGEMENT					
Ref.	Environmental controls				Project phase
					Background +0 dB(A) (external)
	Implement management measures if vibration from construction is predicted to exceed the standards for structural damage as identified in the following:				
		Vibration velocity (PPV) in mm/s			
		At foundation at a frequency of			Vibration at horizontal plane of highest floor (all frequencies)
	Type of structure	< 10 Hz	10 Hz–0 Hz	50 Hz–100 Hz	
1	Buildings used for commercial purposes, industrial buildings and buildings of similar design	20	20–40	40–50	40
2	Dwellings and buildings of similar design and/or occupancy	5	5–15	15–20	15
3	Structures that because of their particular sensitivity to vibration, do not correspond to those listed in Lines 1 or 2 and have intrinsic value (e.g. heritage-listed)	3	3–8	8–10	8
	Implement management measures if vibration from construction is predicted to exceed the standards for structural damage to existing underground pipelines:				
	Pipe material				Guideline value on pipe (mm/s)
	Steel (including welded pipes)				100
	Clay, concrete, reinforced concrete, pre-stressed concrete, metal (with/without flanges)				80
	Masonry, plastic				50
	Implement management measures if vibration from construction exceeds the human perception of 0.3 mm/s at sensitive receptors.				



13.3.2 Air quality

Table 13.5 Environmental management measures (Air quality)

AIR QUALITY		
Ref.	Environmental controls	Project phase
AQ1	<p>Construction dust management</p> <p>Implement management and control measures during construction activities to minimise dust including:</p> <ul style="list-style-type: none"> • Water carts to be used on unsealed work areas as required • Crushed rock to be placed on existing permanent unsealed access tracks where agreed with relevant stakeholders – especially in areas where housing abuts, or may abut by the time construction occurs, the construction corridor • Water spray units to be used, where required, on soil stockpiles and during the loading and unloading of dust generating materials, i.e. Soil/sand/fill and aggregates • Vehicle loads to be covered when carrying dust (or litter) generating material • Vehicle speed within the construction area must be restricted to 30 km/hr • Dust suppression activities must consider weather patterns, ground cover, ground conditions e.g. type and moisture content of soil present, and type of activities being conducted as well as proximity to sensitive receptor locations • Undertake a sufficient level of compaction on stockpile surfaces to minimise dust. <p>If all available methods of dust stabilisation fail to suppress dust and dust emissions are evident beyond the site boundary at identified sensitive receptor locations (as identified by real-time reactive monitoring, as required), the contractor must temporarily modify or suspend dust generating activities until conditions subside.</p>	Construction

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



AIR QUALITY		
Ref.	Environmental controls	Project phase
	<p>Controls must be implemented if dust is observed to be causing a hazard (such as a wind barrier where directly impacted residences are located immediately adjacent to the construction corridor). If dust levels cannot be contained works must be modified or stopped until dust hazard is reduced to a manageable level, such that it can be controlled using the standard measures.</p> <p>Construction dust monitoring</p> <p>Reactive dust monitoring instruments must be used during construction where isolated rural residences or rows of housing that abut the construction corridor are within the impact 'footprint' distances identified in Table 23 of Technical Report G Air Quality. Instruments must be consistent with those detailed in the Protocol for Environmental Management: Mining and Extractive Industries and be capable of sending a SMS text message to the contractor. These instruments must be deployed for each work day subject to where the daily workforce is in relation to the specific areas where sensitive receptors are located.</p>	

DRAFT

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



AIR QUALITY		
Ref.	Environmental controls	Project phase
AQ3	<p>Odorous soils management</p> <p>In the event that odorous soils (as a result of contamination or acid sulfate soils) are uncovered during construction, standard soil management measures must be undertaken, as outlined in EMM C1 (Implement spoil management measures).</p>	Construction
AQ4	<p>The VTS Pipeline Integrity Management Plan details the activities that must be taken to ensure the integrity of the VTS pipelines, including avoiding leaks of odours during operation. These are considered measures to minimise fugitive gas emissions and include:</p> <ul style="list-style-type: none"> • Regular pipeline inspections and patrols • Pipelines constructed as per AS2885 or standards at time of construction • The pipeline is identified in the ground via danger marker tape and above ground via pipeline marker sign on the easement • Cathodic protection system installed for corrosion resistance, with 12 month detail survey • Insulation of a series sacrificial anodes along the pipe for corrosion resistance • Remote SCADA monitoring • Third party engagement i.e. working around pipeline emergency services, government, civil contractors • In line integrity pigging as determined by Pipeline Risk Assessments. <p>The design of the Wollert Compressor Station includes a stack that is capable of venting emergency or routine maintenance gas (unburnt natural gas) higher into the atmosphere than simply allowing fugitive emissions at ground level.</p>	Design, Construction and Operation



13.3.3 Biodiversity

Table 13.6 Environmental management measures (Biodiversity)

BIODIVERSITY		
Ref.	Environmental controls	Project Phase
B1	<p>Vegetation management (construction)</p> <p>Confine all vegetation clearing works to the defined construction area.</p> <p>Minimise loss of native vegetation, particularly the EPBC Act-listed communities, through detailed design and construction planning including reducing the width of the construction corridor where practicable, in particular at environmentally sensitive locations.</p> <p>Clearly demarcate all buffer zones, no-go zones, tree protection zones, and the boundary of the construction area prior to relevant works commencing.</p> <p>Install and maintain temporary fencing along the construction footprint boundary in areas adjacent to sensitive environmental values. The Matted Flax Lily and Tough Scurf-Pea would be protected by temporary fencing (e.g. star pickets and wire fencing or galvanized temporary construction fencing). For works within conservation areas of the MSA (ie KP 43 and 49) fencing must be compliant with relevant DELWP guidelines specific to these areas.</p> <p>Clearly demarcate and identify on site all environmental features to be retained within or directly adjacent to the construction corridor, prior to relevant works commencing.</p> <p>Any necessary trimming of tree branches located on the edge of the construction corridor and, overhanging into construction/activity areas must be carried out by a qualified arborist.</p> <p>Develop and implement a Tree Management Plan (B23).</p>	Construction

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



BIODIVERSITY		
Ref.	Environmental controls	Project Phase
B2	<p>Pest plant/animal/pathogen control (construction)</p> <p>Implement the following measures during construction to manage biosecurity risks and address Catchment and Land Protection Act 1994 (CaLP Act) obligations:</p> <ul style="list-style-type: none"> • Locate CaLP Act listed weeds in the construction corridor, and assess the risk of additional spread prior to relocating topsoil, implement measures to manage this risk during clear and grade, and reinstatement. • To a reasonable extent practicable during the clear and grade phase, ensure that vehicles and plant are free of soil clumps and sods prior to entry and exit from the construction corridor. • Evaluate disturbed areas post-construction and implement remedial measures as required within a reasonable timeframe. • Manage waste in accordance with EMM C7. <p>Pathogen control</p> <ul style="list-style-type: none"> • All vehicles and plant undertaking construction works directly in the watercourse (Merri and Jacksons Creeks) must be cleaned, free of soil sods and sprayed with bleach prior to entrance of each waterway and on exit if working between multiple waterways (excluding vehicles and plant using the constructed access route). 	Construction
B3	<p>Contractor awareness</p> <p>Before commencing site work, all Project personnel must attend an induction that outlines environmental management requirements. This must include:</p> <ul style="list-style-type: none"> • No-go zones • Biodiversity values of the construction corridor, specifically areas of native vegetation and threatened species habitat • Habitat and fauna awareness • Location of other environmentally sensitive areas • Native vegetation removal regulations and penalties for non-compliance • EPBC Act and FFG Act regulations and penalties for non-compliance. 	Construction

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



BIODIVERSITY		
Ref.	Environmental controls	Project Phase
B4	<p>GDE mitigation</p> <ul style="list-style-type: none"> • Engage an arborist to assess the potential for long-term impacts on native trees based on the expected timeframe for dewatering, depth to which water is modelled to be drawn down, and the proximity of the trees to identified and potential GDEs • Develop and implement a Tree Management Plan (B23) • Salvage aquatic and terrestrial fauna during open cut dewatering activities within Jacksons and Merri creeks. Measures are to include salvage and relocation protocols which must be outlined within the CEMP and include details regarding: <ul style="list-style-type: none"> - Within waterways, undertake checks for the species during dewatering to remove any individuals found. - Install fauna-proof fencing along the edge of the terrestrial works area once habitat has been made unsuitable and cleared of individuals to prevent individuals recolonising for the period between clearing and construction - Handling and relocation protocols, e.g. animal storage, hygiene controls - Locations of suitable habitat (within 100 m for terrestrial fauna and 200 m for fish) to relocate any individuals found - A protocol for any individuals found where appropriate release habitat is not available within 100 m or 200 m of capture (dependent on species) - Means of treatment or disposal for any individuals injured or killed by works. <p>Measures to manage impacts to GDEs are described in EMM GW1 and EMM GW2.</p>	Construction
B5	<p>Lighting impacts to fauna</p> <p>Design and manage lighting in accordance with best practice lighting design as outlined within the National Pollution Guidelines for Wildlife (DAWE 2020) where these do not conflict with construction safety.</p>	Construction

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



BIODIVERSITY		
Ref.	Environmental controls	Project Phase
	Where lighting is required, avoid unnecessary light spill into surrounding areas that provide habitat for threatened fauna as far as reasonably practicable.	
B6	<p>Noise impacts to fauna</p> <p>Construction noise and vibration must be managed in accordance with the requirements identified in EMM NV1 and NV2.</p>	Construction
B7	<p>Site rehabilitation after construction</p> <ul style="list-style-type: none"> Reinstate the construction corridor with consideration of native vegetation composition indigenous to the area as applicable to site conditions, adjacent ground surface levels, and in consultation with the landholder and in accordance with any agreement made as part of easement negotiations. In known and assumed Golden Sun Moth and Striped Legless Lizard habitat that contain native patches of grassland, revegetate areas with appropriate native grass seed mix (e.g. Wallaby Grass, Spear Grass, Kangaroo Grass) that provide habitat and food sources. On private property this will be in consultation with land owners. Rehabilitation of construction areas and all temporary facilities, temporary access tracks and extra works areas would begin as soon as practicable after the completion of the construction activities, with the aim of restoration of ground cover within six months. Rehabilitation activities are estimated to take approximately three months. Any applicable replanting will be undertaken within 12 months of construction completion (subject to seasonal requirements). <p>Subject to landholder agreement the following requirements to return habitat features to the construction area will be considered:</p> <ul style="list-style-type: none"> Return habitat features removed during construction such as large hollow logs and large rocks or rock piles to the construction area during rehabilitation if consistent with rehabilitation objectives at a particular location. 	Construction

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



BIODIVERSITY		
Ref.	Environmental controls	Project Phase
	<ul style="list-style-type: none"> Rip soil surfaces that have been compacted due to construction activities, such as those subject to traffic and/or storage areas within the site, to allow the topsoil to bind with the subsoil and increase water filtration, as appropriate, prior to revegetation with indigenous native species. Do not rip areas that are either known or assumed Golden Sun Moth or Striped Legless Lizard habitat and/or contained patches of native vegetation prior to construction. Measures to rehabilitate Jacksons Creek as set out in EMM SW7 (Develop appropriate control measures as part of the CEMP for open cut construction) and EMM SW8 (Site rehabilitation (Jacksons Creek)) will be implemented. <p>Subject to Melbourne Water works on waterway permit conditions, rehabilitation of Jacksons Creek and Merri Creek will take into consideration appropriate instream and terrestrial reinstatement of habitat with regard to Platypus and Growling Grass Frog habitat.</p>	
B8	<p>Topsoil management</p> <p>Topsoil imported to site from external locations must be free of weeds and pathogens. Stockpiled topsoil removed from weed-infested sites for the Project must only be re-used, as far as reasonably practicable, in the location that it was originally sourced from. Stockpiled topsoil from weed-infested sites may be reused where soil is sourced from sites supporting Golden Sun Moth where larvae may be present.</p> <p>Stockpiled topsoil from weed-infested sites must not be re-spread over threatened species habitat or where native vegetation is to be reinstated.</p> <p>For impacted areas that are Golden Sun Moth habitat:</p> <ul style="list-style-type: none"> In areas that are to be disturbed temporarily (i.e., reinstated after construction) and that require topsoil removal, the period between pre-trenching topsoil removal and post-trenching topsoil replacement must be minimised to the extent practicable. Where the removal of topsoil is unavoidable appropriate measures to remove, separate (from sub-soils) and replace topsoils in the construction corridor 	Construction

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



BIODIVERSITY		
Ref.	Environmental controls	Project Phase
	<p>must be undertaken. As far as reasonably practicable, topsoil will be progressively reinstated.</p> <ul style="list-style-type: none"> • Manage dust during the Golden Sun Moth flying season (November to January) in properties that are known or assumed Golden Sun Moth habitat to minimise impacts of dust on flying individuals as per requirements in EMM AQ1. 	
B9	<p>Fauna management</p> <p>Measures to mitigate impacts on native fauna must be developed and will be incorporated into a Fauna Management Plan. This must include the following requirements:</p> <ul style="list-style-type: none"> • Woody vegetation, trees and hollows to be removed must be inspected for fauna by a suitably qualified wildlife handler immediately prior to removal. Measures to mitigate impacts on fauna must include: <ul style="list-style-type: none"> - A walk-through/visual inspection of habitat to be removed immediately prior to clearance to flush out fauna and capture and relocate - Wildlife handler to be present during hollow-bearing tree removal and habitat removal for Growling Grass Frog and Striped Legless Lizard - Wildlife handler to provide advice, which must be implemented, that minimise fauna impact, and detailing appropriate measures to manage injured wildlife. • Keep records of all fauna interactions, listing the species encountered, date, nature and outcome of the interaction and GPS coordinates. All fauna records will be submitted to the Victorian Biodiversity Atlas. • Trench management: Work areas, particularly excavations and trenches left open overnight, must be visually inspected for fauna at the start of each work day. Any trapped fauna to be removed prior to work commencing. Measures are to include egress points along the trench to allow fauna to escape the trench when unattended, protocols for trapped fauna removal and provision of in-trench shelters for sections left open overnight • Native fauna are to be captured, handled and relocated only by a qualified and authorised fauna 	Construction

BIODIVERSITY		
Ref.	Environmental controls	Project Phase
	<p>handler. All fauna handling must be in line with a Wildlife Act Permit Management Authorisation and any conditions within. It is an offence under the Wildlife Act 1975 to handle or disturb fauna without authorisation</p> <ul style="list-style-type: none"> • Records of all fauna relocations must be kept • Records of all fauna deaths or injuries to be kept and reported to DELWP • Exposed pipe ends must be capped each night to prevent fauna entry • Prepare and implement Kangaroo management for areas where connectivity for fauna movement will be restricted during construction • Temporary strainer assemblies and gateways must be installed at every fence line that is intersected by the construction corridor in agreement with the landowner and in accordance with construction specifications. This must provide security for farmstock during construction. Temporary security fencing must be installed around the construction site in all public open spaces to prevent unauthorised access to the right of way (ROW) and for public safety. When it is determined that there is no further safety risk to members of the public all security fencing will be removed. <p>For all threatened fauna:</p> <ul style="list-style-type: none"> • Any threatened species found within the construction site and needing relocation to avoid harm or death must be relocated to the nearest available suitable habitat. Details of suitable locations and a protocol for release for any locations where this is expected to be in excess of 100m from the point of capture is required. 	
B10	<p>Surface water sedimentation and runoff</p> <p>Manage surface water sedimentation and runoff risks and impacts in accordance with EMM SW4 and EMM SW5.</p>	Construction
B11	<p>Surface water contamination</p> <p>Manage chemicals fuels and hazardous materials in accordance with EMM C6 to mitigate impacts on ecological values.</p>	Construction
B15	<p>Reinstate native vegetation</p>	Construction

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



BIODIVERSITY		
Ref.	Environmental controls	Project Phase
	Where natural regeneration of species in situ is not feasible, revegetate the area using seed or nursery stock obtained from within the local area, to support preservation of native vegetation values within the broader area.	
B16	<p>Additional site assessment and management (construction)</p> <ul style="list-style-type: none"> Any vegetation clearing or damage to plants outside the construction corridor that occurs accidentally or without prior approval must be reported as an incident and works must cease immediately. The accidental clearing area must be subject to: Botanical surveys to assess and map the condition and extent of native vegetation. If site based information of the native vegetation can no longer be observed, DELWP mapped data must be used to determine offset requirements. The extent and condition of accidental vegetation removal must be reported to the relevant authority as soon as reasonably practicable. A qualified arborist must assess any damage to trees and must identify tree protection zones (TPZs) and SRZs. All native vegetation to be retained must be demarcated via fencing, so no-go zones are clearly delineated and noted by workers, and any further accidental loss of vegetation is avoided Install and maintain temporary fencing along the construction footprint boundary in areas adjacent to sensitive environmental values. For works within conservation areas of the MSA (ie KP 43 and 49) fencing must be compliant with relevant DELWP guidelines specific to these areas. 	Construction
B17	<p>Barriers to fish passage and / or migration</p> <p>Minimise the creation of a barrier that impedes native fish passage and /or migration, and the time required for installation of the pipeline during open cut trenching across Jacksons Creek and Merri Creek by using the following approaches:</p> <ul style="list-style-type: none"> Assemble and prepare the pipeline so it can be installed as soon as reasonably practicable once trenching through the watercourse is complete. 	Construction

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



BIODIVERSITY		
Ref.	Environmental controls	Project Phase
	<ul style="list-style-type: none"> Remove all obstructions to flow and passage as soon as reasonably practicable after the pipeline has been laid and backfilled. That is, with the exception of the flume pipe at Merri Creek, which may not be immediately removed after the pipe has been laid. Reinstate the exposed trench within the watercourse and riparian zones as soon as reasonably practicable following the installation of the pipeline. Works on a designated watercourse must have a permit for Works on Waterways from Melbourne Water. All works must be completed in accordance with permit requirements. 	
B18	<p>Value-specific mitigation</p> <p>Develop and implement specific measures to protect EPBC Act and/or FFG Act communities that are impacted, including:</p> <ul style="list-style-type: none"> Measures required by EMM B1 Establishing no-go areas around plant populations Install and maintain temporary fencing along the construction footprint boundary in areas adjacent to sensitive environmental values. For works within conservation areas of the MSA (ie KP 43 and 49) fencing must be compliant with relevant DELWP guidelines Marking any significant values such as large old trees on site plans An arborist's assessment to establish no-go areas around retained large old trees close to the construction corridor On-site supervision by a botanist and/or arborist to avoid accidental damage to retained native vegetation during construction works in GEVVVP Retention of stockpiled vegetation to be used for site rehabilitation Rehabilitating disturbed areas as soon as reasonably practicable A Tree Management Plan must be prepared based on detailed construction drawings and surveyed tree locations (EMM B23) 	Construction

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



BIODIVERSITY		
Ref.	Environmental controls	Project Phase
B19	<p>Fauna Mitigation – Golden Sun Moth</p> <p>Prepare and implement a Golden Sun Moth Management Plan and obtain approval for the plan from DELWP. The plan must include details regarding:</p> <ul style="list-style-type: none"> • Location of Golden Sun Moth habitat and method for mitigation measures in these areas • Topsoil management (including as outlined within EMM B8) • Rehabilitation measures • Ongoing management and/or monitoring. 	Construction
B20	<p>Fauna Mitigation – Striped Legless Lizard</p> <p>Prepare and implement a Striped Legless Lizard Management Plan and obtain approval for the plan from DELWP. The plan must include the following measures:</p> <ul style="list-style-type: none"> • Undertake active searching of areas identified as Striped Legless Lizard habitat (including rock rolling and lifting debris) prior to slashing • Slash areas of known and assumed habitat one week prior to tyning, to make them less suitable for lizards and encourage lizards to vacate the construction area. Slashing heights to be limited to no lower than 50 mm to minimise risk to individuals • If tyning is delayed, areas may need to be re-slashed to keep the grass short • Tyne areas of known and assumed habitat immediately prior to trenching to salvage and relocate individuals to immediately adjacent suitable habitat • A suitably qualified wildlife handler would be present during all tyning activities to undertake salvage and relocation activities • Once habitat has been made unsuitable and tyning has been completed, install lizard-proof fencing along the construction site boundary (where it meets lizard habitat) to prevent individuals from recolonising the site during construction. Fencing must be a solid material (e.g. polyethylene sheeting or plastic) that is 400 mm high and dug into the ground at a depth of 100 mm • Develop a record-keeping, storage, treatment and/or disposal protocol for killed or injured individuals, in 	Construction

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



BIODIVERSITY		
Ref.	Environmental controls	Project Phase
	<p>accordance with DELWP advice. All such records will be reported to DELWP</p> <ul style="list-style-type: none"> • Management of topsoil as per EMM B7 and B8 is also required. 	
B21	<p>Fauna Mitigation – Growling Grass Frog</p> <p>Schedule construction within Jacksons Creek outside the species’ peak active period (November to March).</p> <p>Prepare and implement a salvage and translocation plan for the Growling Grass Frog and obtain approval for the plan from DELWP. The salvage and translocation plan must include details regarding:</p> <ul style="list-style-type: none"> • Making habitat unsuitable for Growling Grass Frog by slashing bank vegetation one week prior to construction to discourage individuals from remaining within the site. • Undertaking checks for the species immediately prior to construction to remove any individuals found • For dams proposed for removal that have been identified as habitat, install fauna-proof fencing around the waterbodies once habitat has been made unsuitable and cleared of individuals to prevent individuals recolonising for the period between clearing and construction • For waterways identified as habitat, install fauna-proof fencing along the edge of the terrestrial works area once habitat has been made unsuitable and cleared of individuals to prevent individuals recolonising for the period between clearing and construction. • Install fauna-proof fencing within 100 m of areas with habitat known or assumed to support Growling Grass Frog. • Handling and relocation protocols e.g. animal storage, hygiene controls • Locations of suitable habitat (within 100 m) to relocate any individuals found • A protocol for any individuals found where appropriate release habitat is not available within 100 m of capture • Means of treatment or disposal for any individuals injured or killed by works. All deaths or injuries to be recorded and reported to DELWP. 	Construction

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



BIODIVERSITY		
Ref.	Environmental controls	Project Phase
	<ul style="list-style-type: none"> Fauna-proof fencing for Growling Grass Frog will be of a suitable structure and material to prevent frog movement from one side of the fence to the other Minimise the risk of high flow events on Growling Grass Frog habitat through site-specific measures outlined in EMM SW7 and EMM SW9 including but not limited to timing of works, Flood Management Plan and Response Plans. 	
B22	<p>Fauna Mitigation – Platypus</p> <p>Protect Platypus in accordance with the Platypus Management Guidelines (Australian Platypus Conservancy https://platypus.asn.au/management-guidelines/). This must include:</p> <ul style="list-style-type: none"> A pre-construction survey for the presence of burrows within the construction corridor at Jacksons Creek where open cut trenching is to occur If the presence of burrows can't be ruled out, the construction works at Jacksons Creek waterway/banks will be timed to avoid the peak juvenile nesting period between September and beginning of March If burrows are observed or can't be ruled out, excavations should proceed carefully using a non-toothed excavator bucket (e.g. mud or batter bucket) in order to allow any individuals present to escape. Minimise where practicable activities that involve excavating or driving over banks with heavy machinery and limit these to areas within the construction corridor To avoid disturbing active platypus, schedule work activities during daylight hours in Jacksons Creek. This excludes the use of pumps to extract water from the construction footprint overnight. Locate pumps as far from the waterway as reasonably practicable with use of noise deflectors to minimise noise impacts. All pumps and pipes to include exclusion grill to prevent Platypus becoming trapped, injured or killed. Egress points should be installed to allow any trapped individuals to escape coffer dams. Install exclusion fencing around coffer dams to reduce risks of predation on Platypus travelling around the coffer dams overland. 	Construction

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



BIODIVERSITY		
Ref.	Environmental controls	Project Phase
	<ul style="list-style-type: none"> • Manage loose soil from moving from the banks to the channel while works are underway. Areas of bare or disturbed soil are to be replanted as soon as reasonably practicable once works are completed and in accordance with landowner agreements. • Implement measures to prevent chemicals or litter associated with work activities from entering waterways and drainage lines • To maintain natural foraging substrates for platypus, concrete must not be substantially used as a binding agent along surface areas of the channel or banks This does not include the subsurface concrete encasement of slab protection considered for pipe protection as part of EMM SW7 • Develop and implement a contingency plan for dealing with any platypus that may be accidentally injured or displaced during work activities. 	
B23	<p>Remnant Tree Management Plan</p> <p>Develop and implement a Tree Management Plan to identify all remnant native (non-planted) trees within 15 m of the construction corridor boundary, deemed "lost" through encroachment of their TPZs and specifies:</p> <ul style="list-style-type: none"> • Trees to be impacted as part of the construction activities • The condition and arboricultural value of the trees. <p>Maximise tree retention to the extent practicable through detailed design and selection of construction methods to minimise canopy loss including by retaining trees where practicable and minimising potential impacts to trees.</p> <p>Arboricultural assessments must inform the Tree Management Plan in order to maximise tree retention and long-term viability of individual trees including those deemed "lost" through encroachment of their TPZs or groundwater changes.</p> <p>The Tree Management Plan must be informed by a pre-construction site assessment to confirm the area and number of trees proposed to be impacted.</p> <p>The area and number of trees actually removed are to be confirmed through a post-construction arborist assessment.</p>	Design and Construction

13.3.4 Cultural heritage

Table 13.7 Environmental management measures (Cultural heritage)

CULTURAL HERITAGE		
Ref.	Environmental controls	Project phase
CH1	<p>Cultural Heritage Management Plans</p> <p>Implement and comply with the Cultural Heritage Management Plans (CHMP 16594 and CHMP 16593) management conditions to preserve registered and unidentified Aboriginal cultural heritage places and values.</p>	Construction
CH2	<p>Archaeologically sensitive land forms</p> <p>Identify and complete subsurface testing in all archaeologically sensitive areas within the Project area during the completion of Cultural Heritage Management Plans (CHMP 16594 and CHMP 16593) in consultation with AV and WWCHAC.</p>	Construction
CH3	<p>Listed historic heritage sites</p> <p>For any potential impact to VHI sites, obtain consent from Heritage Victoria in advance and implement management measures required in the consent, including fencing off the site during works, monitoring and recording.</p>	Construction
CH4	<p>Unlisted historic heritage sites</p> <p>Should an unknown historic heritage site, value or object be discovered during construction, follow the unexpected finds procedure, outlined in the CHMP.</p>	Construction

13.3.5 Contamination

Table 13.8 Environmental management measures (Contamination)

CONTAMINATION		
Ref.	Environmental controls	Project phase
C1	<p>Implement spoil management measures</p> <ul style="list-style-type: none"> Prepare and implement spoil management measures in accordance with relevant regulations, standards and guidelines including EPA Publication 1834 Civil construction, building and demolition guide. The spoil management measures must be developed in consultation with the EPA Victoria and include processes and measures to manage all spoil types i.e. all excavated material. The main spoil types would include mostly uncontaminated soils and potentially small volumes of prescribed industrial waste (PIW) in the vicinity of the potential sources noted in Technical report E <i>Contamination</i>. <p>The spoil management measures must define roles and responsibilities and include requirements and methods for:</p> <p>General</p> <ul style="list-style-type: none"> Complying with applicable regulatory requirements including EPA Publication 1834 Civil construction, building and demolition guide and SEPP (Prevention and Management of Contaminated Land) Investigations in accordance with the Australian Standard AS 4482.1:2005 Guide to the investigation and sampling of sites with potentially contaminated soil, the ASC NEPM and the EPA Victoria Industrial Waste Resource Guidelines (IWRGs) Leaving contaminated soils in-situ to the extent possible. Assessment of any material imported to the site for use as backfill in accordance with IWRG 621 and 702. Imported material must meet the 'Fill Material' criteria as defined in Table 2 of IWRG621. <p>Assessment</p> <ul style="list-style-type: none"> Completing further soil investigations to assess soil quality for the analysis detailed in Technical report E <i>Contamination</i> prior to construction in order to inform the CEMP: 	Pre-construction and construction

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



CONTAMINATION		
Ref.	Environmental controls	Project phase
	<ul style="list-style-type: none"> - At the Diggers Rest (KP 9.95 - KP10.14), which is being used to store hundreds of wrecked cars, - A possible former quarry in Beveridge (KP 37.5) along the construction corridor to ascertain if the former quarry extents encroaches onto the Project - The retarding basin (KP 34-35.5) prior to any excavation in these areas. - Wollert Compressor Station (KP 50.78 to KP 51.045) - Shallow sediments in Jacksons Creek. • Following these further investigations, updating the CEMP to include areas of potential contaminated soils • Identifying where any contaminated or hazardous material is exposed during construction and how it would be made safe for the site owner and the environment. Beneficial uses of land and ASC NEPM guidance on criteria protective of those beneficial uses must be considered for the land uses in these areas. <p>Unexpected contamination</p> <ul style="list-style-type: none"> • Identifying, containing and managing unexpected contamination in accordance with applicable regulatory requirements including EPA IWRG 621 and 702 <p>Handling, stockpiling and transport</p> <ul style="list-style-type: none"> • Conducting all spoil handling and transport for offsite disposal in accordance with the EPA IWRGs • Managing construction works during wet weather, which can lead to runoff of contaminated and uncontaminated soil from stockpiles and excavations into nearby waterways, in accordance with SW1 and SW4. • Regularly monitoring weather conditions and planning works accordingly to avoid or minimise impact to sensitive receptors from works during adverse weather (i.e. runoff from rainfall). • Implementing personal protective equipment and standard hygiene practices when handling contaminated spoil • Separating stockpiles of trench spoil into contaminated and uncontaminated soil. As both of 	

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



CONTAMINATION		
Ref.	Environmental controls	Project phase
	<p>these waste types can adversely impact the environment (e.g. through runoff to waterways), all stockpiles must be managed in accordance with EPA Victoria Publication 1834 Civil construction, building and demolition guide and EPA Publication 1895 Managing Stockpiles, 2020.</p> <ul style="list-style-type: none"> • Where it is necessary to excavate contaminated soils, stockpiling these separately, with containment and treatment measures appropriate to the type of contamination present. This must include. <ul style="list-style-type: none"> - All stockpiles of potentially contaminated spoil must be appropriately secured, lined and bunded to prevent leaching - All stockpiles of potentially contaminated spoil must be appropriately covered and bunded to limit rainwater ingress, dust generation and contact by fauna - Stockpiling of contaminated soil must be kept to a minimum and removed to landfill or other use at the earliest opportunity • Handling and transport of contaminated spoil for off-site treatment/disposal in accordance with Environment Protection (Industrial Waste Resource) Regulations 2009. Transport companies must be licensed by EPA Victoria to carry contaminated soil • Managing PFAS-impacted soil (if any) in accordance with the PFAS NEMP and EPA guidance. • Monitoring, recording and tracking spoil and other waste handling including but not limited to stockpile management, trucking and destination tracking, and sampling results. <p>Reuse or Disposal</p> <ul style="list-style-type: none"> • Assessing potentially contaminated spoil, which is to be disposed of offsite, in accordance with IWRG 621 and 702. • Considering the waste management hierarchy including opportunities for reuse, with spoil that is unable to be reused to be removed from site via designated haulage routes <p>Disposing drilling muds in accordance with Environment Protection (Industrial Waste Resource) Regulations 2009</p>	

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



CONTAMINATION		
Ref.	Environmental controls	Project phase
	and EPA Victoria Industrial Waste – Classification for Drilling Mud, Victoria Government Gazette G37.	
C2	<p>Managing any unknown contamination</p> <p>The spoil management measures referenced in EMM C1 must include requirements and methods to address and manage any contamination that was not expected during construction.</p> <p>Such material may be identified by visual or olfactory observations, the presence of asbestos and other anthropogenic material. The spoil management measures must include contingency plans and appropriate responses in accordance with EPA guidelines. These must include, as a minimum:</p> <ul style="list-style-type: none"> • Cease ground disturbance at the unknown contamination location and within the immediate vicinity. • Assess site contamination and identify appropriate management action. 	Construction
C3	<p>Minimise impacts from disturbance of acid sulfate soil</p> <p>PASS may be present in saturated alluvium beneath and within close proximity to the creeks. Carry out further assessment where dewatering of alluvium may occur, specifically at Jacksons Creek and Merri Creek.</p> <p>The spoil management measures referenced in EMM C1 must include requirements and methods to minimise impacts from disturbance of acid sulfate soil, including but not limited to:</p> <ul style="list-style-type: none"> • Characterising acid sulfate soil and rock prior to excavation in accordance with EPA Publication 655.1 Acid sulfate soil and rock • Developing appropriate stockpile areas including lining, covering and runoff collection to prevent release of acid to the environment • Identifying suitable sites for re-use, management or disposal of acid sulfate soil • Preventing oxidation that could lead to acid formation if practicable, through cover and/or scheduling practices, for example by minimising the length of time that acid sulfate soil is left in stockpiles as far as 	Construction

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



CONTAMINATION		
Ref.	Environmental controls	Project phase
	<p>reasonably practicable and/or addition of neutralising compounds</p> <ul style="list-style-type: none"> • Completing further acid sulfate soil assessment prior to construction in order to inform the CEMP at: <ul style="list-style-type: none"> - Jacksons Creek - Merri Creek. <p>Requirements and methods must be in accordance with the Industrial Waste Management Policy (Waste Acid Sulfate Soils), EPA Victoria Publication 655.1 Acid Sulfate Soil and Rock, and the Department of Sustainability and Environment’s Victorian Best Practice Guidelines for Assessing and Managing Coastal Acid Sulfate Soil.</p>	
C4	<p>Minimise risks from contaminated groundwater</p> <p>Develop and implement groundwater management measures in accordance with EMM GW3.</p>	Construction
C5	<p>Minimise risks from vapour and ground gas intrusion</p> <p>Relevant sections of the Project must consider vapours and gases associated with any construction that interfaces with landfill sites (within 500 metres of the boundary of the boundary of the waste) or contaminated areas. These include the sections of the alignment adjacent to the Bulla Landfill (approx. KP 15 to KP 16) and near the Diggers Rest property (approx. KP 9.95- KP 10.14).</p> <p>The spoil management measures referenced in EMM C1 must include requirements for assessment, monitoring and management of intrusive vapour, including potentially flammable or explosive conditions, in enclosed spaces within 500 metres of the Bulla Landfill (approx. KP 15-KP 16) and Diggers Rest (approx. KP 9.95- KP 10.14) property and trenches in those areas.</p> <p>The spoil management measures must address vapour risks associated with excavation of impacted soils, extraction of impacted groundwater, open excavations and stockpiles and gases.</p> <p>Specifically associated with the Bulla Landfill (KP 15-KP 16), this must include, where relevant:</p> <ul style="list-style-type: none"> • Securing of the excavation and stockpile area from the public and livestock including signage warning of open excavations 	Construction



CONTAMINATION		
Ref.	Environmental controls	Project phase
	<ul style="list-style-type: none"> • Continuous monitoring of landfill gas conditions when any person is in the trench or during hot works or works that could potentially produce a spark within the trench. • Setting of trigger values that require action within areas being trenched and including any temporary structures within the vicinity of the landfill. These must be developed in accordance with EPA Victoria Publication 788 Best Practice Management; Siting, design, operation and rehabilitation of landfills (landfill BPEM) and relevant occupational health and safety regulations and compliance codes. • Contingencies to address any breaches of trigger values including temporary cessation of work until a reappraisal of risks is conducted, additional monitoring at a higher frequency, implementation of additional safety measures and or vapour extraction systems in response to the risk assessment. <p>Specifically relevant to the Diggers Rest property (approx. KP 9.95- KP 10.14), this must include, , prior to construction to inform the CEMP:</p> <ul style="list-style-type: none"> • Investigation of soils within the construction corridor to assess for the presence contamination including metals, TRHs, BTEX, PAHs and solvents. • If volatile contamination is identified a risk assessment to determine the risk from vapours to construction workers during trenching may be required. 	
C6	<p>Manage chemicals, fuels and hazardous materials</p> <p>The spoil management measures must include requirements for management of chemicals, fuels and hazardous materials including to:</p> <ul style="list-style-type: none"> • Minimise chemical and fuel storage on site and store hazardous materials and dangerous goods in accordance with the relevant guidelines and requirements. • Comply with the Victorian WorkCover Authority and Australian Standard AS1940 Storage Handling of Flammable and Combustible Liquids and EPA Victoria publications 1834 Civil construction, building and demolition guide and Publication 1698: Liquid storage and handling guidelines – EPA Victoria. 	Construction

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



CONTAMINATION		
Ref.	Environmental controls	Project phase
	<ul style="list-style-type: none"> • Develop and implement management measures for dangerous substances, including: <ul style="list-style-type: none"> - Creating and maintaining a dangerous goods register - Disposing of any hazardous materials, including asbestos, in accordance with Industrial Waste Management Policies, regulations and relevant guidelines - Implementing requirements for the installation of bunds and precautions to reduce the risk of spills. • Develop and implement contingency and emergency response procedures to handle fuel and chemical spills, including availability of on-site hydrocarbon spill kits • Make spill kits available at all locations where machinery/plant are operating, refuelling points and fuel and chemical storage locations. <ul style="list-style-type: none"> - Limit the type and volume of liquid material (fuel, oil, lubricant) stored on-site for construction activities to only that which is required. Liquid material must not be stored within 50 metres of waterways. 	
C7	<p>Management of waste streams</p> <p>Implement the following measures to manage non hazardous waste:</p> <ul style="list-style-type: none"> • Manage wastes in accordance with the IWR Regulations • Undertake an assessment of potential wastes to be generated for the construction phase of the project that identifies waste elimination, reduction measures and opportunities for the re-use and recycle of construction waste • Use appropriately designated/designed facilities to handle the identified waste streams including necessary segregation and storage requirements. This must include dedicated and labelled on site disposal locations, which segregates wastes into streams for offsite disposal or recycling • Locate waste facilities away from natural drainage systems and low-lying areas 	Construction

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



CONTAMINATION		
Ref.	Environmental controls	Project phase
	<ul style="list-style-type: none"> • PIW (such as waste oils, oily water mixtures, oily rags and oil filters, etc) must be segregated, labelled and securely stored and transported to a facility licensed to accept these wastes • Classify and dispose waste in accordance with the IWR Regulations including by using a licensed waste contractor and completing waste transport certificates for PIW • Carry out a toolbox meeting including specific awareness on chemical management/refuelling and differences between waste types to facilitate correct segregation, storage and disposal • Sufficiently enclose putrescible wastes for odour control (e.g. use of suitable bins) • No PIW shall be comingled with other waste streams • Document and implement a detailed process for monitoring, recording and tracking waste handling. 	
C8	<p>Management of hydrostatic test water</p> <p>Implement measures for management of hydrostatic testing water including:</p> <ul style="list-style-type: none"> • Manage hydrostatic test water in accordance with SEPP (Waters) • Sample water to be used for hydrostatic testing to determine water quality prior to use • Prior to hydrostatic testing, pre-clean the pipeline to remove weld debris, dust and surface scale • Reuse water where practicable to minimise the number of discharge locations and conserve water • Only discharge hydrostatic test water discharge where water designated for release into the environment is of a quality that is within relevant statutory water quality guidelines. Relevant landholder(s) must be consulted prior to any discharge of hydrostatic test water to land • Any discharge of hydrostatic test water must not result in soil erosion or sedimentation of land or water. Sediment control devices to remove suspended solids such as geotextile fabric filters must be used • Direct discharge must not occur to watercourses or drains. 	Construction

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



CONTAMINATION		
Ref.	Environmental controls	Project phase
C9	<p>Management of drilling fluids</p> <p>Implement measures for management of drilling fluids including:</p> <ul style="list-style-type: none">• Making spill kits or similar available to contain spills on land, preventing runoff into surface water and drains.• Identifying and implementing contingency measures when HDD activities are in the vicinity of waterway zones• Disposing drilling fluids in accordance with Environment Protection (Industrial Waste Resource) Regulations 2009 and EPA Victoria Industrial Waste – Classification for Drilling Mud, Victoria Government Gazette G37.• If HDD occurs through a potentially contaminated site the IWRG 621 and 702 must be followed for offsite disposal• Selecting appropriate inert drilling fluids.	Construction

DRAFT



13.3.6 Greenhouse gas

Table 13.9 Environmental management measures (Greenhouse gas)

GREENHOUSE GAS		
Ref.	Environmental controls	Project phase
GG1	<p>Construction emissions</p> <p>Reduce greenhouse gas emissions during construction by:</p> <ul style="list-style-type: none"> a Using low embodied energy materials where they are of comparable quality, utility, availability and cost b Using fuel efficient plant and equipment where practicable during construction c Using locally sourced materials, including those provided by suppliers, where they are of comparable quality, utility, availability and cost d Reducing the amount of vegetation removal along the pipeline alignment as far as reasonably practicable e Monitoring construction greenhouse gas emissions via audit/monitoring processes f Mulching trees for recycling g Minimising the amount of fossil fuel based explosives required during the construction phase. 	Construction

13.3.7 Ground movement

Table 13.10 Environmental management measures (Ground movement)

GROUND MOVEMENT		
Ref.	Environmental controls	Project Phase
GM1	<p>Third party asset management</p> <p>Identify and prove all third party services prior to construction and agree vertical and horizontal clearance requirements with asset owners. Liaise with asset owners for any asset within the construction easement to confirm asset clearance and other mitigation, protection or contingency requirements, including possible settlement monitoring at the railway crossings.</p> <p>Where utility crossings occur during open trench construction, the asset protection must be agreed with the provider and adhered to.</p>	Design and Construction
GM2	<p>Design and construction to be informed by geotechnical and hydrogeological conditions</p> <p>Existing and planned geotechnical and hydrogeological investigations must form the basis of design and inform expected ground and water conditions during construction so that due consideration is given toward the existing ground key issues (such as those identified in Technical report D <i>Land stability and ground movement</i>). This information is to:</p> <ul style="list-style-type: none"> • Provide information on the soil and rock expected to be encountered during all excavations • Provide information on the presence of reactive soils • Provide information on the presence of dispersive (“sodic”) soils • Provide information on the locations and extent of groundwater drawdown requirements. 	Design and Construction

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



GROUND MOVEMENT		
Ref.	Environmental controls	Project Phase
GM3	<p>Management of trench stability: support and duration</p> <p>Carry out trench excavation works in accordance with the requirements of the Safe Work Australia Code of Practice: Excavation Work (2018) and WorkSafe Victoria Compliance Code: Excavation (2019).</p> <p>Measures are also to be considered where potentially unstable ground may compromise the stability of the trench as assessed by a suitably qualified geotechnical engineer.</p> <p>In addition, the time that trenches and bell holes remain open will be minimised as far as reasonably practicable. As a general rule, trenches should not remain open for longer than 3 months and should comply with SafeWork Australia (2018). For some excavations (for example for main line valves, hydrostatic test sections and tie-in locations) this time period may be exceeded and trench wall support is to be provided in accordance with SafeWork Australia (2018).</p> <p>Should failure occur, contingency response actions may include, for example, methods for temporary shoring and the removal, replacement, and rehabilitation of the disturbed soil.</p>	Construction

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



GROUND MOVEMENT		
Ref.	Environmental controls	Project Phase
GM4	<p>Management of trench erosion, consolidation and swelling</p> <p>Implement measures to manage soil dispersion, erosion, consolidation and swelling risks including:</p> <ul style="list-style-type: none"> • Implementation of erosion and sediment control measures in accordance with EPA 1834 guidelines (2020) and is to be informed by the International Erosion Control Association (IECA) Best Practice Erosion and Sediment Control, Appendix P – Land Based Pipeline Construction (2008). This includes the use of trench breakers installed at regular intervals along the trench excavation where necessary (for example, near to existing slopes and where shallow groundwater tables exist) to minimise ongoing erosion caused by altered water flow regimes as a result of trench construction. • Compaction of the trench backfill as per APA’s performance requirement and/or contractor’s construction requirements. Degree of compaction and design of backfill to take into account design load limits on the pipe and density and permeability of surrounding soil. • Routine inspection and monitoring of the construction area (easement patrols) must be undertaken throughout operation as per the VTS OEMP to identify any issues such as ongoing erosion, ground movement, slope creep or other adverse effects on land use. Management, monitoring and identification of issues may be in accordance with IECA Best Practice Erosion and Sediment Control (2008). <p>Additional erosion control measures in proximity to waterways are contained in EMM SW4.</p> <p>Additional measures for rehabilitation and monitoring of trenched waterways are contained in EMM SW3.</p>	Construction and Operation

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



GROUND MOVEMENT		
Ref.	Environmental controls	Project Phase
GM5	<p>HDD trenchless bore management</p> <p>Use trenchless bore support (such as a suitable drilling mud or bentonite) to temporarily support the bore during the trenchless activities in accordance with the guidelines for horizontal directional drilling, microtunnelling and pipe jacking (ASTT, 2009).</p> <p>Prior to construction, undertake a detailed hydrofracture risk assessment where appropriate to confirm that the risk of blow-out is low. Prepare and implement a volumetric drilling fluid tracking program with defined threshold levels for fluid loss, stop works and further investigation.</p> <p>Monitor and manage support fluid to effectively minimise ground deformations and risk of bore collapse in unstable ground to reduce the risk of damage to nearby sensitive receptors as well as the potential for frac-out.</p>	Construction
GM6	<p>Confirmation of ground risk</p> <p>For sites where there is insufficient or no geotechnical information, confirm the viability of proposed temporary works (i.e. choice of trenchless method) by completing additional geotechnical investigations. Additional investigations may include shallow surface geophysical methods, trial pitting or drilling as appropriate (subject to environmental or access constraints).</p> <p>Take into account any new geotechnical information at all relevant sites and develop and implement measures for trenchless construction to mitigate the risk of adverse environmental impacts (for example excessive settlement, damage to assets). Relevant sites include Beatty’s Road, Morefield Court, Sunbury Road, Oaklands Road, Donnybrook Road (West).</p> <p>Carry out further utility proving works where information is not currently available at the crossing location (including at the Donnybrook Road (West) crossing).</p>	Design and Construction

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



GROUND MOVEMENT		
Ref.	Environmental controls	Project Phase
GM7	<p>Preparation and implementation of sodic soil management measures</p> <p>Complete additional site investigations to further identify areas of higher dispersion risk along the alignment (in addition to those listed in Technical report D <i>Land stability and ground movement</i> Section 6.3).</p> <p>Develop, document within the CEMP and implement minimum requirements to be put in place to manage dispersive/sodic soils during construction and operation. Management measures may be proportional to the level of risk identified by the additional site investigations and in general accordance with the guidelines contained within Best Practice Erosion and Sediment Control, Appendix P (IECA, 2008) where applicable.</p> <p>A management plan must be developed prior to construction and implemented detailing how sodic soil hazards will be managed during construction.</p> <p>Application of EMM GM4 is also considered to assist in the management of dispersive soils.</p>	Construction

13.3.8 Land use

Table 13.11 Environmental management measures (Land use)

LAND USE		
Ref.	Environmental controls	Project phase
LU1	<p>Impacts to Precinct Structure Plans (PSPs) and growth areas</p> <p>Minimise impacts as far as reasonably practicable to PSPs and growth areas by providing for consistency with approved and PSPs that are yet to be approved. This must include:</p> <ul style="list-style-type: none"> • Co-locating the alignment with other utility and transport infrastructure projects to avoid impacts on net developable land where practicable • Where the pipeline has not been provided for in an existing PSP: <ul style="list-style-type: none"> - designing the pipeline in accordance with AS 2885 with consideration to current land use • Incorporating the proposed easement and notification area based on the Area of Consequence into any future PSPs along the alignment • Rehabilitating land within existing PSPs in accordance with EMM LU2 • Providing for future uses along the pipeline (e.g. shared use paths) in accordance with the APA Site Planning and Landscape National Guidelines (APA 2020). 	Construction

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



LAND USE		
Ref.	Environmental controls	Project phase
LU2	<p>Continuation of existing land uses</p> <p>Construct and operate the Project in accordance with EMM AQ1, AQ3, AQ4, NV1, NV2, NV3, NV4, NV5 to minimise amenity impacts and support the continuation of existing land uses during construction and operation phases.</p> <p>Rehabilitate land in accordance with the Project CEMP.</p> <p>Continuation of agricultural land uses must be managed in accordance with EMM S2.</p> <p>Inform landowners and occupiers of the construction commencement, and details of the proposed construction programme, in accordance with the Project Consultation Plan.</p>	Construction and operation
LU3	<p>Impacts to land tenure and access</p> <p>Provide compensation for the reservation of the easement and acquisition of land for the Project in accordance with Pipelines Act 1985 and Land Acquisition and Compensation Act 1986.</p> <p>Consult relevant stakeholders in relation to construction access and operational activities in accordance with the Project Consultation Plan and Project EMMs S3 and S5.</p>	Construction and operation
LU4	<p>Interruptions to roads and railways</p> <p>Develop and implement Traffic Management Plans in accordance with EMM S3.</p> <p>Use trenchless construction methods to avoid disruptions to major roads and railway lines as far as reasonably practicable.</p>	Construction

13.3.9 Landscape and visual

Table 13.12 Environmental management measures (landscape and visual)

LANDSCAPE AND VISUAL		
Ref.	Environmental controls	Project Phase
LV1	Avoid tree removal as far as reasonably practicable. Through detailed design and selection of construction methods identify and demarcate trees to be retained (within the construction corridor) that provide screening to private property residences prior to commencement of construction. Protect trees to be retained in accordance with AS-4970 Protection of trees on development sites.	Design and construction
LV2	Prior to construction, undertake an arborist report on trees that screen private residences from road reserves to be retained immediately bordering the construction corridor where trimming would be required. The arborist assessment must consider any potential impacts on trees from proposed construction activities in accordance with AS-4970 Protection of trees on development sites.	Construction
LV3	Remove machinery, materials and temporary infrastructure from site as soon as it is no longer required. Keep construction laydown areas tidy and minimise dust in accordance with EMM AQ1.	Construction
LV4	Manage light generated during night construction activities such as HDD, in general accordance with the requirements in Australian Standard AS/NZS 4282:2019 Control of the obtrusive effects of outdoor lighting. Design lighting to minimise off-site light spill as far as reasonably practicable.	Construction
LV5	Where trees and shrubs within the approved construction area are lost and affect public places or existing screening of private residences from road reserves, replace trees and shrubs where practicable, reasonably requested and in consultation with the affected landholder and/or responsible authority. Undertake planting in accordance with the relevant bushfire management overlays for the area.	Construction

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



LANDSCAPE AND VISUAL		
Ref.	Environmental controls	Project Phase
LV6	<p>Introduce trees and shrubs to screen the mainline valve from roads and residences, if reasonably requested by affected landholders and with any necessary approvals granted (while meeting requirements of the Asset Protection Zone (APZ)). The planting of trees and shrubs must be undertaken in consultation with the affected landholder and/or responsible authority. Undertake planting in accordance with the relevant bushfire management overlays for the area.</p>	Construction
LV7	<p>Develop and implement a planting and remediation plan (applicable to screening trees directly impacted) where planting of trees and shrubs are proposed, in consultation with any affected landowners where requested.</p> <p>Planting will be undertaken with consideration of APA requirements for restricted uses within an easement and other necessary approvals granted.</p> <p>The plan must be reviewed by the responsible authority and/or affected landholder. The plan must outline a monitoring and defects period for planting and remediation.</p>	Construction and Operation

13.3.10 Safety

Table 13.13 Environmental management measures (Safety)

SAFETY		
Ref.	Environmental controls	Project Phase
SA1	<p>Pipeline, MLV and compressor works safety standards Design, construct and operate the pipeline, MLV and compressor works in accordance with AS/NZS 2885, including:</p> <ul style="list-style-type: none"> • Completion of identification/assessment of threats and mitigating strategies as part of detailed design • Maintenance and inspections of the pipeline in accordance with APA procedures and AS/NZS 2885. <p>Maintain and inspect the MLVs and the Wollert compressor station at a frequency in accordance with APA's monitoring regime and procedures. This must include vegetation management, valve and compressor operation and corrective maintenance.</p>	Design and construction
SA3	<p>Fire protection Develop and implement a Health and Safety Management Plan that requires:</p> <ul style="list-style-type: none"> • Provision of active fire protection and suppression for liquid fires in the turbine enclosure • Storage of diesel in storage tanks in accordance with AS 1940:2017 and provision of foam for firefighting purposes at diesel stations and implementation of routine monitoring to manage the risk of any fire events. <p>Manage diesel in accordance with the HSEMS, including the creation of Emergency Response Plan(s).</p>	Construction
SA4	<p>Emergency response plans Develop and implement emergency response plans, such as for spills, for both the construction and operations phases of the Project.</p>	Construction & Operation
SA5	<p>Bushfire Management Plan Review and update the existing APA Bushfire Management Plan to consider the new infrastructure introduced by the WORM Project in consultation with relevant stakeholders including the Country Fire Authority and Fire Rescue Victoria.</p>	Construction & Operation

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



SAFETY		
Ref.	Environmental controls	Project Phase
SA6	Traffic Management Plan Develop and implement a Traffic Management Plan to manage risks to both workers and the public on the movement of vehicles on public roads and at site access points as per EMM S3.	Construction

DRAFT

13.3.11 Social

Table 13.14 Environmental management measures (Social)

SOCIAL		
Ref.	Environmental controls	Project Phase
S1	<p>Reduce community disruption:</p> <p>Construct the Project in accordance with EMMs AQ1, AQ3, AQ4, B7, LV1, LV2, LV5, NV1, NV2, NV3, NV4, NV5, NV6, and NV7 to minimise noise, vibration, air quality, and landscape and visual amenity impacts to residents directly adjacent to the alignment, community facilities and recreation areas.</p>	Construction
S2	<p>Minimise property impacts:</p> <p>Minimise the risk of property damage due to construction of the Project by carrying out construction activities in accordance with the mitigation measures detailed in the Agricultural Impact Assessment (Appendix-C). Refer EMM S7 to EMM S23.</p>	Construction
S3	<p>Community and residential access and connectivity:</p> <p>The following must be implemented to manage potential impacts to local access roads during construction:</p> <ul style="list-style-type: none"> • Approved Traffic Management Plans (TMPs) to mitigate risks to workers and the public arising from the movement of construction vehicles on public roads and at site access points • Stakeholder and communications arrangements in accordance with the Project Consultation Plan (Refer to EMM S6) • Measures to prevent impacts to emergency services access. 	Pre-construction

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



SOCIAL		
Ref.	Environmental controls	Project Phase
S4	<p>Land access:</p> <p>Prior to any works commencing on a property, develop agreements with the landowners and occupiers regarding the use of existing roads or tracks, the selection of new access routes and any property-specific measures to implement during construction and operation, such as</p> <ul style="list-style-type: none"> • Access across the construction area • Relocation / duplication of facilities and infrastructure. <p>Inform land owners and occupiers of the construction commencement, and details of the proposed construction program, in accordance with the Project Consultation Plan (EMM S6).</p>	Pre-construction
S5	<p>Source workers, supplies and services during construction from the regional study area as far as reasonably practicable.</p> <p>Support regional employment and purchasing by requiring the main construction contractor to detail mechanisms to provide for regional employment and purchasing during the tender phase. The adequacy of this plan must be a consideration in the selection of the preferred construction contractor. Once engaged, contractors must be required to report on performance against set criteria.</p>	Construction

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



SOCIAL		
Ref.	Environmental controls	Project Phase
S6	<p>Develop and implement a Project Consultation Plan to facilitate ongoing consultation with relevant stakeholders throughout the Project’s planning and construction. The Plan must include:</p> <ul style="list-style-type: none"> • The approach to communicating and engaging with the community and potentially affected stakeholders in relation to: <ul style="list-style-type: none"> - The likely timing and nature of the Project’s construction activities and potential impacts. - Changes to transport conditions. • The mechanisms and timing for communicating Project updates for all stakeholders through multiple channels (website, newsletters, local media) • The approach for communicating and engaging with vulnerable groups, including community groups and residents that do not speak English. Translation services will be promoted as and where appropriate for specific project communications. • Measures to evaluate the effectiveness of the communication and engagement under the Plan. • Arrangements for receipt and management of feedback and complaints, including timeframes for responding to complaints. 	Construction
S7	<p>Consult with relevant landholders regarding property-specific measures to implement during construction and operations including:</p> <ul style="list-style-type: none"> • Access across the construction corridor during construction • Stock management • Biosecurity. 	Design and construction
S8	<p>Undertake all reasonable steps to enter into an agreement with each landholder on fair and reasonable terms. Agreements must include commitments to agreed measures to minimise the impact of the Project on landholder activities.</p>	Design and construction

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



SOCIAL		
Ref.	Environmental controls	Project Phase
S9	Compile and maintain a schedule of Landholder Agreements, documenting actions to be carried out on each property.	Design and construction
S10	All third party services within the easement, including on farm infrastructure, must be identified and marked on the ground in advance of open trench construction activities.	Design and construction
S11	Manage interfaces with all identified third party services and water lines so that their operation can continue during pipeline construction, wherever reasonably practicable.	Construction
S12	Develop and implement biosecurity management measures for the construction phase of the Project in accordance with the Catchment and Land Protection Act 1994.	Construction
S14	Progressively commence and complete reinstatement as soon as reasonably practicable post-construction.	Construction
S15	Reprofile the construction corridor to original contours or to new, stable contours (where it is not reasonably practical to re-profile to original contour) in line with contractor construction specification.	Construction
S16	Apply soil amelioration and fertiliser where required as determined by soil assessments and tailored to rehabilitation requirements in consultation with the landholder.	Construction
S17	Compact the trench backfill as per APA's performance specification and/or contractor's construction specifications. Degree of compaction to take into account design load limits on the pipe whilst minimising changes to pre-construction groundwater conditions.	Construction
S18	Implement compaction relief by ripping or scarifying areas of the construction corridor which have been compacted by construction activities. Particular attention must be given to areas subject to regular watering and high traffic volume.	Construction

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



SOCIAL		
Ref.	Environmental controls	Project Phase
S19	Reinstate all access tracks, fences and gates post construction in consultation with landholders and any relevant third parties.	Construction
S20	Install permanent access gates post construction, where required at fence intersections and for access to MLV compounds which will be completely fenced.	Construction
S21	<p>Where seeding is adopted to facilitate prompt revegetation and soil stabilisation, consider the following principles:</p> <ul style="list-style-type: none"> • Formulate seed mixtures with consideration of the vegetation composition of the areas adjacent to the construction corridor and in consultation with the relevant landholder. • Sterile seed stock (cover crop) may be used to provide short term surface stability. • Disperse seed evenly dispersed over the disturbed area. • Seeding to take place as soon as reasonably practicable after reinstatement of the soil profile. • A suitable fertilizer may be applied depending on soil conditions and any landholder requirements. 	Construction
S22	Monitor the condition of the construction corridor and other disturbed areas post construction with remedial measures undertaken, as required, with the aim that all disturbed areas are re-profiled to a stable landform consistent with original contours and drainage lines, or proposed new stable contours, and vegetated with a self-sustaining, non-pest species groundcover.	Construction and operation
S23	Implement reasonable and practicable measures to avoid impacts to landholder national vendor declarations and other requirements under applicable livestock production assurance programs due to the use of herbicides, pesticides and other chemicals during construction and operations. Such measures must be informed by consultation with Meat and Livestock Australia.	Construction and operation

13.3.12 Surface water

Table 13.15 Environmental management measures (Surface water)

WATER		
Ref.	Environmental controls	Project Phase
SW1	<p>Managing runoff from adjacent construction areas, discharge from dewatering activities and spills / leaks</p> <p>Implement measures to minimise impacts on downstream environments due to construction activities and potential runoff, including:</p> <ul style="list-style-type: none"> • Where practicable, construct all trenched crossings of ephemeral watercourses during no or low flow conditions and reinstated as soon as reasonably practicable • Form discrete stockpile segments (i.e. rather than a continuous row of stockpile materials) to prevent causing water to pond on the upstream side • Where drainage lines intersect the construction corridor, place flow diversion measures upstream of soil stockpiles • Direct surface water runoff from external catchments through regular gaps in soil stockpiles where erosion and sediment controls are installed to allow runoff to pass over the construction corridor at a controlled location without causing erosion. • Implement erosion and sediment controls for the site with reference to International Erosion Control Association Best Practice Erosion and Sediment Control, Appendix P – Land Based Pipeline Construction (IECA, 2008). • Monitor weather forecasts to manage the pipeline works with the intent of avoiding open trench works at each individual waterway crossing when high rainfall events are expected. • Collect and treat water from dewatering of trenches due to rainfall prior to discharge into the waterways (e.g. grass filtration) if turbidity exceeds requirements in accordance with SEPP (Waters). Manage non-contaminated groundwater and surface water run-off that enters the open trenches and bell holes in accordance with SEPP (Waters). Discharge to land (i.e. grass filtration) must not occur within 100 metres of watercourses. 	Construction

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



WATER		
Ref.	Environmental controls	Project Phase
	<ul style="list-style-type: none"> Manage any spills and / or leaks during construction in accordance with mitigation measures described in EES Technical Report E: Contamination assessment (EMM C6). <p>Implement measures to minimise impacts due to discharge from Trenchless construction sites including, where reasonably practicable:</p> <ul style="list-style-type: none"> Install a combination of earth bunds and drainage channels around the upper edges of trenchless drilling sites to divert runoff away from the site and prevent it from mixing with material used during drilling operations Install sump pits at the bottom of trenchless drilling sites to capture any runoff from drilling compound and construct earth bunds around the sump pits to prevent spillage from entering the waterway Construct bunds around all facilities that are involved in the HDD activities including around slurry operations and pumping of drilling mud <p>Manage trenchless bores and drilling fluids in accordance with mitigation measures described in EES Technical Report E: Contamination (EMM C9) and EES Technical Report D: Land stability and ground movement (EMM GM5 and EMM GM6).</p>	
SW2	<p>Waterway and floodplain function (construction)</p> <p>Implement measures to minimise impacts to the function of waterways and floodplains during construction and allow flow to be conveyed across the construction area, including:</p> <ul style="list-style-type: none"> Form discrete stockpile segments (i.e. rather than a continuous row of stockpile materials) to prevent causing water to pond on the upstream side Provide regular gaps in stockpiles to allow flood water to pass through. Avoid stockpiling material near waterways. Material must be located away from the top of banks so that there is no restriction to the flow conveyance area. To maintain the waterway and floodplain function, the Project must compact soil, scarify and re-profile the land to original contours as far as reasonably practicable. 	Construction

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



WATER		
Ref.	Environmental controls	Project Phase
SW3	<p>Site Rehabilitation measures for disturbance caused by open cut trench construction</p> <p>This will include all standard construction management measures and site rehabilitation measures outlined in Table 8-7 of EES Technical report B Surface water. Implement site rehabilitation measures including:</p> <ul style="list-style-type: none"> • Compact soil, scarify and re-profile the land to original contours to maintain the waterway and floodplain function • Restrict any operational works to the easement only, with landholder requirements determined prior to commencement of works. • Restore waterway bed and banks as soon as reasonably practicable after pipe installation and backfilling works • Restore banks by grading (nominally 1:3 grade. and revegetation), and smoothly transition to the undisturbed banks (refer to APA standard drawing no. 530-DWG-L-5008). • Restore waterway bed to preconstruction profile, and smoothly transition to the upstream and downstream undisturbed bed condition • Provide temporary protection such as geofabric or erosion matting on bed and banks to prevent erosion until vegetation has established • Carry out routine inspections (e.g. minimum every six months plus potentially following any significant flood event) to monitor effectiveness of civil rehabilitation works (earthworks and rock beaching works) during the first 12 months post-construction. Where monitoring identifies defects or deficiency in civil rehabilitation works, appropriate rectification measures will need to be implemented. • Establishment of vegetation cover within the first three months post construction. Following establishment of vegetation/ground cover, routine maintenance to be undertaken for a period between 12- 24 months to monitor and manage successful reinstatement • Include site specific application of rock beaching protection as part of site rehabilitation where required 	Construction

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



WATER		
Ref.	Environmental controls	Project Phase
SW4	<p>Control measures for open cut trenching construction and watercourse management</p> <p>Where open cut trenching is required for a watercourse implement the following mitigation measures:</p> <ul style="list-style-type: none"> • Implement erosion and sediment controls (ESC) for the site with reference to International Erosion Control Association Best Practice Erosion and Sediment Control, Appendix P - Land Based Pipeline Construction (IECA, 2008). • Construct trenched crossings of ephemeral watercourses during no or low flow conditions where reasonably practicable. • Monitor weather forecasts to minimise the likelihood of having open trenches at the waterway when high rainfall events are expected. • Remove all obstructions to flow after the pipe has been laid and backfilled. • Assemble and prepare the pipeline so that it can be installed as soon as reasonably practicable once the trenching over the watercourse has been undertaken. • Reinstate the exposed trench within the watercourse and riparian zones as soon as reasonably practicable following the installation of the pipeline. • Design waterway reinstatement to avoid future erosion over the pipeline alignment and to provide bank stability at the crossing location as the same or better than prior to construction. • Provide temporary erosion and sediment control as needed to prevent erosion and scour until the vegetation has established throughout the post-construction period (e.g. up to 12 months depending on establishment of vegetation) • Undertake visual monitoring downstream of the trench during flow events if the trench has not been reinstated. • Provide temporary flow diversions if there is permanent flow in the waterway. Flow diversion measures may include pumps to ensure that water can be moved from one side of trench to the other, screened inlets (or other appropriate equipment) to minimise the entrapment of aquatic fauna and outlet structures 	Construction

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



WATER		
Ref.	Environmental controls	Project Phase
	<p>that are designed to avoid scouring of the channel. Measures must be in accordance with International Erosion Control Association Best Practice Erosion and Sediment Control, Appendix P – Land Based Pipeline Construction (IECA, 2008).</p> <ul style="list-style-type: none"> • Restore waterway bed and banks as soon as reasonably practicable after pipe installation and backfilling works • Carry out bed and bank restoration, temporary protection and monitoring of establishment works as part of the site rehabilitation. • Prepare a construction management plan for Merri Creek works including site works methodology, construction timeframes and durations, and water quality monitoring frequency and parameters for APA approval. <p>Groundwater levels and flows will be managed in accordance with EMM GW1 described in EES Technical Report C: Groundwater.</p>	
SW5	<p>Implement a Monitoring Program</p> <p>Develop and implement a monitoring program, for the main waterways to determine if there are any construction related impacts. This must occur in Merri Creek and Jacksons Creek where open cut construction will occur.</p> <p>The monitoring program must adopt a control/impact approach with water quality monitored at a suitable distance of 20 - 200 metres from the Project Area both upstream and downstream of the works to establish background conditions. The monitoring program must be developed and undertaken in accordance with SEPP (Waters) and ANZG Australia Guidelines for Water Quality Monitoring and Reporting (2018).</p> <p>Water quality monitoring must occur immediately prior to construction to establish background conditions upstream and downstream of the Project area. Monitoring must then occur on a continual basis during construction (e.g. at appropriate intervals) with comparisons of upstream and downstream conditions used to infer if there is a downstream impact such as increased turbidity.</p>	Construction

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



WATER		
Ref.	Environmental controls	Project Phase
	<p>The biodiversity monitoring must occur at the two sites upstream and downstream of the Project Area prior to construction to establish background conditions. A final biodiversity and water quality monitoring must be repeated post-construction to identify any potential impacts from the construction and rehabilitation works.</p> <p>Should the monitoring determine adverse residual impacts on surface water and biodiversity values, contingency measures must be developed and implemented. These remedial actions may include:</p> <ul style="list-style-type: none"> • Identifying, repairing and redesign failed management measures aimed at reducing impacts due to erosion and sedimentation • Further stabilise banks and beds at waterway crossing to reduce erosion potential and sedimentation • Inspect pumping of water from coffer dams and / or other areas if water quality exceeds background conditions and implement further management measures. 	
SW7	<p>Design and Construction Management (Jacksons Creek)</p> <p>The detailed design must include the following measures:</p> <ul style="list-style-type: none"> • Minimum depth: 2m below bed invert level • Length of flat grade pipe (extend from top bank to top of bank) • Pipe protection: concrete encasement, concrete coated pipe or slab protection to be considered below the ground surface before backfilling <p>Develop site specific construction management measures for Jacksons Creek :</p> <ul style="list-style-type: none"> • Timing of works: Summer-autumn only • Flow management: Prepare a flow management work method statement to detail reliance on pumping, cofferdams (partial or full), temporary flume pipes • Weather Forecast: align timing of works with long term weather forecast without significant rain • Trench exposure: Limit the longitudinal extent of trench exposure to the extent reasonably practicable (i.e. to what could be backfilled within 24 hours) • Construction duration: limit time for trench exposure and construction duration between bank to bank 	Design, construction and operation

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



WATER		
Ref.	Environmental controls	Project Phase
	<p>works to the extent reasonably practicable (e.g. pre-prepare the pipe works)</p> <ul style="list-style-type: none"> • Backfilling works: Backfilling in accordance with appropriate MWC standard drawings for pipe trenching and backfilling and compaction requirements • Contingency works: Have available backfill and stockpile of rock beaching to protect exposed trench in lieu of a late change or unexpected forecast weather event • Prepare a construction management plan for Jacksons Creek works including site works methodology, construction timeframes and durations, and water quality monitoring frequency and parameters for APA approval. 	
SW8	<p>Site Rehabilitation (Jacksons Creek) Develop and implement site specific rehabilitation for Jacksons Creek including:</p> <ul style="list-style-type: none"> • Timing: Restore waterway bed and banks in accordance with site-specific requirements after pipe installation and backfilling works • Bed & Bank restoration: bed and bank rock protection in accordance with MWC Service Crossing Open Trench Medium Creek Crossing - guidelines. This may be a combination of lower bank rock beaching and upper bank and floodplain revegetation. The works must smoothly transition to upstream and downstream undisturbed conditions. • Rehabilitate and reinstate Jacksons Creek in accordance with EMM B7 described in EES Technical Report A: Biodiversity and habitats • Carry out routine inspections (e.g. minimum every two months or following any significant flood event) to monitor effectiveness of civil rehabilitation works (earthworks and rock beaching works) during the first 12 months post-construction. Where monitoring identifies defects or deficiency in civil rehabilitation works, appropriate rectification measures will need to be implemented. • Establishment of planting and vegetation for the first three months post construction. Following planting 	Construction and operation

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



WATER		
Ref.	Environmental controls	Project Phase
	and vegetation establishment period, routine maintenance (e.g. monthly during autumn and spring) to be undertaken for a period between 12-24 months to monitor and manage successful vegetation establishment.	
SW9	<p>Develop and implement a Flood Management and Response Plan (FMRP) for Jacksons Creek, Deep Creek, Kalkallo Creek and Merri Creek</p> <p>Develop and implement a Flood Management and Response Plan during construction for Jacksons Creek, Deep Creek, Kalkallo Creek and Merri Creek. The FMRP must include but not limited to:</p> <ul style="list-style-type: none"> • Measures to manage flood risk during construction including end of day requirements to limit flood risk exposure overnight • Limiting footprint of disturbance of works within waterways and floodplains to limit flood risk exposure at any point in time to the extent reasonably practicable • Placement of construction equipment and stockpile materials above threshold flood levels. • Flood warning communication protocols and emergency response procedures. <p>As part of the detailed design, flood modelling of the existing conditions for the waterways must be undertaken and verified by MWC to inform the FMRP and to understand the flood response within the floodplain for the range of possible design events.</p> <p>The plan could identify restrictions on construction activities within threshold flood extents, as well as contingency planning if a flood were to occur.</p> <p>A specific FMRP must be prepared for Kalkallo Retarding Basin and the various waterways and drainage lines that enter the Kalkallo Retarding Basin to consider the flood response within the basin and incoming waterways during construction.</p>	Construction

13.3.13 Groundwater

Table 13.16 Environmental management measures (Groundwater)

GROUNDWATER		
Ref.	Environmental controls	Project phase
GW1	<p>Minimising dewatering rates and impact to groundwater levels and flows</p> <p>Design and construct the Project to minimise changes in groundwater levels, flows and quality. Implement the following measures during construction to minimise groundwater impacts:</p> <ul style="list-style-type: none"> • Where excavations require dewatering, adopt a construction method that minimises the dewatering period. The anticipated period is expected to be approximately four weeks at the creek crossings • Install trench breakers adjacent to watercourses, wetlands and steep slopes as shown in the standard drawing (530-DWG-L7003) to minimise trench inflows. 	Construction
GW2	<p>Minimise impact to groundwater bore users</p> <p>Although it is not anticipated that any neighbouring bore will be impacted by dewatering, it is possible there is unregistered bores nearby, or a slightly greater than predicted distance of drawdown influence may occur. If this is the case, and any neighbouring bores are considered likely to be impacted by the Project within 60 metres of an area of dewatering (including the registered bore at approximately KP 47.6), then the location, condition and functionality of the bore must be visually confirmed and make-good arrangements must be agreed in consultation with affected landholders, if required.</p>	Construction
GW3	<p>Minimise impacts associated with contaminated groundwater and disposal</p> <p>Establish baseline groundwater level and quality conditions prior to the construction phase to assess any existing contamination or quality issues where groundwater is likely to be intercepted during construction and dewatering is expected, and also allow suitable disposal options to be assessed and planned.</p>	Construction

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



GROUNDWATER		
Ref.	Environmental controls	Project phase
	<ul style="list-style-type: none"> • Complete additional groundwater quality analysis in the existing bore network to confirm baseline conditions • Investigate Bendigo Rail/Tame St Drain area further as regional data suggests dewatering may be necessary • Investigate PFAS at Jackson Creek so that any dewatering in this area can be informed about the presence of PFAS to allow for appropriate management of the groundwater, and sediments. Investigations must occur prior to construction in order to inform the CEMP and include shallow groundwater and sediment sampling. <p>Manage extracted groundwater as follows:</p> <ul style="list-style-type: none"> • Dispose groundwater in accordance with the SEPP (Waters) and EPA Guidelines and all relevant approvals processes with relevant authorities. • Groundwater from areas that have been identified as contaminated must not be discharged to the environment (land, waterways). If required, engage with the local water authority to develop a trade waste agreement for sewer discharge. This agreement would specify the levels of contamination to allow for sewer discharge. • Contaminated groundwater must either be treated onsite, depending on contaminant encountered (this may require approval from the EPA Victoria) or disposed offsite to an EPA Victoria licensed facility. Alternatively, a construction approach may be adopted where contaminated groundwater is left in-situ (i.e. not abstracted or disturbed). • Manage dewatering of excavated trenches/bellholes to minimise sedimentation, including the use of sediment control devices to remove suspended solids and dissipate flow. Sediment control devices must be listed in site specific environmental management plans. Minimise the duration that trench sections and bell holes are open, and divert surface water runoff away from the excavations, to reduce the potential for poor quality runoff impacting groundwater. 	

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



GROUNDWATER		
Ref.	Environmental controls	Project phase
GW4	Manage chemicals, fuels and hazardous materials Manage chemicals, fuels and hazardous materials as detailed in EMM C6.	Construction and operation
GW5	Drilling Fluids Requirements Manage drilling fluids in accordance with EMM C9.	Construction
GW6	Implement Spoil Management Procedures Implement spoil management procedures as detailed in EMM C1.	Construction
GW7	Design Requirements The pipeline design shall consider where groundwater interaction is expected to occur and incorporate trench breakers or plugs, as well as suitable backfill compaction, to prevent preferential flow paths. Implement trench compaction procedures as detailed in GM4 including the design of the backfill to take into account the density and permeability of the surrounding soil.	Design, construction and operation

13.4 Fuels & chemicals

Table 13.17 Performance standards (Fuels & chemicals)

FUELS & CHEMICALS		
Ref.	Environmental controls	Project phase
F1	<p>All fuels and chemicals must be stored and handled to comply with the following:</p> <ul style="list-style-type: none"> • Australian Standard AS1940:2004: The storage and handling of flammable and combustible materials • EPA Publication 1698: Liquid Storage and Handling Guidelines • Victorian Worksafe Codes of Practice • Manufacturer’s instructions and • Relevant safety data sheets. 	Construction
F2	Safety data sheets must be available for reference for all fuels and chemicals at the storage location.	Construction
F3	The volume of liquid material (fuel, oil, lubricant) required on-site for construction activities is to be limited to only that which is required.	Construction
F4	All liquid material must be stored within containment facilities (e.g. bunded areas, leak proof trays) at a designated area within the site.	Construction
F5	Where flammable or combustible chemicals are required to be stored on-site, fire-fighting equipment proportionate to the risk of the materials stored must be available for the duration of the material storage.	Construction
F6	Vehicle and equipment inspections must be undertaken to check for oil, lubricant or fuel leaks and general wear and tear of hoses.	Construction
F7	Spill kits must be available at all work sites, refuelling points and fuel and chemicals storage locations.	Construction
F8	Should a spill/release occur the Contingency Plan for Chemical/Fuel Spill Response must be followed (refer to Section 10).	Construction

PLAN



13.5 Waste

Table 13.18 Performance standards (Waste)

WASTE		
Ref.	Environmental controls	Project Phase
W1	Waste management must comply with the EPA waste hierarchy - waste avoidance, waste re-use, waste recycling, and waste disposal.	Construction
W2	The site must be kept free of litter and waste and refuse containers or skip bins must be located at designated storage areas. Skip bins are to be covered to prevent access by fauna and pest species.	Construction
W3	General waste to be removed from site by crews. Surplus or waste materials to be stockpiled at laydown areas for regular collection.	Construction
W4	Separate, labelled general and regulated waste bins must be available. An EPA licensed contractor must collect regulated waste for recycling or licensed disposal.	Construction
W5	Spill kits are to be available at regulated waste storage areas	Construction
W6	Disposal of any waste contaminated soil must be undertaken in accordance with EPA Publications IWRG 821: Waste Transport Certificates and IWRG 822: Waste Codes and must require the use of EPA-registered trucks for transport of the soil to appropriately licensed landfills. Contaminated soil must be remediated or disposed of at an EPA approved facility in accordance with EPA waste disposal guidelines.	Construction
W7	Toilets at the construction depot must be a self-bunded portable blocks. Clearing of portable toilet facilities, including waste collection and disposal, must be undertaken by a licensed waste contractor.	Construction

13.6 Horizontal directional drilling

Table 13.19 Performance standards (HDD and Thrust Boring)

Performance standard – horizontal directional drilling		
Objective	To plan for and manage environmental impacts associated with the proposed HDD and thrust boring activities.	
Target	No loss of material or contamination of land or water outside of the designated work areas.	
Application	During the installation of HDD and thrust bored crossings.	
Ref.	Environmental controls	Project phase
D1	For major HDDs, the drill profile design, the work method statement and the proposed volumetric drilling fluid tracking program is to be approved by APA prior to the commencement of HDD activities. The work method statement is to be prepared to the satisfaction of the Regulator.	Pre-construction
D2	An Inspection and Test Plan must be developed to ensure quality control during the HDD activities.	Pre-construction
D3	Earth bunds and drainage channels must be placed around the upper edges of drill sites and work areas, to divert natural run-off around and away from the site.	Construction (HDD Activities)
D4	Appropriate measures must be installed for HDD works to manage drilling fluid and bunding requirements.	Construction (HDD Activities)
D5	Any runoff in sump pits used during drilling activities must be managed daily.	Construction (HDD Activities)

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



Performance standard – horizontal directional drilling		
D6	Appropriate spill response and clean up equipment will be onsite during HDD activities. If a spill/release occurs, work will cease and the Contingency Plan for HDD mud lease or fuel and or chemical release (refer to section 9) will be implemented.	Construction (HDD Activities)
D7	Drilling fluids are to comprise only benign materials without the potential to cause contamination to land and water.	Construction (HDD Activities)
D8	All facilities utilised in the surface mud handling (mixing, cleaning and pumping) during the HDD activities must be bunded.	Construction (HDD Activities)

13.7 Hot works

Table 13.20 Performance standards (hot works)

Performance standard – hot works		
Objective	To plan for and manage environmental impacts associated with hot works during construction of the pipeline.	
Target	No hot works impacts to land or property. No non-conformance with these performance standards.	
Application	During pipeline construction.	
Ref.	Environmental controls	Project phase
HW1	Undertake hot works in areas cleared of combustible materials (e.g. fuel, chemicals, wood, paper, plastic or rubbish). Combustible materials that cannot be cleared from the area shall be covered, screened or otherwise made safe.	Construction (hot works)
HW2	<p>Comply with Fire Rescue Victoria (FRV)/Country Fire Authority (CFA) restrictions during the CFA declared Fire Danger Period when carrying out hot works:</p> <ul style="list-style-type: none"> • a fire-resistant shield or guard is in place to stop sparks, hot metal or slag • an area at least 1.5 metres from the operation is clear of flammable material or wetted down sufficiently to prevent the spread of fire • a hose connected to a reticulated water supply or water spray knapsack containing at least 9 litres of water • all cut-offs and hot materials from the operation are placed in fire-proof containers • a person is in attendance at all times while the fire is alight (hot work in progress) and has the capacity and means to extinguish the fire 	Construction (hot works)

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



Performance standard – hot works		
	<ul style="list-style-type: none">the fire is completely extinguished before the person leaves.	
HW3	Obtain and comply with FRV/CFA Section 40 permit on Total Fire Ban Days if carrying out hot works	Construction (hot works)

DRAFT

13.8 Hydrostatic testing

Table 13.21 Performance standards (hydrostatic testing)

Performance standard – hydrostatic testing		
Objective	To plan for and manage environmental impacts associated with the cleaning and hydrotesting of the new pipeline section.	
Target	No adverse impacts to land or water from cleaning, hydrostatic testing and venting or flaring. No non-conformance with this performance standard or complaint from landowners.	
Application	The duration of the cleaning, hydrotesting and venting or flaring activities.	
Ref.	Environmental controls	Project phase
H1	Prior to hydrostatic testing, the pipeline must be pre-cleaned to remove weld debris, dust and surface scale. Produced waste water must be captured in a temporary pit or bunded area and removed by an EPA licenced waste contractor.	Cleaning/Flushing
H2	All hydrotesting operations must conform to AS2885.5: <i>Gas and liquid petroleum - Field pressure testing</i> .	Hydrotesting
H3	Hydrostatic test water discharge must only be undertaken where water designated for release into the environment is of a quality that is within relevant statutory water quality guidelines.	Hydrotesting
H4	Where hydrostatic testing is not consistent with any of Environmental Controls H3 to H5, hydrostatic test water must be removed by an EPA licenced waste contractor.	Hydrotesting

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



Performance standard – hydrostatic testing

H5	Any discharge of hydrotest water must not result in soil erosion or sedimentation of land or water. Sediment control devices to remove suspended solids such as geotextile fabric filters must be used. No direct discharge must occur to watercourses or drains.	Hydrotesting
H6	Pumps and compressors used for hydrotesting and pigging activities must be muffled to reduce noise.	Hydrotesting, cleaning and drying
H7	All venting and flaring activities must be supervised by APA	Venting and flaring

DRAFT

13.9 Reinstatement

Table 13.22 Performance standards (reinstatement)

Performance standard – reinstatement		
Objective	To allow for the return of the land to its previous land use and capacity.	
Target	Landowner/occupier satisfaction with completion of works and timely rectification of any defects.	
Application	The duration of the proposed reinstatement works and the identified rehabilitation monitoring period.	
Ref.	Environmental controls	Project phase
R1	Project activities must be progressed sequentially, with clean-up, restoration and rehabilitation as soon as practical after installation activities are complete unless weather conditions prevent this.	Reinstatement
R2	If weather conditions prevent the prompt reseeded of the disturbed areas within the site controls must be put in place, monitored and maintained to manage erosion and sedimentation until such time reseeded can occur.	Reinstatement
R3	The site must be rehabilitated to pre-existing contours with natural drainage lines restored and protected if required. Where required, seeding, soil conditioning of disturbed areas must be undertaken as part of the reinstatement activities.	Reinstatement
R4	Soil inversion must be avoided during respreading of topsoil	Reinstatement
R5	Soil surfaces that have been compacted due to construction activities, such as those subject to traffic and/or storage areas within the site, must be ripped to allow the topsoil to bind with the subsoil and increase water filtration.	Reinstatement
R6	Targeted control of weeds must be undertaken by a qualified pest plant control contractor to ensure that the site does not have an increased density and distribution of noxious and agricultural weeds relative to adjacent areas	Reinstatement

PLAN

Western Outer Ring Main Project – Construction Environment Management Plan



Performance standard – reinstatement		
R7	Following completion of reinstatement, agreement must be sought from landowners (and occupiers, managers or government agencies as applicable) of the satisfaction of the reinstatement work as required by conditions of the Pipelines Licence.	Post-construction
R8	Following the completion of reinstatement activities, the site must be monitored for a period of 12-24 months to ensure the land is stable and consistent with adjacent areas. Any defects from construction must be rectified during this time and following this period any residual environmental issues must be addressed through the APA's Operating Environmental Management Plan.	Post-Construction
R9	Reinstatement will be undertaken in accordance with land owner agreements required under the Pipeline Licence	Post-Construction

Attachment 3 – Health and Safety Management Plan

Privacy Statement

Any personal information about you or a third party in your correspondence will be protected under the provisions of the Privacy and Data Protection Act 2014. It will only be used or disclosed to appropriate Ministerial, Statutory Authority, or departmental staff in regard to the purpose for which it was provided, unless required or authorised by law. Enquiries about access to information about you held by the Department should be directed to the Privacy Coordinator, Department of Environment, Land, Water and Planning, PO Box 500, East Melbourne, Victoria 8002

HEALTH AND SAFETY MANAGEMENT PLAN

Western Outer Ring Main Project

APA
safeguard

Working together for zero harm



Project No		18035				
Document No		18035-PL-HSE-0003				
Rev	Date	Status	Originated	Checked	Checked	Approved
1	23/04/21	Issued for Use	[Redacted]	[Redacted]	[Redacted]	[Redacted]
			[Redacted]	[Redacted]	[Redacted]	[Redacted]
			HS Advisor	Project Manager Pipeline	Project Manager Facilities	Program Manager SE
0.2	28/01/21	Re-Issued for Review (ESV Comments Incorporated)	[Redacted]	[Redacted]	[Redacted]	[Redacted]
			[Redacted]	[Redacted]	[Redacted]	[Redacted]
			HS Advisor	Project Manager Pipeline	Project Manager Facilities	Program Manager SE



0.1	05/11/20	Issued Review	for [REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
			HS Advisor	Project Manager Pipeline	Project Manager Facilities	Program Manager SE

© Copyright APA Group 2018

ESV CONSTRUCTION PROJECTS - COMPLIANCE TABLE v7.1

	Document Requirement	ESV Requirement	Licensee Comments (If document not applicable note N/A)
1	HSMP submission for 'pipeline operation'. Must include an attestation that the 'pipeline' is designed and will be constructed in accordance with AS 2885 by appropriately trained and competent personnel	HSMP to be approved and submitted by licensee)or authorised delegate)	
2	Completed ESV compliance table (i.e. this Table 1).	To be signed and submitted by Licensee (or authorised delegate)	
3	Project Plan – Including scope of work, schedule, organisational chart in context of the overall organisation, and pipeline details e.g. license number, MAOP, diameter, material grade, wall thickness etc.	To be provided.	
4	Safety Management Study (per. AS2885.1)	To be provided	
5	Design Basis Manual (including loading calculations as requested by ESV)	To be provided	
6	Approved construction drawings	To be provided (A3 hard copy)	
7	Emergency Response Plan (Project Specific)	To be provided	
8	Safe Work Method Statements (SWMS) including issue dates	To be provided	
9	Work Procedures including issue dates	Provide a list only	
10	Risk Assessments (Job Safety/Environment Analysis etc.)	To be provided	
11	Permit To Work System	Provide a safety case/HSMP reference only or reference to "Authority to commence work" documentation for contractors.	
12	WPS Index (template available from ESV) (all welds)	To be provided	
15	Welder(s) Qualification Records (all welds)	To be provided	
16	Hydrostatic Pressure Testing Plan and Procedure including details of calculations as appropriate	To be provided	
17	Pipe Material Data Reports	To be available on request	
18	Fittings and Spools Material Data Reports	To be available on request	
19	Other Components Material Data Reports	To be available on request	
20	Protective Coating(s) Material Data Reports	To be available on request	

Name of Licensee or authorised delegate: Albert Brovedani, Technical Regulations Manager

Signed: _____ Date: _____

Table of Contents

1.	PROJECT SUMMARY	9
1.1	Purpose	9
1.2	Key Objectives	9
2.	PROJECT OVERVIEW	10
2.1	Overall Project	10
2.2	Pipeline and mainline valves	10
2.3	Wollert Compressor Station upgrade	11
2.4	Management of Change	12
2.5	Activities in the Project Area	13
2.6	Scope of Work – Wollert Compressor Station upgrade	14
2.6.1	Compressor Unit and Aftercooler	14
2.6.2	Compressor Unit	15
2.6.3	Aftercooler	15
2.6.4	WORM Regulating Station	16
2.6.5	DFC Assembly (VNI and WORM)	16
2.6.6	Control Equipment Building	17
2.6.7	Permanent Pipeline Isolation Valve	17
2.6.8	Wollert Facility Power Supply and new DEA	17
2.7	Scope of Work – Pipeline	18
2.7.1	Western Outer Ring Main Pipeline	18
2.7.2	Actuated MLV (MLV1)	18
2.7.3	Actuated MLV (MLV2)	19
2.7.4	Actuated MLV (MLV3)	19
2.7.5	End of Line Scraper Station	20
2.8	Key Contacts and Information	20
2.9	Subcontractor and other contractor details	22
2.10	Emergency Contact Information	23
3.	SAFETY IN DESIGN	25
3.1	General	25
4.	WORKPLACE HEALTH SAFETY & ENVIRONMENT OVERVIEW	26
4.1	Strategy	26

4.2	Organisational Chart.....	27
4.3	Duties of Principal Contractors	28
4.4	Duties of Key Project Personnel	30
4.4.1	APA Project Manager	31
4.4.2	APA Construction Supervisor	31
4.4.3	APA ID HSE Manager	32
4.4.4	APA HSE Advisor.....	33
4.5	Principle Contractor Project Manager	34
4.6	Duties Of The Employer	35
4.7	Duties Of The Employee.....	35
4.8	Legal And Other Requirements.....	35
5.	APA GROUP POLICIES	38
5.1	Health, Safety And Wellbeing Group Policy.....	38
5.2	Environmental and Heritage Group Policy.....	38
6.	HAZARD IDENTIFICATION & RISK CONTROL	39
6.1	General	39
6.2	Risk Identification, Assessment and Control Process.....	40
6.3	Approval to Construct	40
6.4	Performance Objectives	41
6.5	Site Rules.....	42
6.6	Hazard Management Documents.....	43
6.7	High Risk Construction Work	45
6.8	Job Hazard & Environmental Analysis	47
6.9	Authority to Work Permits.....	47
6.10	Project Risk Register	48
7.	INCIDENTS, ACCIDENTS & EMERGENCY MANAGEMENT.....	49
7.1	First Aid Management.....	49
7.2	Incident Management and Reporting.....	49
7.3	Incident Reporting	50
7.4	Incident Investigation.....	52
7.5	OHS Notifiable Incidents	52
7.6	Workers Compensation, Rehabilitation and Return to Work Program.....	52
7.7	Emergency Plans and Communications	53

8.	SITE ESTABLISHMENT	55
8.1	Site Signage	55
8.2	Site Start-up Requirements	55
8.3	Site Amenities	55
8.4	Underground Services	56
8.5	Overhead Services	57
8.6	Procurement.....	58
8.6.1	Facilities Procurement.....	59
8.7	Management System Documentation	59
8.8	General Records Management.....	60
8.9	Site Security	60
8.10	Site Roles & Responsibilities.....	61
8.11	Consultation & Communications Arrangements	61
8.12	Communication Meeting Schedule	62
8.13	Project Meetings	62
8.14	Pre-Start Meeting	62
8.15	Toolbox Meetings.....	63
9.	INDUCTION & COMPETENCY	64
9.1	Induction	64
9.2	Visitors' Induction	65
9.3	Commissioning Induction	65
9.4	Competency	65
10.	SITE SAFETY	67
10.1	General	67
10.2	Specific Site Hazards (as Applicable).....	67
10.3	Fire Prevention and Control	68
10.4	Bushfire Management.....	69
11.	ENVIRONMENT	71
11.1	General	71
12.	PERSONAL PROTECTIVE EQUIPMENT	72
13.	DRIVING	73
14.	PLANT AND EQUIPMENT	74

14.1	Mobile Plant.....	74
14.2	Crane Operations.....	75
14.2.1	Critical Lift.....	76
14.3	Licences.....	77
14.4	Plant & Equipment.....	78
14.5	Traffic Management.....	80
15.	HAZARDOUS SUBSTANCES, DANGEROUS GOODS & OTHER SUBSTANCES.....	82
15.1	General.....	82
15.1.1	Hazardous Chemicals Register.....	82
15.1.2	Safety Data Sheets (SDS).....	82
15.2	Managing risks from airborne contaminants.....	83
15.3	Hazardous atmospheres.....	83
15.4	Storage of flammable or combustible substances.....	84
15.5	Management Measures for Dangerous Substances.....	84
15.6	Hazardous waste management.....	84
15.7	Asbestos.....	84
15.8	Abrasive Blasting.....	85
15.9	Control of Radioactive Substances and Irradiating Devices.....	85
15.10	Health Surveillance.....	86
16.	EXCAVATION AND TRENCHING.....	87
16.1	Responsibilities.....	87
16.2	Community Impacts within Urban Areas.....	88
16.3	Blast Management Plan.....	89
17.	CONFINED SPACES.....	90
18.	PREVENTION OF FALLS.....	91
18.1	General.....	91
18.2	Scaffolding.....	92
19.	ELECTRICAL SAFETY.....	93
19.1	General.....	93
19.2	Energy Isolation.....	94
20.	HOT WORKS.....	96

20.1	Welding	97
20.2	Hot Taps.....	97
21.	HYDROSTATIC TESTING.....	98
22.	HORIZONTAL DIRECTIONAL DRILLING	99
23.	MONITORING & AUDITING.....	100
23.1	General	100
23.2	Processes.....	100
23.2.1	Workplace Inspections.....	100
23.2.2	Project Audits.....	101
23.2.3	Fitness for Work	101
23.2.4	Working Hours and Fatigue Management	101
23.3	Performance Reporting	102
23.4	Non-Conformance	102
24.	REVIEW AND IMPROVEMENT	104
24.1	Staged Submissions of the SMP	104
24.2	Management Review and Improvements Found	104
25.	ISSUE RESOLUTION	106
25.1	General	106
25.2	Notices issued by other parties.....	106
26.	ATTACHMENTS	107
26.1	Appendix A: APA Group Policies	107
26.1.1	APA Group Policy Health, Safety and Wellbeing	108
26.1.2	APA Environment and Heritage	110
26.2	Appendix B: APA (Group Level) HSE Reference Documents	111
26.3	Appendix C: Definitions	114
26.4	Appendix D: Notifiable Prescribed Incidents	119
26.5	Appendix E: Notifying under the Pipelines Act 2005	121
26.6	Environmental Protection Act.....	121
26.7	Appendix F APA Fatal Risk Protocols	122
26.8	Appendix G Construction Processes and their Associated Typical Hazards	123

1. PROJECT SUMMARY

1.1 Purpose

The purpose of this Health & Safety Management Plan (HSMP) is to establish and maintain effective H&S systems, and to ensure the safety of all those who access the project site, including direct employees, contractors and visitors who are involved in the construction phase of the Western Outer Ring Main Project (WORM).

APA Transmission Pty Ltd (APA) is committed to providing a zero-harm work environment to all parties. APA will consult, coordinate and cooperate with all relevant parties and stakeholders to ensure that risks to health and safety are managed appropriately and that a structured safety management system is implemented to achieve a consistently high standard of safety performance. In addition, the “Plan” will serve to ensure that the Contractor meets the obligations of its internal occupational health and safety policy and all relevant Work Health Safety legislation.

All work performed in accordance with this Plan, shall comply with the requirements of the relevant local Acts, Regulations, Standards, Codes of Practice and Compliance Codes of all authorities having jurisdiction over the work.

When conflict exists between the various applicable documents, the following order will apply, in decreasing order of precedence. Where APA requirements are more stringent, they are to take precedence. Any identified discrepancies are to be reported to the APA Project Manager for resolution.

- Acts of law or other legislation
- Government licences and permits
- Australian Standards
- International Standards
- Project specific documents
- APA Engineering Standards and Specifications

This plan satisfies the requirements of Section 126 of the Victorian Pipelines Act 2005 and Part 6 of the Pipeline Regulations 2017 (Victoria) and is in alignment with AS 2885.1 2018 Pipelines – Gas and Liquid Petroleum – Design and Construction.

1.2 Key Objectives

The objectives of this HSMP are to:

1. Describe the overall approach to H&S management which will be applied by APA and all contractors during project work;
2. Set the safety management performance requirements for activities;
3. Describe the relationship between APA's Safety Management Systems, this HSMP and subordinate procedures; and
4. Identify and assign responsibilities for HS management and activities.

2. PROJECT OVERVIEW

2.1 Overall Project

The Project comprises three key operational components:

- **A new pipeline:** The proposed pipeline would be approximately 51 kilometres in length and fully buried within an easement.
- **Mainline valves:** Three mainline valves would be located along the pipeline alignment within the proposed easement.
- **The Wollert compressor station upgrade:** The construction of a new Solar Centaur 50 compressor, an end of line scraper station and a regulating station is proposed within the existing APA facility at Wollert.

2.2 Pipeline and mainline valves

The pipeline will comprise of an approximately 51km long up to DN600 underground high pressure gas transmission pipeline to transport gas from APA's existing Plumpton Regulating Station (approximately 38 kilometres North West of Melbourne's CBD) and Wollert Compressor Station (approximately 26 kilometres north east of Melbourne's CBD). It 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.

Addressing this missing link will deliver improved network reliability by increasing the amount of natural gas that can be stored underground in Port Campbell for times of peak demand and ensuring sufficient volumes of natural gas can be moved where it is needed most.

The Western Outer Ring Main will help to deliver sufficient natural gas to Victorian homes for heating and cooking on very cold days, as well as supplying natural gas for power generation during times of peak electricity demand. The project also provides the opportunity for new growth suburbs on Melbourne's urban fringe to be supplied with natural gas as those areas are developed.

The pipeline will be buried for its entire length at or below the minimum depth as detailed in the governing standard AS2885.1 (where the final depth is determined as an outcome of the Safety Management Study). Key pipeline construction techniques include trenching, horizontal directional drilling (HDD) or boring, typically within a 30-metre-wide pipeline construction right of way (ROW).

The Pipeline will comprise of the following key components:

- Three (3) remotely actuated mainline valves would be located along the pipeline alignment within the proposed easement, which will allow for isolation of the pipeline in an emergency.
- End of line scraper station (EOLSS) located at APA's existing Wollert Compressor Station.

- Occupy a typical 15 metres wide operational easement.
- Corrosion protection system consisting of external coating and an impressed current cathodic protection system (ICCP).
- Pipeline marker signs installed along the length of the pipeline.
- Additional facilities including mainline valves sites (x 3 MLVs), pig trap assembly and

Once operational, the WORM will form part of the Victorian Transmission System (VTS) owned by APA, operated by AEMO and will be incorporated into the VTS Safety Case. The VTS will not require a new safety case.

2.3 Wollert Compressor Station upgrade

Wollert Station facilities will include:

- New Solar Centaur C50 turbine and C33 compressor package
- Extension of the existing WCSB suction and discharge headers as common headers
- Installation of separate discharge flow control skids for VNI and WORM
- Installation of a new PRS for flows from the WORM to the Pakenham pipeline header.
- New pig trap at Wollert
- New control equipment building
- Upgraded power supply and new DEA.

Flows from the common header will be split towards the VNI via a new Discharge Flow Control system and towards the WORM via a new Discharge Flow Control system.

Flows from the WORM will be pressure controlled into the Pakenham to Wollert pipeline (T61) to help manage pressures in the Pakenham header during peak periods.

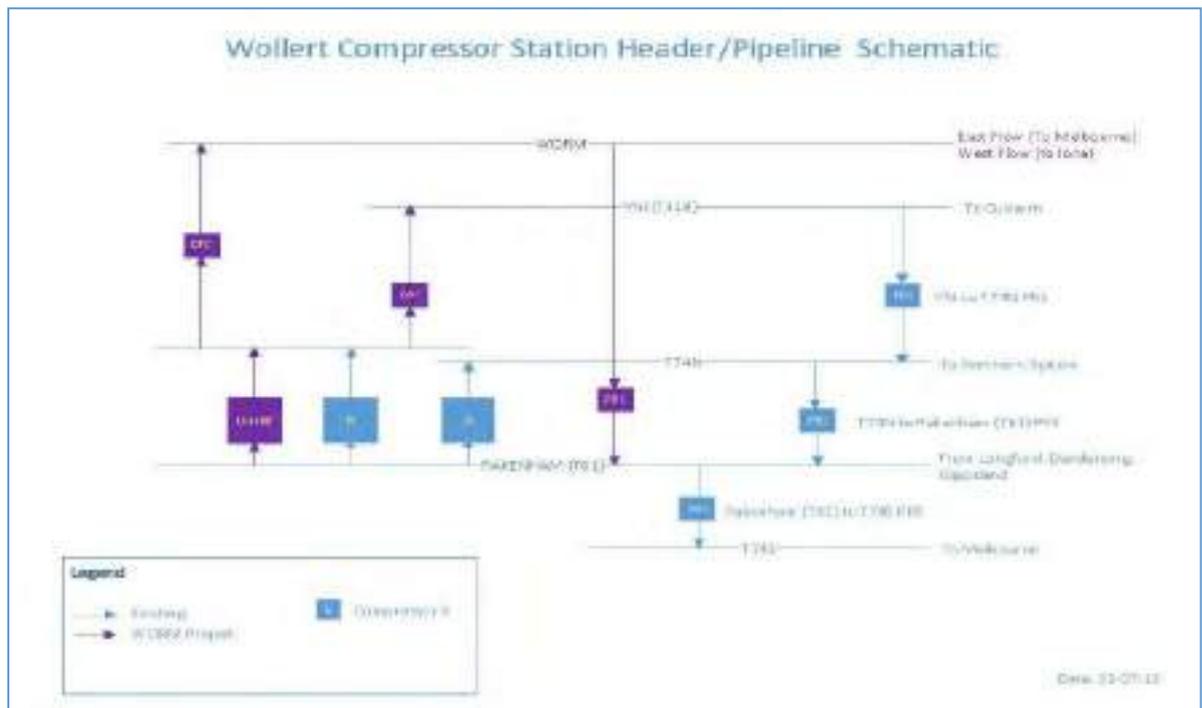


Figure 1 Wollert Compressor Station Header/Pipeline Schematic

2.4 Management of Change

APA is aware of the importance of managing changes to its operating assets in order to ensure continued safe and reliable operation of the assets under its control. It is in APA's interest to establish Management of Change (MoC) procedures and processes that ensure all changes to infrastructure assets or their operating context, and their management system are captured, reviewed and approved resulting in all impacts being clearly defined and managed to completion.

The purpose of the MoC process is to ensure changes to the asset and its management processes are captured and recorded such that:

- Risks and impacts of proposed changes are assessed and well understood;
- Decision making and approval responsibilities and trails are evident;
- The right people are involved and notified of the change;
- All actions required to deliver the change are managed;
- Asset and management system information and records are accurate; and
- All impacts are managed and tracked to completion.

All MoC procedures and processes for new and existing assets are undertaken in accordance with APA's Asset Change Management Framework Manual (Document No. 530-MAN-A-0003).

2.5 Activities in the Project Area

The below table identifies some activities in the project area that may present a risk during project construction. The associated risks shall be considered in accordance with Section 6 of this document.

No.	Approx. KP	Identified Activity
1	KP0 – KP9	Colocation within APA's existing Sunbury Pipeline easement. Adjacent urban growth from KP1 to KP3. Melton Highway crossing at KP3
2	KP8 – KP9	Sunbury railway horizontal bore crossing and Calder Freeway HDD crossing
3	KP13 – KP14	HV Powerline easement crossing and Jacksons creek crossing
4	KP15	Sunbury Road mini HDD crossing
5	KP16.5 – KP17	Deep Creek HDD crossing
6	KP22.5	Craigieburn Road horizontal bore crossing
7	KP26.5 – KP27	Parkland Crescent street works
8	KP27	HV Power easement crossing
9	KP34 – KP37	Adjacent to Gunns Gully
10	KP37 – KP37.5	Hume Freeway HDD crossing
11	KP41	Northern railway line horizontal bore crossing
12	KP42 – KP51	Colocation within APA's existing Wollert to Wodonga Pipeline easement. Adjacent urban growth from KP45 – KP47
N/A	Various	Existing buried assets

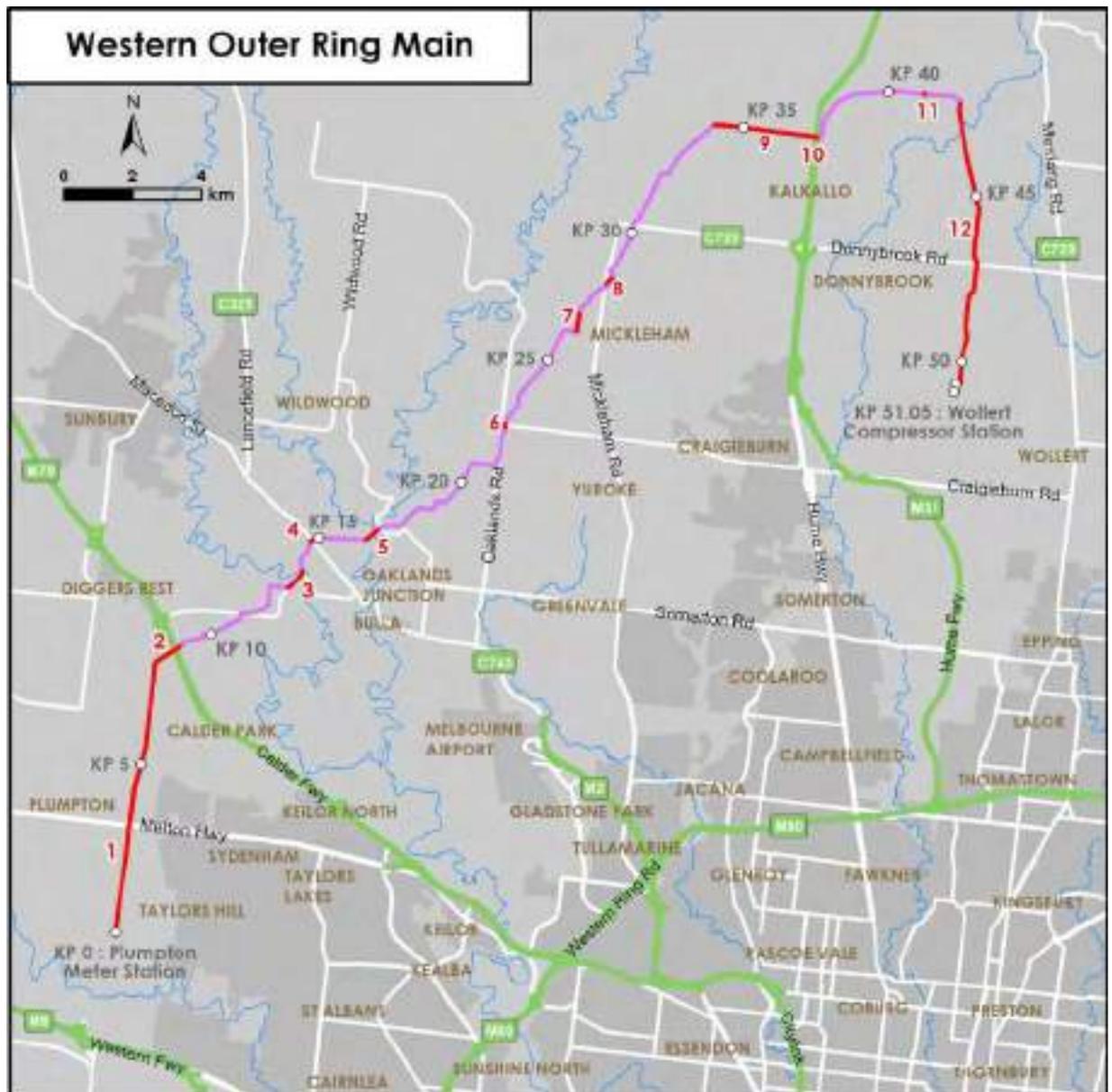


Figure 2 Western Outer Ring Main pipeline Route High Risk Activity areas (refer to table above for further detail)

2.6 Scope of Work – Wollert Compressor Station upgrade

2.6.1 Compressor Unit and Aftercooler

The new Solar - Centaur 50 gas turbine driven compressor unit, along with associated valves, pipework and equipment, would be installed within the existing Wollert compressor station, which currently contains two existing Solar - Centaur 50 and three existing Solar - Saturn 10 gas turbine driven compressor units.

2.6.2 Compressor Unit

The gas turbine driven gas compressor (GTC) unit shall be suitable for service in the environmental conditions defined in WORM Design Basis Manual (DBM). The GTC shall be capable of continuous operation over all load ranges under the conditions presented in Section 6 of the DBM.

One Solar Turbines package consisting of a Centaur 50 Gas Turbine, C33 Compressor Body will be supplied. An Application Check Sheet (ACS) has been provided by Solar Turbines to define the Solar Turbines scope of supply (including custom features).

The GTC has the following functionalities and specifications:

- Centaur 50-6102S - two shaft standard combustion industrial gas turbine rated at 4,500 kW (nominal, ISO conditions);
- Solar Turbines C334EH housing configuration, centrifugal compressor fitted with dry gas seals;
- Dry coupling of flexible disc type;
- "Cold" recycle control valve with process control and anti-surge control interface to the Solar Turbines control system;
- "Cold" fast stop valve;
- Exhaust system including duct and stack/silencer

The gas compressor enclosure has the following functional description:

- Provides sound attenuation to achieve required noise emissions in accordance with the relevant state and federal requirements, regulations and compliance codes;
- Individually house and fully enclose the GTC and ancillary equipment;
- Provides adequate and continuous ventilation during operation consistent with vendor requirements. This ventilation is to:
 - Maintain the enclosure interior temperature at less than 85°C which is the maximum rated temperature for instrumentation (standard Solar enclosure temperature for HH shutdown is 85°C, and H alarm is set at 75°); The main source of heat is the turbine compressor package;
 - Create a modified non-hazardous rated environment (Zone 1 NE) by dilution of the compressor enclosure atmosphere in the event of a gas leak or fugitive emission(s); and
 - Provide slight positive pressure to reduce the chance of dust entering the enclosure.

2.6.3 Aftercooler

An Air Cooled Heat Exchanger (Aftercooler) shall be installed to cool the gas discharging into the WORM and VNI pipelines. Thermal and hydraulic sizing cases shall be identical to those used to specify the Unit 4 and 5 Aftercoolers.

The compressor discharge piping shall have adequate protection to prevent against burns to operators and maintenance personnel.

Cooler standard features shall include:

- Forced draft;
- 2 pass cooler;
- Carbon steel tube with embedded aluminium fins;
- Electric motors with IECEx certification for use in Australia;
- MCC mounted soft starters to be utilised;
- Fans are belt driven, manual pitch adjustable with aluminium fan blades;
- 316SS fan shafts;
- Intrinsically safe 4-20mA vibration transmitters;
- <85 dBA at 1 m noise level external to the ACHE enclosure;
- Insect screens to be provided at all openings.

The compressor aftercooler functional requirements shall be consistent with the existing Wollert B unit aftercooler designs.

2.6.4 WORM Regulating Station

When high pressure gas in a pipeline is required to be delivered at a lower pressure into another pipeline, a regulating station is used to do this. The pressure regulating station enables flow of gas from the (proposed) high pressure WORM pipeline to the (existing) Pakenham-Wollert pipeline, which is designed for a lower operating pressure.

The WORM PRS will connect the WORM pipeline (MAOP 10200 kPag) and T61 pipelines (MAOP 6890 kPag). Subject to SIL LOPA assessment, protection for the T61 will be in the form of an actuated ball valve with slam shut panel. A second (monitor) regulator shall be considered as an additional protective layer if required by the SIL / LOPA. The panel will provide both electronic trip (set at 101.6% of T61 MAOP) and pneumatic trip (set at 103% of T61 MAOP).

2.6.5 DFC Assembly (VNI and WORM)

Currently, WCSB discharge flow is controlled via combined compressor speed and capacity control valve. In the WORM scheme, flow to each of the two pipelines will normally be via their respective DFC stations. The ability to control total WCSB flow via compressor speed / capacity control will be retained, with the flow signal derived by summing the WORM and VNI flows. The flow setpoint for flow control via compressor speed / recycle will be the sum of the WORM and VNI flow setpoints plus 10%. When both DFC's are controlling flow, the output of the compressor flow controller will be high and non-determining. Flow control via the compressors will become effective on failure open of one or both control valves in a DFC station.

The VNI DFC will take its flow signal from existing venturi flowmeter FE-62304. A new orifice flowmeter will be installed for the WORM DFC.

DFC Flow controllers will control the DFC control valves via a minimum select along with downstream pressure.

The DFC control valves will control in a lead-lag configuration, with each valve sized for 75% of design DFC flow (i.e. 75% of 285 kSm³/h for both DFC stations), and flow apportioned between the two control valves via a flow sharing algorithm.

2.6.6 Control Equipment Building

The facility shall be supplied with a new control equipment building to house a compressor Motor Control Centre (MCC), compressor control system, communications panel, and the facility Main Switchboard.

Control cabinets for equipment located in the control room shall be fully enclosed with lockable (Rittal key or equivalent) access doors. The control equipment building shall be laid out to provide access allowing for the cabinet doors being open. As a minimum, one single door and one double door egress point with security door switches shall be provided for the control building. F-lock keyed doors shall be supplied.

A workstation, including a PC and desk phone, shall be made available to facilitate infrequent planned and unplanned maintenance activities.

Furthermore, the building shall conform to the electrical installation requirements contained within Building Code of Australia (BCA) and AS/NZS 3000.

The building shall be constructed from 2 hour fire rated materials.

2.6.7 Permanent Pipeline Isolation Valve

The pipeline isolation valve system shall comply with the requirements of AS/NZS 2885.1, while also ensuring that flow to customers is not interrupted by spurious trips.

2.6.8 Wollert Facility Power Supply and new DEA

Supply authority metered electrical power shall be provided by AusNet, the distributor servicing the existing 315kVA transformer at Wollert. An upgrade in transformer size is required for the project and shall preferably be located outside the compound where the existing distribution pole is. The nominated upgraded size (500kVA) shall provide spare capacity for all the various running scenarios expected, as detailed in the maximum demand study, which includes a like-for-like upgrade of the existing pole mount transformer.

Additionally, a suitably-sized Diesel Engine Alternator (DEA) shall be installed to provide redundant power in the event of a distribution power supply failure by the supply authority.

APA shall install a Main Switchboard (MSB) within the new control equipment building for the purposes of supplying LV three phase power to the entire Wollert facility.

Furthermore, a mains and generator supply failure alarm and a suitably sized load bank shall be provided.

2.7 Scope of Work – Pipeline

2.7.1 Western Outer Ring Main Pipeline

The transmission pipeline will start from approx. 100m north of the Plumpton City Gate to the Wollert pig trap assembly and consists of the following main equipment:

- Approximately 51 km x up to DN600 gas transmission pipeline.
- 3 main line valves (MLV) (See Section 2.7.2, 2.7.3 and 2.7.4).
- EOLSS at Wollert (see Section 2.7.5).
- Cathodic protection systems and test points along the pipeline.
- Grounding wire cables with AC/DC decouplers along the pipeline.
- Pipeline marker posts and marker tape.

2.7.2 Actuated MLV (MLV1)

The MLV1 facility consists of the following main equipment:

- 1 remote actuated buried MLV located at approx. KP6 (adjacent to Holden Road)
- The MLV1 facility would be co-located with the existing Sunbury Pipeline MLV facility contained within a jointed chain wire fenced compound of approximately 20 m (length) by 15 m (width)
- The MLV will have an aboveground bypass line that includes two vertical aboveground pipings on each side of the MLV with a cross over. Each vertical piping will have:
 - A ball valve;
 - A plug valve;
 - A cross over tee;
 - A restricted orifice to restrict the flow rate during venting
 - A short vent pup with flange connection
 - A blind flange welded with a small valve for pressure relief prior to removing the blind flange for venting
- Integrated panel including battery back-up, Remote Telemetry Unit (RTU) and communication systems
- Safety Instrumented System (SIS)
- General Instrumentation

2.7.3 Actuated MLV (MLV2)

The Actuated MLV2 consists of the following equipment:

- 1 remote actuated MLV (MLV2) located at approx. KP22 (adjacent to Oaklands Road)
- MLV2 facility would be contained within the 15-metre easement in a chain wire fenced compound of approximately 12 by 12 metres.
- The MLV will have an aboveground bypass line that includes two vertical aboveground pipings on each side of the MLV with a cross over. Each vertical piping will have:
 - A ball valve;
 - A plug valve;
 - A cross over tee;
 - A restricted orifice to restrict the flow rate during venting
 - A short vent pup with flange connection
 - A blind flange welded with a small valve for pressure relief prior to removing the blind flange for venting
- Integrated panel including battery back-up, Remote Telemetry Unit (RTU) and communication systems
- Safety Instrumented System (SIS)
- General Instrumentation
- Anode bed

2.7.4 Actuated MLV (MLV3)

The Actuated MLV3 consists of the following equipment:

- 1 remote actuated MLV (MLV3) located at approx. KP35 (adjacent to Gunns Gully Road)
- MLV3 facility would be contained in the 15 metre easement in a chain wire fenced compound of approximately 12 by 12 metres.
- The MLV will have an aboveground bypass line that includes two vertical aboveground pipings on each side of the MLV with a cross over. Each vertical piping will have:
 - A ball valve;
 - A plug valve;
 - A cross over tee;
 - A restricted orifice to restrict the flow rate during venting
 - A short vent pup with flange connection

- A blind flange welded with a small valve for pressure relief prior to removing the blind flange for venting
- Integrated panel including battery back-up, Remote Telemetry Unit (RTU) and communication systems
- Safety Instrumented System (SIS)
- General Instrumentation

2.7.5 End of Line Scraper Station

The routine operation of gas pipelines require the periodic running of a pipeline inspection tool (pig) to inspect the pipe wall. Scraper stations are required to launch and receive pigs under pipeline pressure. A new scraper station is required at the Wollert end of the pipeline and would be located within the existing APA facility at Wollert.

The EOLSS at Wollert will consist of a permanent pig receiver/launcher (to aide bidirectional ILI activities), including pipeline isolation valve and monolithic isolation joint (MIJ).

2.8 Key Contacts and Information

Name	Company	Position
██████████	APA	Program Manager
██████████████████	APA	Project Manager (Facilities)
██████████	APA	Project Manager (Pipeline)
██████████████	APA	Project Engineer (Pipeline)
██████████████	APA	Project Engineer (Facilities)
██████████	APA	Construction Supervisor (Pipeline)
███	APA	Construction Supervisor (Facilities)
██████████	APA	HSE Advisor
██████████████	APA	HSE Manager – Infrastructure Development
Project Name:	Western Outer Ring Main Pipeline Project	
Scope of Work:	Refer Section 2.6 and Section 2.7	
Site Address:	Refer Figure 2 Western Outer Ring Main pipeline	
Existing Site Conditions:	Works will be in both brownfield (Sunbury easement, Wollert to Wodonga easement and Wollert CS) and greenfield. Project conditions to be confirmed.	
Commencement Date:	Q1 2022 (subject to pipeline license)	

Completion Date:	Q4 2022 (construction only)
Person Conducting a Business or Undertaking (PCBU):	APA Group
Address:	Level 14, IBM Tower 60 City Road, Southbank VIC 3006
Project Phone Number:	1800 951 444
ABN:	65 083 009 278
Contact:	<p>██████████ Project Manager – Western Outer Ring Main Project Level 14, IBM Tower 60 City Road, Southbank VIC 3006 ██████████ ██</p> <p>██████████ Project Manager – Western Outer Ring Main Project Level 14, IBM Tower 60 City Road, Southbank VIC 3006 ██████████ ██</p>
Principal Contractor Facilities (FPC):	TBA
Address:	TBA
Phone:	TBA
ABN:	TBA
Contact:	TBA
Persons with HSE Responsibilities:	TBA
Principal Contractor Pipeline (PPC):	TBA
Address:	TBA
Phone:	TBA



ABN:	TBA
Contact:	TBA
Persons with HSE Responsibilities:	TBA

2.9 Subcontractor and other contractor details

Principal Contractor to advise APA on all subcontractors to be used on the project. Threshold amount to be inserted upon contractor confirmation.

2.10 Emergency Contact Information

Principal Contractor is to establish and maintain a contacts list for all emergency services and utility providers relevant to the project.

Service	Contact Information
Police	000
Ambulance	000
Melbourne Fire Brigade	000
Doctor/Medical Treatment Centre Epping	Epping Medical Centre 230 Cooper Street Tristar Medical Group Epping Vic, 3810 (03) 8401 1777
Hospital Epping	Northern Hospital Epping 185 Cooper Street Epping Victoria 3076 (03) 8405 8000
Doctor/Medical Treatment Centre Sunbury Plumpton/Sunshine	Sunbury Medical Centre 38-40 Gap Road Sunbury Vic, 3429 (03) 8401 1777
Hospital Craigieburn	Northern Health Craigieburn Centre 274-304 Craigieburn Road Craigieburn Vic 3064 (03) 8338 3000
Workplace Health & Safety Regulator	Worksafe Victoria 1800 136 089
Gas Regulator	Energy Safe Victoria (ESV) 1800 800 158 (03) 9203 9700
Environment Regulator	Environment Protection Authority (EPA) 1300 372 842 (1300 EPA VIC)
Pipeline Regulator	Department of Environment, Land, Water and Planning (DELWP) Pipeline Regulation Unit: Phone: 0439 799 598 Email: pipeline.regulation@delwp.vic.gov.au
DBYD (Dial Before You Dig)	1100 or (03) 9203 9700
National Security – Suspicious activity	National Security Hotline 1800 123 400
Water Service	South East Water 03 9552 3000 Yarra Valley Water 132762



	Western Water
Poisons Information Centre	13 11 26

3. SAFETY IN DESIGN

3.1 General

Safety in design aims to prevent HSE incidents through methodical analysis of hazards throughout the engineering design phase. The Project design is completed in accordance with the Design Basis Manual (WPT.2373-DBM-A-0001).

APA implements a rigorous process for the mitigation of risk throughout all phases of a project and recognises safe design as a key opportunity for the elimination of hazards in subsequent phases. In pursuit of APA's zero harm target, the following risk based reviews are implemented during the design phase:

- Design reviews (30%, 60%, 90% 3D model reviews);
- Hazard and Operability Studies (HAZOPS);
- Safety Management Study (SMS)
- Instrumented Safety Systems Layer of Protection Analysis (LOPA)
- Hazard Identification (HAZID) workshops;
- Constructability Reviews;
- Fire Risk Study
- Reliability (What-If?) Workshop

The above reviews seek to reduce hazards associated with construction, operation, and ongoing maintenance of the new facilities.

They encompass all pipeline design including facilities, hardware, systems, equipment, products, layout and configuration.

The Project Engineering Team maintains compliance with relevant standards including the suite of AS/NZS 2885 standards. Accordingly, Risk Assessments and Safety Management Studies are conducted to ensure that all credible threats to the any pipeline section or facility are identified and managed to be As Low As Reasonably Practicable (ALARP).

Design will be complete prior to commencement of construction however, any significant design changes will be managed under APA's management of change process which, depending on the nature of the change, may prompt one or more of the abovementioned reviews. All changes, irrespective of their magnitude will consider:

- Approved design standards and specifications;
- Health, Safety, Environmental impacts associated with the design;
- Applying risk management principles to the design process to eliminate hazards and minimise risk that may occur during construction, operation and maintenance;
- Site conditions such as existing assets, layout / access, existing operational and maintenance requirements, geotechnical assessments – as applicable.

4. WORKPLACE HEALTH SAFETY & ENVIRONMENT OVERVIEW

4.1 Strategy

APA aspires to provide a zero harm work environment. We are committed to the effective implementation of our HSE Policy and to the continual improvement of our HSE Performance.

The APA HSE Management System is called 'Safeguard' and provides a framework by which the processes relating to the company's Health, Safety and Environment (HSE) activities are defined, implemented and controlled. Additionally, local business unit processes and procedures/requirements provide instruction to workers on performing activities safely.

The high-level HSE risk management framework (known as RCA) is shown below in figure 1.



Figure 1: Risk – Control - Assure (RCA) Model

RISKS

Identify hazards that may cause harm;

Assess the risks by determining likelihood and consequence of these hazards causing harm;

CONTROLS

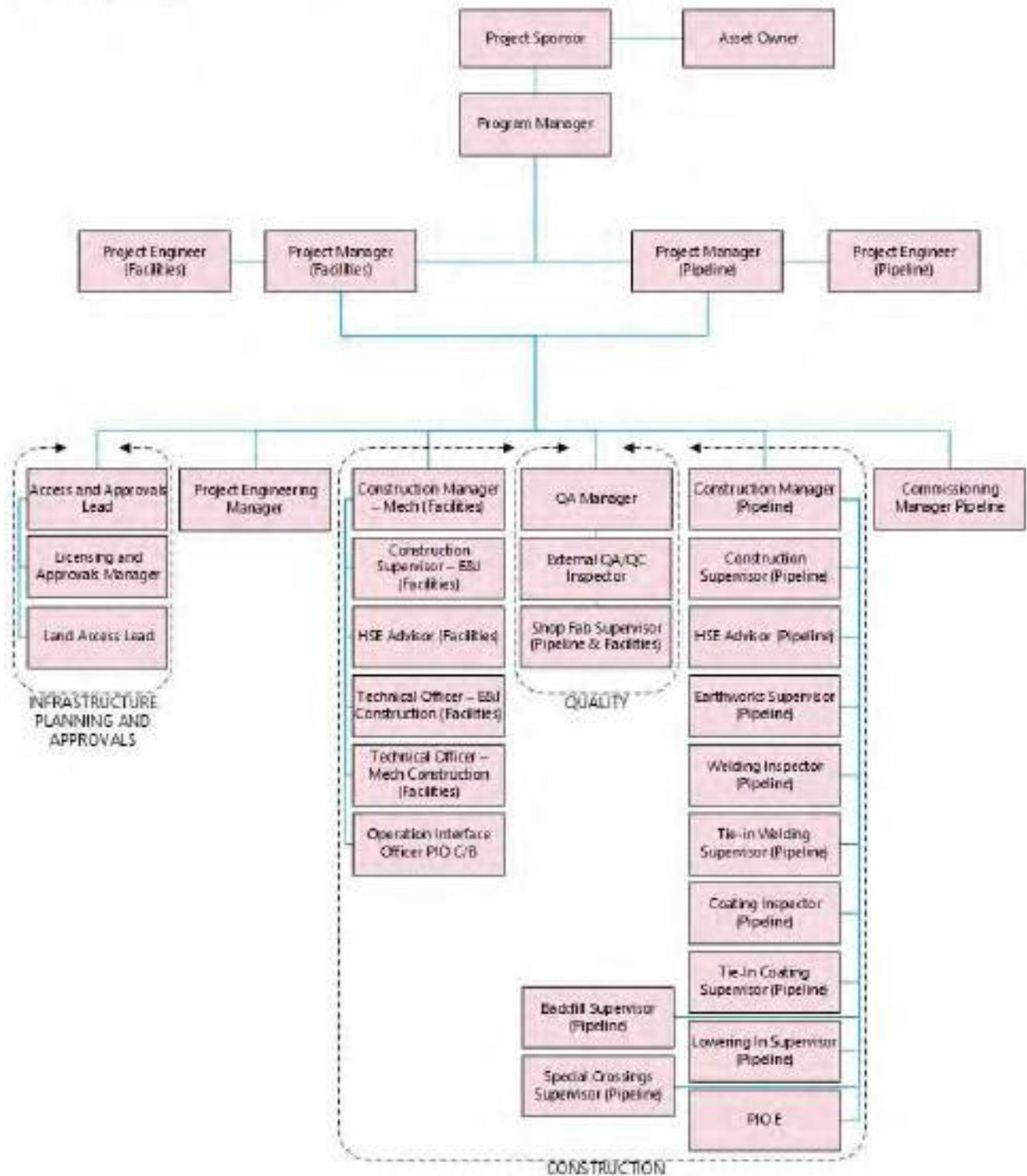
Implement and maintain control measures which prevent and/or reduce consequences of harm;

ASSURE

Monitor and review the effectiveness of the control measures.

4.2 Organisational Chart

**Western Outer Ring Main (18035)
Organisation Chart
Delivery Stage**



4.3 Duties of Principal Contractors

The project will engage two Principal Contractors: a Pipeline Principal Contractor and a Facilities Principal Contractor. The delineation of the Pipeline and Facilities Principal Contractors is distinguished by battery limits and demarcations at the Wollert Compressor Station stated in the Scope of Work provided to each contractor. The demarcation points are shown in Figure 3 and Figure 4.

The Principal Pipeline Contractor is responsible for the HSE requirements associated with the delivery of Scope of Work – Pipeline. The Principal Facilities Contractor is responsible for the HSE requirements associated with the delivery of Scope of Work – Wollert Compressor Station upgrade. Both contractors will be engaged via competitive tenders with an Issue for Construction (IFC) pack. The battery limits for each scope will be reviewed as we progress the design through to IFC and during tender evaluations through to award.



Figure 3 Wollert Compressor Station Northern Demarcation of Pipeline and Facilities scopes shown in red



Figure 4 Wollert Compressor Station Southern demarcation of Pipeline and Facilities scopes shown in red

The Pipeline and Facilities Principal Contractors are each responsible, to the extent that is reasonably practicable, to ensure the health and safety of workers and the general public.

The Victorian OHS Act sets out specific duties, which the Pipeline and Facilities Principal Contractors must comply with as part of their general duty.

These include:

- Setting of key performance indicators, performance monitoring, reporting, and review for the Project and communicated to the workforce;
- Consulting with workers (including Contractors and their workers, employees of labour hire companies) and Health & Safety Representatives (HSRs) (where appointed) about matters that directly affect them;
- Providing and maintaining a working environment that is safe and without risks to health, including the entering and exiting of the workplace;
- Providing and maintaining plant, structure and systems of work that are safe and do not pose health risks (e.g. providing effective guards on machines and regulating the pace and frequency of work);
- Ensuring all workplace activity relating to the erection, commissioning, decommissioning or dismantling of plant or structures is without risks to health or safety;
- Ensuring the safe use, handling, storage and transport of plant, structure and substances (e.g. toxic chemicals, dusts and fibres);
- Providing adequate facilities for the welfare of workers at workplaces under their management and control (e.g. washrooms, lockers and dining areas);
- Providing workers with information, instruction, training or supervision needed for them to work safely and without risks to their health;
- Monitoring the health of their workers and the conditions of the workplace under their management and control to prevent injury or illness;
- Maintaining any accommodation owned or under their management and control to ensure the health and safety of workers occupying the premises.
- Ensure a Corrective Action Register is maintained and that the close out of actions is monitored;
- Ensure sufficient resources are provided to develop, implement and maintain the H&S management systems to achieve project H&S objectives.

The Principal Contractor Project Manager is responsible to ensure these obligations are fulfilled by the Principal Contractor and lower tier Contractors.

4.4 Duties of Key Project Personnel

Key personnel involved in the project whose role includes specific health and safety responsibilities are:

- APA Project Manager;
- APA Construction Supervisor;
- APA HSE Manager Infrastructure Development;
- APA HSE Advisor;
- Principal Contractor Project Manager.

At time of contract award, an interface communication framework will be established between APA and the Principal Contractor.

4.4.1 APA Project Manager

Roles and responsibilities include but are not limited to the following:

- Overall responsibility for HSE on the project for APA Group;
- Set the HSE standards for the project;
- Show visible leadership and lead by example at all times;
- Overall responsibility for monitoring the implementation of the HSMP;
- Ensure new APA Group personnel are inducted into the HSMP;
- Ensure HSE responsibilities, including HSE System administration, are clearly assigned to relevant members of the project team;
- Establish, review and maintain the Project Hazard Profile and subordinate Risk Assessments;
- Ensure the HSE Communication, Consultation and Co-ordination processes are established for the site between APA Group and the Principal Contractor;
- Notify the HSE Manager and HSE Advisor where required of any reportable HSE incident;
- Ensure all incidents are investigated, followed up and actions closed;
- Provide the HSE Manager with any required report on the HSE performance on site;
- Liaise with HSE Manager in regard to any HSE incident under investigation by a statutory authority and or client organisation, including before obtaining legal representation following any incidents;
- Ensure requirements for community liaison/consultation are carried out;
- Ensure that APA Group site staff and site personnel are provided with appropriate training, information, instruction and supervision in relation to HSE;
- Ensure that all non-conformances issued internally or externally in relation to breaches of the APA Group HSMP are actioned in a prompt and timely manner;
- Attend meetings and inspections, in accordance with the consultative process established on the project;
- Nominate APA Group personnel to conduct site specific inductions;
- Chair project team meetings and ensure HSE is included as a standing agenda item;
- Ensure a training needs analysis for APA Group personnel working on site is completed.

4.4.2 APA Construction Supervisor

Roles and responsibilities include but are not limited to the following:

- Assist the Project Manager with the implementation and maintenance of all aspects of the HSMP;

- Ensure the HSE standards set for the project are upheld and maintained at all times;
- Show visible leadership and lead by example at all times;
- Ensure the Principal Contractor / Sub-contractors provide SWMS for all High Risk Construction Work;
- Record and report internally on any visits to the site by an authorised officer;
- Review the SWMS and sign off prior to the work commencing on site;
- Issue directions for the work to cease where it is observed that work is being carried out contrary to the required SWMS and or safety standards;
- Ensure all workers undergo Site-specific induction before being allowed to commence work on site;
- Conduct accident/investigate incidents and complete required forms;
- Arrange and conduct regular HSE inspections and ensure that HSE hazards requiring rectification are completed where required;
- Ensure appropriate hazardous substances spill response equipment is available on site;
- Monitor overall HSE performance;
- Ensure that all HSE non-conformances are recorded and actioned in a prompt and timely manner;
- Conduct / participate daily, weekly, monthly HSE reporting requirements;
- Lead / participate in tool box and pre-start meetings;
- Ensure injury management and return to work processes are established, implemented and maintained.

4.4.3 APA ID HSE Manager

Roles and responsibilities include but are not limited to the following:

- Ensure the HSE standards set by APA Group are upheld and maintained at all times;
- Provide assistance during investigations;
- Participate in project risk assessment activities;
- Where required conduct incident / accident investigations for notifiable incidents;
- Maintain a schedule of HSE audits;
- Monitor the closure of all significant HSE issues identified during inspections and audits;
- Attend Project HSE meetings as required;
- Periodically attend meetings and/or inspections conducted by the HSE Consultative Process established on each site;

- Ensure that all Lost Time Injury (LTI), Medically Treated Injury (MTI) and High Potential work incidents are investigated and recorded within the nominated time frame and make recommendations as required;
- Monitor the performance of all projects within the Infrastructure Development unit and initiate appropriate corrective action to deal with any adverse trends in performance;
- Keep the project team up to date with relevant safety alerts issued both internally and externally;
- Initiate appropriate HSE educational programmes in conjunction with the Head of HSE;
- Maintain a sound knowledge of HSE legislation covering activities undertaken by APA Group and advise site of any changes or amendments;
- Ensure that any notice issued by the HSE Statutory Authority is closed out in the required time frame;
- Liaise with APA Group site management on all site related HSE issues.

4.4.4 APA HSE Advisor

Roles and responsibilities include but are not limited to providing assistance to the Construction Supervisor in ensuring a safe workplace by the following actions:

- Assist with implementing HSE plans and strategies at major projects sites;
- Participate in the development of site construction safety management and environmental plans;
- Assist with the preparation and / or review of Safe Work Method Statements (SWMS);
- Review and evaluate the Principal Contractors health, safety and environment management plans and systems;
- Provide leadership in creating and encouraging a culture that promotes safety as the primary driver of all behaviours - lead by example at all times;
- Ensure that Health, Safety and Environment programs are implemented;
- Ensure overall Health, Safety and Environment compliance of projects;
- Conduct / participate in workplace audits, inspections and risk assessments;
- Recommend remedies to identified risks and hazards;
- Assist in addressing identified actions resultant from SMS and/or Regulator audits at sites as required;
- Ensure safe work method statements are prepared, accurate and followed;
- Ensure Principal Contractor management processes are followed on site;
- Liaise with the Construction Supervisor for the resolution of HSE issues;
- Ensure Fitness for Work activities are implemented on site as required, including BAC and drug testing, fatigue management and heat stress / strain management;

- Ensure the safe storage and handling of hazardous chemicals in accordance with the Safety Data Sheets;
- Ensure adequate supplies of PPE are maintained and issued to personnel as required;
- Ensure site signage, barricading and security requirements are in place;
- Actively contribute to the reduction of injury and illness rates resulting in lowered workers compensation costs, improved productivity and morale;
- Ensure consultation processes provide employees with the opportunity to be involved in workplace planning, design and HSE matters;
- Participate in and / or support the Construction Supervisor in accident / incident / near miss reporting, incident investigation, corrective actions and improvements plans for level 1 and 2 incident investigations, in accordance with APA Group Procedures;
- Assist the HSE Manager Infrastructure Development in the investigation of level 3 or 4 incidents, as required;
- Ensure toolbox talks and daily pre-start meetings are conducted;
- Ensure all personnel have undertaken the required induction training, including APA Inductions, General Construction Induction (White Card or similar), Project Specific Inductions;
- Ensure all personnel hold the applicable licences, competencies and authorities to undertake their works;
- Confirm that appropriate HSE training and instruction is provided to all personnel working on site;
- Maintain HSE related information and records as required;
- Compile and analyse weekly and monthly work injury statistics;
- Contribute to project weekly and monthly reports;
- Ensure Site Registers, including lifting equipment, electrical equipment, hazardous chemicals, inspection and test records, calibration records, and waste tracking are maintained;
- Ensure that all activities on site are performed are in accordance with the requirements of Safeguard;

4.5 Principle Contractor Project Manager

The Principal Contractor Project Manager is responsible to ensure all matters relating to Health & Safety are managed in accordance with the APA / Principal Contractor's Construction Health & Safety Management Plan. The Principal Contractor Project Manager shall be or nominate the client's "first point of contact" for all matters relating to Health & Safety and ensure that an appropriate organizational structure is established for the project and that all roles and responsibilities are defined and communicated. Principal Contractor shall nominate HSE responsibilities in their CHSMP.

4.6 Duties Of The Employer

APA shall ensure, so far as is reasonably practicable, that the workplace and anything arising from the workplace does not put at risk the health or safety of any person.

The requirements of the plan shall be communicated to each person who is to carry out work in connection with the site and this plan.

4.7 Duties Of The Employee

While at work, workers must take reasonable care for their own health and safety and that of others who may be affected by their actions or omissions. They must also:

- Comply, so far as they are reasonably able, with any reasonable instruction given by APA to allow APA to comply with OHS laws, and
- Cooperate with any reasonable policy or procedure of APA relating to health or safety at the workplace that has been notified to workers.

4.8 Legal And Other Requirements

The Principal Contractor is responsible to ensure all relevant work health and safety legislative obligations and responsibilities relating to this scope of work are identified and fulfilled and that all relevant personnel have access to sufficient HSE legislative information to allow them to understand and fulfil the HSE obligations of their job role.

The Principal Contractor's CHSMP structure shall reflect the common principles of AS/NZS 4801:2001 Occupational Health and Safety Management Systems - Specification with Guidance for Use; AS/NZS 4804:2001 Occupational Health and Safety Management Systems - General guidelines on principles, systems and supporting techniques and OHSAS 18001:2007 Occupational health and safety management systems requirements.

Procedures and plans shall be developed in compliance with the applicable legislation and codes. The list below comprises the most commonly referenced Acts, Regulations and Standards used during APA Projects. The list is not exhaustive (refer to APA's Safeguard website under HSE References for the complete register).

The key elements of the project legislative framework are listed below:

- Occupational Health and Safety Act 2004 (Victoria)
- Occupational Health and Safety Regulations 2017 (Victoria)
- Workplace Injury Rehabilitation and Compensation Act 2013
- Workplace Injury Rehabilitation and Compensation Regulations 2014
- Pipelines Act 2005 (Victoria)
- Pipelines Regulations 2017 (Victoria)
- Dangerous Goods Act 1985 (Victoria)
- Dangerous Goods (Storage and Handling) Regulations 2012 (Victoria)
- Electricity Safety Act 1998 (Victoria)
- Electricity Safety (Installations) Regulations 2019 (Victoria)

- Accident Compensation Act 1985 (Victoria)
- AS 1940 - 2017 - Storage and handling of flammable and combustible liquids;
- AS 2187.2 - 2006 - Explosives Storage and use;
- AS 2885.1 - 2018 Pipelines - Gas and liquid petroleum - Design and Construction;
- AS 2885.2 - 2020 Pipelines - Gas and liquid petroleum - Welding;
- AS 2885.3 - 2012: Pipelines - Gas and liquid petroleum - Operation and maintenance;
- AS 2885.5 - 2020 Pipelines - Gas and liquid petroleum – Field Pressure Testing;
- AS 4801 - 2001 Occupational Health and Safety Management Systems - General guidelines on principles, systems and supporting techniques
- OHSAS 18001:2007 Occupational health and safety management systems requirements.
- WorkSafe Handbook for Construction Regulations;, Working Safely in the general construction industry
- WorkSafe Victoria Compliance Code for Confined Spaces
- WorkSafe Victoria Compliance Code for First Aid in the Workplace
- WorkSafe Victoria Compliance Code for Managing Asbestos in Workplaces
- WorkSafe Victoria Compliance Code for Prevention of Falls in General Construction
- WorkSafe Victoria Compliance Code for Removing Asbestos in Workplaces
- WorkSafe Victoria Compliance Code for Workplace Amenities and Work Environment
- WorkSafe Victoria Compliance Code for Plant
- WorkSafe Victoria Compliance Code for Hazardous Substances
- WorkSafe Victoria Compliance Code for Manual Handling
- WorkSafe Victoria Compliance Code for Excavation
- WorkSafe Victoria Compliance Code for Facilities in Construction
- WorkSafe Victoria Code of Practice Storage and Handling of Dangerous Goods
- Victorian Code of Practice for Worksite Safety – Traffic Management Victoria
- Other related Australian Standards and Codes of Practice as required.

Note: Where the abovementioned documents make reference to statutes, regulations, guidelines, forms, procedures, policies, matrices, standards, codes of practice, compliance codes, plans, etc. these are deemed to be requirements of the Principal Contractor's CHSMP.

The Principal Contractor Project Manager and the Principal Contractor HSE Advisor shall be responsible for identifying the legislation, standards and other requirements relevant to health, safety and environment applicable to the project.

Procedures, work instructions, Safe Work Method Statements and other relevant documentation shall reflect the requirements of current legislation. Where applicable, these documents will reference the appropriate legislation or standard.

Legislation, standards and other requirements relevant to health, safety and environment shall be monitored for change, which identifies and defines the methods used to monitor developments in safety legislation and their incorporation into policies, procedures and processes.

The Project Manager shall ensure changes in legislation, standards and other requirements are assessed and changes resulting are incorporated into project processes and procedures. Information shall be kept up to date and workers informed of requirements.

5. APA GROUP POLICIES

5.1 Health, Safety And Wellbeing Group Policy

The Health, Safety and Wellbeing Group Policy is a statement of APA's commitment to providing workplaces that are free of injuries and supports the good health, wellbeing, respect and inclusion of our employees.

The effective application of this Policy is key to ensuring we operate in line with our Values and Our Code of Conduct. This Policy enables our commitment to aspire to world class health and safety performance and empower the devolution of health and safety decision making throughout APA's workplaces. The Policy supports decision-making as part of the APA Decision Compass under the segments of "Do Things Safely" and "Take a Long Term Focus".

This policy applies to all APA employees as well as directors, contingent workers, contractors and visitors.

5.2 Environmental and Heritage Group Policy

The Environment and Heritage Group Policy is a statement of APA's commitment to the protection of the environment and preservation of cultural heritage.

The effective application of this Policy will facilitate alignment to APA's Values and Code of Conduct. This Policy will support APA to meet or exceed its legislative obligations in regard to the environment and cultural heritage. The Policy supports decision making as part of the APA Decision Compass under the segments "Take a Long Term Focus" and "Do What We Say We Do".

This Policy applies to all APA activities and joint ventures under APA's control in all of its operating sites and jurisdictions. This Policy applies to all APA employees, contractors and suppliers.



Figure 5: APA Decision Compass

Copies of APA Group Policies are attached as per Appendix A.

6. HAZARD IDENTIFICATION & RISK CONTROL

6.1 General

A risk management system and procedures shall be established by the Principal Contractor for the project to ensure that hazards are identified and risks evaluated and managed. HSE hazards shall be identified considering past, existing and new business activities, products and services along with changes in operations.

The process for identifying, assessing and managing specific risks shall be documented in procedures for managing HSE aspects of the project, and will generally be as follows:

- Hazard identification;
- Risk analysis;
- Risk assessment (likelihood and consequence);
- Risk control;
- Action management as applicable
- Reporting and close out.

Selection of risk control solutions shall be in accordance with the risk management hierarchy of hazard control, in order of preference:

- Eliminate – remove hazard completely
- Engineer through:
- Substitution – replace / reduce the hazard with a lower risk one
- Isolation – ensure no access to the area containing the hazard without a permitting system in place
- Engineering – redesign or rework the hazard and/or the work activity to reduce the risk
- Administrative – Document – prepare procedures, Safe Work Method Statements (SWMS) and/or risk control plans
- Personal Protection – use protective equipment.

Consultation and agreement between key personnel forms an intricate part of the whole process. All control measures shall ensure that risks are reduced to “as low as reasonably practicable” (ALARP).

A system shall be implemented to assess risks prior to any planned changes or when any unplanned changes occur. A system shall be implemented to mitigate risk to an acceptable level before any change has been implemented. Only appropriately trained and experienced personnel have the authority to approve a change.

Principal contractor shall provide Hazard and incident data to APA in a format suitable for inclusion in the APA Safeguard system. A risk matrix or tool using the consequence/likelihood assessment criteria shall be used to assist in risk management.

Within APA, this is defined in APA HSE GP 06.01 Risk Management Overview though it may also appear in other documentation.

6.2 Risk Identification, Assessment and Control Process

Project Risk Assessment, Design and Engineering Processes Hazard Analysis, Construction, Commissioning, task analysis, management of change, hazard and near miss reporting and associated action management shall be managed in accordance with ISO31000 Risk Management – Principles and Guidelines and the Group Procedures as referenced in Appendix B: APA (Group Level) HSE Reference Documents.

Pipeline construction activities generally follow a standard order. The list of typical hazards and their associated management and control strategies (refer to Appendix G Construction Processes and their Associated Typical Hazards) is intended as a guide. The “key words” will be used to assist participants undertaking the pre-construction HAZID workshop to prepare a Construction Risk Register which shall be maintained by the Principal Contractor for the duration of the Works. Agreed risk acceptance criteria to be established with the Principal Contractor prior to the HAZID.

6.3 Approval to Construct

Approval to construct is to be in accordance with APA ID HSE PR004.01 Approval to Construct. An Approval to Construct (ATC) register is one element of the overall project risk management process. It is conducted in addition to risk identification and management processes and provides a stage gate to validate that all agreed risk control measures are in place and the relevant scopes of work are ready to proceed. Contractor is required to assist in development of the associated procedures to achieve compliance with this “internal to APA” process.

Prior to mobilising to site, the Contractor must have the following documents reviewed and approved by APA, where applicable:

Document Title
Contractor Project Management Plan approved
Contractor Quality Management Plan approved
Contractor ITPs approved
Contractor Construction Health & Safety Management Plan reviewed and approved by APA
Contractor has demonstrated alignment with APA Fatal Risk Protocols
Contractor HSE Procedures reviewed by APA
Contractor conducts Hazid for project and actions are closed out
Contractor SWMS reviewed by APA
Construction Environmental Management Plan reviewed and approved by APA
Contractor Travel Management Plan reviewed
Contractor Site Establishment Amenities and Security Plan reviewed by APA

Contractor Traffic Management Plan reviewed / approved
Contractor Emergency Response Plan reviewed and approved by APA
Accommodation secured
Subcontractor Details Provided and Approved
Contractor Project HSE Audit schedule reviewed by APA
Contractor SWMS reviewed and approved
MDR requirements specified
Contractor Training Register and Competency Matrix / VOC Documentation received
Fitness for Work procedure in place
APA HSE and Environmental on-line inductions completed for all site personnel

6.4 Performance Objectives

The Project Management Team should agree on and define verifiable health and safety objectives, plans and standards for the project which reflect responsibilities, legislative requirements and project health and safety policy commitments.

Typical objectives may include:

- i) Prevention of incidents;
- ii) Identification and control of hazards;
- iii) Stakeholder consultation;
- iv) Compliance with applicable legislative requirements;
- v) Compliance with approved industry standards and codes;
- vi) A platform for continuous improvement.

The Plan should incorporate agreed and measurable health and safety performance objectives including both leading and lagging Health and Safety performance indicators.

Typical performance standards include:

Lagging Indicators
<ul style="list-style-type: none"> • Lost Time Incidents • Lost Time Incident Frequency Rate • Restricted Work Injuries • Medical Treatment Incidents • First aid Treatments • Treatable Injury Incidents (i)

Leading Indicators
<ul style="list-style-type: none"> • Job Observations • Hazard Reports • Corrective Actions • Pre-start Meetings • Toolbox Meetings • Inductions • Inspections

Lagging Indicators
<ul style="list-style-type: none"> • Near Misses • Vehicle Incidents • Regulatory Notices, etc.

Leading Indicators
<ul style="list-style-type: none"> • Management Interactions • Audit Compliance

Project Health and Safety objectives, plans and standards should be communicated to all personnel during induction and toolbox meetings to ensure an understanding of and participation in achieving the project health and safety objectives.

The APA Project Management Team shall ensure that contractors and suppliers are provided relevant inductions on the Project's health and safety requirements.

6.5 Site Rules

The Principal Contractor is responsible to ensure that all persons on site shall comply with the following site rules, and that they are informed of these requirements during the induction process

- All site personnel shall have undergone general safety induction courses before entering construction sites (i.e. completed a White Card – General Construction Industry Safety Induction and any relevant APA inductions). Any worker on site must provide evidence of such inductions upon request.
- All persons entering the site, with the exception of accompanied visitors, must undergo a site-specific induction. Only a site employee who has completed White Card training and APA Group specific induction training may accompany visitors around construction sites.
- Electronic devices, such as mobile phones, radios and cameras are not to be used within the Permit to Work zone area, unless approved for use.
- All work shall be conducted in a safe and environmentally responsible manner and shall comply with all legal and regulatory requirements.
- Safe work method statements (SWMS), APA procedures and plans must be complied with at all times.
- All incidents, injuries, unsafe acts, near misses, hazards and emergency situations must be reported to the APA Construction Supervisor as soon as practicable.
- Workers must wear and maintain, the correct PPE appropriate to the hazard and risk exposure. Minimum standard PPE requirements for personnel are high visibility, long sleeved, 100% cotton shirt (sleeves down); 100% cotton long pants (denim acceptable); safety helmet; safety glasses; and steel cap boots. Additional PPE, such as working gloves, hearing protection, wide brim for safety helmet, wet weather gear, shall be worn where identified in SWMS or as required.
- All waste materials are to be disposed of in accordance with approved SWMS (for regulated activities) or in designated waste/recycling bins.
- No alcohol or illegal drugs are permitted on site at any time. In the event that any employee or sub-contractor is found on site to be under the influence of alcohol or drugs, the individual will be removed from site and may be subject to

disciplinary action. Any worker on site who is undertaking a course of prescription medication that may impact on their ability to work or operate machinery shall advise the site supervisor prior to signing on to any risk assessment or conducting work of any kind. In the event of an incident, failure to have done this may result in disciplinary action.

- Toilets are to be used and good hygiene is to be observed at all times.
- Before using or storing hazardous substances, a copy of the respective Safety Data Sheet (SDS) and Risk Assessment must be given to the site supervisor or team leader prior to starting work. A register of all hazardous substances including quantities and location must be maintained.
- No person shall move, alter, drive or operate any plant and/or equipment unless they are licensed / competent and authorised to do so. All mobile plant and vehicles shall have inspections completed as per legislative requirements.
- Speed limits shall be observed at all times.
- All plant; tools and equipment must be fit for purpose, must comply with statutory inspection requirements, be used only for the intended purpose and in accordance with approved operation instructions by trained and competent persons.
- Children, pets and animals are not permitted on construction sites.
- Theft of any kind will not be tolerated and will be reported directly to the police.
- All persons shall comply with all safety signage.
- All persons operating vehicles and mobile plant shall wear seatbelts regardless of the amount of time, the speed travelled or whether on site or public road.
- Unsafe behaviour (including horseplay and fighting) is prohibited.
- Running in work areas, except for emergency purposes, is prohibited.
- Principal Contractor may add additional site rules as required.

6.6 Hazard Management Documents

Principal contractor shall ensure Hazard management references shall be designed and implemented by competent persons to ensure safe systems of work.

The arrangements for the collection and any assessment, monitoring and review of safe work method statements at the workplace shall be specified.

The identification of hazards and the assessment of risks is an essential part of ensuring safety is managed appropriately. Once hazards and risks have been identified, control measures shall be implemented to eliminate or reduce the risks to be As Low As Reasonably Practicable (ALARP).

The "Hierarchy of Hazard and Risk Control" shall be used on the basis that the higher the control strategy is in the hierarchy, the more preferable and effective it is in controlling the hazard.

Control measures can be used to reduce or eliminate the identified hazard and in some cases, it may be necessary to combine two or more hazard control measures to

achieve a satisfactory solution and reduce risk to an acceptable level. As far as is possible controls shall be applied in the order shown below:

- Elimination
- Substitution
- Isolation
- Engineering controls
- Administrative controls
- Personal Protective Equipment (PPE)

The following list of hazard identification and risk assessment activities are to be applied to the project:

- Project Hazard Profile
- AS 2885.1 and AS 2885.6 Safety Management Studies
- Pre-construction, Pre-Shutdown and Pre-Commissioning Hazard Identification Workshop (HAZID)
- Job Hazard Analysis
- Safe Work Method Statements
- Safeguard Protocols
- Plant Hazard Assessments
- Hazard Reporting
- Near Miss / Incident Reporting and Investigation
- Inspections and Audits
- Personal Preact

<i>Reference Documents</i>	
APA Group	<i>APA HSE GP 08.04 Workplace Inspection and Hazard Reporting</i>
	<i>APA HSE GP 08.04 T1 Workplace Inspection Checklist - Template</i>
	<i>APA HSE GP 06.01 HSE Risk Management Overview</i>
	<i>APA HSE GP 07.01 Incident Reporting</i>
	<i>APA HSE GP 07.02 Incident Investigation and Analysis</i>
	<i>APA HSE GP 08.04 T3 Audit and Self-Assessment</i>
	<i>APA HSE GP 08.02 T1 Safe Work Method Statement Template</i>
	<i>APA HSE GP 08.02 T2 Job Hazard and Environment Analysis Template</i>
	<i>APA HSE GP 08.02 T4 Hazard Prompt List</i>
	<i>APA HSE GP 08.01 Safeguard Protocols</i>

	APA HSE GP 08.02 Job Risk Assessment
	APA HSE GP 08.03 Authority to Work Permits
	APA HSE GP 08.02 T7 Audit and Self-Assessment
	APA HSE GP 06.01 T05 Risk / Hazard Related Registers
	APA HSE PRO-007-T1 Plant and Equipment Risk Assessment Template
Project	Western Outer Ring Main Project - Corrective Action Register
	Principal Contractor – Weekly HSE Inspection Sheet Template

6.7 High Risk Construction Work

Safe Work Method Statements shall be prepared, available and used for high-risk construction work as defined in the Victorian OHS Regulations 2017.

High-risk construction work is defined as shown in the table below:

High Risk Construction Work	Examples
Involves a risk of a person falling more than two metres	Working on ladders, elevated platforms
Is carried out on a telecommunication tower	Installing equipment on a telecommunications tower
Involves demolition of an element of a structure that is load-bearing or otherwise related to the physical integrity of the structure	Knocking down load-bearing walls as part of a warehouse / storage conversion
Involves, or is likely to involve, the disturbance of asbestos	Cutting or drilling into an asbestos cement sheet wall
Involves structural alterations or repairs that require temporary support to prevent collapse	Using props to support a ceiling where a load-bearing wall will be removed
Is carried out in or near a confined space	Confined spaces are commonly found in vats, tanks, pits, pipes, ducts, flues, chimneys, silos, containers, pressure vessels, underground sewers, wet or dry wells, shafts, trenches, tunnels or other similar enclosed or partially enclosed

Is carried out in or near a shaft or trench with an excavated depth greater than 1.5 metres or is carried out in or near a tunnel	Laying or repairing pipes and conduits in a 2-metre trench
Involves the use of explosives	Blasting in preparation for the construction of a building or road, breaking up rock during construction of foundations
Is carried out on or near pressurised gas distribution mains	'Near' means close enough that there is a risk of hitting or puncturing the mains, piping or service.
Is carried out on or near piping chemical, fuel or refrigerant lines	'Near' means close enough that there is a risk of hitting or puncturing the mains, piping or service.
Is carried out on or near energised electrical installations or services	'Near' means, close enough that there is a risk of hitting or puncturing or contact with electrical installation or service. Electrical installations do not include power leads and electrically powered tools. Some examples of high- risk construction work include working near overhead or underground power conductors and construction work that involves drilling into a wall where live electrical wiring may be present.
Where there is any movement of powered mobile plant	Mobile plant examples include: earthmoving machinery (rollers, graders, scrapers, and bobcats), excavators, cranes, hoists, elevated work platforms, concrete placing booms, reach stackers and forklifts.
Is carried out in an area in which there are artificial extremes of temperature;	Any space where normal temperatures are magnified
In or near water or other liquid that involves the risk of drowning	Pumping from local dams, work on a jetty
Is carried out on, in or adjacent to a road, railway, shipping lane or other traffic corridor that is in use by traffic other than pedestrians	Installation of road crossing
In an area that may have a contaminated or flammable atmosphere	Working around live facilities in locations that have been identified as Hazardous Areas

The Principal Contractor is responsible to ensure that SWMS are prepared for all tasks identified as high-risk construction, or where it is assessed the risks associated with the scope of works require a SWMS.

All SWMS are to be developed in consultation with personnel required to perform the task. Where it is not practicable to involve all personnel in their development, personnel carrying out the task are to be provided with the opportunity to comment on the content of the SWMS and offer suggestions, if necessary, regarding possible improvements to the SWMS prior to signing onto the SWMS.

All SWMS are to be submitted to the APA Construction Supervisor for review and sign off prior to use.

Principal Contractor shall list any other specific SWMS applicable to this scope of work and required to be in place.

6.8 Job Hazard & Environmental Analysis

Where required JHEA will be in accordance with APA HSE GP 08.02 T2 Job Hazard and Environment Analysis Template or approved equivalent Contractor document.

6.9 Authority to Work Permits

Brownfields/Greenfields

Construction activities that will be subject to the issuing of permits by APA in accordance with the PTW Procedure are activities that are considered Brownfields, which include:

- Installation of fencing posts greater than 300mm depth within 3m of existing gas pipeline;
- Hot work within 10m of a live gas mechanical connection not part of an existing facility;
- Excavation within 3m of existing gas transmission pipeline including vacuum excavation;
- Excavation > 300mm on sections designated to be "Reverse Right of Way";
- Works within existing APA compounds (e.g. Line Valve or City Gate enclosures);
- Marker post placement;
- Fence Reinstatement;
- Live welding and hot tapping onto existing pipeline;
- Hydrostatic testing (Strength Test only);
- Excavation over known APA buried asset (e.g., CP cables, anode beds, etc.);
- Blasting;
- Tie-in's to existing APA facilities; and
- Construction works carried out inside any existing pipeline or station facilities.

APA PIO's (Permit Issuing Officer's) shall manage all Permits to work for the project.

Outside of these activities, the Principal Contractor shall have their own process to manage high risk activities.

<i>Reference Documents</i>	
<i>Project</i>	<i>APA Construction Permit To Work Management Plan</i>
	<i>Document number TBC once draft issued for review</i>

6.10 Project Risk Register

Principal Contractor will establish and maintain the project risk register. Findings from the Hazid shall contribute to creating the Project Risk Register.

7. INCIDENTS, ACCIDENTS & EMERGENCY MANAGEMENT

7.1 First Aid Management

The Principal Contractor project manager shall ensure that the project is appropriately assessed for first aid requirements and that suitable arrangements are put in place for the provision of first aid. This includes:

- first aid equipment and ensure each worker at the workplace has access to the equipment;
- access to facilities for the administration of first aid;
- an adequate number of workers are trained to administer first aid at the workplace or that workers have access to an adequate number of other people who have been trained to administer first aid.
- a Defibrillator dedicated to the project, and adequately trained personnel in its use.

Records of any first aid given shall be maintained on site. First aid facilities/cabinets, details of First Aiders and the location of first aid facilities will be included in the induction program. First Aiders will be identified for each work crew and made known to all personnel.

7.2 Incident Management and Reporting

All incidents, no matter how insignificant they may seem, shall be reported and fully investigated, where required, so that appropriate actions may be implemented to prevent similar or worse incidents from occurring.

All personnel are responsible for reporting incidents including all near miss incidents. Incidents shall be reported in line with the APA HSE GP 07.01 Incident Reporting.

The following incidents must be reported and investigated as a minimum:

- Any injury resulting in first aid, medical treatment or lost time;
- Any work-related illness;
- Any incident resulting in damage to property and/or the environment;
- Vehicle, plant and equipment damage and accidents;
- Any serious electrical incident or dangerous electrical event
- Any incident which may have resulted in any of the above (near miss)
- Any incident, which triggers notification to a regulatory authority.
- Whenever an incident occurs, appropriate immediate action shall be taken by the personnel on the scene (e.g. first aid, firefighting, spill containment etc.).

Definitions

Refer to Section 26.3 Appendix

Following an incident or near miss there may need to be immediate action.

These actions may include:

- making the situation or scene safe to prevent escalation, immediate recurrence of the incident or injury to others – if it is safe to do so;
- providing immediate care / first aid to individuals as required;
- notifying external responders as required;
- making on-site notification;
- Initiate Emergency Response Plan if required.

Reference Documents	
Project	WORM Emergency Response Bridging Plan
Project	Principal Contractors Emergency Response Plan

7.3 Incident Reporting

An incident is an unplanned event that causes, or has the potential to cause, harm to people, property or the environment. As a result of an incident, people could be injured or made ill, while property and the environment could be damaged.

The Principal Contractor is responsible to ensure all incidents are reported to APA by the relevant contractor as shown below in Table 1 and recorded on an incident report form.

APA personnel will ensure that all incidents are recorded in the APA SafeGuard+ incident reporting system. Where there is no access to the APA IT network and Safeguard+, an incident report form shall be completed and a register of injuries maintained on-site and submitted with the Monthly Safety Performance Report. Incident details shall be made available to all project personnel in a way that ensures that employees involved in the incident cannot be identified, unless they have previously agreed for the information to be discussed.

The APA Group will ensure that all notifiable incidents are reported to the appropriate authority in accordance with the legislative requirements.

Incident Reporting Requirements Table 1				
Level	Criteria	Immediate Local Reporting	Wider APA reporting	APA Safeguard+
Level 1	<ul style="list-style-type: none"> • Negligible/low risk actual/potential • No WHS or Environmental statutory reporting required • Minor environmental harm 	<ul style="list-style-type: none"> • Reported verbally to area supervisor immediately 	Within 24 hours: HSE Advisor/HSE Manager <ul style="list-style-type: none"> • Environmental Manager (as applicable) • Site Manager and Line Manager • All others via Safeguard+ information. 	Entered into Safeguard+ within 24 hours.

Level 2	<ul style="list-style-type: none"> Moderate risk actual potential No WHS statutory reporting required Moderate environmental harm Regulator reporting required (Environment) 	<ul style="list-style-type: none"> Reported verbally to area supervisor immediately 	<p>Within 4 hours:</p> <ul style="list-style-type: none"> HSE Advisor/HSE Manager Environmental Manager (as applicable) Site Manager/Line Manager General Manager Nat Manager Workers Comp & Injury Mgt Head of HSE Relevant Group Executive 	Entered into Safeguard+ within 24 hours.
Level 3	<ul style="list-style-type: none"> High risk actual/potential. Includes near miss asset strike – low/high voltage electrical asset or gas asset (unless otherwise determined.) WHS Statutory reporting required. Regulatory reporting required (Safety Incident Reporting) Regulatory reporting required (Environment) 	<ul style="list-style-type: none"> Reported verbally to area supervisor immediately APA HSE GP 07.07 T1 Significant Incident Reporting, where the level of actual or potential raw risk is assessed as high to extreme 	<p>As soon as reasonably practical (i.e. within 2 hrs):</p> <ul style="list-style-type: none"> HSE Advisor/HSE Manager Environmental Manager (as applicable) Site Manager and Line Manager General Manager Nat Mgr Workers Comp & Injury Mgt Head of HSE Relevant Group Executive Group Executive Human Resources 	Entered into Safeguard+ within 24 hours.
Level 4	<ul style="list-style-type: none"> All incidents requiring legal privilege Extreme risk actual/potential Injury/illness – fatality, hospitalisation Disastrous environmental harm Statutory/regulatory reporting required (WHS & Environment) 	<ul style="list-style-type: none"> Reported verbally to area supervisor immediately APA HSE GP 07.07 T1 Significant Incident Reporting, where the level of actual or potential raw risk is assessed as high to extreme 	<p>As soon as reasonably practical (i.e. within 2 hrs):</p> <ul style="list-style-type: none"> HSE Advisor/HSE Manager Environmental Manager (as applicable) Site Manager and Line Manager General Manager Head of HSE Nat Mgr Workers Comp & Injury Mgt Relevant Group Executive Group Executive Human Resources APA General Council (as required) Managing Director Regulatory bodies – as defined in jurisdictional requirements. 	Entered into Safeguard+ within 24 hours.

Reference Documents

APA Group	APA HSE GP 07.01 Incident Reporting Procedure
	APA Safeguard+ Incident Reporting System
Project	APA Safeguard and Principal Contractors Incident Reporting System

7.4 Incident Investigation

All reportable safety incidents made to Victorian Regulators (including Worksafe Victoria and Energy Safe Victoria) will be investigated and an investigation report will be submitted to the Regulator within the prescribed time frame. All incident investigations are to focus on identifying the facts and circumstances related to the event/s, find the root causes, develop and implement controls & corrective actions, lessons learned and prevent the recurrence of similar events.

The extent of the investigation will depend on the severity, or potential severity, of the incident.

Incident investigations shall be performed in accordance with APA HSE GP 07.02 Incident Investigation and details shall be entered into Safeguard+. Actions arising from APA managed incident investigations shall be entered into Safeguard+ and monitored through to close out. Action timeframes shall be in line with the risk of the deficiency and its potential effect on HSE. Where an action may take some time to resolve and there is a potential risk to HSE in the interim, the site manager shall be informed immediately and action taken to control the risk/hazard until it is addressed.

7.5 OHS Notifiable Incidents

Occupational Health & Safety Legislation includes non-disturbance/site preservation provisions, which require an incident site, which has been defined as a non-disturbance, or site preservation area to remain unaltered until an inspection / investigation has been carried out by the relevant Statutory Authority.

In accordance with this requirement, the Principal Contractor shall ensure that, in the case of a notifiable incident, all work ceases in the immediate area and appropriate barricades and signage are erected to prevent unauthorised entry or alteration and/or contamination of the site. Where possible all plant and machinery is to be shutdown.

The non-disturbance / site preservation provision does not prevent such actions as helping or removing trapped or injured persons, making the scene safe to prevent further incidents, or actions directed or permitted by an Inspector of a Statutory Authority.

The Principal Contractor's CHSMP, associated SWMS, and the notifiable incident investigation report are required to be retained for a minimum of two years following notification of the incident.

Reportable incidents must be notified to the Minister and Energy Safe Victoria (ESV) – refer to Appendix E: Notifying under the Pipelines Act 2005 for further details.

During construction, Worksafe Victoria must also be notified as per the Victorian OHS Act 2004 – refer to Appendix D: Notifiable Prescribed Incidents.

7.6 Workers Compensation, Rehabilitation and Return to Work Program

All employees including subcontractors and self-employed persons must be covered under suitable worker's compensation policy arrangements. Evidence (policy or extract) of workers compensation policies should be retained on the project site.

The Principal Contractor shall ensure that a Workplace Rehabilitation Policy and procedure is in place for this project. A nominated Return to Work Coordinator must be appointed and this shall be communicated during induction training and displayed on notice boards.

7.7 Emergency Plans and Communications

An Emergency Response Plan shall be developed by the Principal Contractor based on the outcome of a risk assessment that systematically identifies all foreseeable site emergencies and assesses their HSE impacts.

The objective of the Emergency Response Plan and procedures is to ensure that effective plans, systems and appropriately trained personnel are in place to detect, mobilise, contain and recover from an emergency event during the work. The priorities in managing an emergency are safety of personnel (on and off-site), minimising impact on the environment and minimising impact on property and assets.

Emergency planning includes but is not limited to the following:

- Nomination of an emergency response controller(s), first aiders and emergency personnel;
- Emergency procedures such as Health and Safety, Environmental, traffic and contact with services;
- Emergency evacuation;
- Assembly points;
- Contact telephone numbers;
- Dissemination of information; and
- Location of emergency equipment.

All applicable personnel shall be trained in the PC Emergency Response Plan to understand their roles and responsibilities, and the use of emergency response resources.

Resources required for the management of emergencies will be allocated and their adequacy reviewed.

The frequency at which emergency response exercises/drills are conducted shall be determined by regulation and the risk of exposure to a particular event and the severity of potential impact. Drills shall ensure that personnel are competent in specific components of the Emergency Response Plan. These drills may include, but not be limited to:

- Medical emergencies;
- Site evacuation and mustering and rescue; APA Operations ER Plan may apply
- Fire and the use of fire extinguishers and emergency equipment;
- Bushfires
- Deployment of spill response kits;



- Use of the communication system;
- Checking of access ways and response times to and from emergency facilities.

The response arrangements in the Emergency Response Plan must be tested in accordance with the Pipelines Regulations, including at a minimum:

- When the arrangements are introduced
- In the event that the arrangements are significantly amended
- In the event that construction works extended for a 12 month period, no later than 12 months after the most recent test.

Where Works take place on or near existing APA assets, APA will produce an Emergency Response Bridging Plan. The Principal Contractor will provide an Emergency Response Plan that aligns with the APA Emergency Response Bridging Plan which will be reviewed and approved by APA, prior to those Works. The Emergency Response Bridging Plan will bridge any gaps between construction emergencies and APA Gas Emergencies.

<i>Reference Documents</i>	
APA	<i>WORM Emergency Response Bridging Plan</i>
	<i>320-PL-ER-0001 Operations Emergency Response Plan</i>
Project	<i>Principal Contractors Emergency Response Plan</i>

8. SITE ESTABLISHMENT

8.1 Site Signage

Signposting and barricading shall be used to demarcate potentially hazardous situations. The signposting and barricading shall comply with AS 1319 Safety signs for the occupational environment and shall include safety signs, regulatory signs, emergency information signs, fire signs, barricades and general signage.

The Principal Contractor shall ensure adequate danger and warning signs shall be installed in the vicinity of site hazards, to adequately warn persons of the presence of the hazards including those from energisation of plant and equipment.

Site signage shall also:

- show the principal contractor's name and telephone contact numbers (including an afterhours telephone number); and
- show the location of the site office for the project, if any; and
- be clearly visible from outside the workplace, or the work area of the workplace, where the construction project is being undertaken.

As a minimum, site barricading shall include the PPE free zone around the office carpark area, the boundary between Green & Brown field areas and if required, project no go zones around the plant maybe required.

8.2 Site Start-up Requirements

Specific plans for the transport and setup of project facilities will be approved prior to dispatch off any delivery vehicles. Requirements will include SWMS for loading and unloading and site set up must be approved prior to arrival at site. A site plan layout must be submitted and approved prior to site setup.

Principal Contractor will have in place a Chain of Responsibility (CoR) process that complies with NHVL (National Heavy Vehicle Laws) in relation to transport, loading and unloading of equipment at sites.

8.3 Site Amenities

The Principal Contractor site manager is responsible to provide and maintain so far as it is reasonably practicable adequate facilities for the welfare of employees at the workplace in accordance with the relevant work health and safety requirements. This includes toilets, drinking water, washing facilities and eating facilities.

Facilities shall be maintained so as to be:

- in good working order; and
- clean, safe and accessible.

Consideration shall be given to:

- the nature of the work being carried out and the nature of the hazards present;
- the size, location and nature of the workplace;

- the number and composition of the workers at the workplace.

Existing APA facilities are not for general project use without prior APA approval.

Reference Documents	
Project	Worksafe Victoria Compliance Code – Facilities in Construction

8.4 Underground Services

APA and the Principal Contractor shall ensure that where any work is to be undertaken in an area where there may be underground utilities/services, measures are to be taken to identify the location of the utilities/services and may include but not be limited to the following:

- Contact “Dial Before You Dig” and investigate, identify any underground utilities/services before any works including but not limited to excavations, trenching, drilling and/or cutting etc., commences;
- Contact the owners of the utilities/services to determine the vertical and horizontal exclusion zones from the underground utilities/services;
- Work in accordance with service providers permit requirements;
- Engage the services of a qualified service locator to positively identify any underground utilities/services via the use of an electronic cable or pipe locator;
- Undertake manual pot holing or non-destructive pot holing to visually identify any underground utilities/services. Pot holing should be carried out along the length of a proposed excavation to identify the path and depth of any underground utilities/service;
- All buried services must be recorded in a buried services register;
- Only “toothless” buckets are to be used on excavators working in the vicinity of any underground utilities/services; and/or
- Exclusion zones and signage, as required, are to be maintained where mobile plant is operating in the vicinity of underground utilities/services.

All excavations shall be conducted under the direct supervision of an APA Permit Issuing Officer (PIO) Class E.

Reference Documents	
APA Group	APA HSE FRP 028 Excavation &Trenching 320-PR-OM-067 APA Transmission Excavation Procedure

8.5 Overhead Services

The Principal Contractor shall ensure where any work is to be undertaken in the vicinity of overhead power lines, a risk assessment is to be carried out to ensure hazards are identified and appropriate controls are implemented prior to works commencing.

If plant comes into contact with an overhead or underground electric line it may become electrified and pose a serious risk to the operator and any persons nearby. In addition to direct electric shock and possible electrocution, contact with electric lines can lead to a variety of hazardous conditions including fire, unpredictable cable whiplash and the electrifying of other objects (for example, signs, poles, surrounding earth, trees or branches).

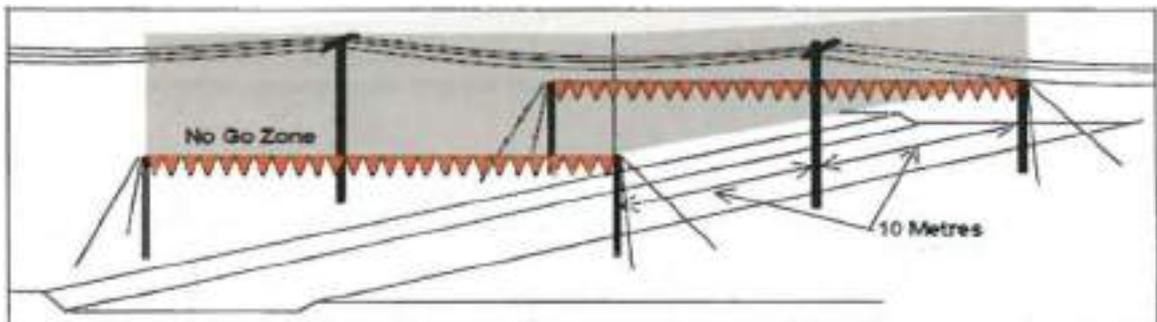
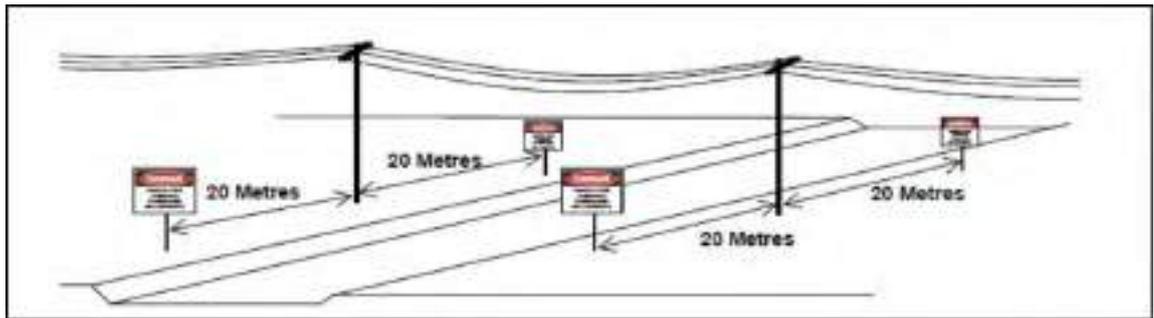
Specific risk control measures must be implemented when work is done in the vicinity of electric lines whether they are overhead or underground. The relevant authority should be consulted and appropriate risk controls implemented.

When excavators, other earthmoving machinery, or similar items of plant are operated near overhead electric lines, a thorough examination of the approaches and surroundings of the workplace must be carried out before taking the plant to the workplace and setting it up. This examination will determine whether precautions need to be taken to prevent any part of the plant or any load carried on it from coming too close or contacting overhead electric lines.

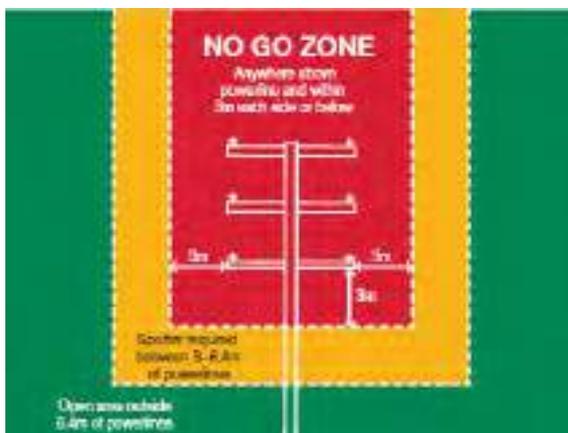
Electrical Hazard Management with Overhead Power Services, if required shall ensure that:

- Safe Working Distances are to be established for work near power lines. The supply authority shall be consulted with respect to clearances and power line voltages.
- Sign post locations, crossing or parallel with power lines indicating the Danger of overhead power lines.
- Trained Electrical Spotters are to be used for plant work and movements where the plant (excavators/cranes) may encroach on the minimum clearance distance from a power line.
- Equipotential Matting and/or mitigative earthing is to be used during welding of pipe strings where power line electric fields are shown to be of a significant strength to pose risk.
- All personnel making and breaking earth connections shall do so whilst wearing long heavy-duty rubber gloves.

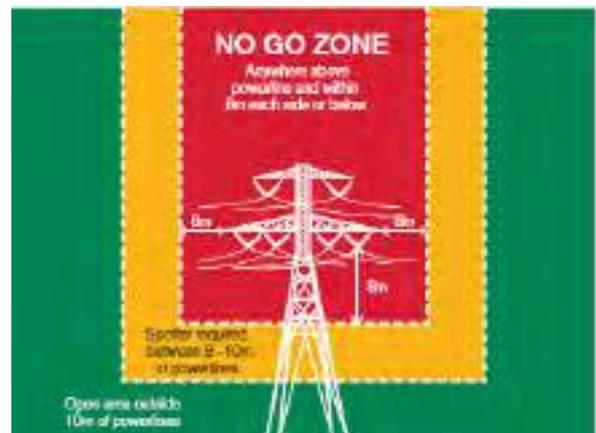
Where the pipeline is in close proximity to a power line, there are potential threats to personal safety from induced voltage and induced or fault currents. 'Danger High Voltage Overhead' signs will be erected 20 metres either side of the power lines in a prominent position (see figure below).



High visibility catenary markers/barriers will be erected 10 metres either side of the power lines.



No Go Zone for
Overhead Power lines



No Go Zone for
Transmission/Tower Power lines

8.6 Procurement

The Pipeline and Facilities Principal Contractors are responsible for procurement of all consumables and PPE and any other materials which shall as a minimum be in accordance with the relevant Group Procedures and Protocols as referenced in Appendix B: APA (Group Level) HSE Reference Documents.

This procurement shall ensure that no new hazards are procured for the site. If new hazardous materials are required, APA must be supplied the SDS and Hazardous material risk assessment 1 week prior to arrival on site.

All materials and supplies must comply with applicable regulatory requirements and relevant AS / ISO standards.

Pipeline and Facilities Principal Contractors are also responsible for the verification of receipted material against specifications, purchase of hazardous items such as chemicals, electrical equipment/tools/plant etc.

Contractors and service providers shall be managed to management procedures that include:

- Selection of contractors based on experience, safety record and management systems;
- Selection of processes based on safety, quality and environmental outcomes;
- Communication of the SMP through contractual arrangements, planning meetings and induction etc.;
- Verification of contractor competencies particularly where Regulatory requirements exist (e.g. a certified Radiation Safety Officer);
- Direct and on-going monitoring of health and safety performance through inspection and audits;
- Selection of plant and equipment to ensure health and safety considerations have been taken into account.

Processes shall be established to ensure that materials are delivered, handled, stored and installed in a manner fit for purpose. These processes shall include arrangements for monitoring of goods and services to ensure technical, quality, safety and environmental specifications are complied with.

8.6.1 Facilities Procurement

The Facilities Principal Contractor is also responsible for additional procurement requirements other than those listed in the APA provided materials list associated with the facilities construction works.

Additional commissioning requirements include:

- Assessment of all Compressor installation testing and commissioning by a Solar field service representative in conjunction with the APA Commissioning Team;
- Other critical vendor supplied equipment (i.e. control valves, flow meter) may require a vendor field service representative to attend site in conjunction with the APA Commissioning Team; and
- Field testing, field hydro-testing and Non-Destructive Testing (NDT) to be submitted to ESV.

8.7 Management System Documentation

Project health and safety documentation including revisions to the Safety Management System and Safety Management Plan must be maintained in electronic

format and accessible on site. A revision to the key project health and safety documentation i.e. plans, procedures, hazard identification and risk assessment records (i.e. JHEAs) must be controlled through a formal Document Control process.

Documentation requirements such as safe operating procedures, work method statements, forms and records etc. should be consistent with any parent company documentation and as identified in any formal safety assessment.

8.8 General Records Management

Maintenance and disposition of Health and Safety information and records shall be in accordance with APA Procedure 100-SCH-QM-0001 Records Retention and Disposal.

Health and Safety records will be held for statutory periods and will be legible, identifiable, traceable and readily retrievable on the APA project server.

Principal Contractor must specify in their documentation how records generated from this work will be stored. Must be in line with APA HSE GP 03.03 HSE Records Management.

8.9 Site Security

Unauthorised entry to a construction workplace can expose persons to a number of hazards that, if not controlled, could result in fatalities or serious injuries.

The Principal Contractor shall ensure the worksite is secured to prevent unauthorised access.

In most cases, risks to unauthorised persons entering the workplace can be controlled with fencing. Unauthorised persons are more likely to comply with a physical barrier, such as a fence, than a warning sign. When fences are installed around the perimeter of the worksite, either permanent or temporary, it should be maintained until unauthorised entrants are no longer at risk.

When constructing the fence, it must be:

- Of a suitable height to deter entry, for example 1.8 metres high;
- constructed from dedicated materials;
- Difficult to climb;
- Difficult to gain access underneath;
- Stable and able to withstand anticipated loads;
- Secured by installing gates and joints so there is no weak point for entry.

Where the risk profile of the construction work has increased, such as a history of unauthorised access, industrial action or security sensitive issues; specific security measures may be required, which could include the employment of security officers to prevent unauthorised access.

Plant and equipment shall not be left unattended at the workplace, including:

- Locking electrical switchboards;
- Securing fuels and hazardous substances;
- Securing tools and equipment;

- Secure/covered storage of materials;
- Locking mobile plant and safe storage.

Principal Contractor will be responsible for Site security of all construction materials and facilities for the Western Outer Ring Main Pipeline Project.

8.10 Site Roles & Responsibilities

The Principal Contractor will define roles and responsibilities for all personnel working on site.

The Principal Contractor must nominate the specific HSE resources that will be provided on site and the minimum requirements for work to commence or continue.

An APA HSE Advisor will be on site to conduct their responsibilities per Section 4.4.4.

8.11 Consultation & Communications Arrangements

Effective, two way communication and interaction between all parties is a critical element in managing safety. The focus of safety-related meetings is to enable all persons to contribute to and have knowledge of safety issues.

The arrangements in place at the workplace for consultation, co-operation and the co-ordination of activities to ensure planned HSE outcomes shall be defined in the Principal Contractor CHSMP in accordance with the Group Procedures as referenced in Appendix B: APA (Group Level) HSE Reference Documents.

The Principal Contractor shall establish effective mechanisms to promote active consultation, communication and involvement of all personnel in HSE management and control of workplace hazards. This should include establishing a process for election of HS representatives. HS representatives should be appropriately trained and competent.

A schedule of daily, weekly and monthly meetings is to be established to communicate issues to all personnel. All meetings shall be minuted, and minutes from safety meetings will be communicated to all commissioning personnel. Issues requiring immediate action are to be communicated via rapid forms of communication such as "Safety Alerts", signage and on-site discussion.

The workforce shall be made aware of safety related matters through their supervisors, toolbox meetings and daily pre-start meetings.

Safety issues that are communicated to site personnel may include but are not limited:

- Simultaneous Operations (SIMOPS);
- Newly identified hazards;
- Incidents and investigation findings;
- Changed processes or procedures;
- Scheduled training;
- Project safety performance;
- Audit and Inspection findings; and
- High-risk site activities.

- Safety Alerts
- Lessons Learnt

8.12 Communication Meeting Schedule

The communication process to be adopted for this project shall include the following:

Description	Frequency
Project Meeting	weekly
Daily Activity Sheet	daily
Pre-Start Meeting	daily
Toolbox Meeting	weekly
HSE Committee Meeting	as required

8.13 Project Meetings

The Principal Contractor shall ensure that weekly project meetings are held. Safety shall be first on the agenda for discussion in the weekly Project meetings.

The purpose of this discussion is to report on and discuss project related issues from the previous week, including health and safety. This forum will discuss any outstanding safety issues from previous meetings and discuss any safety aspects of upcoming planned activities. Minutes of the previous meeting are required to be tabled.

Minutes of the meeting must be kept; including topics discussed, actions raised and participant's names recorded.

Reference Documents	
Project	Principal Contractor Project Meeting Minutes Template

8.14 Pre-Start Meeting

The Principal Contractor shall ensure all personnel attend the pre-start meeting and sign onto the pre-start form. Persons arriving after the designated pre-start meeting must also be given the pre-start briefing and sign onto the pre-start form.

Safety shall be the first item for discussion in the daily pre-start meetings. Safety related matters associated with the work activities will be discussed and shall include, but not be limited to SWMS, hazards associated with current and pending activities, operational interfaces, incident reports, lessons learnt and planning and preparation required for the forthcoming activities. Minutes of the meeting must be kept with topics discussed and participants names recorded.

A site population register shall be used to account for all persons on site. All personnel must sign onto the population register at the pre-start meeting and sign off the register when they leave site. Persons arriving after the designated pre-start meeting must also sign on and off the population register as they arrive and leave.

<i>Reference Documents</i>	
<i>Project</i>	<i>Principal Contractor Site Population Register</i>
	<i>Principal Contractor Pre-Start Meeting Minutes Template</i>

8.15 Toolbox Meetings

The Principal Contractor must ensure all personnel attend weekly toolbox meetings. Safety shall be the main focus for discussion in the weekly toolbox meetings, which are to be an open forum for the workforce to raise any safety concerns they have to their supervisors.

By using this methodology, safety issues and concerns become a focal point and control measures can be initiated to reduce the risk. Safety and health matters that should be discussed include the following:

- Toolbox meeting minutes and actions arising;
- Concerns identified and rectified during the period;
- Concerns identified with corrective action yet to be completed including reasons for incomplete rectification plus a progress report;
- Accidents, incidents or near miss occurring during the period;
- Lessons learnt;
- First aid treatments and safety statistics;
- Training programs;
- Work progress (short term and overall);
- Safe Work Method Statements;
- Safety audits and inspections and results;
- Workforce concerns or new hazards.

Minutes of the meeting must be kept with topics discussed and participants names recorded.

<i>Reference Documents</i>	
<i>Project</i>	<i>Principal Contractor HSE & Toolbox Meeting Minutes Template</i>

9. INDUCTION & COMPETENCY

9.1 Induction

The project and site managers shall ensure that information, training and instruction provided to a worker is suitable and adequate and is relevant to:

- the nature of the work carried out by the worker; and
- the nature of the risks associated with the work at the time the information, training or instruction is provided; and
- the control measures implemented.

The information, training and instruction should be provided in a way that is readily understandable by any person to whom it is provided.

All site employees involved in construction are to have undergone a General Industry induction (White Card) Training as per OH&S legislation before commencing work on the project. The training shall be provided in the form of a documented accredited training course. All workers on APA field sites must also have completed the APA online Health & Safety and Environmental inductions before travelling to site. Evidence of the online inductions must be provided to APA HSE prior to commencement.

These inductions can be completed from any internet connection.

All employers and employees who are to work on site shall undergo a Contractor site-specific induction conducted by a competent person (generally from the Health and Safety Advisor).

The Principal Contractor shall ensure that all personnel who visit the site more than once during the course of their works attend and complete the project specific induction, which shall be in accordance with the requirements of the National Code of Practice for Induction.

The induction is to be presented by a suitably competent person(s) and shall include, but not be limited to:

- Amenities, first aid facilities etc.;
- Site safety rules;
- Hazard reporting arrangements;
- Emergency management;
- Hazard management and control;
- Personal H&S responsibilities
- Arrangements for consultation; and/or
- Other site-specific requirements relevant to those being inducted.

Each attendee at the induction is to provide photographic proof of identity and evidence that they have completed the General Induction, and any other training qualification(s) required to perform any task or operate plant/equipment on the site, which is to be attached to the attendees Induction form. Where it is not possible to obtain copies of the required certification the person conducting the induction is to

sight the documentation, make note on the individual's induction form that documentation has been sighted, and record the required details.

If a person being inducted is from a non-English speaking background and has a difficulty understanding English, their employer is to provide a translator to interpret the induction content to the person being inducted. Where a translator is used at an induction the translator is to provide details on the induction record form.

On completion of induction, sign off is required to formally recognise that the worker has completed this induction. A Site Induction Register is to be used to record details of all inductions carried out on the site.

All licenses and certificates of competency held shall be sighted and recorded prior to, or at the induction.

The person conducting the induction training shall ensure personnel understand the induction content and site-specific requirements.

9.2 Visitors' Induction

All visitors to work sites shall be required to:

- Undertake a visitor's induction which approves them to enter the work site;
- Be fully supervised by an inducted person whilst on site at all times;
- Align with site PPE requirements;
- Be subject to all site policies (including Fitness for Work).

A register of all visitor inductions and visitors on site shall be maintained on site.

9.3 Commissioning Induction

A specific induction will be developed and conducted prior to the commencement of Commissioning Activities. The focus of the Commissioning component of the induction process should communicate health and safety information contained in the Project Commissioning Management Plan including isolation and tagging systems, introduction of product on site, gas monitoring (if relevant) and emergency arrangements.

9.4 Competency

All workers shall be suitably qualified and competent to perform assigned tasks.

As a minimum, the PC will verify the competence of all personnel operating plant for the project at site.

The Project Management Team shall assess and plan the human resource requirements of the project to ensure personnel are suitably fit, competent and demonstrate the necessary safety behaviours for the tasks assigned to contribute to a positive safety culture on site.

Project health and safety training requirements form an integral part of the overall project human resource strategy and training needs analysis. The competency criteria and safety attributes necessary for each position shall be described in a Competency and Skills Matrix.

Where a position specification identifies statutory competencies (i.e. certification) evidence of such competencies shall be required prior to selection and a copy of the certificate retained on site within the induction register.

Training programs shall be delivered by nominated workplace trainers and be reviewed and reassessed periodically to ensure the adequacy and effectiveness in delivery of required skills, knowledge and competencies.

All supervisors (APA and Principal Contractors) will be assessed for competency in key health and safety knowledge prior to commencing work on site. The following includes some key health and safety leadership skills:

- a) Legal obligations;
- b) Health and Safety responsibilities and Leadership;
- c) Safety Management System Commitments;
- d) Environmental Management
- e) Project Hazard Identification;
- f) Accident / Incident reporting;
- g) Emergency response leadership;
- h) Development of a JHEA;
- i) Conducting toolbox meetings; and
- j) Tag & lockout procedures.

Specialised training may be required to address safety critical tasks and specific training needs relative to the project i.e. vehicle operation/driving, permit to work, manual handling, first aid, heat stress, etc. These training courses shall be developed by the Principal Contractor that will complement the project safety management system and controls identified in the hazard identification and risk assessment process.

A record of all training shall be retained on site in a Project Training and Induction Register/Competency Skills Matrix.

10. SITE SAFETY

10.1 General

The Principal Contractor shall ensure the workplace shall be arranged in such a way to ensure the following (so far as is reasonably practicable):

- The layout of the workplace allows people to enter and exit and to move about without risk to health and safety, both under normal working conditions and in an emergency;
- Work areas have space for work to be carried out without risk to health and safety;
- Floors and other surfaces are designed, installed and maintained to allow work to be carried out without risk to health and safety;
- Lighting enables:
 - each worker to carry out work without risk to health and safety; and
 - workers to move within the workplace without risk to health and safety; and
 - safe evacuation in an emergency;
- Ventilation enables workers to carry out work without risk to health and safety;
- Workers carrying out work in extremes of heat or cold are able to carry out work without risk to health and safety;
- Work in relation to or near essential services does not give rise to a risk to the health and safety of people at the workplace.

10.2 Specific Site Hazards (as Applicable)

Principal Contractor will identify all site-specific hazards in their CHSMP. This includes hazards associated with:

- The storage, movement and disposal of construction materials and waste at the workplace;
- Working within live plant – high pressure gas, flammable gas, electricity
- Live services, both above ground and below ground (pipelines, power cables, other services);
- Simultaneous Operations (SIMOPS);
- Crane and lifting related hazards;
- Open excavations
- Working at heights;
- Welding and associated test activities (hydrotest, leak test, NDT)
- The storage at the workplace of plant that is not in use;
- Traffic in the vicinity of the workplace that may be affected by construction work carried out in connection with the work;

Specific worksite hazards could also include hazards related to APA Protocols, including:

- Fatal Risks,
- Construction, Operation, Maintenance and Related Activities,
- Plant, Equipment, Tools and Facilities,
- Chemicals and other Substances,
- Work Environment and Related Activities or others, as applicable and determined by risk assessment.

These Protocols are listed in Appendix B.

10.3 Fire Prevention and Control

APA and the Principal Contractor is responsible to ensure that fire prevention and control procedures are implemented to prevent fires, minimise the spread of fire, prevent injury to personnel, and environmental damage. The procedure shall address:

- A process of hazard identification and risk assessment shall be conducted to identify fire risks and the most efficient means of risk reduction and containment.
- Sites shall have Emergency Response Plans including requirements for emergency response drills to test the effectiveness of response plans.
- Any person working on an APA site shall be trained in the emergency plan requirements according to the level of their involvement i.e. visitor, employee, contractor, Emergency Control Organisation (ECO) member.
- Dangerous goods and hazardous substances shall be stored in accordance with regulatory requirements.
- Housekeeping shall be maintained on workplaces to reduce combustible rubbish, fuels and keep emergency exits clear.
- The storage of diesel in storage tanks shall be in accordance with AS 1940:2017. Foam shall be provided for firefighting purposes at diesel stations and routine monitoring shall be completed to manage the risk of any fire events and spills.
- For all works within an APA site or easement all works will be undertaken in accordance with the project Permit to Work Management Plan, any hot works will have fire protection equipment (i.e. fire extinguisher(s)) as per JHEA/SWMS requirements. Isolation of valves is the primary mitigation to limit gas fuelling any fires.
- Once the Facility is operational, there is a gas suppression system in the control building and a suppression system in the gas compressor enclosure. This will become operational during commissioning and at handover.

An APA Permit to Work shall be in place prior to the commencement of work for all hot work activities performed in:

- Hazardous areas; and
- Any additional area(s) specified by the local business.

A (relevant) Fire Authority Permit shall be in place where required for:

- Areas that fall within a Bush Fire Danger area / period;
- Areas that fall within a Total Fire Ban Day

Contractor shall ensure that information shall be included in the site induction on fire prevention and control (including Bushfire Management).

10.4 Bushfire Management

APA has in place a Bushfire Management Plan that is used to evaluate the level of Fire Danger rating in individual shires. As per below, the ratings are assessed as per alert level, from Low to Catastrophic:

Fire Danger Rating Requirements Summary

During Fire Danger Season and Total Fire Ban (TFB) Alerts

FDR	Preparation Activities	Travel & Communications	Field Activities
Catastrophic	<ul style="list-style-type: none"> • Confirm the FDR, Total Fire Ban Alerts and Bushfire Warning for the location of the work & determine if work can proceed & fire permit/notification requirements. • Area Leader to approve all Field Activities and Travel to field locations in this area. • Obtain fire permit/notify local authorities for any "essential" work which has the potential to cause fires. 	<ul style="list-style-type: none"> • Bushfire travel items are available for travel to bushfire prone areas in accordance with APA HSE FRP 000 312 Bushfire Travel Guidelines. • Journey planning & monitoring of field personnel in accordance with APA HSE FRP 000 Driving. • Maintain a watch on site for bushfires in the local area. <ul style="list-style-type: none"> ○ Visual watch on site and surroundings. ○ Listening watch via local ABC broadcaster radio, and/or the (BCMA) website. 	<ul style="list-style-type: none"> • Implement the "Advice Warning" level actions in the Bushfire Action Plan at worksite. • No outdoor work which has potential to cause fire (e.g. blowing, cutting, welding, grinding). • Any "essential" work which has potential to cause fire carried out in accordance with APA HSE FRP 000 Hot Work: <ul style="list-style-type: none"> ○ Conditions of the permit/notification process implemented and documentation available at the worksite. ○ Suitable firefighting equipment and fire watch available at worksite as specified by local fire authority(SWIS).
Extreme	<ul style="list-style-type: none"> • Confirm the FDR, Total Fire Ban Alerts and Bushfire Warning for the location of the work & determine if work can proceed & fire permit/notification requirements. • Obtain fire permit/notify local authorities for any work which has the potential to cause fires. 	<ul style="list-style-type: none"> • Bushfire travel items are available for travel to bushfire prone areas in accordance with APA HSE FRP 000 312 Bushfire Travel Guidelines. • Journey planning & monitoring of field personnel in accordance with APA HSE FRP 000 Driving. • Maintain a listening watch for bushfires in the local area via local ABC broadcaster radio, and/or the (BCMA) website. 	<ul style="list-style-type: none"> • For TFB alerts "very high" or above rating implement the "Advice Warning" level actions in the Bushfire Action Plan at worksite. • All site personnel be on site EOP. • Any "essential" work which has potential to cause fire carried out in accordance with APA HSE FRP 000 Hot Work: <ul style="list-style-type: none"> ○ Conditions of the permit/notification process implemented and documentation available at the worksite. ○ Suitable firefighting equipment and fire watch available at worksite as specified by local fire authority(SWIS).
Severe	<ul style="list-style-type: none"> • Confirm the FDR, Total Fire Ban Alerts and Bushfire Warning for the location of the work & determine if work can proceed & fire permit/notification requirements. • Obtain fire permit/notify local authorities for any work which has the potential to cause fires. 	<ul style="list-style-type: none"> • Bushfire travel items are available for travel to bushfire prone areas in accordance with APA HSE FRP 000 312 Bushfire Travel Guidelines. • Journey planning & monitoring of field personnel in accordance with APA HSE FRP 000 Driving. • Maintain a listening watch for bushfires in the local area via local ABC broadcaster radio, and/or the (BCMA) website. 	<ul style="list-style-type: none"> • For TFB alerts "very high" or above rating implement the "Advice Warning" level actions in the Bushfire Action Plan at worksite. • All site personnel be on site EOP. • Any "essential" work which has potential to cause fire carried out in accordance with APA HSE FRP 000 Hot Work: <ul style="list-style-type: none"> ○ Conditions of the permit/notification process implemented and documentation available at the worksite. ○ Suitable firefighting equipment and fire watch available at worksite as specified by local fire authority(SWIS).
Very High	<ul style="list-style-type: none"> • Confirm the FDR, Total Fire Ban Alerts and Bushfire Warning for the location of the work & determine if work can proceed & fire permit/notification requirements. • Obtain fire permit/notify local authorities for any work which has the potential to cause fires. 	<ul style="list-style-type: none"> • Bushfire travel items are available for travel to bushfire prone areas in accordance with APA HSE FRP 000 312 Bushfire Travel Guidelines. • Journey planning & monitoring of field personnel in accordance with APA HSE FRP 000 Driving. • Maintain a listening watch for bushfires in the local area via local ABC broadcaster radio, and/or the (BCMA) website. 	<ul style="list-style-type: none"> • For TFB alerts "very high" or above rating implement the "Advice Warning" level actions in the Bushfire Action Plan at worksite. • All site personnel be on site EOP. • Any "essential" work which has potential to cause fire carried out in accordance with APA HSE FRP 000 Hot Work: <ul style="list-style-type: none"> ○ Conditions of the permit/notification process implemented and documentation available at the worksite. ○ Suitable firefighting equipment and fire watch available at worksite as specified by local fire authority(SWIS).
High	<ul style="list-style-type: none"> • Confirm the FDR, Total Fire Ban Alerts and Bushfire Warning for the location of the work & determine if work can proceed & fire permit/notification requirements. • Obtain fire permit/notify local authorities for any work which has the potential to cause fires. 	<ul style="list-style-type: none"> • Bushfire travel items are available for travel to bushfire prone areas in accordance with APA HSE FRP 000 312 Bushfire Travel Guidelines. • Journey planning & monitoring of field personnel in accordance with APA HSE FRP 000 Driving. • Maintain a listening watch for bushfires in the local area via local ABC broadcaster radio, and/or the (BCMA) website. 	<ul style="list-style-type: none"> • For TFB alerts "very high" or above rating implement the "Advice Warning" level actions in the Bushfire Action Plan at worksite. • All site personnel be on site EOP. • Any "essential" work which has potential to cause fire carried out in accordance with APA HSE FRP 000 Hot Work: <ul style="list-style-type: none"> ○ Conditions of the permit/notification process implemented and documentation available at the worksite. ○ Suitable firefighting equipment and fire watch available at worksite as specified by local fire authority(SWIS).
Low	<ul style="list-style-type: none"> • Confirm the FDR, Total Fire Ban Alerts and Bushfire Warning for the location of the work & determine if work can proceed & fire permit/notification requirements. • Obtain fire permit/notify local authorities for any work which has the potential to cause fires. 	<ul style="list-style-type: none"> • Bushfire travel items are available for travel to bushfire prone areas in accordance with APA HSE FRP 000 312 Bushfire Travel Guidelines. • Journey planning & monitoring of field personnel in accordance with APA HSE FRP 000 Driving. • Maintain a listening watch for bushfires in the local area via local ABC broadcaster radio, and/or the (BCMA) website. 	<ul style="list-style-type: none"> • For TFB alerts "very high" or above rating implement the "Advice Warning" level actions in the Bushfire Action Plan at worksite. • All site personnel be on site EOP. • Any "essential" work which has potential to cause fire carried out in accordance with APA HSE FRP 000 Hot Work: <ul style="list-style-type: none"> ○ Conditions of the permit/notification process implemented and documentation available at the worksite. ○ Suitable firefighting equipment and fire watch available at worksite as specified by local fire authority(SWIS).

Note: A notification process with local authorities is used in some states and territories rather than a fire permit for work which has potential to cause fires during TFB alerts. Consult local fire authorities for specific requirements.

APA also has the Bushfire Action Plan, which contains four sections with checklists that provide actions to enable personnel to prepare and respond to a bushfire threat, and recover after a bushfire event.

The actions are implemented based on the level of bushfire warning issued by local authorities.

The four sections are as follows:

5. Advice Warning: Be aware, prepare and keep up to date.
6. Watch and Act Warning: Put your preparations into action – do not wait and see.
7. Emergency Warning: Take immediate action to survive – you will be impacted by fire.

8. Post Bushfire Actions: Initial response and assessment of site after the fire has passed and access to site is possible to provide situation update and clean up. Take care to avoid any dangers and keep up to date.

This Bushfire Action Plan (320-PI-ER-0019) is to be read in conjunction with the Bushfire Management Plan (320-PL-ER-0016) and the Fire Danger Rating Requirements Summary (320-GD-ER-0008).

11. ENVIRONMENT

11.1 General

Overall accountability for environmental compliance for the Project lies with APA, however the Principal Contractor is responsible for day-to-day environmental management and compliance to legislative and CEMP requirements associated with construction of the Project works. Sub-contractors and individuals are also responsible and accountable through their conditions of employment or contract.

The Principal Contractor has responsibility to ensure that the environment characteristics are understood, develop and implement the Construction Environmental Management Plan (CEMP), environmental risk processes are applied, management controls are developed, monitoring programs are in place and all applicable personnel are appropriately trained and aware of their environmental responsibilities.

A stand-alone Construction Environmental Management Plan (18035-PL-HSE-0004) has been developed for this project.

12. PERSONAL PROTECTIVE EQUIPMENT

Personal protective equipment (PPE) shall be provided by the Principal Contractor to all workers under their management. PPE requirements shall be established as part of the site rules.

Personal protective equipment (PPE) shall:

- Be selected to minimise risk to health and safety, including by ensuring that the equipment is:
- suitable having regard to the nature of the work and any hazard associated with the work; and
- a suitable size and fit and reasonably comfortable for the worker who is to use or wear it; and
- Be maintained, repaired or replaced so that it continues to minimise risk to the worker who uses it, including by ensuring that the equipment is:
- clean and hygienic; and
- in good working order; and
- Be used or worn by the worker, so far as is reasonably practicable.

Information, training and instruction for PPE shall be provided for the:

- proper use and wearing of personal protective equipment; and
- the storage and maintenance of personal protective equipment.

Where specified, workers shall use or wear the equipment in accordance with any information and/or training provided. PPE shall not be intentionally misused or damaged. Damaged, defective or otherwise unusable PPE shall be reported immediately.

The PC will define project required PPE but as a minimum, the following PPE shall be worn on the construction site at all times:

- Safety eyewear;
- Safety footwear, lace up, with steel capped toes;
- Hard Hat, with broad brim for UV protection if required; and
- High visibility, long sleeve shirts and trousers (natural fibre).

Additional PPE may be required for specific tasks will be defined by the PC. This shall be identified in the relevant SWMS or JHEA and may include:

- Hearing protection where designated by signage, or when required
- Gloves suitable for the task
- Goggles or double eye protection
- Respirators when using hazardous or dangerous goods
- Fall protection
- Respiratory protection

All project personnel shall be trained in the correct use and maintenance of specific PPE as required.

13. DRIVING

Persons driving a vehicle related to work shall be appropriately licensed and trained, and the vehicles including any load being carried, shall be fit for purpose and legally compliant.

The Principal Contractor shall ensure that:

- Drivers shall be fit for duty and not affected by alcohol or drugs including medications.
- Persons driving a vehicle shall comply with road traffic laws and APA rules.
- Drivers shall hold the appropriate license for the vehicle being operated.
- Vehicles shall be operated within their legal load limits.
- Any load carried on, or within a vehicle, shall be restrained.
- Persons operating a specialist vehicle e.g. 4WD, ATV shall be trained.
- Vehicles shall have current registration in place.
- Vehicles shall be maintained and be fit for purpose.
- Journey plans shall be in place for all rural and remote journeys, appropriate to the risks, including management of fatigue hazards.
- Vehicle pre-start inspections shall be conducted by drivers.

<i>Reference Documents</i>	
<i>APA Group</i>	<i>APA HSE FRP 030 Driving</i>
<i>Project</i>	<i>Site Training/License Register</i>

14. PLANT AND EQUIPMENT

All plant and equipment, including mobile equipment, lifting gear and portable electrical equipment shall be tested, inspected and monitored in accordance with the manufacturer's and/or legislative requirements. A register of all equipment shall be kept, identifying test date, frequency required and next test due date. Where required current test status tags will be fixed to equipment, these tags shall not be removed under any circumstances.

No portable electric equipment is permitted on site without a current test tag attached, this applies to both Contractor equipment and that supplied by Subcontractors.

Plant and equipment that is found to be defective shall be quarantined and tagged "Out of Service" to ensure inadvertent use is eliminated until the plant or equipment is repaired by a competent and authorised person.

All electrical equipment is to be stored undercover overnight. Principal Contractor will specify requirements for the storage of plant that is not in use at the site.

14.1 Mobile Plant

The Principal Contractor shall ensure that all mobile plant planned to be used on site is subject to the following conditions:

- Equipment shall be registered with the relevant authority where required;
- A suitable combination of operator protective devices for the plant shall be provided, maintained and used.
- Risk assessments and Safe Operating Procedures (SOP) shall be in place for mobile plant relative to the workplace hazards. SWMS shall be completed for each type of mobile plant respective to the workplace hazards. A lift plan shall be developed when a crane is used;
- Exclusion zones shall be identified and communicated to all persons in the workplace appropriate to the risks and mobile plant;
- Pre-start checks shall be completed on mobile plant in line with manufacturers requirements at the beginning of each shift to confirm the suitability for use, and that all safety devices are installed and working correctly;
- Operators of mobile plant shall be trained, competent and if required, to be licensed;
- Operators shall operate mobile plant with a blood alcohol limit of zero and not affected by prescription or illicit drugs;
- All mobile plant shall be serviced and maintained;
- Only approved intrinsically safe (IS) mobile plant shall be operated in classified hazardous areas, unless under the control of an APA permit to Work;
- Mobile plant and attachments shall be used in line with the load chart / safe working limit for the item of plant.

- A permit to work must be in place for high-risk activities such as a work box for lifting people;

The Principal Contractor must establish and maintain a Register of Plant on site which details all mobile plant that is to be used on the project and provide plant documentation for each item of mobile plant and provide the relevant documentation prior to the plant being used on site, including:

- Mobile Plant Risk Assessment;
- Maintenance records (last service record as a minimum);
- Daily pre-inspection log book for each item of mobile plant;
- Documentation stating it is free of weeds or seeds;
- SWMS covering the use of the items of plant and equipment: and
- Site Plant Authorisation Form

If deemed necessary, mobile plant is to be fitted with safety warning devices (flashing lights and audible reversing alarms) and the devices must be operational. Fire extinguishers are to be carried by all mobile plant.

All mobile plant used on site shall have effective pollution controls and sound attenuation devices fitted, that meet the requirements of the local Environmental Protection Authority.

Plant and equipment shall only be used for the purpose that it was designed; the carrying of passengers is prohibited unless the manufacturer has provided appropriate seating.

The Principal Contractor is not to loan mobile plant to other sub-contractors until it has been confirmed that the operator(s) have been authorised by their employer, have the required qualifications, deemed competent in the use of the particular plant and a safe work method statement covering the use of the mobile plant.

14.2 Crane Operations

Hazards and risks associated with hire, installation, operation and maintenance of cranes, lifting and load restraint equipment shall be managed as follows:

- All lifts must be planned. The planning should include assessment of risks associated with all lifting, assembly activities and environmental conditions;
- Lifting equipment shall be labelled with the correct working load limit, have a certificate of compliance and be registered with the relevant authority where required;
- Lifting equipment shall be maintained, serviced and tested in accordance with the relevant Australian Standards;
- Inspections shall be completed on lifting equipment in accordance with manufacturer's requirements and prior to use to confirm the suitability for use and that all safety devices are installed, working correctly and within test date;
- Only qualified persons holding necessary high risk licences / tickets and verified as competent shall be permitted to operate mobile cranes or rig loads;

- All slings and rigging equipment shall be inspected for serviceability and included in a Lifting Equipment Register prior to use. Records of inspection shall be included as an element of the Lifting Method Statement and/or weekly workplace inspection process;
- All lifting equipment shall be subject to an inspection and maintenance program and Operating Instructions and Maintenance records are to be on site;
- Lifting documentation, including risk assessments, SWMS and PTW's shall be completed prior to the lift commencing. For a critical lift a study and / or plan shall also be completed;
- At no time shall a crane's controls be unattended with a suspended load;
- At no time shall personnel work beneath suspended loads;
- The Crane/Equipment operator has the full responsibility for the safe operation when using hoisting equipment to make lifts. The equipment operator, assigned dogman and supervisor shall verify weights of loads (lifting survey) to be lifted. No load shall be lifted which exceeds the manufacturer's rated capacity of the crane, sling or lifting component;
- Certified operators shall be directly responsible for ensuring that all equipment is used within its recommended load limitations, and stored in a proper manner when not in use;
- Lifting equipment shall only to be used for the purpose for which it is designed and within its rated capacity; and,
- All cranes and hoisting equipment shall, where required by regulatory authority, be covered by a valid "Cranesafe Certificate" before entering construction areas. This equipment shall be inspected as required by law on a regular basis. Records of inspection shall be submitted prior to mobilisation.

14.2.1 Critical Lift

Critical lifts include any of the following criteria:

- Lifts of high capital value equipment;
- Lifting operations, which take place in an area less than 5 metres from an exposed live pipeline, live electric cables and other operating installation;
- Involves lifting over operating facilities as determined by APA Operations;
- Requires 2 or more cranes to complete the lift or complex lifting of intricate plant items;
- Lifts where the operating arcs of two or more cranes can overlap;
- Requires specialised equipment or a complicated rigging configuration to be used;
- Involves loads equalling or exceeding 75% of the crane's rated capacity at the working radius;
- Lifts exceeding 50 Tonnes;
- Using more than one hoist simultaneously on the same crane; and,

- Lifts specifically identified as a critical lift by the APA Project Team.

Critical lifts shall be performed in accordance with the following:

- A specific Lift Study incorporating a Critical Lift Assessment. The Lift Study shall be prepared and planned for prior to commencement of the lift and be conducted in accordance with ISO 31000:2009 – Risk Management – Principles & Guidelines. Critical lift assessments will be conducted on site with the relevant qualified personnel and managed within the PTW system where required;
- Lifting Over Live Assets Risk Assessment (if applicable); and,
- Lift SWMS - authorised by APA prior to the lift commencing.
- Pre-lift meeting with all identified stakeholders where the lift details, hazards and controls are to be discussed.

14.3 Licences

The Principal Contractor is responsible to ensure that a valid Licence to Perform High Risk Work (previously known as a Certificate of Competency) is held by all persons required to perform works on site to which that licence applies. These include cranes and hoists, forklift operation, rigging and dogging, scaffolding and pressure equipment.

Other relevant licences and competencies, such as Confined Space Entry (CSE), Elevated Work Platform (EWP) "Yellow Card", Electrical Contractors licence, Builders licence, shall be held by all persons required to perform works on site to which that licence or competency applies.

No person shall commence works on site that require a licence or specific competency until the validity of their documentation is verified. Copies of relevant licences and competencies shall be attached to each person's induction record and suitably retained on site so they are available for inspection.

Persons conducting the following activities are required to hold a current High Risk Work License and are required to demonstrate their competency prior to commencement of work.

Scaffolding			
(SB) Basic scaffolding	(SI) Intermediate scaffolding	(SA) Advanced scaffolding	
Rigging / Dogging			
(DG) Dogging	(RB) Basic rigging	(RI) Intermediate rigging	(RA) Advanced rigging
Crane & Hoist Operation			
(C2) Slewing mobile crane (up to 20 tonnes)	(C6) Slewing mobile crane (up to 60 tonnes)	(C1) Slewing mobile crane (up to 100 tonnes)	
(C0) Slewing mobile crane (over 100 tonnes)	(WP) Boom-type EWP (boom length 11 metres or more)	HM) Materials hoist (cantilever platform)	
Fork Lift Truck Operation			

(LO) Order picking fork lift truck	(LF) Fork lift truck and Manitou / Tele handler if operated in forklift configuration
------------------------------------	---

Earth moving equipment that does not require a high-risk license must only be operated by those that are trained and competent in its use. Evidence of competency from a Registered Training Organisation (RTO) must be supplied (a ticket). Examples of the types of earth moving equipment falling into this category are listed below with qualification codes where applicable:

Dozers (Qualification Code LZ)	Excavators (Qualification Code LE)	Front End Loaders (Qualification Code LL)	Front End Loaders / Backhoes (Qualification Code LB)	Skid Steer Loaders (Qualification Code LS)
Road Roller (Qualification Code LR)	Grader (Qualification Code LG)	Dump / Haul Truck		

14.4 Plant & Equipment

The Principal Contractor shall ensure that each item of mobile plant has a logbook that records all daily pre-use inspections and maintenance details. The logbooks are to be kept with the mobile plant or on site. Copies of any pre-use inspections provided by the owner, supplier and/or hirer are to be attached to copies of maintenance/service reports carried out in accordance with the manufacturers, suppliers or Australian Standard requirements.

Plant and equipment is to be tested and inspected in accordance with the manufacturer's recommendations or legislative requirements. The following table serves as a guide as to the frequency of inspections and does not absolve the plant or equipment supplier/owner obligations to inspect and test plant or equipment in accordance with the manufacturer's recommendations.

Item	Inspection Frequency	Inspection By	Australian Standard
Electrical Equipment including PETE	Monthly, 3 monthly RCD calibrations. Projects longer than 6 month duration an Independent inspection is to be carried out at least once in the duration of the project	Licensed Electrician / Competent Person	AS 3000 AS 3012
Elevated Work Platforms / Boom lift / Scissor Lift	Daily, 3 monthly, yearly, 10 yearly	Competent Person	AS 2550.10

Item	Inspection Frequency	Inspection By	Australian Standard
Explosive Power Tools	Daily inspection to manufacturers' recommendations dismantled and examined for defects weekly, yearly by manufacturer	Competent Person	AS 1873
Fibre Rope Slings & Chains	Labelled, inspection prior to each use & 3 monthly	Competent Person	AS 3775
Fire Extinguishers	Regular inspection, # 6 monthly test (if not disposable)	Competent Person	AS 1851
Flat synthetic slings	Labelled, inspection prior to each use & 3 monthly	Competent Person	AS 1353
Forklift truck	Regular inspection & maintenance as per manufacturer	Competent Person	AS 2359.2
Ladders, Platform Ladders	Visual inspection when purchased, each time before use, regular intervals, clearly labelled, e.g. safe working load & industrial use and in accordance with risk rating provided for each SWMS	Competent Person	AS 1892.5
Laser Level	Warning Signage and in accordance with risk rating provided for each SWMS	Competent Person	AS 2211 AS 2397
Lifting Gear (Chain Slings)	Labelled, inspection prior to each use & 12 monthly	Competent Person	AS 3775
Men and Materials Hoist	Daily, 3 monthly, yearly 10 yearly, Independent inspection at least once in the duration of the project	Competent Person	AS 2550.7 AS 1418
Mobile & Static Plant	Daily, pre-start and regular inspection at max monthly intervals or to manufacturers recommendations	Competent Person	
Mobile Cranes & Tower Cranes EWP's	Daily, Annually, 10 yearly Independent inspection of tower crane at least once in the duration of the project	Competent Person	AS 2550 AS 1418
Oxy/Acetylene	Regular inspection and adequate separation and storage and in accordance with risk rating provided for each SWMS	Competent Person	AS 4332
Rope Access	Visual inspection before use, 6 monthly by competent persons	Competent Person	AS 4488

Item	Inspection Frequency	Inspection By	Australian Standard
Safety Harness, lanyards	Visual inspection before use by a competent person, 6 monthly by height safety equipment inspector,	Competent Person and/or height safety equipment inspector	AS 1891.4
Safety Lines/fall arrest devices (installation)	Visual inspection before use by a competent person, 6 monthly inspection by a height safety equipment inspector, 12 monthly full inspection / service by a height safety equipment inspector	Competent Person and/or height safety equipment inspector	AS 1891.4
Traffic Control	Regular Inspection in accordance with risk rating provided for each SWMS	Competent Person	AS 1742.3

The Principal Contractor shall ensure that where required, equipment shall be calibrated in accordance with the manufacturer's specification by a certified testing authority. Calibration certificates shall be kept with the equipment or on site and available for inspection.

A register of all equipment shall be kept, identifying test date, frequency required and next test due date. Any equipment that is hired must be delivered to site with a copy of the current calibration certificate before delivery will be accepted. A register of Measuring and Testing equipment including calibration due dates shall be available on site.

14.5 Traffic Management

Traffic management involves the safe movement of vehicles (such as cars, trucks and buses), mobile powered plant (such as forklifts) and pedestrians within, through and around work sites. The Principal Contractor shall ensure that a Traffic Management Plan (TMP) is in place to prevent or control hazards to employees, visitors and the public where interaction between vehicles or mobile plant and people may occur.

- Risk assessments are completed to identify the potential interactions of people with powered mobile plant and vehicles.
- Traffic management plans that impact local access during construction must be approved by the relevant road authority and be in place prior to the commencement of construction in the area of relevance of TMP.
- Traffic management plans are to establish stakeholder and communications arrangements in accordance with the Project Consultation Plan.
- Traffic management plans are developed to provide detail on the separation methods of workers, visitors and the public from construction vehicles and mobile plant. Traffic management plans are to mitigate risks in areas including public roads and at site access points.
- Risks in setting up traffic management arrangements on site are assessed and controlled.

- Persons involved with work where traffic management is required are trained to understand the controls required and maintaining the effectiveness of the plan.
- Signage for risks (e.g. speed, traffic flow etc.) are appropriate to the risks identified and maintained throughout the work site.
- Persons required to be in the work area where mobile plant is operating are to wear upper-torso high-visibility garments at all times.
- Prior to entering near operating heavy mobile plant positive communication is made with the plant operator. The mobile plant operator's or spotter permission shall be obtained prior to entering each exclusion zone.
- Measures to prevent impacts to emergency services access on public roads and to the construction site are to be incorporated in traffic management plans.

<i>Reference Documents</i>	
<i>APA Group</i>	<i>APA HSE FRP 027 Mobile Plant</i>
	<i>APA HSE PRO 007 Plant & Equipment</i>
	<i>APA HSE PRO 032 Traffic Management in the Workplace</i>
<i>Project</i>	<i>Principal Contractor Traffic Management Plans</i>

15. HAZARDOUS SUBSTANCES, DANGEROUS GOODS & OTHER SUBSTANCES

15.1 General

The Principal Contractor is responsible to ensure the purchase and use of hazardous substances and dangerous goods shall be carried out in accordance with applicable legislation, codes and or standards, and APA procedures. Refer to APA HSE PRO 005 Chemical Management. Safety Data Sheets (SDS) shall be obtained for all hazardous chemical prior to their acceptance on site and a copy of shall be retained in the on-site SDS register.

Personnel shall be trained in the requirements of the safe use, handling, storage and disposal of chemicals prior to using. Training shall be undertaken in the form of a toolbox meeting as a minimum. The training shall be recorded on a toolbox meeting form and shall record all participant names and signatures as verification of attendance.

The handling, storage and transport of Dangerous Goods shall be in accordance with Hazardous Substances and Dangerous Goods procedures and comply with the following procedures:

- AS 1940 – Storage Handling of Flammable and Combustible Liquids;
- Dangerous Goods Act 1985 (Victoria)
- Dangerous Goods (Storage and Handling) Regulations 2012 (Victoria)
- EPA Victoria Publication 1834: Civil construction, building and demolition guide; and
- EPA Victoria Publication 1698: Liquid storage and handling guidelines

A Dangerous Goods Assessment shall be conducted at all storage locations in accordance with applicable legislation, codes and/or Standards.

15.1.1 Hazardous Chemicals Register

A hazardous chemicals register is a list of all the hazardous chemicals that are used, handled or stored at the workplace along with the safety data sheet for each chemical. This information may be maintained either as a hard copy or in electronic format. The register will be kept in the site office and first aid facility, to ensure that is easily accessible to workers and other persons that may come in contact with the chemicals, including emergency service personnel. The register shall have the name of the hazardous chemical, location and quantity stored.

15.1.2 Safety Data Sheets (SDS)

A SDS must be supplied for every hazardous chemical. This sheet contains information about the substance including chemical composition, PPE requirements, safe storage and handling practices and what to do during an emergency involving the hazardous chemical. Safety data sheets are required to be reviewed every 5 years. The register should include the most up to date version of the SDS (that is, less than 5 years old).

The Principal Contractor is responsible to inform all workers of the presence of hazardous materials or chemicals, as well as the measures for controlling exposure and safe disposal. Safety Data Sheets (SDS) for hazardous chemicals must be readily available for reference. A Chemical Risk Assessment must be available for all hazardous material on site that have a Chemwatch hazard rating of moderate, high or extreme.

Where contaminated materials are found to be present, an appropriate assessment of the exposure levels should be undertaken before selecting the control measures. A risk assessment process should be used to determine the engineering controls, work practices and workplace atmospheric or biological monitoring required.

Monitoring measures the amount that workers may be exposed to any contaminants or hazardous substances and may be needed as a part of the risk assessment, or to check that control measures are effective. Some contaminants may be hazardous chemicals that have exposure standards that must be observed. Details of exposure standards are set out in the manufacturer's Safety Data Sheet (SDS) or in the Workplace Exposure Standards for Airborne Contaminants.

15.2 Managing risks from airborne contaminants

The Principal Contractor site manager shall ensure that no person at the workplace is exposed to a substance or mixture in an airborne concentration that exceeds the exposure standard for the substance or mixture.

Air monitoring shall be carried out to determine the airborne concentration of a substance or mixture at the workplace to which an exposure standard applies if:

- It is not certain on reasonable grounds whether or not the airborne concentration of the substance or mixture at the workplace exceeds the relevant exposure standard; or
- Monitoring is necessary to determine whether there is a risk to health.

Air monitoring test results shall be recorded and kept for 30 years after the date the record is made. Results of air monitoring shall be readily accessible to persons at the workplace who may be exposed to the substance or mixture.

15.3 Hazardous atmospheres

Risks associated with hazardous atmospheres at the workplace shall be managed. An atmosphere is a hazardous atmosphere if:

- the atmosphere does not have a safe oxygen level; or
- the concentration of oxygen in the atmosphere increases the fire risk; or
- the concentration of flammable gas, vapour, mist or fumes exceeds 5% of the LEL for the gas, vapour, mist or fumes; or
- combustible dust is present in a quantity and form that would result in a hazardous area.

Ignition sources in hazardous areas shall be managed, unless the ignition source is part of a deliberate process or activity at the workplace that is adequately controlled. This work will be undertaken under the Permit to Work system.

15.4 Storage of flammable or combustible substances

The Principal Contractor site manager shall ensure that, if flammable or combustible substances are kept at the workplace, the substances are kept at the lowest practicable quantity for the workplace. This includes flammable and combustible liquids, including waste liquids, in containers, whether empty or full; and gas cylinders, whether empty or full. The storage of these materials shall be in accordance with Hazardous Substances and Dangerous Goods procedures.

15.5 Management Measures for Dangerous Substances

The Principal Contractor shall develop and implement management measures for dangerous substances, including:

- Creating and maintaining a Dangerous Goods Register.
- Disposing of any hazardous materials, including asbestos, in accordance with Industrial Waste Management policies, regulations and relevant guidelines.
- Implementing requirements for the installation of bunds and precautions to reduce the risk of spills.
- Develop and implement contingency and emergency response procedures to handle fuel and chemical spills, including availability of on-site hydrocarbon spills.
- Make spill kits available at all locations where machinery/plant are operating, refuelling points and fuel and chemical storage locations.
- Limit the type and volume of liquid material (fuel, oil, lubricant) stored on-site for construction activities is to be limited to only that which is required.
- Liquid material must not be stored within 50 metres of waterways.

15.6 Hazardous waste management

The Principal Contractor site manager has responsibility to ensure that all hazardous waste is managed in accordance with regulatory requirements. As a minimum, hazardous waste shall be disposed of by a licensed carrier to a licensed disposal site. Upon disposal, the waste certificate is to be kept for audit purposes.

15.7 Asbestos

When assessing the risk of exposure to airborne asbestos, the Principal Contractor shall ensure, as a minimum:

- Operators involved in asbestos inspection or removal shall be trained with their competency verified. Operators conducting Class A and B asbestos removal shall be licensed with the appropriate regulator.
- Risk assessments including SWMS/ JHEA, as well as PTW shall be documented prior to licensed asbestos removal works commencing.
- An asbestos removal / control plan shall be developed when licensed asbestos removal work is required that details labelling, handling, storage and transport as well as the waste management and environmental requirements.

- A site-specific asbestos register shall be developed that lists all identified (or assumed) asbestos in the workplace.
- An asbestos management plan shall be developed that sets out how asbestos or ACM that is identified at the workplace will be managed.
- PPE shall be worn that is specific to the hazards related with the processes of either inspecting or removing asbestos.
- Licenses and permits as required for local regulatory requirements shall be in place prior to removal work commencing, and to certify clearance and correct disposal of waste.
- Health surveillance shall be conducted for persons involved in carrying out licensed asbestos removal work, ongoing asbestos removal work, or asbestos work where there is a risk of exposure to asbestos when carrying out the work.
- Areas where asbestos-containing materials has been identified or is suspected shall be signposted.
- Information regarding asbestos containing materials in the workplace shall be made available to any person as appropriate to the works being conducted.

15.8 Abrasive Blasting

Principal Contractor shall ensure that:

- Workers who perform abrasive blasting activities shall be trained and be competent in the activity and where stipulated by an authority, have a license to perform the activity.
- Equipment used for abrasive blasting shall be fit for task and maintained.
- Risk assessments shall be documented and reference Safety Data Sheets, waste management and environmental requirements
- Areas where abrasive blasting is being undertaken shall be signposted, with restricted access.
- Health surveillance shall be conducted for persons exposed to hazardous chemicals resulting from abrasive blasting.
- Licenses and permits as required for local regulatory requirements shall be in place prior to work commencing.
- Where performed, abrasive blasting shall be recorded in the site Risk Profile register.
- An emergency response plan shall be developed for abrasive blasting work, and tested periodically.
- PPE shall be provided that is specific to the hazards related with abrasive blasting.

15.9 Control of Radioactive Substances and Irradiating Devices

Arrangements shall be in place to minimise the risk of adverse health effects to employees, customers, contractors, visitors and the public, due to the exposure to

radioactive substances or irradiating devices used as part of APA's operations by ensuring:

- Risk assessments shall be documented and controls in place for radioactive substances and irradiating devices.
- A radiation safety manual / plan shall be prepared as required by the regulator.
- A Radiation Safety Officer (RSO) shall be appointed for each work place that has radiation substances or irradiating devices.
- Persons conducting work involving radioactive substances or irradiating devices shall be appropriately licensed.
- Health surveillance shall be conducted for persons exposed to radioactive substances or irradiating devices.
- Areas where radioactive substances or irradiating devices are being used shall be signposted, with exclusion zones established.
- Permit to work shall be in place before any work is carried out that involves radioactive substances or irradiating devices.

15.10 Health Surveillance

Where appropriate or required by regulation, Principal Contractor will identify activities that require health surveillance, and shall ensure personnel undertake ongoing health surveillance and workplace monitoring.

<i>Reference Documents</i>	
<i>APA Group</i>	<i>APA HSE PRO 005 Chemical Management</i>
<i>Project</i>	<i>APA HSE PRO 020 Asbestos Management</i>
	<i>APA HSE PRO 021 Control of Radioactive substances and irradiating devices</i>
	<i>Site SDS Register</i>
	<i>Site Hazardous Chemical Register</i>
<i>External</i>	<i>Workplace Exposure Standards for Airborne Contaminants</i>

16. EXCAVATION AND TRENCHING

16.1 Responsibilities

APA and the Principal Contractor shall ensure that where there is a risk to a person or person's health and safety from the collapse of an excavation, i.e. whilst working in or accessing a trench or excavation, that the following mandatory controls are implemented:

- Appropriate site and task specific risk controls shall be detailed through the use of Safe Work Method Statements (SWMS), Job Hazard Environmental Analysis & an emergency plan (where required).
- Prior to mobilising plant into position to commence excavation, underground and overhead services shall be identified and referenced in the site risk assessment (for example, "Dial Before You Dig" plans and requirements for minimum safe working distances from overhead assets).
- All underground assets (active and inactive) shall be physically located (visually identified) and marked prior to excavation
- The setup of the excavation and trenches shall allow for safe access & egress, and be designed with the appropriate use of shoring, battering, benching and consideration of the zone of influence.
- All relevant approvals, permits required from other asset owners and licensing shall be in place prior to works commencing.
- All safety equipment shall be appropriate and available according to the hazards identified through the risk assessment process.
- Where road, rail or pedestrian traffic may be impacted by the excavation or trenching works, a traffic management plan shall be in place.
- Workers involved in excavation and trench works shall be appropriately qualified and trained, and have the appropriate permits and licenses to perform the work.
- Open excavations and assets shall be secured in a safe manner when there are no personnel on site.
- Environmental impacts associated with excavation and trenching activities shall be considered as part of any hazard and risk assessment, and managed in accordance with all regulatory requirements.

In areas of ground instability, shoring or shielding will be installed prior to personnel entering the excavation. In locations where working space is restricted to the point that benching and battering to a standard shown in the figures below is not possible, such as restricted Right of Way areas, shoring and/or shielding will be installed prior to personnel entering the excavation. All excavations must be adequately shored or benched in accordance with the relevant codes.

The risk of contamination through a build-up of gases and fumes needs to be controlled in excavation work. Gases and fumes heavier than air can accumulate in trenches, tunnels and excavations (e.g. gases such as sulphur dioxide, engine fumes

such as carbon monoxide and carbon dioxide, leakage from gas bottles, fuel tanks, sewers, drains, gas pipes, and LPG tanks).

If there is a risk of trench or excavation collapse where personnel may be trapped or engulfed, a specific Emergency Response Rescue Plan is required for the activity.

<i>Reference Documents</i>	
APA Group	320-PR-OM-0067 Transmission excavation Procedure
	320-FM-OM-0433 Excavation Inspection Form
	320-FM-OM-0434 Pipeline Excavation Record Form
	APA HSE FRP 028 Excavation and Trenching

16.2 Community Impacts within Urban Areas

Due to the nature and location of the work being undertaken in close proximity to urban areas, the Contractor is required to have a separate section in the CHSMP to identify all possible community impacts, and mitigations in regards to all to all construction activities. This can include but not limited:

- Dust suppression
- Noise
- Traffic Management
- Exclusion zones for Hydrotesting
- Site Security
- Safety
- Emergency Response
- Fauna Protection
- Site Access
- Blasting
- NDT
- Use and Storage of Dangerous Goods

16.3Blast Management Plan

Blasting shall be carried out in a safe manner and in accordance with AS 2187.2 (Explosives — Storage and use) and statutory requirements, as per AS 2885.1. Should the Contractor undertake any blasting works, a Blast Management Plan (BMP) will be completed by the Contractor that will be reviewed and approved by APA before commencing any site works.

The Principal Contractor will be required to engage a qualified Blasting Contractor and qualified Blasting Consultant. No blasting shall commence until a competent person has authorised the Blast Management Plan.

17. CONFINED SPACES

The Principal Contractor shall ensure all Confined Space Entry (CSE) activities shall be in accordance with the APA Fatal Risk Protocol 017 and The Occupational Health and Safety Regulations 2017 and WorkSafe Compliance Code for Confined Spaces March 2018 and AS2865 Confined Spaces.

All works shall be subject to an APA Group Permit to Work (PTW) and undertaken in accordance with the permit requirements.

Safe Work Method Statements (SWMS) shall be completed before confined space work is conducted, which should ensure certain procedures are carried out, including:

- Any person working within a confined space, or assisting with confined space entry (e.g. standby person) shall be trained and deemed competent to perform the works
- Confined spaces shall be signposted and have a secure controlled access
- All confined spaces shall be listed on a confined space register
- Confined space authority to work permits shall be used each time a person enters. The permit shall be completed by a competent person, and include a risk assessment and clearly identify the appointed standby person(s)
- Prior to a confined space entry, a rescue plan shall be in place, with rescue equipment readily available
- Equipment required for use in preparing and monitoring the confined space, and used within the confined space shall be calibrated
- Atmospheric monitoring shall be conducted prior to a person entering a confined space, and continuously while personnel are within the confined space
- Prior to any person entering a confined space, all potentially hazardous services, shall be isolated where it is reasonably practicable to do so. If it is not reasonably practicable to eliminate the risk, the risk shall be reduced so far as is reasonably practicable.

<i>Reference Documents</i>	
APA Group	APA HSE FRP 028 Excavation and Trenching
	APA HSE FRP 017 Confined Spaces
	320-PR-OM-0067 Gas Transmission Excavation Procedure

18. PREVENTION OF FALLS

18.1 General

APA and the Principal Contractor is responsible to ensure that where there is a risk of a fall by a person from one level to another that is reasonably likely to cause injury, it shall be managed to as low as reasonably practicable to minimise the risk of injury. If the work is to be conducted at height, i.e. construction work at 2 metres or more, or a trench of 1.5 metres deep; a SWMS is to be prepared outlining how the risk is to be controlled, taking into account the hierarchy of control.

All work where a fall potential exists shall be conducted in accordance with the WorkSafe Compliance Code Prevention of Falls in the general construction Edition 2 December 2019

The hierarchy of control for working at heights shall follow in this order, that the work be undertaken:

- On the ground or from a solid construction;
- Using a passive fall prevention device (scaffold, EWP, etc.);
- Using a work-positioning system (travel-restraint systems such as static lines);
- Using a fall-arrest system (i.e. safety harness fall-arrest system);
- From ladders, or implement an administrative control.

In addition, the Principal Contractor must ensure that the following mandatory controls are implemented:

- A Safe Work Method Statement (SWMS) shall be in place for work that involves a risk of a person falling more than 2 metres. This includes using the details of a rescue plan.
- All fixed fall from height hazards shall be registered and secured to prevent unauthorised access. Temporary fall from height hazards (e.g. construction site openings / excavations and trenches) shall also be assessed and controlled as per this document.
- Documented risk assessments and inspections shall be undertaken to confirm that the general workplace and access systems are appropriate to each work site and working at height tasks.
- Any person required to work at heights greater than 2 metres not working from a solid construction shall be trained in fall prevention, shall be assessed as competent and where necessary, be licensed to perform the work.
- Equipment used to prevent or arrest falls from height shall be procured, installed, used and inspected as per relevant standards and manufacturer's requirements.
- The hierarchy of controls shall be used to eliminate identified risks of working at heights, or at minimum reduce the likelihood & consequence.
- Controls shall be used to secure infrequently accessed roofs & fixed ladders and roofing materials shall have adequate controls to prevent fall through (e.g. fencing, pig wire, signposting etc.).

- Portable ladders shall be listed on a register, incorporating inspection and maintenance requirements.
- Fixed ladders, platforms, stairways and anchorage points shall be compliant with design guidelines and standards.

18.2 Scaffolding

The Principal Contractor is responsible to ensure that scaffolding used on this project is compliant with the Victorian Occupational Health and Safety Regulations 2017 and the AS NZS 4576 Guidelines for Scaffolding.

- All scaffolding shall be erected, altered and dismantled by competent persons in accordance with the manufacturer's/supplier's instructions.
- Any scaffold from which a person or object could fall more than four metres shall be erected, altered and dismantled by, or under the direct supervision of, a licensed scaffolder (holder of a current basic, intermediate or advanced scaffolder certificate).
- An "Out of Service" tag or similar shall be placed in a prominent location at the access point of each unfinished scaffold until constructed and deemed fit for safe use.
- Scaffolding shall not be used unless there is written confirmation from a competent person that the construction of the scaffold has been completed. A "Scaff tag" shall be placed in a prominent location at the access point of each completed scaffold to indicate that the scaffold is safe for access and use.
- All scaffolding is to be recorded on a register and inspections recorded.
- Safe work method statements are required for all high risk construction work, including any scaffolding work that involves the risk of a person falling more than 2 metres.

<i>Reference Documents</i>	
<i>APA Group</i>	<i>APA HSE FRP 029 Prevention of Falls</i>
<i>Project</i>	<i>Site Training/License Register</i>
	<i>Site Scaffolding Register</i>

19. ELECTRICAL SAFETY

19.1 General

Procedures shall be developed and implemented by the Principal Contractor, which define the essential requirements to ensure the safety of all personnel who are required to operate electrical equipment and for other personnel who are required to work in the vicinity of electrical equipment. This includes purchasing, safe use, residual current devices, maintenance, static electricity, earthing, explosive atmospheres, inspection, maintenance and repairs.

Electricity has great potential to seriously injure or kill persons. Electrical equipment shall be designed, selected, operated and maintained in a way that is safe and protects personnel from harm.

The Principal Contractor shall ensure that the following minimum mandatory requirements are met:

- Electrical equipment located in hazardous areas shall be correctly certified and suitable for the hazardous area classification;
- All work on the installation, repair, alteration or removal of an electrical circuit, associated fittings, equipment, accessories and infrastructure shall only be completed by persons holding an electrical licence or permit of the relevant class and in accordance with AS/NZS 3000:2018 Electrical installations, and AS/NZS 3012:2019 Electrical installations - Construction and demolition sites and other relevant standards;
- Electrical workers shall have the required PPE available at all times;
- All electrical work must be completed in accordance with and approved isolation LOTO procedure;
- Ignition sources shall not be introduced into a hazardous area without a hot work permit;
- All electrical equipment and hand tools purchased, hired or introduced to the project must comply with the requirements of the relevant Australian Standard and be tested and tagged in accordance with AS/NZS 3760:2010 In-service safety inspection and testing of electrical equipment;
- RCD devices shall be installed where practicable, with an inspection and testing process in place;
- Switchboard inspection and testing shall be performed when carrying normal operating loads;
- Access shall be limited by use of a tool to prevent unlicensed persons from accessing energised electrical equipment;
- Emergency response requirements shall be identified and available as required;
- Construction work that is carried out on or near energised electrical installations or services is defined as High Risk Construction Work and a SWMS must be prepared before this work commences

- Where mixed circuits exist in an enclosure (i.e. LV and ELV) the highest working voltage shall be referenced and accessibility controlled accordingly;
- Defective or damaged equipment shall be tagged and removed from use until it is either repaired or replaced;
- Electrical circuit diagrams shall be retained and maintained for currency including equipment labelling.

The Principal Contractor is responsible to ensure compliance with this requirement and to retain a copy of workers Electrical Licences and permits in the project records.

19.2 Energy Isolation

Failure to shut down, de-energise or isolate energy sources on plant during maintenance and non-production tasks puts workers at risk of death or injury. Plant shall be isolated before any work is carried out. Isolation means energy is prevented from entering the plant and all stored energy is de-energised. The following requirements are mandatory:

- Isolation points shall be identified to ensure correct isolation is applied.
- All persons working on plant and equipment, are to be trained and deemed competent in how to apply a personal lock and tag to ensure the equipment remains de-energised until their work is complete;
- Personal locks are uniquely keyed and controlled only by the individual who has applied the lock;
- Isolation hardware, appropriate to the plant and equipment in the workplace, is to be available to any person needing it;
- Prior to working on plant and equipment that has been de-energised, each person who has applied an isolation, is to verify the isolation;
- All plant and equipment requiring isolation shall be defined, including those that have been exempt by way of risk assessment (e.g. Hot tap)
- Where minor tool changes, adjustments and other minor servicing activities occur without lock and tag, risk assessments are done to verify effectiveness of alternate control systems
- Critical HSE equipment (e.g. fire protection, ventilation, water) requires approval prior to isolation occurring.

<i>Reference Documents</i>	
<i>APA Group</i>	<i>APA HSE FRP 031 Energy Isolation</i>
	<i>APA HSE FRP 035 Electrical Safety</i>
<i>External</i>	<i>AS/NZS 3000:2018 Electrical installations</i>
	<i>AS/NZS 3012:2019 Electrical installations - Construction and demolition sites</i>
	<i>AS/NZS 3760:2010 In-service safety inspection and testing of electrical equipment</i>



	<i>AS 3190:2016 Approval and Test Specifications - RCD</i>
--	--

20. HOT WORKS

Hot Work is any work activity that can produce enough heat from a flame, spark (e.g. cutting, welding, grinding) or other source of ignition, with sufficient energy to ignite combustible material or flammable atmospheres.

The Principal Contractors must have in place a process to manage Hot Works onsite, which includes:

- General Hot Works
- Hot Works on Total Fire Ban days
- Permit to Work requirements

For onsite hot works on days of Total Fire Bans, the Contractor must have in place:

- A permit to undertake Hot Works issued by Fire Rescue Victoria (FRV)
- A trained Fire Watch will monitor the Hot Works area during breaks and upon completion of the Hot Works

All Hot Works to be undertaken in accordance with the following APA documents:

- APA HSE PRO 012 Fire Prevention and Control;
- APA HSE PRO 037 Hot Work;
- 320-PR-HS-0018 Fire Prevention and Control Procedure; and
- 320-FM-HS-0021 Fire Prevention Check Sheet.

The Principal Contractor is to monitor any Total Fire Bans or Fire Restrictions during constructions and implement controls as per the issued FRV Permit in consultation with the local fire authority.



20.1 Welding

On site welding procedures will be supplied by the Principal Contractor. The Principal Contractor will develop welding procedures that comply with the requirements of AS2885.2 2020 for all welds required for construction of the works. All welding Procedures Specifications (WPS) and associated Procedure Qualification Records (PQR) (called a "WPS- QR") will be validated by an APA approved independent third party.

All welders will be formally tested to demonstrate that they can successfully weld in accordance with all WPS' that they are required to weld to. All welders will be qualified to weld in accordance with the same WPS.

Qualified welding procedures and welder records will be maintained on site and in addition entered into the Project MOR. All hot tap fittings will be welded to APA's qualified live welding procedures in accordance with AS2885.2 2020.

<i>Reference Documents</i>	
<i>APA Group</i>	<i>APA Project Quality Management Plan</i>
<i>External</i>	<i>ASME 831.3 2018 Process Piping</i>
	<i>AS 2885.1 Design and Construction 2018</i>
	<i>AS 2885.2 Pipelines- Gas and Liquid Petroleum – Welding 2020</i>
	<i>AS 2885.3 Pipelines- Gas and Liquid Petroleum operation and Maintenance 2012</i>

20.2 Hot Taps

Hot Tap works will be undertaken by a specialist contractor using their propriety hot tapping procedures. The specialist contractor's procedures will be reviewed and approved by APA prior to use to ensure alignment with API 2201 Safe Hot Tapping Practices in the Petroleum and Petrochemical Industries.

21. HYDROSTATIC TESTING

A detailed hydrostatic testing program in accordance with AS 2885.5 - 2020 will be prepared by the Principal Contractor and approved by APA and ESV prior to testing.

All testing will be performed by a NATA registered company and will be carried out by NATA certified personnel.

The safety of the public and site personnel is paramount. Barricading and signposting of exclusion zones will be established prior to testing operations commencing. All property owners and occupiers will be notified before the commencement of pressurisation.

22. HORIZONTAL DIRECTIONAL DRILLING

A HDD Management Plan in accordance with AS 2885.1-2018 will be prepared for approval by ESV prior to works commencing.

The HDD Management Plan will cover the following

- Management of mud including additives and safe disposal protocols
- Crossing design drawings
- Key personnel competencies
- Safe Work Method Statements (SMWS)
- Work procedures
- Method for performing assessment of pipe coating integrity post installation in accordance with AS2832.1- 2015
- As-built drawings and results of coating integrity inspection will be made available to ESV post works.

23. MONITORING & AUDITING

23.1 General

Active monitoring arrangements shall be in place to provide assurance that planned arrangements are in place and operating effectively.

Results of audits and inspections shall have action lists developed and implemented to ensure corrective actions are tracked to completion and a system of continuous improvement exists.

HSE Observations shall be undertaken by supervision on a regular basis to ensure employees are complying with adopted work procedures, JSEA/SWMS and processes.

Contractors shall be audited to ensure they are fully aware and in compliance of HSE requirements.

23.2 Processes

23.2.1 Workplace Inspections

Daily site inspections shall be conducted by the Principal Contractor. Any observations are recorded and where necessary, Corrective Action Requests are issued to the appropriate personnel.

Weekly formal WHS Inspections are to be conducted by the Principal Contractor site manager. Where required, Corrective Action Requests will be issued to the applicable parties. The findings of the WHS Site Inspection shall be discussed with employees and subcontractors via toolbox meetings.

Workplace inspections must be carried out in accordance with the relevant Group Procedures referenced in Appendix B: APA (Group Level) HSE Reference Documents.

Typical inspections will include:

- Procedures for ensuring plant is checked prior to use;
- Planned regime of health and safety inspections;
- Work activity observations;
- Pre-operation inspections of vehicles and plant;
- Inspection and testing of electrical equipment;
- Inspections of cranes and lifting equipment;
- Inspection of fall protection equipment
- Inspections of pressure vessels and pressure testing equipment;
- Inspections of emergency, first-aid, fire and spill control equipment; and

Planned inspections and/or observations shall be performed by a competent and experienced person and may include an elected Health and Safety Representative or the Health and Safety Advisor if there are no representatives. Inspections should follow an agreed format (i.e. checklist), timeframes, and be documented.

23.2.2 Project Audits

The Principal Contractor shall have procedures in place for regular, prioritised (based on the significance of risks and previous performance) HSE assessments (audits, self-assessments, workplace inspections and reviews). These shall be conducted by APA and the Principal Contractor to ensure compliance with laws, regulations and other requirements and conformance with management systems and procedures. The Principal Contractor must submit an audit schedule detailing planned audits for the duration of the project.

Audits shall be undertaken to review and verify the status of compliance against the HSE Management Plan, Construction or Commissioning Safety and Environment Plans and other project requirements (including KPIs). Audits shall be undertaken as per the APA Corporate Audit Schedule and Active Monitoring requirements identified in the CHAT (Contractor HSE Assessment Tool).

23.2.3 Fitness for Work

Principal Contractor shall have a procedure in place that ensures compliance with the APA Group Policy Health, Safety and Wellbeing. The APA Alcohol and other Drugs Protocol (APA HSE PRO 029) ensures that all persons including APA Operations, APA Project, Principal Contractor, Sub-contractors and visitors are fit before commencing work and remain so for the time they are at work. This includes travelling to and from the site. The Project mandates zero (0.00) BAC (breath alcohol content) and zero illegal drug tolerance for all sites.

Principal Contractor Alcohol testing will be undertaken daily, as part of the pre-start meeting; and drug testing will be undertaken on a random basis throughout the project. Drug and alcohol testing will also occur for causal investigations following a significant incident. The Policy and associated procedures and programs or disciplinary procedures shall be fully discussed during the project induction to ensure that all personnel are fully aware of the expectations and consequences of the policy.

23.2.4 Working Hours and Fatigue Management

Fatigue is an acute, ongoing state of tiredness that leads to mental or physical exhaustion and prevents people from functioning within normal boundaries.

The causes of fatigue include, but are not limited to, insufficient sleep, high workloads, extended periods of work, irregular hours, 'out of hours' operations, as well as poor personal health and/or well-being. Fatigue increases the risk of accidents that may result in injury or, in extreme situations even death.

The Principal Contractor shall have a procedure in place to manage fatigue for workers on the project. The following mandatory requirements are addressed as part of fatigue management:

- Risk assessments shall be completed for safety critical roles & activities that may have increased risk of fatigue;
- Both routine and emergency work is managed for fatigue;
- Review and approval is required where work is to occur outside established work roster hours;

- Fatigue Management shall be considered where travel to remote locations occurs.
- Education and training will be provided to 'at risk' personnel.
- All personnel must stop work and report it to their supervisor where they experience the effects of fatigue.
- Fatigue-related hazards associated with project activities shall be identified and where fatigue-related risk is determined to be elevated to unacceptable levels, preventative actions shall be applied.

These may include but are not limited to:

- Increased frequency of breaks;
- Rotation of tasks;
- Reduced working hours;
- Additional personnel;
- Training;
- Encouraging reduced alcohol consumption;
- Exercise opportunities;
- Minimising "sleep debt".

Reference Documents	
APA Group	APA HSE FRP 026 Fatigue Management
	APA Group Policy Health, Safety and Wellbeing
	APA HSE FRP 026 T5 Fatigue Management Tool Box Talk
	APA HSE FRP 026 T1 Fatigue Management Hazard Checklist

23.3 Performance Reporting

Project statistical data shall be collated by the Principal Contractor for project monthly reports. The data shall be analysed and reported weekly/monthly in project management team meetings and reports and yearly in project review meetings.

23.4 Non-Conformance

The results obtained from monitoring and measuring will be evaluated to:

- correct poor performance;
- identify the reasons for poor performance; or
- Address the potential likelihood of future poor performance.

A non-conformance is viewed as any aspect of the Project operation that does not conform or comply with specified requirements.

Non-conformances to HSE requirements shall be effectively managed to resolve the issue(s). The Principal Contractor site manager is responsible for ensuring that any non-



compliance is rectified immediately or control measures implemented until such time as the non-compliance can be rectified. All HSE non-conformances shall be entered into Safeguard+ and appropriate actions allocated.

24. REVIEW AND IMPROVEMENT

24.1 Staged Submissions of the SMP

Under the Pipelines Act 2005, Part 9, Division 2, Section 126 (2) a SMP may be given to ESV and accepted in stages.

APA will seek approval to commence works to enable the Principal Contractor to mobilise, set up site, commence earthworks including fencing, clear and grade and trenching and the stockpiling and stringing of pipe.

Various other documents required by ESV cannot be provided until the Principal Contractor has forwarded documents such as pipeline weld procedures and HDD Management Plan to APA for its approval. The Principal Contractor is required to prepare this documentation to assist the Licensee obtain Approval to Construct.

The compliance matrix above noted that some documents will be submitted under separate cover. Hold points are placed on various key processes of pipeline construction until the required information has been submitted and accepted by ESV.

Staged submissions of documentation include:

- APA Live Welding Documentation - Est. submission date mid- April 2021
- Principal Contractors Emergency Response Plan (Site Specific), SWMS and Work Procedures List - Est. submission date mid-APRIL 2021
- Welding Documentation - Est. submission date late APRIL 2021
- HDD Management Plan - Est. submission date MAY 2021
- Hydrostatic Test Plan - Est. submission date April 2021
- Commissioning Plan - Est. submission date May 2021

24.2 Management Review and Improvements Found

Performance against the agreed HSE Performance Indicators described in this Safety Management Plan will be a formal part of the Project Close-Out Report (as scoped in the PMP 18035-PL-A-0001).

The HSE section of the Close-Out Report may include;

- Identified areas for health and safety improvement;
- Sources of information used to and applicable to the project;
- Effectiveness of employee communication;
- Results of Accident/Incident Investigations;
- Health safety and environmental impacts of changes in technology;
- Changes in the Project Organisational Structure;
- Improvements in construction work practices; and
- Community HSE impacts and expectation.

The object of the review will be to determine the adequacy with which the Safety Management Plan was implemented.

The formal project Close-Out Report will be utilised to make recommendations for improvements to the Safety Management Plan documentation for future projects.

Verification:

- Project Closeout Report;
- Audits Completed;
- Completed Safety Inspection Forms;
- Checklists; and
- Registers.

25. ISSUE RESOLUTION

25.1 General

Everyone involved in the work place has the right to stop any given job if they genuinely believe that their or other peoples' safety is at risk. Where a worker encounters what they believe to be a hazard, or are allocated work in what they consider constitutes an unsafe situation, they shall discuss the situation immediately with their responsible supervisor.



If required the site manager will facilitate resolution meetings, which involve the relevant personnel and ensure a timely rectification of issues. This process allows for isolation of the matter in dispute without impacting the continuity of the project and for the escalation of unresolved matters.

25.2 Notices issued by other parties

Notices issued by other parties, including regulators shall be treated as an incident and the details entered into Safeguard+. Principal Contractor shall notify APA immediately of the issue of any Regulatory Notice.



26. ATTACHMENTS

26.1 Appendix A: APA Group Policies

- Health, Safety and Wellbeing
- Environment and Heritage

26.1.1 APA Group Policy Health, Safety and Wellbeing

1/12/2020

APA Group Policy Health, Safety and Wellbeing

Document type	Group Policy
Effective from	01 December 2020
Key contact	General Manager Health, Safety, Environment and Heritage
Document owner	Group Executive People, Safety and Culture
Approved by	Managing Director
Approved date	01 December 2020
Next review date	December 2022
Review cycles	3-yearly, in accordance with Group Documentation Standard
Related Group Standard	APA Health, Safety, Environment and Heritage Standard
Legend	<p>Open links to either a location in this document or to an external site or website</p> <p>References to an APA document</p> <p>Glossary terms (in the Glossary in this document)</p> <p>Version control (in the Version Control in this document)</p>



1/12/2020

Empowering our People

- Not working work if it is not safe
- Stopping work and/or intervening when work is not being done safely; and
- Switching off plant in line with stated protocols or not using equipment that is not safe

Risk Management

- Conducting appropriate due diligence and risk assessments in planning projects and operating activities
- Managing our operating risks and the critical controls that prevent or mitigate major incident events
- Proactively seeking to eliminate hazards, with critical controls and reduce the risk of injury and ill health
- Prevent harmful substance or energy release by managing our major incident control
- Promoting prompt reporting of all hazards, incidents, near misses and injuries to foster transparency, quick response and learning; and
- Conducting robust investigations and root cause analysis of incidents to embed learning and reduce the risk of repeated incidents

Communication and Training

- Consulting and engaging with our employees, worker representatives and other stakeholders
- Communicating expectations, standards and non-negotiables to employees, contractors and stakeholders
- Delivering holistic, proactive education and training for employees and contractors to take ownership of risk, management systems, standards and responsibilities
- Providing appropriate supervision, specialist support and other resources for health and safety matters; and
- Responding to deviations or breaches of its policies, and procedures with a fair and just response

Fitness for Work

- Providing anoxic free workplaces
- Providing a workplace free from alcohol and illicit substances
- Establishing processes which ensure that workers are fit for duty and not affected by alcohol and other drugs which may impair their ability to work safely and
- Providing effective injury management and return to work processes and resources that support early intervention and workplace rehabilitation to assist the affected employee's recovery and return to work

Health, Safety and Wellbeing Group Policy | Document identifier: HSW001 | Page 3 of 8



1/12/2020

1 Purpose

Our Health, Safety, and Wellbeing Group Policy is a statement of APA's commitment to creating workplaces that are free of harm and support the growth, wellbeing, respect and inclusion of our employees, contractors and visitors.

2 Decision Context



The effective application of this Policy is only achieved by operating in line with our Values and Our Code of Conduct. This policy enables our commitment to drive to world class health and safety performance and ensure the development of health and safety enables making thoughtful and wise decisions. The Policy supports decision making as part of the APA Decision Context under the segments of 'Do Things Safely' and 'Take a Long Term Focus'

3 Scope

This policy applies to all APA employees as well as direct, contingent workers, contractors and visitors.

4 APA Position

APA will deliver its Health, Safety and Wellbeing commitment through the following objectives:

Leadership and Culture

- Fostering a culture where our people's health and safety is our priority
- Ensuring leadership is accountable for the development, understanding, effective implementation and continual improvement of our safety management system
- Holding the executive and director to drive accountability for health and safety performance
- Recognising that all employees have an obligation to look after their own health, safety and wellbeing and of those they work with by both actions and omission and to take all reasonable steps to prevent incidents; and
- Developing a workplace culture that prioritises safety, respect and inclusion.

Health, Safety and Wellbeing Group Policy | Document identifier: HSW001 | Page 2 of 8
energy. connected.



1/12/2020

Managed Systems, Compliance and Metrics

- Seeking for continual improvement in the APA health and safety management system to support excellent performance
- Establishing and measuring measurable, fit for purpose objectives and targets around health, safety and wellbeing outcomes and performance; and
- Working to exceeding applicable industry regulations and legal obligations.

5 Objectives

The objectives of this policy are to confirm that:

- We operate in a workplace free of illness and injury, with a culture where people feel respected and supported
- Safety comes before everything else
- We believe that disclosure and honest behaviour that have beyond compliance, translates high performance and accountability
- Safety includes health, wellbeing and psychological safety such that the physical person is considered

6 Key roles and responsibilities

APA's health, safety and wellbeing policies, standards and procedures are essential in ensuring that the safety, health and wellbeing of our people remains a priority.

Our approach empowers people to identify and manage health and safety risk that are applicable to them, follow instructions and promote behaviour that have beyond compliance, translates high performance and accountability.

It is our obligation as an employer, contractor and client to follow and support the application of these policies, standards and procedures, and participate in continual improvement to create workplaces that are free of incidents and injury.

7 Glossary

Term	Definition
Group Policy	Document that reflects the strategic intent and key decisions of the organization for employees, leaders and external stakeholders. Group policies apply across all of APA.

Health, Safety and Wellbeing Group Policy | Document identifier: HSW001 | Page 4 of 8
energy. connected.

1/13/2020



B Related Documents

- APA Health, Safety, Environment and Heritage Standard
- APA Code of Conduct (Our Code)
- APA People and Culture Policy

9 Version Control

Date	Changes
04 July 2020	Initial Draft
01 December 2020	Revised policy format aligned to the APA Document Framework. Approved by the HSE Committee and Board

26.1.2 APA Environment and Heritage

W11/2020

APA Group Policy Environment and Heritage

Document type	Group Policy
Effective from	09 November 2020
Key contact	General Manager Health, Safety, Environment and Heritage
Document owner	Group Executive People, Safety and Culture
Approved by	Managing Director
Approved date	09 November 2020
Next review date	November 2022
Review cycles	2 yearly, in accordance with OHSU Reassessment Standard
Related Group Standard	APA Health, Safety, Environment and Heritage Standard
Legend	Link is either a location in this document or to an internet site or website Sentence is an APA document Glossy text is in the Glossary in this document Version control in the Version Control in this document



W11/2020

- Reporting of environmental and cultural hazards and incidents to promote transparency, quick and effective response, learning and improvement.
- Applying of reasonable measures to avoid environmental and heritage incidents and taking appropriate and rapid action to address any incidents that occur.
- Driving ongoing improvements to performance through reporting environment and heritage data, monitoring, review of targets and team conversations.

5 Objectives

The objectives of this policy are to:

- Manage and minimise our impact on the environment and cultural heritage (air and natural resources).
- Foster a culture of responsibility, leadership and awareness of our environmental and heritage obligations and practices.
- Ensure active consultation of impacted stakeholders; and
- Maintain respect for the past and protection of the future.

6 Key roles and responsibilities

All employees and contractors are responsible for managing environment and heritage in accordance with this Policy.

APA's approach is to empower people to identify environment and heritage risks, notify issues, advise stakeholders and promote progressive and innovative practices. Detailed authorities are outlined in [Appendix A - Roles and Responsibilities Table](#) of the Health, Safety, Environment and Heritage Group Standard.

7 Glossary

Term	Definition
Group Policy	Document that reflects the strategic intent and key decisions of the organization for employees, readers and external stakeholders. (Group policies apply across all of APA).

8 Related Documents

- APA Health, Safety, Environment and Heritage Standard
- APA's Code of Conduct

Environment and Heritage Group Policy - Document controlled externally Page 5 of 4



W11/2020



1 Purpose

This Environment and Heritage Group Policy is a statement of APA's commitment to the protection of the environment and preservation of cultural heritage.

2 Decision Compass



Thoughtful application of this Policy will facilitate alignment to APA's values and Code of Conduct. This Policy will assist APA to meet or exceed its legislative obligations in regard to the environment and cultural heritage. The Policy supports decision making as part of the APA Decision Compass under the segments 'Take a long term focus' and 'Do What We Say We Do'.

3 Scope

This Policy applies to all APA activities and joint ventures under APA's control or all its operating sites and jurisdiction. The Policy applies to all APA employees, contractors and suppliers.

4 APA Position

APA will deliver on its environment and cultural heritage commitments through the following:

- Promotion of strong environment and heritage culture through visible leadership and employee initiatives.
- Compliance with all relevant legislative and social obligations and commitments through effective identification and application of controls.
- Consulting appropriate due diligence and for assessments in signing projects, project delivery and operating activities.
- Operating under an effective Environment Management System aligned to International Standards.
- Bringing early, transparent and consistent consultation and collaboration with impacted stakeholders and third-party groups.
- Delivering holistic, proactive education and training for employees and contractor to raise awareness of risk, management systems, standards and responsibilities.

Environment and Heritage Group Policy - Document controlled externally Page 2 of 4



W11/2020



9 Version Control

Date	Change
01 July 2020	Initial Draft
09 November 2020	Revised (after formal review) to final APA document - 1 to present

Environment and Heritage Group Policy - Document controlled externally Page 4 of 4



26.2 Appendix B: APA (Group Level) HSE Reference Documents

Document Type	Name
Safeguard Protocol – Fatal Risk	APA HSE FRP 017 Confined Spaces
	APA HSE FRP 026 Fatigue Management
	APA HSE FRP 027 Mobile Plant
	APA HSE FRP 028 Excavation and Trenching
	APA HSE FRP 029 Prevention of Falls
	APA HSE FRP 030 Driving
	APA HSE FRP 031 Energy Isolation
	APA HSE FRP 032 Traffic Management in the Workplace
	APA HSE FRP 035 Electrical Safety
	APA HSE FRP 038 Process Safety
Group Procedure	APA HSE GP 01.01 HSE Policy
	APA HSE GP 01.02 HSE Accountability and Responsibility
	APA HSE GP 02.01 HSE Plans and Performance Indicators
	APA HSE GP 03.01 HSE Legal Requirements and Information Management
	APA HSE GP 03.02 HSE Document Control
	APA HSE GP 03.03 HSE Records Management
	APA HSE GP 04.01 HSE Education and Training
	APA HSE GP 04.02 HSE Employee Engagement
	APA HSE GP 04.03 Safeguard HSE Excellence Awards
	APA HSE GP 05.01 HSE Consultation
	APA HSE GP 05.02 HSE Communication
	APA HSE GP 06.01 HSE Risk Management Overview
	APA HSE GP 07.01 Incident Reporting
	APA HSE GP 07.02 Incident Investigation and Analysis
	APA HSE GP 08.01 Safeguard Protocols
	APA HSE GP 08.02 Job Risk Assessment
	APA HSE GP 08.03 Authority to Work Permits
	APA HSE GP 08.04 Workplace Inspections and Hazard Reporting
	APA HSE GP 08.05 Monitoring the Working Environment
	APA HSE GP 09.01 Planning and Design - Management of Change

	APA HSE GP 09.02 HSE Due Diligence - Acquisitions
	APA HSE GP 10.01 HSE in Purchasing of Goods
	APA HSE GP 10.02 Managing Contractors
	APA HSE GP 10.03 APA Contracted Services
	APA HSE GP 11.01 Emergency Management
	APA HSE GP 12.01 Occupational Health Surveillance
	APA HSE GP 12.02 Post Injury Management
	APA HSE GP 12.03 Health and Wellbeing
	APA HSE GP 13.01 Environmental Management
	APA HSE GP 14.01 HSE Performance Measurement and Reporting
	APA HSE GP 15.01 HSE Audit and Self-Assessment
	APA HSE GP 15.02 HSE Management Review
Plan	APA HSE PLN 002 Safeguard Communication Plan
Policy	APA Group Policy Health, Safety and Wellbeing
	APA Group Policy Environment and Heritage
Safeguard Protocol General	APA HSE PRO 001 Personal Protective Equipment
	APA HSE PRO 002 Vibration
	APA HSE PRO 003 Housekeeping
	APA HSE PRO 005 Chemical Management
	APA HSE PRO 007 Plant and Equipment
	APA HSE PRO 011 Hazardous Areas
	APA HSE PRO 012 Fire Prevention and Control
	APA HSE PRO 013 Commissioning Plans and Control
	APA HSE PRO 014 Lone and Isolated Workers
	APA HSE PRO 015 Working Outdoors
	APA HSE PRO 016 Abrasive Blasting
	APA HSE PRO 018 Air Quality and Dusts
	APA HSE PRO 019 Lifting Equipment
	APA HSE PRO 020 - Asbestos Management
	APA HSE PRO 021 Control of Radioactive Substances and Irradiating Devices
	APA HSE PRO 022 Noise Management
	APA HSE PRO 024 Biological Hazards
	APA HSE PRO 025 Construction HSE Management Plans
	APA HSE PRO 033 Manual Handling

	APA HSE PRO 034 Office Health and Safety
	APA HSE PRO 036 Gas Detectors
	APA HSE PRO 037 Hot Work
	APA HSE PRO 039 Alcohol and Other Drugs
HSE Elements	HSE ELE 01 Safeguard Management System Overview Elements
Environmental Procedures	APA HSE EP 13.04.02 Contaminated Land Management
	APA HSE EP 13.03.01 Gas, Dust and Light Management
	APA HSE EP 13.03.02 Noise and Vibration Management
	APA HSE EP 13.07.02 Aboriginal Cultural Heritage
	APA HSE EP 13.07.01 Natural and Built Heritage
	APA HSE EP 13.06.01 Soil and Land Management
	APA HSE EP 13.06.02 Watercourse Management
	APA HSE EP 13.02.01 Native Vegetation Management
	APA HSE EP 13.02.02 Fauna Management
	APA HSE EP 13.02.03 Pest Disease and Weed Management
	APA HSE EP 13.05.01 Regulated Waste Management
	APA HSE EP 13.05.02 General Waste Management
	APA HSE EP 13.05.03 Wastewater Management
Other Relevant APA Documents	18035-PL-HSE-0004 Construction Environment Management Plan
	18035-PL-A-0001 Project Management Plan
	WPT.2373-DBM-A-0001 Design Basis Manual

26.3 Appendix C: Definitions

APA Group	The Principal/Client Organisation responsible for the overall design, construction, testing, inspection, operation and maintenance of pipelines. For licensed pipelines, this is the "licence holder".
AS	Australian Standard
As Low As Reasonably Practicable (ALARP)	A level of risk that is not intolerable, and cannot be reduced further without the expenditure of costs that are grossly disproportionate to the benefit gained.
Audit	A critical examination of all or part of the total project management system with reference to health and safety.
CEMP	Construction Environment Management Plan
CHSMP	Construction Health & Safety Management Plan
Competent Person	A person who has acquired, through training, qualification, or experience, or a combination of these, the knowledge and skills, including the Health and Safety knowledge and skills, qualifying that person to perform the task required.
Consequence	The outcome of a hazardous event or possible range of outcomes associated with an event, injury, loss or damage.
Control Measures	Actions to eliminate or reduce the chance of an event occurring or to reduce the effect of the hazard event if it does occur.
Contractor	A person or company acting under a contract to provide services such as labour, equipment or expertise.
Construction	Work involving, or directly associated with, the building, structural alteration, services installation, finishing/fit-out, dismantling or demolition of a building or structure, and includes the on-site management, supervision and/or direction of such work, including the on-site provision or preparation of technical advice.
Dangerous Incident	<p>A dangerous incident is an incident in relation to a workplace that exposes a worker or any other person to a serious risk to a person's health or safety emanating from an immediate or imminent exposure to:</p> <ul style="list-style-type: none"> • An uncontrolled escape, spillage or leakage of a substance

	<ul style="list-style-type: none"> • An uncontrolled implosion, explosion or fire • An uncontrolled escape of gas or steam • An uncontrolled escape of a pressurised substance • Electric shock that is not a serious electrical incident or a dangerous electrical event • The fall or release from a height of any plant, substance or thing • The collapse, overturning, failure or malfunction of, or damage to, any plant that is required to be authorised for use in accordance with the regulations • The collapse or partial collapse of a structure • The collapse or failure of an excavation or of any shoring supporting an excavation • The inrush of water, mud or gas in workings, in an underground excavation or tunnel • The interruption of the main system of ventilation in an underground excavation or tunnel.
Employee	Any individual engaged to perform work on the project site or easement on behalf of the licence holder or Principal Contractor and includes employees contractors or in a self-employed capacity.
Employee Health and Safety Representative	An employee elected representative and member of a health and safety committee to represent a group of employees on Workplace Health and Safety matters.
ERP	Emergency Response Plan
Hazard	A source or a situation with a potential for harm in terms of human injury or ill-health, damage to property, damage to the environment or a combination of these.
Hazard/Risk Control	Hazard or risk reduction actions that are undertaken to reduce the risk to as low as is reasonably practicable.
HAZID	<p>Hazard Identification Study</p> <p>A HAZID review seeks to identify hazards at a global level. Many of these hazards will be external to the hydrocarbon process (e.g. environmental forces, dropped objects, human errors) but process or facility related hazards (e.g. overpressure), may also be addressed at a high level.</p>
HS	Health and Safety

HSE	Health Safety Environment
HSMP	Health and Safety Management Plan
Incident	Any unplanned event resulting in, or having a potential for injury, ill health, damage or loss. Includes Near Miss events.
LP	Low Pressure
Lost Time Injury	An injury sustained by a worker whereby they are not able to return to work for their next rostered shift, as defined in AS 1885.
Medical Treatment Injury	Any injury sustained by a worker where treatment by a doctor is required, but the worker is able to return to work at full duties (refer to AS 1885).
Near Miss	An unplanned event that did not result in injury, illness, or damage – but had the potential to do so. Alternatively described as Near Collision or a Near Hit.
Non Negotiables	APA Non Negotiable as set out in documentation
Notifiable Incident (Workplace Health and Safety)	Notification is required where an incident at a workplace results in: <ul style="list-style-type: none"> • death, • serious injury or serious illness of a person, or • involves a dangerous incident.
PCBU	Person in Control of the Business or Undertaking
Plant	Includes: <ul style="list-style-type: none"> (a) Any machinery, equipment, appliance, implement and tool; and (b) Any component of any of those things; and (c) Anything fitted, connected or related to any of those things.
PPE	Personal Protective Equipment
Principal Contractor (PC)	For a construction workplace (other than a construction workplace for domestic premises) the principal contractor is: <ul style="list-style-type: none"> • The person appointed as principal contractor by the owner of the workplace; • If no principal contractor is appointed, the owner of the workplace; and

	<ul style="list-style-type: none"> For a construction workplace for domestic premises, the principal contractor is the person in control of the workplace.
<p>Risk</p>	<p>Combination of the frequency, or probability, of occurrence and the consequence of a specified hazardous event.</p>
<p>Safeguard (APA)</p>	<p>Safeguard is APA's QHS&E Management System. The QHS&E documentation system is for all APA Policies & Procedures for the APA Group.</p>
<p>Serious Injury or Illness</p>	<p>An injury or illness requiring the person to have:</p> <ul style="list-style-type: none"> Immediate treatment as an in-patient in a hospital Immediate treatment for: The amputation of any part of his or her body A serious head injury A serious eye injury A serious burn The separation of his or her skin from an underlying tissue (such as degloving or scalping) A spinal injury The loss of a bodily function Serious lacerations or Medical treatment (treatment by a doctor) within 48 hours of exposure to a substance <p>Any infection to which the carrying out of work is a significant contributing factor, including any infection that is reliably attributable to carrying out work:</p> <ul style="list-style-type: none"> With micro-organisms; or That involves providing treatment or care to a person; or That involves contact with human blood or body substances; or That involves handling or contact with animals, animal hides, skins, wool or hair, animal carcasses or animal waste products. <p>The following occupational zoonosis contracted in the course of work involving the handling or contact with animals, animal hides, skins, wool or hair, animal carcasses or animal waste products:</p>

	<ul style="list-style-type: none"> • Q fever • Anthrax • Leptospirosis • Brucellosis • Hendra virus • Avian influenza • Psittacosis
SOP	Safe Operating Procedure describes the precautions to take when operating plant or equipment.
Sub-contractor	A person or company engaged by the Contractor under a contract to provide services such as labour, equipment or expertise.
SWI	Safe Work Instruction describes the methodology for the management of a specific hazard.
SWMS	Safety Work Method Statement incorporates the Work Method and describes the construction controls to minimise risk for construction/commissioning work packages. Incorporates specific controls to be in place to obtain an acceptable level of residual risk.
TRI	Total Recordable Incidents - Fatalities + Lost Time Injuries + Medical Treatment Injuries.

26.4 Appendix D: Notifiable Prescribed Incidents

Notifiable Incidents or dangerous occurrences where an employee/s sustain serious injuries or involving registered plant or involving imminent risk of explosion, fire or serious bodily injury shall be reported to WorkSafe Victoria.

Where an incident is required to be reported to any Government Authority, the incident will be reported immediately to Worksafe by the Principal Contractor, and APA shall be notified immediately. A copy of all written reports on all reportable incidents will be retained on site and at the project office.

It shall be the responsibility of the APA Construction Manager to report to the APA Project Manager any of the following events, initially and immediately by telephone to be followed up in writing.

If any of the reportable incidents listed below occur, Worksafe Victoria must be notified as per the Victorian OHS Act 2004. :

- death, or
- serious injury

Serious injury is used in this context to describe those incidents that result in the consequences described in section 37(1) of the Act. They include, but are not limited to, incidents that result in a person requiring:

- medical treatment within 48 hours of exposure to a substance
- immediate treatment as an in-patient in a hospital
- immediate medical treatment for:
 - amputation
 - serious head injury
 - serious eye injury
 - separation of skin from underlying tissue (for example de-gloving or scalping)
 - electric shock
 - spinal injury
 - loss of bodily function
 - serious lacerations

The notification duty also applies to incidents that expose a person in the immediate vicinity to an immediate health or safety risk through incidents including:

- the collapse, overturning, failure or malfunction of, or damage to, plant that is required to be licensed or registered
- the collapse or failure of an excavation or of any shoring supporting an excavation
- the collapse or partial collapse of a building or structure
- an implosion, explosion or fire

- the fall or release from a height of any plant, substance or object;
- the escape, spillage or leakage of any substance including dangerous goods.

26.5 Appendix E: Notifying under the Pipelines Act 2005

S20 of the *Pipelines Regulations 2017* establishes the requirement for notification of a *reportable environmental incident* or a *reportable safety incidents* arising from the activities under the pipeline licence within Victoria. Energy Safe Victoria and the Minister is the regulator of pipelines in Victoria.

Reportable environmental incidents are defined in the *Pipelines Regulations 2017* as incident arising out of a pipeline operation:

- that causes substantial damage to the environment; or
- that has significant potential impact on the environment.

Reportable safety incidents are defined in the *Pipelines Regulations 2017* as incident arising out of a pipeline operation that causes:

- any person to suffer a serious injury or to die;
- substantial damage to, or destruction of, property; or
- an ignition or escape of anything being conveyed in a pipeline.

The contact details for notifying the Minister, DELWP and **Energy Safe Victoria** about a *reportable environmental incident* or a *reportable safety incident* are:

- immediate (but no later than 2 hours after becoming aware of the incident) notification must be made in writing to esvreports@energysafe.vic.gov.au and pipeline.regulation@delwp.vic.gov.au as well as by telephone:
 - ESV Duty Controller 1800 671 337
 - DELWP Incident Reporting 0439 799 598
- written report on the incident within 7 days of the date of occurrence of the incident. Refer s20(4) of the *Pipelines Regulations 2017* for the content of reports on *reportable environmental incident* or a *reportable safety incidents*.

26.6 Environmental Protection Act

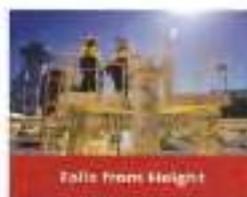
Incidents causing or threatening serious or material harm under the *Environment Protection Act 1994* must be reported to the Environment Protection Authority (EPA). The EPA require notification as soon as reasonably practical but in any case within two hours of becoming aware of an incident which results in the release of solid, liquid or gas (or a combination thereof) that is not specifically authorised by an environmental authorisation and is not trivial.

26.7 Appendix F APA Fatal Risk Protocols

APA Group

HEALTH, SAFETY & ENVIRONMENT FATAL RISK PROTOCOLS

Fatal risks relate to high or extreme consequence activities that may be performed in APA workplaces. If these activities are not managed and performed safely they could, in some circumstances, result in incidents and even fatalities.



APA has developed a suite of Fatal Risk Protocols that set out the minimum requirements to manage these risks.

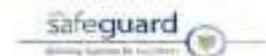
They include statements to assist people in the identification, assessment, control and successful management of workplace hazards.

Key actions required are:

Be aware of these hazards in the workplace.

The Fatal Risk Protocols must be implemented in their fullest at all APA sites.

All staff and contractors must comply with all aspects of the Safeguard Fatal Risk Protocols at all times.



26.8 Appendix G Construction Processes and their Associated Typical Hazards

Process	Typical Hazards	Typical Management and Control Strategies
Landowner Consultation and Survey	<ul style="list-style-type: none"> • Working alone • Driving • Weather • Unsupervised remote work • Poor communications • Natural hazards • Fauna, stock and snakes • Dehydration 	<ul style="list-style-type: none"> • Procedures and JHEAs • Remote communications equipment • Check-in processes • Well-equipped vehicles • Maps, GPS • PPE • First aid kits and qualifications • Adequate water
Fencing	<ul style="list-style-type: none"> • Working alone • Natural hazards • Poor communications • Falling trees • Electric fences, • Fauna, stock and snakes • Use of chainsaws • Barb wire • Walking on uneven ground • Dehydration • Overhead and underground hazards 	<ul style="list-style-type: none"> • Procedures and JHEAs • Radio contact • First aid kits and qualifications • Adequate water • PPE including gloves • Manual Handling training • Dial Before you Dig
Clear and Grade	<ul style="list-style-type: none"> • Overhead and underground hazards • Dust/ Poor visibility • Inexperienced Operators 	<ul style="list-style-type: none"> • Procedures and JHEAs • Dial Before you Dig • Ticketed Operators



	<ul style="list-style-type: none"> • Poor ground conditions • Personnel in vicinity 	<ul style="list-style-type: none"> • Radio communications in all vehicles • Signage on Power lines • Check ground conditions • Inductions and PPE • First aid kits and qualifications in crew • Check area before reversing or slewing
<p>Pipe Stringing and load out</p>	<ul style="list-style-type: none"> • Overhead hazards due to lifting, carrying, strapping and rigging • Crushing • Swinging pipe • Dropped loads • Rolling pipe • Slips, trips and falls • Wet, uneven and/or slippery surfaces • Inexperienced Operators 	<ul style="list-style-type: none"> • Procedures and JHEAs • Power lines marked; vehicle heights & crane reach known • Qualified and experienced dogman and operators • Areas kept clear where lifting activities take place • Test loads • Lifting equipment inspections and registers • Stable areas nominated for pipe locations • Hands clear of pipe • Observe maximum working at heights limits • Personnel clear of the fall zone of the pipe

		<ul style="list-style-type: none"> • PPE includes good footwear, gloves and hardhats • Vacuum lift, pipe marked at centres • Transport Management Plan • First aid kits and qualified personnel in crew
Pipe Bending	<ul style="list-style-type: none"> • Crushing • Swinging pipe • Slips, trips and falls • Wet, uneven and/or slippery surfaces • Burns • Fire • Inexperienced Operators 	<ul style="list-style-type: none"> • Procedures and JHEAs • PPE including gloves • First aid kits and qualified personnel in crew • Qualified and experienced dogman and operators • Clear of bending machine when in operation • Personnel clear of the fall zone of the pipe
Trenching including exposing buried services by hand	<ul style="list-style-type: none"> • Slips, trips and falls • Electricity • Manual handling • Overhead hazards • Underground hazards • Dust • Snakes and fauna • Trench collapse • Wet, uneven and/or slippery surfaces • Inexperienced Operators 	<ul style="list-style-type: none"> • Procedures and JHEAs • Power line signage • Dial Before you Dig • First aid kits and qualified personnel in crew • Remain clear of machines when starting • Competent ticked operators • Awareness of conveyors and

		<p>exposed moving parts</p> <ul style="list-style-type: none"> • Guarding to remain in place • Remain safe distances from working machinery • PPE to include hearing protection and safety glasses • Persons setting range poles to be clear of and aware of ditching machine • No entering trenches >1.5m • Personnel to remain clear of trench edges • Isolate machines for maintenance
<p>Welding, cutting and Tie-ins</p>	<ul style="list-style-type: none"> • Falling or swinging pipe • Springing pipe – unexpected pipe movement • Crushing • Sparks, buffer wire and burrs • Broken grinding discs • Grinder kickback • Air pressure hoses • Slips, trips and falls • Eye injuries- dust, particles and weld flash • Burns • Fire • Oxygen and acetylene 	<ul style="list-style-type: none"> • Procedures and JHEAs • No standing between pipe and boom • First aid kits and qualified personnel in crew • PPE includes gloves, double eye protection, anti-flash safety glasses • Pre-use inspections for equipment, hoses and cables • Firefighting equipment incl. water tank • Secure and stable skidding of pipe

	<ul style="list-style-type: none"> • Electrical hazards (overhead, underground) • Manual handling • Wet, uneven and/or slippery surfaces 	<ul style="list-style-type: none"> • Earthing of pipe • Hands clear of pipe
NDT	<ul style="list-style-type: none"> • Radiation exposure • Radiation Sources • Chronic health effects • Long term illness and /or death 	<ul style="list-style-type: none"> • Procedures and JHEAs • First aid kits and qualified personnel in crew • Radiation Management Plan • Trained and qualified personnel • Signage • Barriers • Training and induction of personnel • Radiation monitoring
Blasting and Field Joint coating	<ul style="list-style-type: none"> • Abrasive blasting • Pressure hazards • Dust • Chemicals • Manual handling • Air quality • Fire/explosion • Air pressure hoses • Sips, Trips and falls • Chemical fumes and skin exposure • Fire • Static electricity • Wet, uneven and/or slippery surfaces 	<ul style="list-style-type: none"> • Procedures and JHEAs • Personnel to be clear of grit blasting area, signage • First aid kits and qualified personnel in crew • PPE incl. safety glasses and blasting helmet • Ventilation suit with filter and air intakes clear • Pre-use inspection checks • Certified blasting equipment • Use less hazardous blasting medium



		<ul style="list-style-type: none"> • Hose fittings, dead man switches, whip checks, etc. • Housekeeping practices • MSDS • Manual handling training • Chemical handling procedures • PPE to include those required by MSDS • Fire extinguishers • No smoking in vicinity of flammable chemicals • Job rotation
<p>Lowering -in</p>	<ul style="list-style-type: none"> • Overhead hazards • Falling pipe • Crushing • Slips, Trips and Falls • Wet, uneven and/or slippery ground • Inexperienced operators • Open trench, trench collapse • Electrical shock 	<ul style="list-style-type: none"> • Procedures and JHEAs • First aid kits and qualified personnel in crew • Power lines marked • No standing between pipe and boom • Spotters as necessary • Lifting equipment register • Pre-use inspections • PPE to include hard hats • Earthing strings • Trained in use of Jeeper

		<ul style="list-style-type: none"> • No entry to trench >1.5 m • Competent ticketed operators
Bedding, Padding, Backfill	<ul style="list-style-type: none"> • Overhead hazards • Open trench, trench collapse • Dust • Slips, Trips and Falls • Wet, uneven and/or slippery ground • Moving plant • Inexperienced Operators 	<ul style="list-style-type: none"> • Procedures and JHEAs • First aid kits and qualified personnel in crew • No entry to trench >1.5 m • Spotters • PPE to include safety glasses and dust masks • Reversing alarms, flashing lights • Competent ticketed operators • Eye contact with operators
Reinstatement	<ul style="list-style-type: none"> • Overhead hazards • Moving plant • Uneven ground • Dust 	<ul style="list-style-type: none"> • Procedures and JHEAs • First aid kits and qualified personnel in crew • Reversing alarms, flashing lights • Marking of power lines • PPE to include hearing protection • Eye contact with operators • Ensure area clear before operating equipment • Fire extinguishers • Plant pre-use inspections

		<ul style="list-style-type: none"> Assess area for hazards (e.g. excessive slope, rocks, slippery/muddy conditions)
Hydrotesting, Clean and Dry Pipe.	<ul style="list-style-type: none"> Chemicals and fuel Slips, Trips and Falls Working in Bellholes Manual handling High pressure hoses 24/7 work. 	<ul style="list-style-type: none"> Procedures and JHEAs Appropriately rated whip checks Correctly rated hoses MSDS Fire extinguishers Pre-use inspections Emergency plan for site Tested and tagged equipment Lifting aids such as cranes Radio communications Monitoring of pressures Secure area, Signage and barricading of the area Access and egress from bellhole Earthing Shift work, Fatigue Management Plan
Horizontal Directional Drilling and Boring	<ul style="list-style-type: none"> Overhead hazards Slips, trips and falls Crushing High pressure hoses Underground hazards 	<ul style="list-style-type: none"> Procedures and JHEAs Housekeeping PPE Shift work, Fatigue Management Plan

	<ul style="list-style-type: none"> • 24/7 work. • Working in Bellholes 	<ul style="list-style-type: none"> • Lifting aids such as cranes • Access and egress from bellhole • Secure area, Signage and barricading of the area • Appropriately rated whip checks • Correctly rated hoses • Dial Before you Dig
<p>General Labouring Tasks that includes skid handling, water and fuel trucks, trades assistants, fauna handlers etc.</p>	<ul style="list-style-type: none"> • Strains • Sprains • Work at height • Slips, trips and falls • Manual handling injuries (cuts and abrasions) • Snakes and fauna • Trench collapse • Wet, uneven and/or slippery surfaces • Fuel 	<ul style="list-style-type: none"> • JHEAs • Task assessments • First aid kits and qualified personnel in crew • Minimise size and weight of sandbags • Rotate tasks • Mechanical lifting devices • Gloves
<p>Camp and Workshop</p>	<ul style="list-style-type: none"> • Slips, trips and falls • Chemical exposure and spills • Rotating machinery • Sharp objects • Fire 	<ul style="list-style-type: none"> • Procedures and JHEAs • First aid kits and qualified personnel • Emergency response plan • Housekeeping • Food and hygiene inspections • Workshop inspections • Training

<p>Refuelling</p>	<ul style="list-style-type: none"> • Fire • Explosion • Slips, trips and falls • Spills 	<ul style="list-style-type: none"> • Procedures and JHEAs • No source of combustion within 20m of refuelling activity • Earthing
<p>Commissioning</p>	<ul style="list-style-type: none"> • Live gas environment • Live electrical equipment • Unidentified hazards 	<ul style="list-style-type: none"> • Commissioning planning • Commissioning procedures and plan • Permit systems • Tagging and Isolation • Barricading, fencing, and locking • Authorised personnel • Competent commissioning personnel

Attachment 4 – Pipeline Consultation Plan

Privacy Statement

Any personal information about you or a third party in your correspondence will be protected under the provisions of the Privacy and Data Protection Act 2014. It will only be used or disclosed to appropriate Ministerial, Statutory Authority, or departmental staff in regard to the purpose for which it was provided, unless required or authorised by law. Enquiries about access to information about you held by the Department should be directed to the Privacy Coordinator, Department of Environment, Land, Water and Planning, PO Box 500, East Melbourne, Victoria 8002



CONSULTATION PLAN

Western Outer Ring Main Project

Project No		18035			
Document No		18035-PL-LH-0001			
Rev	Date	Status	Originated/ Custodian	Checked	Approved
3	12/05/2021	Draft for review	[Redacted]	[Redacted]	[Redacted]
			[Redacted]	[Redacted]	[Redacted]
			Project Community Engagement Advisor	Access and Approvals Project Manager	Manager Access and Approvals - SE
2	15/07/2020	Issue for Review	[Redacted]	[Redacted]	[Redacted]
			[Redacted]	[Redacted]	[Redacted]
			Manager Approvals and Community Liaison	Access and Approvals Project Manager	Manager Access and Approvals - SE
1	01/03/19	Issued for Use	[Redacted]	[Redacted]	[Redacted]
			[Redacted]	[Redacted]	[Redacted]
			EA Advisor	Environmental Assessment Manager	Manager - A & A Projects
0	15/01/19	Issued for Use	[Redacted]	[Redacted]	[Redacted]
			[Redacted]	[Redacted]	[Redacted]
			EA Advisor	Environmental Assessment Manager	A&A Manager - VIC, SA & WA
A	17/12/18	Draft for Review	[Redacted]	[Redacted]	[Redacted]
			[Redacted]	[Redacted]	[Redacted]
			EA Advisor	A&A Manager - VIC, SA & WA	Manager - A & A Projects

© Copyright APA 2018



Table of contents

1.	INTRODUCTION.....	5
1.1	Purpose and scope.....	5
1.2	Abbreviations.....	6
1.3	Document references.....	7
2.	PROJECT OVERVIEW.....	8
2.1	The Project.....	8
2.2	Proponent.....	9
2.3	Project Rationale.....	10
2.3.1	Victorian Transmission System Context.....	10
2.3.2	Natural Gas Storage Facilities.....	12
2.3.3	Project benefits.....	12
2.3.4	Unlocking capacity to and from Port Campbell.....	12
2.3.4.1	Security of supply.....	12
2.3.4.2	Operational benefits of the Project.....	12
2.3.4.3	Reducing reliance on Brooklyn Compressor station site.....	13
2.3.4.4	Future growth.....	13
3.	PIPELINE ROUTE SELECTION.....	14
3.1	Project Alternatives.....	14
3.2	Constraints identification.....	14
3.3	Route Selection Process.....	15
4.	CONSULTATION APPROACH.....	17
4.1	APA Policy.....	17
4.2	Consultation and Engagement Principles.....	17
4.3	Consultation objectives.....	18
4.4	Engagement Objectives.....	19
4.5	Consultation outcomes and reporting.....	19
4.6	Communication tools and techniques.....	20
5.	IDENTIFICATION OF RELEVANT STAKEHOLDERS.....	21



6. PROJECT DEVELOPMENT AND STAGES OF CONSULTATION..... 22

6.1 Phase 6: Pipeline construction.....24

6.1.1 Purpose of the consultation.....24

6.1.2 Means of consultation.....24

6.1.2.1 Pre-construction24

6.1.2.2 Construction25

6.1.2.3 Notifying owners, occupiers and stakeholders25

6.1.2.4 Reinstatement and rehabilitation.....25

6.1.3 Timing of consultation25

6.1.4 Monitoring and verification26

6.2 Phase 7: Handover / closeout phase27

6.2.1 Purpose of the consultation.....27

6.2.2 Monitoring and verification27

6.3 Phase 8: Pipeline operation27

6.3.1 Purpose of the consultation.....28

6.3.2 Means of consultation.....28

6.3.3 Timing of consultation29

6.3.4 Monitoring and verification30

7. MEDIA 30

8. COMPLAINT AND GRIEVANCE MANAGEMENT 31

8.1 Complaints management31

8.1.1 Guidelines.....31

8.1.2 Negative Feedback vs Complaints31

8.1.3 Complaints Procedure32

8.1.4 Lodging a complaint.....32

8.1.5 Record keeping33

9. MANAGEMENT OF POTENTIAL IMPACTS..... 33

10. COMPULSORY ACQUISITION OF LAND..... 35

10.1 Pipelines Act.....35

CONSULTATION PLAN

Western Outer Ring Main Project



10.2	Land Acquisition and Compensation Act	35
11.	PROJECT TIMEFRAMES	36
12.	RECORDS MANAGEMENT	37
12.1	Personal Information.....	37
13.	FURTHER INFORMATION	38
13.1	Proponent.....	38
13.2	Regulatory agencies.....	38
13.2.1	Department of Environment, Land, Water and Planning	38
13.2.2	Energy Safe Victoria.....	39
14.	OTHER REFERENCE DOCUMENTATION	39
APPENDIX A	INFORMATION FOR THE PUBLIC (KEY MESSAGES)	41
APPENDIX B	CHECKLIST OF REQUIREMENTS FOR A CONSULTATION PLAN	43
APPENDIX C	IMPLEMENTATION PLAN	45
APPENDIX D	GLOSSARY	48
APPENDIX E	CONSULTATION REPORT	50
APPENDIX F	STAKEHOLDER ENGAGEMENT MATRIX	51
APPENDIX G	PROJECT INFORMATION BROCHURE	55
APPENDIX H	PROJECT COMMUNICATION - WRITTEN NOTICES (EXAMPLES)	56



1. INTRODUCTION

APA VTS Australia (Operations) Pty Limited, a subsidiary of the APA Group (APA) is proposing the construction and operation of the Western Outer Ring Main (the Project), a 600mm diameter gas transmission pipeline between Plumpton and Wollert to connect the eastern and western sections of the Victorian Transmission System (VTS).

APA has undertaken several revisions of this Consultation Plan to reflect various stages of the project lifecycle. The overarching intent of the Plan is to address how APA proposes to consult and interact with stakeholders, particularly landowners and occupiers, likely to be affected by the Project.

The latest revision (V3) includes updates outlining APA's intent to proactively approach stakeholder engagement and communication of construction matters and to address the impacts associated with construction of the Project.

In addition to this plan, an Environment Effects Statement (EES) Consultation Plan (18035-RP-HSE-0001) was prepared as part of the regulatory requirements of the *Environment Effects Act 1978*. The EES Consultation Plan informs the consultation and engagement that would be undertaken during the preparation of the EES phase. Through these plans, APA has committed to proactive engagement with stakeholders and communities impacted by the pipeline corridor. This Consultation Plan sets out the consultation commitments for beyond EES preparation and into construction phases.

All activities performed in accordance with this Consultation Plan shall comply with the relevant acts, regulations, standards and codes of practice of all regulatory authorities having jurisdiction over the activities. When conflict exists between various applicable documents, the following order of preference shall apply, in decreasing order of precedence:

- Acts of law or other legislation;
- Government licenses and permits;
- APA Standards; and
- Local standards.

Where APA requirements are more stringent, they shall take precedence. Any identified discrepancies in this Consultation Plan should be reported to the document owner for remedy. If you are reading a hard copy of this document, please consider it uncontrolled.

1.1 Purpose and scope

This Consultation Plan is prepared in accordance with Part 4, Division 1 of the Victorian *Pipelines Act 2005* (**Pipelines Act**) and requirements of the *Pipelines Regulations 2017* (**Pipelines Regulations**). Section 17 of the Pipelines Act outlines the requirements for a consultation plan. A checklist of these requirements with the contents of this Plan is provided in **Attachment A**.

This Consultation Plan is also prepared in accordance with Objective 3c and Sections 128(1) and 135(1) and regulation 47 and 48(7) of the Pipelines Act, which set out requirements for the licence holder to develop sound consultative processes and to consult any person who owns, occupies or manages the land for the construction and operation of the pipeline.

The consultation plan meets these requirements by:

Outlining the communication and engagement principles, objectives and delivery commitments;

- Identifying the key Project stakeholders and analysing the key messages and engagement and communication tools to reach those stakeholders;
- Detailing roles and responsibilities required to carry out the Plan;
- Detailing process to monitor and review the consultation performance and continually improve.
- The Consultation Plan is based on the intent of the following guidance documents:
 - The Australian Pipelines and Gas Association (APGA) Stakeholder Engagement Guidelines (2015);
 - The APGA and Victorian Farmers Federation's (VFF) Pipeline easement guidelines (2009);
 - The former Department of Primary Industry's Guidelines for the preparation of pipeline consultation plans – Pipelines Act 2005;
 - The International Association for Public Participation Australasia (IAP2's) Public Participation Spectrum (2014); and
 - The Victorian Auditor-General's Office Auditing in the Public Participation in Government Decision-making – Better practice guide (2015).

These guidelines intend to promote best practice and a positive relationships between landowners, occupiers and pipeline companies and meeting relevant regulatory requirements for the content requirements of a consultation plan.

1.2 Abbreviations

The abbreviations used in this document are listed in **Table 1.1**. A glossary of commonly utilised pipeline industry terminology has been attached as **Attachment B**.

Table 1.1: Abbreviations

Item	Definition
APA	APA Group
APGA	Australian Pipelines and Gas Association
BLP	Brooklyn Lara Pipeline

CONSULTATION PLAN

Western Outer Ring Main



CEMP	Construction Environmental Management Plan
DELWP	Victorian Department of Environment, Land, Water and Planning
EE Act	<i>Environment Effects Act 1978 (Vic)</i>
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999 (Cth)</i>
ESV	Energy Safe Victoria
HSE	Health, safety and environment
LDP	Longford Dandenong Pipeline
MAOP	Maximum Allowable Operating Pressure
Pipelines Act	<i>Pipelines Act 2005 (Vic)</i>
Pipelines Regulations	<i>Pipelines Regulations 2017 (Vic)</i>
SWP	South West Pipeline
The Project	Western Outer Ring Main Project
UGS	Underground Gas Storage Facility
VFF	Victorian Farmers Federation
VNI	Victorian Northern Interconnect
VTS	Victorian Transmission System
XIC	X-Info Connect

1.3 Document references

All work performed in accordance with this Consultation Plan shall be in conformance with the current issue, including amendments, of those national and international standards, codes of practice, guidelines and APA documents listed in

Table 1.2.

Table 1.2: APA referenced documents

Item	Definition
120-PR-QM-0001	Document Control Procedure
320-PL-HEL-0015, 320-PL-HEL-0016, 320-PL-HEL-0017	Operating Environmental Management Plan – VIC

& 320-PL-HEL-
0018

560-PR-QM-0001 Landowner Engagement Procedure

560-PR-QM-0004 Authorised Third Party Works Management Procedure

GD-A-1051 Community Consultation Planning Guide

POL-A-2010 Community Consultation Policy

2. PROJECT OVERVIEW

2.1 The Project

The Western Outer Ring Main is a proposed 600mm diameter high pressure gas transmission pipeline between APA's existing Plumpton Regulating Station and the Wollert Compressor Station (located ~30km north east of Plumpton) which will provide an additional connection between the eastern and western pipeline networks of the Victorian Transmission System (VTS).

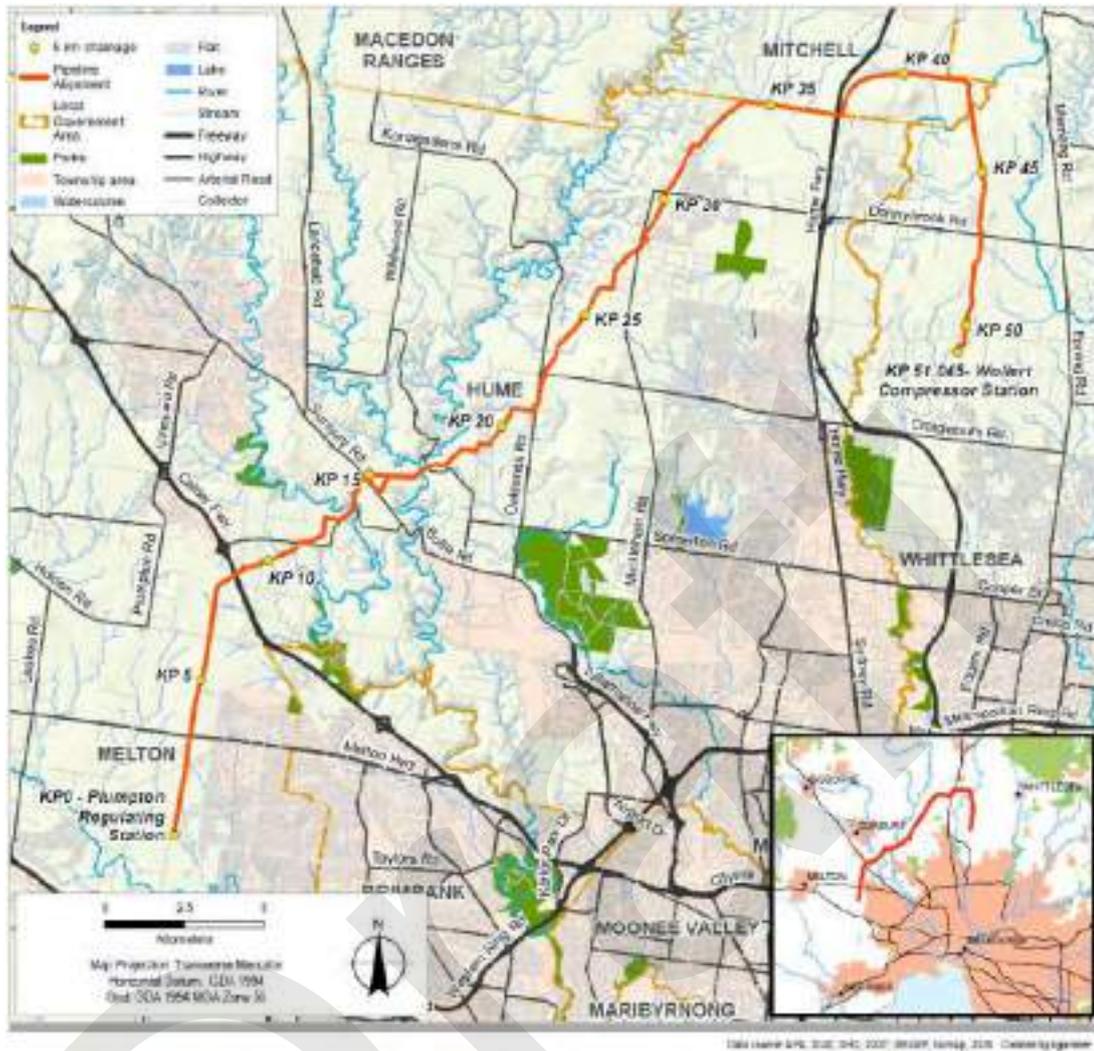
The pipeline will occupy an easement of nominally 15m width and be buried for its entire length to a minimum depth of 750mm. Additional compression and a regulating station are also proposed as part of the Project at APA's existing Wollert Compressor Station Site.

The pipeline and all the associated facilities will be designed, constructed, commissioned and operated in accordance with AS2885 and a Pipeline Licence, which would be required pursuant to the Pipelines Act.

Figure 2-1: Western Outer Ring Main

CONSULTATION PLAN

Western Outer Ring Main



2.2 Proponent

APA is the proponent of the Project. APA is Australia's largest natural gas infrastructure business, owning and/or operating approximately \$21 billion of energy assets. Its gas transmission pipelines span every state and territory in mainland Australia, delivering approximately half of the nation's gas usage. APA has direct management and operational control over its assets and investments.

APA also has ownership interests in, and operates the Allgas gas distribution network, as well as operating the Australian Gas Networks (formerly Envestra Limited), which together have approximately 27,000km of gas mains and approximately 1.4 million gas consumer connections.

APA currently owns and operates 15,000km of natural gas pipelines, as well as owning or having interests in gas storage facilities, gas-fired power stations and wind/solar farms.

Further information on APA operations and activities is available on the APA website: <https://www.apa.com.au/>

2.3 Project Rationale

2.3.1 Victorian Transmission System Context

The Victorian Transmission System (VTS) has three main branches, as follows:

The Longford Dandenong Pipeline (LDP) which lies between Dandenong in Melbourne's south east and South Eastern Victoria;

The Victorian Northern Interconnect (VNI) which lies between Wollert in Melbourne's north and the NSW border; and

The South West Pipeline (SWP) which lies between Brooklyn in Melbourne's west and South Western Victoria.

The LDP and the VNI are linked by the high pressure Outer Ring Main (Pakenham to Wollert Gas Pipeline) and this provides the ability to send gas under high pressure between these two pipelines. The Outer Ring Main is a 93.1km long 750mm pipeline with a Maximum Allowable Operating Pressure (MAOP) of 6,890 kPag.

There is no equivalent link, operating at high pressures, between either the VNI and the SWP or the LDP and the SWP. Sending gas between these non-linked pipelines involves using the lower pressure Melbourne pipeline network, and this limits the amount of gas that can be moved across Victoria in this direction. The Project is therefore the missing link in the VTS.

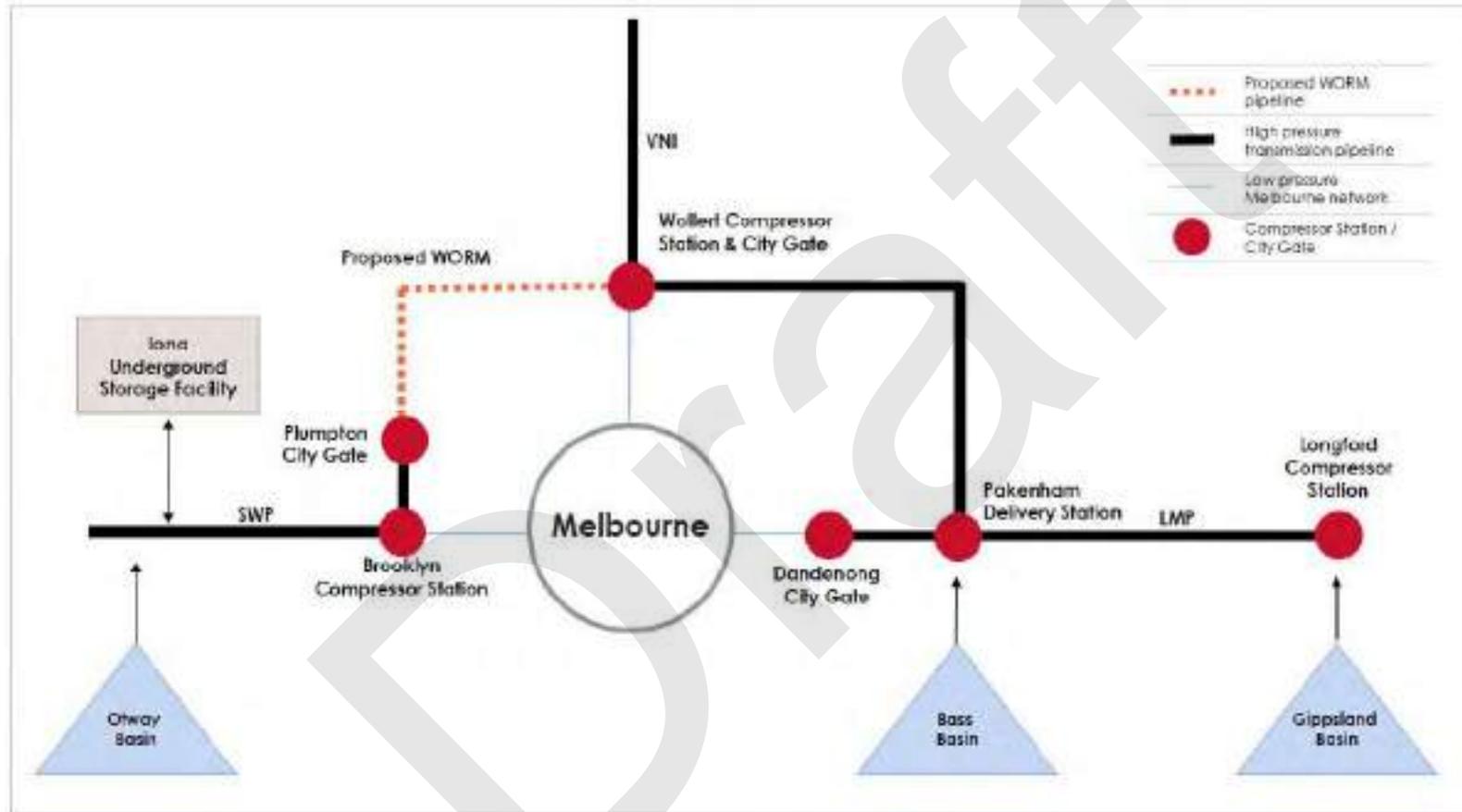
The schematic below (**Figure 2-2**) shows a diagrammatic representation of the VTS and the current constraint to gas flow between the east and west systems.

CONSULTATION PLAN

Western Outer Ring Main



Figure 2-2: Victorian Transmission System Schematic



2.3.2 Natural Gas Storage Facilities

Victoria has two major natural gas storage facilities, Iona Underground Storage Facility (UGS) and Dandenong LNG Storage Facility. Of these two, the more significant in terms of storage capacity is the Iona UGS with a total storage capacity of 26PJ (compared to 0.7PJ for Dandenong LNG).

Lochard Energy owns the Iona UGS. Located near the town of Port Campbell, the Iona UGS uses a depleted gas field to store natural gas. The storage facility is connected to the SWP with the ability to be refilled from the SWP as well as being able to inject into the SWP to flow gas to Melbourne.

AEMO¹ has forecast that Victoria will face natural gas shortages should the WORM not be in-service by late 2022. Refilling and withdrawal rates for the Iona UGS are currently limited by capacity on the SWP. The Project will increase the SWP transportation capacity towards Port Campbell (to support Iona UGS refilling) and towards Melbourne to support peak day demand. The Project will therefore play a key role in helping to avoid the supply shortages forecast by AEMO.

2.3.3 Project benefits

The primary benefit of the Project is system security enabling increased east-west flow capacity between Longford and Iona, and also gas to and from the Victorian Northern Interconnect (VNI).

2.3.4 Unlocking capacity to and from Port Campbell

The Project would be able to move higher volumes of gas from the SWP, hence unlocking greater supply capacity to and from Port Campbell. This means higher refilling rates for the Iona UGS. Victoria relies on Iona UGS to meet winter maximum gas demand.

2.3.4.1 Security of supply

In the event of loss of supply from any of the market scheduled gas trains at Longford, Port Campbell (Iona UGS, Otway or Minerva) or Pakenham (Lang Lang), it would be possible for alternate supplies to be scheduled (i.e. using the Western Outer Ring Main).

Flow constraints on either SWP / Brooklyn Lara Pipeline (BLP) or eastern systems are also removed with the Project.

2.3.4.2 Operational benefits of the Project

A direct connection between the Western Outer Ring Main and the Pakenham to Wollert pipeline would allow gas to flow at high pressure interchangeably between the east and west pipeline systems with fixed operating set points and without direct operator intervention. The VTS will

¹ AEMO, Victorian Gas Planning Report Update, March 2021.

therefore be able to operate within a tighter band of operation than is currently achieved.

With the Project, there will be better management of the VTS. The Project provides increased capacity to store gas within the pipeline system, having the following benefits:

Linepack balancing: The capability of balancing linepack across the Western / Northern / Eastern systems using the Western Outer Ring Main and Wollert compressor hub reduces the risk of Longford or Port Campbell plant trip due to a high pressure constraint (e.g. early morning) in the supplying Longford or Port Campbell pipelines.

Gas Powered Generation readiness: Management of linepack depletion due to short-term operation of Gas Powered Generation in the first half of the gas day becomes easier with the facility to transfer gas across the Western Outer Ring Main as required, matching the available supply to the demand location.

Gas-on-gas competition: Ability to maintain gas contracts with the assurance that any surplus gas supply can be physically injected into the VTS, even in periods of low system demand.

2.3.4.3 Reducing reliance on Brooklyn Compressor station site

The Brooklyn compressors are currently used to refill the Iona UGS and also to maintain capacity on the Brooklyn to Ballarat and Geelong systems. The construction of the Project reduces the reliance on the Brooklyn compressor site both operationally and for future growth in capacity on the VTS.

With the Project, one compressor unit at Wollert would increase the capacity into the Iona UGS and would be achieved with significantly less than half the compression required compared to using two or more compressors at Brooklyn. Greater package efficiency (i.e. lower fuel per volume of gas moved) is therefore achievable by compressing at Wollert into the Western Outer Ring Main.

The Project also has the advantage of reducing fuel gas consumption and compressor maintenance costs to manage flows between Longford and Port Campbell. There will also be less reliance on Brooklyn compressors to compress gas towards Port Campbell.

2.3.4.4 Future growth

The Project provides capacity within the VTS for future growth in demand. APA estimates that the Project would be required for growth (in addition to the current system security benefits) by 2025. The proximity of the project proximal to increasing areas of demand in Melbourne's northern and western growth corridors positions it ideally to address this growth.

In combination with the Winchelsea compressor, the Project also provides additional capacity to support growth as a result of new Gas Fired Power Generation.

3. PIPELINE ROUTE SELECTION

3.1 Project Alternatives

A new high pressure pipeline between Plumpton and Wollert is the logical solution to address the identified constraints in the VTS. Possible alternative solutions to the Project such as a much longer pipeline west of Melton and north west of Sunbury or a pipeline south of the Melbourne urban area and across Port Philip Bay would come at considerably greater cost, which would ultimately be passed on to consumers, and therefore have not been further considered.

3.2 Constraints identification

APA identified key constraints between Plumpton and Wollert which were then used to inform development of pipeline route options. Key constraints for the area between Plumpton and Wollert were as follows:

Areas of existing residential and industrial urban development at Taylors Hill, Hillside, Diggers Rest, Caroline Springs, Bulla, Greenvale, Mickleham, Merrifield, Roxburgh Park, Kalkallo, Craigieburn, Somerton and Epping

Areas where urban development planning is proposed or well-advanced within the urban growth boundary in line with approved or proposed precinct structure plans

Existing and proposed quarrying operations

The location of major public and private facilities, including the Calder Park raceway, the Commonwealth quarantine station at Mount Ridley, and Melbourne Water operated assets at Greenvale Reservoir and the Kalkallo retarding basin

The location of existing major transport infrastructure including Melbourne Airport, the Sunbury and Craigieburn rail lines, the Calder and Hume freeways, and arterial roads

Major topographic features, comprised of steeply incised valleys (Deep Creek, Emu Creek and Jacksons Creek) and rises (Mount Fraser, Bald Hill, Redstone Hill, Aitken Hill, Mount Ridley, Woody Hill, Summer Hill)

Areas of high biodiversity value, including Organ Pipes National Park, Woodlands Historic Park, Holden Flora Reserve, Mount Ridley and Craigieburn Grassland nature conservation reserves, conservation areas prescribed under the Melbourne Strategic Assessment (MSA), likely occurrences of threatened species and ecological communities, and Merri Creek; and

Features and areas of social and cultural heritage significance, such as areas of indigenous cultural heritage sensitivity, sites listed on the Victorian Heritage Registry and inventory including the Holden cobbled stone road and Mickleham Avenue of Honour, Merri Creek, Jacksons Creek and places of religious significance.

3.3 Route Selection Process

Project specific pipeline route selection objectives were developed based upon the key constraints and opportunities identified during an initial assessment of potential route options. Based on this assessment five technically feasible route options were developed for detailed assessment before a preferred pipeline route was selected.

Specific parameters for qualitative and quantitative assessment of the pipeline route options were then identified. The assessment criteria were developed in line with the objectives of the Pipelines Act, the Australian Pipelines and Gas Association (APGA) Code of Environmental Practice and AS 2885. These criteria are:

- Capital cost
- Relative length
- Constructability
- Operability
- Infrastructure
- Approvals
- Community
- Land; and
- Environmental and heritage.

A ranking and scoring system was then applied to each of the options based on the above criteria. APA consulted with relevant stakeholders during the route selection process as described in Figure 3-1 below.

4. CONSULTATION APPROACH

4.1 APA Policy

APA has a Community Consultation Policy (POL-A-2010) that serves to explain APA's approach to community consultation. The policy applies to all staff and contractors of the entities that make up APA Group and/or represent APA in the community. As such, the Project will be developed in accordance with the Community Consultation Policy.

The Community Consultation Policy outlines the following values and commitment with respect to consultation processes:

"APA values and respects its relationships with the communities in which its assets and operations exist and focuses on ensuring that it remains engaged with its stakeholders to inform and engage them in meaningful ways on the activities it undertakes.

APA recognises that every community has insights, knowledge and experiences that can add value to, or improve the outcomes of, proposed activities it may take in a location. By tapping into these insights, knowledge and experiences, APA can improve its decision-making processes and develop better ongoing sustainable solutions.

APA is committed to meeting all applicable regulatory and legislative requirements and working with regional government group to fully communicate its approach and principles.

APA is also committed to building and maintaining relationships with all its stakeholders and ensuring each stakeholder community is recognised and listened to as appropriate to its ongoing work or specific projects."

In addition, APA has developed a Community Consultation Planning Guide (GD-A-1051), which assists staff to adhere to the above policy when identifying the appropriate approach and level of consultation for the activity they are to undertake. In addition to external guidance documents, this guide has been relied upon in the preparation of this Consultation Plan.

4.2 Consultation and Engagement Principles

The following key principles will guide APA's understanding and application of this plan for construction of the Project.

The key principles are:

Community engagement and communications – APA will ensure a proactive, and responsive approach for all communications regarding the Project to key stakeholders, including (but not limited to), Commonwealth, State and Local government, stakeholders and owners and occupiers.

Disruption notification – APA will ensure to provide stakeholders with details of extent and expected timeline for disruptions. APA will proactively plan construction to minimise negative impacts to the local community,

communicate impacts to the local community during disruption to manage community expectations and notify and thank community for patience on completion of disruptive work.

Community complaints – APA will ensure community complaints protocols and procedures are implemented as part of the consultation including response timing for complaints. APA will agree to raise any community complaints or issues directly with the Corporate Communications team so that as needed, an engagement approach and response time can be agreed;

Media – Should media issues occur which relate to the project, APA staff, contractors will ensure those issues are shared with APA Media contact in a timely manner (i.e. as soon as practicable, and generally no more than one hour after receipt) and all statements made in relation to the Pipeline are agreed between the Project team and Corporate Communications team before being issued.

Media contacts – APA will designate key media contacts to enable timely preparation and release of responses. Refer to Section 8.3.1 Designated media contact;

Land access – APA commits to provide prior notice as formally agreed with landholders when access is required and to be respectful of private property.

4.3 Consultation objectives

The primary objectives of the consultation activities proposed under this Consultation Plan are to:

- Ensure a consistent consultation approach is adopted during the Project
- Meet the statutory requirements and expectations of regulatory agencies in relation to the consultative processes used by the Project for engaging with stakeholders
- Ensure that consultation activities enable the stakeholders and the community to better understand the Project through the timely distribution of Project information that is presented in an understandable format
- Ensure Culturally and Linguistically Diverse (CALD) communities are provided communications tailored to their language, so they are informed of the project and their opportunities to provide feedback
- Ensure that APA is able to understand the views of stakeholders
- Ensure landowners and occupiers are sufficiently informed about the Project, the aspects that they can influence, and their rights
- Allow landowners and occupiers to have input into those aspects of the Project that could affect them; and
- Outline the process of consultation with landowners and occupiers and the complaints process, to ensure consistency with regulatory requirements.

This Consultation Plan is an action document that guides staff in undertaking and reporting on community consultation and engagement for the Project. It sets out strategies and activities that need to be taken and aligned to the Project development timeframe.

4.4 Engagement Objectives

APA values and respects its relationships with stakeholders and communities within which our assets and operations exist. We are committed to building and maintaining long term relationships with all stakeholders of the Project, as well as meeting all applicable regulatory and legislative requirements.

The approach to stakeholder engagement will be guided by the following objectives:

- **No surprises:** Inform and engage community members and key stakeholders early in the process, and ensure they remain fully informed;
- **Be inclusive:** Ensure the community has easy access to clear and concise information about the Project, ensuring all communications use language (e.g. non-technical language) appropriate to each audience;
- **Be honest and act with integrity:** Always use facts and speak the truth. If the answer is not known then the question will be taken on notice, the appropriate stakeholder spoken with and a response delivered promptly;
- **Be responsive:** Respond to all stakeholder contact in a timely manner and make every effort to resolve issues to the satisfaction of all involved;
- **Be a part of the community:** Use the Project to contribute to stronger local communities and provide economic and social benefit; and
- **Honour all obligations:** Deliver on commitments made to the community and stakeholders.

4.5 Consultation outcomes and reporting

APA is focused on achieving positive community consultation outcomes as part of its business activities. As such, the following consultation outcomes will be utilised to benchmark the consultation undertaken as part of the Project:

- Positive relationships are formed between APA and its stakeholders
- Affected community stakeholders are fully notified and engaged before any activity starts that may or will impact them or their environs
- Clear and transparent information was provided to allow the community to engage and respond appropriately to our consultation processes
- Appropriate forums were offered and provided to ensure full understanding of the impact APA may have on community activity, environs or land; and
- APA is seen as a business of integrity that is respectful of the communities within which it operates, while being fully engaged and accountable for its activities.

In summary the consultation process is designed to be transparent, respectful and iterative, with statutory approvals subject to issues identified during consultation being addressed. Specific criteria with respect to desired outcomes have been developed for each phase of the consultation programme. These criteria are outlined in Section 6.

APA will generate monthly reporting to the Department of Environment, Land, Water and Planning (**DELWP**) on the consultation undertaken with external stakeholders in the previous month, including specific reference to any complaints or grievances. The reporting will be undertaken until completion of the regulatory approval process, by way of acceptance of the Construction Environmental Management Plan (**CEMP**) and Construction Safety Management Plan (**CSMP**). Following this, regulatory reporting will be undertaken in accordance with the approved management documentation.

This reporting of consultation activities will be based on a calendar month and be provided to DELWP within five (5) business days of the end of the reporting period (being the end of month).

A consolidated report on the consultation carried out to date between the APA and all relevant entities, including in the course of developing the Environment Management Plan as required by the Pipelines Regulations (r47), is provided in **Appendix E**.

Information to address all commonly raised issues will be provided through the FAQ's published on the Project website.

All media enquiries will be directed to a dedicated person within APA's Media and Communications Group responsible for handling media enquiries on behalf of the Project.

4.6 Communication tools and techniques

The following tools and techniques will be used by APA to engage with stakeholders and the wider community during construction phase, if required.

Print / digital communication

Letter distribution	Letters delivered to impacted stakeholders to inform them of Project information.
Fact sheets and brochures	A suite of material: from initial overview, history, field investigations, design progress through to statutory planning and construction. Available online (in an accessible, HTML format) and in hard copy for face to face events and distribution to community outlets.
Posters and signage	Posters, banners and signage to help increase local awareness of the Project.
Media update	Radio, local print and digital advertising to help inform people about the Project and feedback opportunities.



Website	Dedicated Project website which will be updated promptly as new information becomes available. Content prepared in line with accessibility guidelines (WCAG 2.1).
Email updates	Sent at regular intervals (milestone triggers) to keep stakeholders and owners and occupiers informed of Project information.

Engagement

Owners and occupiers	Regularly communicating with owners and occupiers located within close proximity to the proposed pipeline route. Includes door-knocking activities.
Stakeholder meetings	Face-to-face communication through meetings and briefings, targeted and on request.
Community presentations	Presentations to identified interest groups of the Project such as councils, stakeholders or government representatives.
Email and telephone	Receiving and responding to enquiries via a 1800 phone number and community email address for queries. All calls, responses and actions required are to be recorded in an accredited stakeholder database.

5. IDENTIFICATION OF RELEVANT STAKEHOLDERS

This Consultation Plan has been prepared to engage and consult with stakeholders that may be impacted by the Project. The Consultation Plan generally seeks to engage with stakeholders with a non-technical interest such as the general community, private and public landowners, land occupiers, indigenous groups and local interest groups directly impacted by the Project.

It is acknowledged that additional government and private entities will be consulted for the Project, which may occur outside of the processes outlined in this Consultation Plan.

As a minimum, stakeholders that are to be engaged as part of this Consultation Plan are identified in **Appendix F**. The matrix in **Appendix F** also includes responsibilities for engagement and ongoing relationship management. It is with these parties that APA seeks to build an open, ongoing relationship to facilitate clear channels of communication and feedback.

6. PROJECT DEVELOPMENT AND STAGES OF CONSULTATION

The Consultation Plan acknowledges the different stages of the Project's development. These stages form logical phases of consultation, with distinct aspects in relation to the provision of information, the method of consultation and level of engagement required with relevant landowners and other stakeholders for each stage. The relevant stages along with a description of the likely consultation requirements for each stage are illustrated in Figure 6-1.

The stages that have been completed at this report revision have been marked with 'Completed'.

The identified stages of development and phases of consultation have been identified as follows:

1. Information gathering for route selection – **Completed**
2. Initial stakeholder engagement– **Completed**
3. Obtaining land access for surveys– **Completed**
4. Agreement on pipeline corridor– **Completed**
5. Completion of regulatory approvals– **Completed**
6. Pipeline construction; and
7. Pipeline operation.

These stages generally follow the APGA/VFF's *Pipeline easement guidelines* (2009) stages of feasibility, approvals, construction and operation. The stages that are 'completed' have not been included in this report, however can be found in previous versions.

The following sections detail the ongoing phases of Pipeline construction and Pipeline operation.

CONSULTATION PLAN

Western Outer Ring Main



Figure 6-1 Stages of consultation



6.1 Phase 6: Pipeline construction

Pipeline construction is completed on a production line basis with a sequence of activities progressing along the pipeline route. As such, impacts to landowners at any one location are anticipated to be intermittent and manageable if suitable controls are implemented to avoid and minimise potential impacts.

APA will engage a suitably experienced construction contractor to undertake construction of the Project. The consultation associated with this phase is to ensure that landowners are fully aware of the likely activities prior to the commencement of construction. During construction it is important that landowners are aware of communication paths to notify and communicate with construction personnel. Following construction, communication will be relevant to the reinstatement and rehabilitation of disturbed areas.

6.1.1 Purpose of the consultation

The purpose of the consultation associated with this phase is as follows:

1. To advise landowners of the construction commencement and details of the proposed construction programme
2. To introduce the construction contractor's representative to the landowner
3. To advise the landowner of the appropriate communication protocols with both APA and the construction contractor during the construction period
4. To confirm with the landowner and the construction contractor property specific requirements that are to be followed with respect to individual landowner requirements
5. To provide additional details on specific construction activities (where required)
6. Address enquiries, issues and complaints that may arise during the construction programme; and
7. Inspection of the reinstated areas following construction and rehabilitation to obtain landowner and occupier sign-off on the reinstatement (damage release).

6.1.2 Means of consultation

6.1.2.1 Pre-construction

As per previous phases of consultation, face-to-face consultation will continue to be the primary form of communication, with the provision of additional information resources (e.g. handouts, brochures) undertaken as necessary. APA will send all landowners a letter confirming that the Project is planned to proceed and the likely dates for construction of the Project. This notice will also include reference to the engaged construction contractor.

APA will offer to each landowner to introduce the landowner to the construction contractor's representative for the works. In addition to introducing the parties, the construction contractor will complete a property inspection report that details the contact information for the landowner, any above or below ground assets potentially impacted, and any operational requirements that need to be addressed by the construction contractor. This meeting ensures that these matters have been communicated effectively and to the satisfaction of the landowner and APA.

6.1.2.2 Construction

APA and the construction contractor will also formalise and communicate the appropriate communication paths for landowners to follow during construction. The construction contractor is likely to be responsible for general communication or enquiries with landowners regarding scheduling of activities and other minor issues, though APA representatives will also be involved where necessary. APA personnel will investigate and respond to any landowner claims or losses as necessary in consultation with the construction contractor.

6.1.2.3 Notifying owners, occupiers and stakeholders

Notifications will be sent to owners, occupiers and stakeholders to ensure construction is undertaken as efficiently as possible, while ensuring the owner, occupier or stakeholder can conduct their normal operations and activities with as little disturbance as possible. Communications may relate to changes to project updates, schedule changes, advising of stand down periods, and where to call for assistance

6.1.2.4 Reinstatement and rehabilitation

APA and the construction contractor will also liaise with landowners to ensure that they are satisfied with the reinstatement of any disturbed areas. This process will be undertaken by both parties for a final clearance of the disturbed areas with the landowner. APA will then provide any relevant payment of damage releases and seek sign-off of a damage release form indicating that the restoration of land has been completed to an acceptable standard and the landowner is prepared to accept the disturbed area. Depending on the scope of issues associated with the rehabilitation, this process may also require formal correspondence.

6.1.3 Timing of consultation

a. Pre-construction

Upon completion of regulatory approvals and the construction contract is awarded, APA would provide relevant information to all landowners and occupiers advising them of the appointment of the Construction Contractor. The notification will provide landowners and occupiers a program of the works to be carried out and the timeframes.

APA would contact landowners and occupiers to schedule a meeting for more specific timeframes for the upcoming works. Material would be provided outlining the construction program and phases that would be followed.

Pre-construction condition photos

Pre-construction condition photos would be taken during this stage to capture the condition of significant infrastructure located on properties that will be affected by the construction corridor. The purpose of these photos is to inform the development of the Property Management Plans port and guide the rehabilitation process.

Property Management Plans

Property Management Plans record essential information, such as the location of underground assets and essential property operation assets, agreed reinstatement details and preferred contact details. This is an APA standard document for recording property information.

The construction contractor would utilise the Property Management Plan and include details of typical construction activities as a general advice statement to the landowner or occupier.

b. Construction

Initial meetings for introductions of construction contractors to landowners, occupiers and stakeholders will be arranged and attended by APA. Once the initial meeting is carried out, the construction contractor Land Liaison team is then authorised to communicate with landowners, occupiers and stakeholders affected by the project.

Landowners and occupiers will be requested to communicate with the Project primarily through their dedicated construction contractor Land Liaison Officer during the period of construction.

c. Commissioning phase

Landowners and occupiers will be informed of the works involved in the commissioning and hydro-testing of the assets, and what to expect with regards to noise, personnel movement and other such activities.

d. Rehabilitation phase

Landowners and occupiers will again be consulted to re-confirm re-seeding specifications and other rehabilitation practices.

6.1.4 Monitoring and verification

The effectiveness of the consultation undertaken in this phase will be verified against the following criteria:

- ✓ All enquiries, feedback and complaints are recorded and documented in the landowner database

- ✓ No complaints are received from landowners regarding construction related requirements that were not adequately communicated prior to construction; and
- ✓ Complaints or incidents will be reported in a general nature on a public forum (ie. the Project website) during construction, for transparency and wider community awareness.
- ✓ Complaints of a serious nature will be escalated to the relevant construction managers and will form part of the regular construction site meeting agenda. Where appropriate, these complaints will then be notified across construction personnel to ensure that learnings are taken into account, with a view to reducing the potential for future incidents.
- ✓ All reportable incidents will be investigated in line with APA's Incident Investigation and Analysis Procedure (APA HSE GP 07.02).

6.2 Phase 7: Handover / closeout phase

The construction contractor will contact landowners and occupiers for final clearance to confirm a satisfactory restoration process has been implemented. Accompanied by an APA representative, the construction contractor will perform an inspection of the restored easement to identify any defects requiring attention prior to project close-out and damage releases being sought.

6.2.1 Purpose of the consultation

Inspection of the reinstated areas following construction and rehabilitation to obtain landowner sign-off on the reinstatement (damage release).

6.2.2 Monitoring and verification

The effectiveness of the consultation undertaken in this phase will be verified against the following criteria:

- ✓ All enquiries, feedback and complaints are recorded and documented in the landowner database;
- ✓ No complaints are received from landowners or occupiers regarding impacts from construction activities that were not adequately communicated prior to construction; and
- ✓ All reportable incidents will be investigated in line with APA's Incident Investigation and Analysis Procedure (APA HSE GP 07.02).

6.3 Phase 8: Pipeline operation

The operation of high pressure gas pipelines typically have a very low impact on landowners and other third parties and, as the pipeline operation phase typically extends over decades, it is necessary to take steps to ensure that awareness of the gas pipeline is maintained. Given that a pipeline is a long-

term infrastructure investment, it is in the interest of both landowners and APA to develop a sound relationship.

APA will also implement an easement maintenance program in order to maintain line of sight between established pipeline markers, ensure access along the easement is preserved and to manage physical land changes that may threaten the pipeline (e.g. erosion).

The operation and maintenance of the pipeline will be undertaken in accordance with APA's *Landowner Engagement Procedure* (560-PR-QM-0001) and the *Authorised Third Party Works Management Procedure* (560-PR-QM-0004). The Landowner Engagement Procedure identifies awareness objectives that are to be met and provides confidence that key messages are being communicated to external stakeholders, including landowners.

6.3.1 Purpose of the consultation

- o The purpose of the consultation associated with this phase is as follows:
- o To raise awareness of how APA operates its gas pipelines and associated infrastructure
- o To provide information of pipeline infrastructure
- o To outline unauthorised activities and detail the approval process for undertaking work in the pipeline easement
- o To provide information and support to mitigate land-use changes altering existing location classifications
- o Ensure that third parties are informed of APA's planned activities with regards to their interests; and
- o Provide knowledge to identify an emergency situation and what to do in such an event.

6.3.2 Means of consultation

APA will facilitate a handover of the pipeline asset from APA's Project personnel to the APA personnel that are responsible for operating and maintaining the asset (Field Services and Infrastructure Protection Teams). This handover process will occur within six (6) months of commencing operation of the pipeline, or following satisfactory rehabilitation of the land surface post-construction.

The frequency of pipeline awareness activities is determined through a Safety Management Study (**SMS**) for the pipeline asset, which includes a stakeholder risk assessment. Minimum consultation requirements have been determined as follows:

All landowners are mailed an information pack on an annual basis, which contains an information booklet, landowner brochure and guidance for

landholder activities in proximity of the pipeline. This includes the Dial Before You Dig campaign and asset management information from APA.

Notification to landowners and occupiers regarding the commencement of different stages of the project, including construction, commissioning and operation. All landowners will have a face-to-face visit at a minimum of every three years by an APA representative; and

Notification to landowners regarding non-routine maintenance activities (e.g. chemical vegetation and weed control, excavations, etc.)

Access is undertaken by APA representatives as necessary to maintain vegetation (for line of sight), ensure access along the easement is preserved and to manage physical land changes that may threaten the pipeline (e.g. erosion). Generally this routine maintenance does not require landowner consultation.

The information booklet mailed annually as part of the information pack will contain key messages such as when to contact APA, APA contact details, emergency contact details, explanation of pipeline markers, guidelines for appropriate activities near pipelines, activities that may result in damage to the pipelines and methods of recognising threats to the pipeline and what to do in an emergency.

Where the SMS process has identified landowner activities as high risk, the landholder will be contacted via face-to-face visits at a frequency that best addresses the individual risk factors identified in the SMS. For landowners undertaking high risk activities the minimum frequency of visits from an APA representative is annually.

In addition, APA shall facilitate meetings with regulatory and planning authorities (including local governments) that have jurisdiction over land in which APA has assets located annually.

Each landowner visit will be recorded on an operational landowner contact form, which is then included in the stakeholder management database, X-Info Connect (**XIC**). The XIC database forms the basis of the operational stakeholder management systems within APA.

6.3.3 Timing of consultation

Handover of the asset from APA project personnel to the Field Services and Infrastructure Protection Teams will occur within six (6) months of commencing operation of the pipeline, or following satisfactory rehabilitation of the land surface post-construction.

Engagement of landowners will occur for the life of the asset, at the frequency identified in Section 6.1.3 or on an as needs basis in the event of an enquiry, complaint or incident.

6.3.4 Monitoring and verification

APA will monitor the effectiveness of the Landowner Engagement Procedure and the Authorised Third Party Works Management Procedure, through the review processes outlined in these procedures. Compliance with these procedures is integral to confirm the suitability of the procedures in reducing the risk posed by third parties to APA's assets and management of external interface activities.

The operational procedures will document and confirm that:

- ✓ The landowner database of third parties is accurate and current
- ✓ The plans are being implemented in a timely fashion
- ✓ SMS outcomes have been incorporated into the plans
- ✓ The number of third parties that have been contacted as part of APA's activities; and
- ✓ Actions relating to any reported incident have been completed.

These processes will also be formally audited as part of APA's existing internal procedures. The requirement to have formal audits of these systems will be tracked in the APA Management of Audits, Regulatory Compliance and Operations Incidents System.

7. MEDIA

All media enquiries will be directed to a dedicated person within APA's Media and Communications Group responsible for handling media enquiries on behalf of the Project. The management and response to media enquiries will be in accordance with APA's media management protocols.

All personnel as part of the project induction will be informed of the relevant reporting protocols.

8. COMPLAINT AND GRIEVANCE MANAGEMENT

The primary stakeholder group from which APA anticipates to receive complaints is from landowners and occupiers impacted by the proposed pipeline route. Previous experience has indicated that complaints and grievances from other third-party stakeholders are rare.

Various channels exist for stakeholders to air their grievances (e.g. phone, email, face to face and online) and these channels will be promoted during all consultation with stakeholders. APA will also advise any complainant that they are able to raise issues with the pipeline regulator. The relevant contact details of the regulator are provided in Section 8.1.4.

APA will establish a Complaints Register which will be maintained throughout the life of the Project. The Complaints Register will provide a structure for the lodgement and management of all information in relation to complaints. All interactions with stakeholders, related to complaints submitted, and all further actions taken as a result will be recorded in this system.

APA will endeavour to acknowledge a complaint within 24 hours of receiving it and provide a timeframe for the follow-up and close-out of any investigation.

The Complaints Register enables the generation of a variety of reports for the review, presenting and auditing of complaints throughout the life of the Project.

8.1 Complaints management

8.1.1 Guidelines

APA's complaints management procedure for stakeholder enquiries and complaints has been developed in line with the **AS NZ 10002-2014 'Guidelines for complaint management in organisations'**. This guideline recommends open and timely responses to complaints, minimising causes of complaints through organisational changes, developing protocols to train and support staff, develop framework to continually monitor and review the procedure.

8.1.2 Negative Feedback vs Complaints

Primarily, complaints can only be resolved if they are about the behaviour of APA, its contractors, consultants or representatives.

Sometimes stakeholders or community members provide negative feedback but are not expecting further action or active resolution.

Briefing about what is a complaint and how to manage complaints will be included in construction contractor and consultant onboarding procedures and during inductions.

8.1.3 Complaints Procedure

The APA Project team, including its construction contractor and consultants, will take a proactive approach to minimising the causes of complaints.

The construction contractor will be required to advise the APA Project Team of a complaint received by stakeholders or owners and occupiers, including regulatory agencies, within 2 hours of receiving the complaint.

Within 24 hours, APA and the Contractor will discuss how to respond to the complaint, the action to take, and assign responsibility. Acknowledgement will be given to the complainant within 24 hours.

APA will investigate the complaint, record it into a Complaints Register, and ensure action will be taken and the complainant is advised of the outcome.

Issues that would require an immediate response include, but are not limited to, impacts to boundary fences, gates, non-compliant or unprotected excavation, inadequate warning signs, stock damage or loss, etc.

A Complaints Protocol for the WORM Project will set out the requirements for handling complaints during construction. This will be used as an internal document, shared with the Construction Contractor and incorporated during the tendering process.

8.1.4 Lodging a complaint

Stakeholders or owners and occupiers can lodge a complaint or enquiry via:

- The dedicated Construction Contractor land liaison team
- Project hotline – 1800 951 444
- Project email address – worm@apa.com.au
- Postal address – PO Box 423, Flinders Lane VIC 8009
- APA Land Access Officer or Environment Officer

Project contact details will be published on all community publications, notifications and digital platforms.

In the event that complaints are not resolvable through the APA's complaint management process, they would be escalated through the mediation system via the DELWP Pipeline Regulation Unit.

Pipeline	Phone:	0439	799	598
Regulator Victoria	Email:	pipeline.regulation@delwp.vic.gov.au		
		https://www.energy.vic.gov.au/pipelines		
		DELWP Head Office (Not open to the public) - 8 Nicholson St, Melbourne 3000		

8.1.5 Record keeping

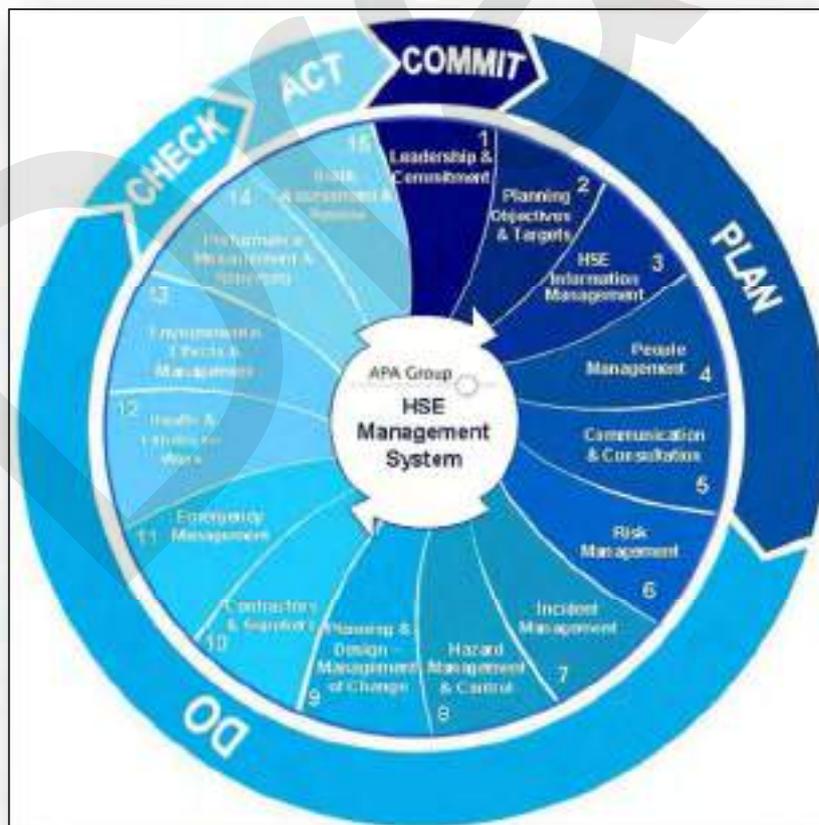
All notifications of complaints received by APA will be recorded in a Complaints Register using X-Info Connect and appropriate actions identified.

9. MANAGEMENT OF POTENTIAL IMPACTS

Potential adverse impacts on private and public land are to be avoided by pre-disturbance surveys of the land, consultation with landowners and occupiers, recommendations of specialist investigations and access and construction requirements agreed with the landowner. Where adverse impacts cannot be reasonably avoided the residual impacts will be minimised and then compensation for the impacts will be agreed with the landowner.

Potential adverse impacts on health, safety and the environment (HSE) will be managed within the framework of APA's HSE Management System, known as Safeguard. Safeguard is designed to ensure that information on health, safety and environmental requirements is provided to personnel in a relevant, accessible and understandable form. The broad relationships and linkages between the project's management plans and APA's HSE Management System are represented diagrammatically in **Figure 9-1**.

Figure 9-1: APA's HSE Management System, Safeguard



Safeguard is implemented at all levels of the business through position descriptions, operational and HSE management processes and procedures. Information, training and awareness is provided to APA's employees and contractors to ensure that they are aware of APA's commitment and of their responsibility to comply with quality management and HSE management requirements.

Management documents prepared in relation to the Project will set out the plans, roles, responsibilities, procedures, and specific commitments required to carry out the project in accordance with APA HSE Policy. In addition to this Consultation Plan, the following key management documents shall be prepared to the satisfaction of the relevant regulatory agencies:

Construction Environmental Management Plan

A CEMP will be developed in accordance with *Pipelines Act 2005 (Vic)* requirements and *Pipelines Regulations 2017*. It will be informed by information collected from any necessary field surveys and stakeholder consultation. The document will identify sensitive environmental areas and detail the construction methodologies to minimise environmental impacts.

Construction Safety Management Plan

Construction Safety Management Plan will be developed to meet the applicable APA policies, AS2885 and *Pipelines Act 2005 (Vic)* requirements and regulations, Victorian *Occupational Health and Safety Act 2004* and the *Occupational Health and Safety Regulations 2007*. The document will detail the systems and processes the construction contractor shall implement including hazard alert protocols, incident reporting, safety meetings and hazard analysis processes.

Cultural Heritage Management Plan

A Cultural Heritage Management Plan, or Plans, will be developed in accordance with the *Aboriginal Heritage Act 2006 (Vic)* and *Aboriginal Heritage Regulations 2018*. The CHMP(s) will be developed using the data generated from desktop studies, a standard assessment and, if required, a complex assessment. The document will detail the construction methodologies to minimise construction and ongoing operation impacts on sensitive cultural heritage areas.

Operations Environmental Management Plan

In the development of an Operations Environmental Management Plan, in accordance with *Pipelines Act 2005 (Vic)* requirements and *Pipelines Regulations 2017*, ongoing activities that support the operation of the pipeline will be assessed and work practices defined to minimise impacts on the environment. APA has an existing Operations Environmental Management Plan that addresses APA's Victorian Transmission Network, and the pipeline will be managed under this plan.

Operations Safety Management Plan

The Operations Safety Management Plan will be developed to meet the applicable APA policies, AS2885 and *Pipelines Act 2005 (Vic)* requirements and regulations, Victorian *Occupational Health and Safety Act 2004* and the *Occupational Health and Safety Regulations 2007*. It will provide an integrated safety management approach in line with APA's existing safety management policies and practices for pipeline operations.

10. COMPULSORY ACQUISITION OF LAND

10.1 Pipelines Act

The Pipelines Act and the Pipeline Regulations detail a process which has been described in the preceding pages to ensure that landowners are treated fairly and with respect leading up to the negotiation of easement rights. APA is committed to providing fair, adequate and equitable compensation to impacted landowners for disturbance and loss of production in accordance with the Pipelines Act, and the APGA/VFF's *Pipeline easement guidelines* (2009).

The Pipelines Act includes a provision which enables a proponent to apply to the Minister responsible for the Pipelines Act to permit compulsory acquisition of the required easement, providing the proponent is able to clearly demonstrate adherence to the required procedures.

It is noted that if APA cannot negotiate an easement agreement with a landowner, APA are not able to approach the Minister to seek the Minister's consent to compulsorily acquire the easement for a period of six months from issuing the landowner with the Notice of Pipeline Corridor (unless the Minister agrees to abridge this timeframes under Section 90(4) of the Pipelines Act).

Landowners affected by the Project are encouraged by APA to seek independent legal advice on any concerns they may have with regard to legal implications of the Project which could include the project's potential impact on their land and its use or any other legitimate concern. Pre-defined and agreed reasonable costs incurred in seeking advice in relation to the Project will be reimbursed by APA.

10.2 Land Acquisition and Compensation Act

The *Land Acquisition and Compensation Act 1986* and the *Land Acquisition and Compensation Regulations 2010* detail the process of compulsory acquisition having secured consent from the Minister responsible for the Pipelines Act. Following compulsory acquisition of the required easement, this Act also details how claims are made, how compensation is assessed and how issues and disputes are resolved. It also details the rights and obligations each party has with respect to the compulsory acquisition of an interest in land.

This Act provides for the securing of temporary occupation of land for the purposes of the Special Act, the 'Special Act' being the Pipelines Act.

11. PROJECT TIMEFRAMES

The proposed timeframes for each stage of the Project's development is summarised in **Table 11-1**. These stages are consistent with the phases of consultation that are further described in Section 6.

Table 11-1: Development timeframes of the Project

Stage	Activities	Indicative Timing
Phase 1: Information Gathering for Route Selection	Key stakeholder identification and consultation with key stakeholders regarding route selection.	1 month Completion: Q1 2019
Phase 2: Initial Stakeholder Engagement	Database establishment, consultation with regulatory agencies and initial landowner meetings.	2 months Completion: Q2 2019
Phase 3: Obtaining Land Access for Surveys	Seek agreement for land access, issue Notice of Intention to Enter Land for Survey and undertake necessary field surveys.	3 months Completion: Q4 2019
Phase 4: Agreement of Pipeline Corridor	Issue Notice of Pipeline Corridor, seek easement agreements and any required crossing agreements with third parties.	12 months Completion: Q2 2021
Phase 5: Completion of Regulatory Approvals	Make application for a Pipeline Licence (including other approval applications if required), issue Notice of Pipeline Licence Application, and obtain relevant State and Commonwealth regulatory approvals.	18 months Completion: Q4 2021
Phase 6: Pipeline Construction	Construction – clear and grade, trenching, pipe stringing, welding, special crossings, lowering in, backfill and reinstatement.	6 months Completion: Q3 2022
	Commissioning	1 month Completion: Q3 2022
	Final release – acceptance of level of reinstatement (rehabilitation and damage releases to continue into operation of the pipeline).	1 month Completion: Q3 2024
Phase 7: Project Operation	Operate the pipeline for the life of the asset	60 year design life

12. RECORDS MANAGEMENT

APA will maintain a stakeholder management database for the life of the Project to retain information relevant to the development of the project, which is to include copies of data gathered in the field and from title searching, copies of correspondence, relevant discussion records and agreements for each landowner. The stakeholder management database, XIC, will also record enquiries, feedback and complaints raised and details of the relevant response resolution.

XIC will be used to record all external communications and stakeholder engagement activities. Consultation during the construction phase will be required to be recorded by the construction contractor utilising an equivalent system. Incidents affecting landowners, arising from the construction phase will be notified to APA and recorded for follow-up action by the construction contractor.

Copies of any agreements and discussion records will be left with landowners at the time of meeting or alternatively records will be made available to landowners or their legal representation on request.

12.1 Personal Information

APA is committed to handling and protecting personal information in accordance with Australian Privacy Principles set out in the Commonwealth *Privacy Act 1988*. Information collected in discussions with landowners will solely be used by APA, its representatives and the engaged construction contractors for project purposes.

All personal information received by APA is held either in electronic files on APA's computer systems or in physical files stored at APA's premises. Only APA personnel will have access to this personal information. APA takes reasonable steps to protect all personal information it holds by using necessary technology (i.e. firewalls) and systems to reasonably ensure that the information is secure from misuse, interference and loss, and from unauthorised access, modification or disclosure.

13. FURTHER INFORMATION

13.1 Proponent

A summary of the relevant company information and the details of the company representatives are presented in **Table 13.1**.

Table 13.1: Company's details

Details	Organisation		
Entity	APA VTS Australia (Operations) Pty Limited		
ACN	083 009 278		
Office Location	<table border="0"> <tr> <td>Head Office: Level 19, 580 George Street Sydney NSW 2000</td> <td>Project Office: Level 13, 60 City Road Southbank VIC 3006</td> </tr> </table>	Head Office: Level 19, 580 George Street Sydney NSW 2000	Project Office: Level 13, 60 City Road Southbank VIC 3006
Head Office: Level 19, 580 George Street Sydney NSW 2000	Project Office: Level 13, 60 City Road Southbank VIC 3006		
Website	www.apa.com.au		
Representative	<p>██████████ Access and Approvals Project Manager ██████████ Email: ██████████</p>		

13.2 Regulatory agencies

13.2.1 Department of Environment, Land, Water and Planning

DELWP, among other functions, is responsible for maintaining a licencing and permitting system for certain gas pipelines and regulates the pipeline industry in Victoria to ensure that environmental management standards are met. The primary approval to enable construction and operation of a transmission pipeline is a Pipeline Licence, which is issued by the Minister for Energy, Environment and Climate Change.

The contact details for DELWP are as follows:

Pipeline Regulation

Department of Environment, Land, Water and Planning

PO Box 500

East Melbourne VIC 8002

Phone: 0439 799 598

Email: pipeline.regulation@delwp.vic.gov.au

Website: <https://www.energy.vic.gov.au/pipelines>

13.2.2 Energy Safe Victoria

Energy Safe Victoria (**ESV**) is the independent technical regulator responsible for electricity, gas and pipeline safety in Victoria. Under the Pipeline Regulations, ESV's role is broad and ranges from accepting industry's safety cases and safety management schemes for the design, construction and maintenance of electricity, gas and pipeline networks across the State to regulating against standards and administering regulations covering gas and electrical appliances and installations and energy efficiency.

The relevant contact details for ESV are as follows:

Gas and Pipeline Infrastructure Safety Division

PO Box 262

Collins Street West VIC 8007

Phone: (03) 9203 9700

Fax: (03) 9686 2197

Website: www.esv.vic.gov.au

14. OTHER REFERENCE DOCUMENTATION

Other information sources that may be helpful for landowners to understand high pressure gas pipelines and context of the Project are identified in **Table 14.1**.

Table 14.1: Reference documents

Information Type	Document (and location)
Relevant Legislation	Commonwealth: www.comlaw.gov.au Victorian: www.legislation.vic.gov.au
Australian Standards	AS 2885.1-2012 Pipelines - Gas and Liquid Petroleum – Design & Construction AS 2885.3-2012 Pipelines - Gas and Liquid Petroleum – Operation & Maintenance
Guidelines and Codes of Practice	APGA Stakeholder Engagement Guidelines (October 2015) APGA Code of Environmental of Environmental Practice – Onshore Pipelines (September 2017) APGA/VFF Pipeline Easement Guidelines (2009) Guidelines for the Preparation of Pipeline Consultation Plans – Pipelines Act 2005 International Association for Public Participation Australasia (IAP2S) Public Participation Spectrum (2014)



	Victorian Auditor-General's Office Auditing in the Public Participation in Government Decision-making – Better practice guide (2015)
--	--

Draft

Appendix A Information for the Public (Key Messages)

APA commit to ensuring the Project team who may come into contact with stakeholders and the wider community have a good knowledge and understanding of the Project and is well acquainted with the key stakeholder engagement messages.

The following project messages can be used by those authorised representatives as a basis for external communication or answering stakeholder and wider community queries:

General	
What is the project?	The proposed Western Outer Ring Main Project includes construction of: a buried pipeline, approximately 51 kilometres long an additional compressor, at the existing Wollert Compressor Station, owned by APA, on Summerhill Road three main line valves and associated above ground equipment Connections into our existing APA infrastructure at Plumpton and Wollert.
What is the rationale for the project?	Refilling rates for the Iona Underground Storage (UGS) are currently limited as gas is required to be transferred through the low pressure pipeline network in Melbourne. This limits the amount of gas that can be moved across the network in Victoria to Iona UGS. The Western Outer Ring Main pipeline will enable gas to be sent at high pressure directly to Port Campbell (to support Iona UGS refilling) which will support peak demand supply during winter periods in Victoria.
Timing	
How long will construction occur?	The Project is currently in the process of seeking regulatory approvals from the relevant State and Federal government authorities. Should the Project receive approval, construction of the WORM is scheduled to begin towards the end of 2021 with completion of construction scheduled mid-late 2022.
What is the operation lifespan?	Once constructed, WORM would operate for the life of the asset (60 year design life).
Environment	

<p>How have impacts to the environment been minimised in the design of WORM?</p>	<p>In March 2019, APA identified a preferred pipeline route for the Project, based on an assessment of such key constraints including environmental values, cultural heritage, terrain, existing and proposed infrastructure corridors, watercourses, and land use.</p> <p>The Project EES details the potential impacts and mitigation measures on a range of environmental areas. APA has made number of commitments to ensure environmental impacts are minimised before the project is approved by State and Federal governments.</p>
<p>Cultural Heritage</p>	
<p>What has APA done to minimise impacts on Aboriginal cultural heritage?</p>	<p>Engagement with Traditional Owners and Registered Aboriginal Parties (RAPs) has been undertaken throughout the CHMP process. Two Cultural Heritage Management Plans (CHMPs) were required for the project.</p> <p>APA has worked with Aboriginal Victoria to develop a CHMP for areas west of Diggers Rest, involving three Traditional Owner groups including Boon wurrung Land and Sea Aboriginal Corporation, Bunurong Land Council Aboriginal Corporation, Wurundjeri Woi-wurrung Cultural Heritage Aboriginal Corporation (WWCHAC). A CHMP from Diggers Rest to Wollert was drafted where WWCHC has CHMP evaluation jurisdiction as the RAP for in and around Melbourne.</p>
<p>Stakeholder Engagement</p>	
<p>How have landowners or occupiers been engaged?</p>	<p>Since March 2019, APA has been obtaining landholder agreement to access land along the preferred pipeline route so that detailed investigations regarding the route could be undertaken. These investigations have been necessary to confirm the preferred alignment and inform the detailed environmental assessment.</p>

Appendix B Checklist of requirements for a consultation plan

Requirements for a consultation plan (s17, Pipelines Act) **Reference to section of this document**

A consultation plan must-	
be prepared in accordance with the regulations; and	Pipelines Regulation does not contain any requirements in relation to the preparation of a consultation plan.
set out the information that the proponent is to provide to owners and occupiers of land to whom notice must be given under Division 2 or 3.	Information on purpose, means, timing and verification of each stage of consultation is outlined in Section 5. Specific examples of information are included in Attachment E and F. Attachment E provides information about APA and the Project. Attachment F includes templates of the following: Notice of Intention to Enter Land for Survey, Land Survey entry Agreement, Notice of Pipeline Corridor, Notice of Pipeline Licence Application, Property Inspection Report.
The information to be provided to owners and occupiers of land must include-	
general information about the types of activities to be undertaken by the proponent for the purpose of any survey under Division 2 or the construction and operation of the pipeline;	Attachment E provides information about field survey activities undertaken by APA. A Notice of Intention to Enter Land for Survey (Attachment F) will also be provided to landowners prior to the commencement of any surveys.
information about how potential adverse impacts of the construction and operation of the pipeline on	Information relevant to managing potential impacts is outlined in Section 7.

CONSULTATION PLAN
Western Outer Ring Main



land, health, safety and the environment are to be managed;	
details of the procedures that are to be followed under this Act and any other Act to permit the construction and operation of the pipeline including the procedures for any compulsory acquisition of land;	Consultation undertaken in relation to the construction and operation of the pipeline are outlined in Section 5.6 and 5.7 respectively. Information relevant to the compulsory acquisition of land is contained in Section 8.
a statement-	
advising that owners and occupiers of land may seek independent advice on the pipeline proposal; and	Refer to Sections 5.3.2, 5.4.2 and 8.1. Further to this, refer specifically to landowner information samples contained in Attachment E and F. Attachment E provides information about APA and the Project. Attachment F includes templates of the following: Notice of Intention to Enter Land for Survey, Land Survey entry Agreement, Notice of Pipeline Corridor, Notice of Pipeline Licence Application, Property Inspection Report.
setting out current contact information for the Department.	Refer to Section 11.2 and landowner brochures contained in Attachment E.

Appendix C Implementation Plan

The following describes proposed engagement activities for the Western Outer Ring Main Project during the project phase – to prepare EES documentation for public exhibition in line with Minister for Planning’s scoping requirements.

This Implementation Plan is subject to change and may be updated during the project consultation process.

Target Date or Requirement	Engagement Activity	Target Audience	Status	Responsibility
Ongoing for project lifespan				
Ongoing	Send direct correspondence where required	All stakeholders and community		APA
Ongoing	Provide Project fact sheets and brochures	Impacted Landholders Wider community		APA
Ongoing	Update project website	All stakeholders and community		APA
Ongoing	Send news updates	Registered parties		APA
Ongoing	Hold meetings with impacted landholders	Impacted landholders		APA/Construction contractor
Ongoing	Undertake Community Presentations	Interested parties		APA
Ongoing	Brief key stakeholders	All levels of government Third party asset owners		APA/Construction contractor

Target Date or Requirement	Engagement Activity	Target Audience	Status	Responsibility
----------------------------	---------------------	-----------------	--------	----------------

CONSULTATION PLAN

Western Outer Ring Main



Pre-Construction			
Provide works commencement notice	Impacted landholders		APA
Hold contractor introduction meeting	Impacted landholders		APA / Construction contractor
Develop property interaction reports	Impacted landholders		Construction contractor
Provide construction induction packs	Impacted landholders		APA / Construction contractor
Install localised signage and posters as required	Wider community		Construction contractor
Construction			
Implement Property Interaction Reports	Impacted landholder		Construction contractor
Follow issues or complaints management procedures as required	Impacted landholders		APA / Construction contractor
Respond to general landholder enquiry	Impacted landholders		Construction contractor
Produce monthly Activity Reports	DEWLP		APA / Construction contractor

CONSULTATION PLAN

Western Outer Ring Main



Target Date or Requirement	Engagement Activity	Target Audience	Status	Responsibility
Commissioning				
	Provide with Information packs	Impacted landholders		Construction contractor
	Provide with formal notice of testing	Impacted landholders		Construction contractor
Rehabilitation				
	Provide with formal rehabilitation notification	Impacted landholders		Construction contractor
	Hold close out meeting	Impacted landholders		APA / Construction contractor
Operation				
Yearly from date of handover	Provide with Safety Management Information Packs	Impacted landholders		APA
Three yearly	Undertake safety Inspections	Impacted landholders		APA
As required	Provide with maintenance notifications	Impacted landholders		APA
As required	Hold maintenance meetings	Impacted landholders		APA
Yearly	Hold safety meeting	Impacted landholders		APA

Appendix D Glossary

Term	Definition
APGA	The Australian Pipelines and Gas Association Ltd (APGA) is the peak body representing Australasia's pipeline infrastructure, with a focus on gas transmission, but also including transportation of other products, such as oil, water, slurry and carbon dioxide. Our members include constructors, owners, operators, advisers, engineering companies and suppliers of pipeline products and services.
AS2885	<p>You will be required to comply with this Australian Standard if you intend to design and construct pipelines that transport gas and liquid petroleum. This Standard is intended for pipelines constructed from steel pipe used for the transport of gas or liquid petroleum.</p> <p>AS2885 has been accepted by the Council of Australian Governments (COAG) as the single and sufficient standard for the technical regulation of pipelines in all Australian jurisdictions. The AS2885 set of standards comprises five parts covering all aspects of pipeline design, construction, operation and maintenance.</p>
Cadastral Survey	To prepare a Pipeline Corridor plan and easement plans it is necessary to complete a detailed survey of the proposed route. This will entail matching the position of the pipeline route to the proposed easement and title boundaries. In doing so it is often necessary for the survey party to leave the easement area to locate a known title position.
Compensation	<p>The underlying concept of compensation is to place the party who has suffered a loss of some kind in a position as close as possible to that prior to the loss. For practical reasons, society has accepted that in most instances compensation is made in a financial form. With respect to pipeline easements, compensation is paid in two parts:</p> <p>Easement Compensation: a one off payment usually assessed by a professional valuer and is a payment in return for the easement rights and restrictions placed on the land by the easement; and</p> <p>Damages Compensation: Paid following pipeline construction for losses which may have been sustained as a result of pipeline construction. This compensation will also include a rent payment for the accrued lease of temporary working area land (refer to <i>Damage Release</i>).</p> <p>Where a significant construction related loss is sustained by a landowner and it is considered unreasonable to wait until</p>

	<p>Damage Release, a Partial Release may be used as a mechanism to clear the liability.</p>
<p>Creation of Easement / Restrictive Covenant</p>	<p>This document describes the rights and obligations the Pipeline Company has and the restrictions imposed on the use of the easement land (sometimes known as the 'pink document'). The rights allow the Pipeline Company to enter the easement land for the purpose of construction and operation of the proposed or existing pipelines. The Pipeline Company is required to restore the land to a condition similar to that prior to construction and pay compensation for damages which may arise as a result of exercising the rights (refer to <i>Damage Release</i>).</p> <p>The main points to note with respect to restrictions within the easement are that excavation of greater than 300mm is not permitted without written consent of the Grantee (Pipeline Company) and structures are not permitted with similar conditions. Normal farming practices such as cereal cropping, and cultivation can be followed without reference to the Grantee. The easement does not prevent subdivision, although it may influence the layout of a subdivision to maximise lot yield.</p> <p>Landowners will be asked to execute a similar document, as will any mortgagees or other parties known to title, in order to register the easement. Upon receipt of title and executed documents, the balance of compensation is paid. Any reasonable legal costs incurred during the easement acquisition process will be met by the Pipeline Company.</p>
<p>Crown Land</p>	<p>Land which is held and managed by the Government. The Government may licence the use of such land for specific purposes (e.g. Grazing Licence, delegation of the land to road authorities) or may alienate the land by selling or leasing.</p>
<p>Cultural Heritage Survey</p>	<p>A cultural heritage survey will be conducted, usually by members of a local indigenous group and personnel with an understanding of regional historical matters. The purpose of this survey is to identify any significant material which is likely to be lost or destroyed by the proposed pipeline and either make arrangements for its preservation or alter the pipeline route. The methods in which these surveys are conducted are by visual inspection and by scraping away the first few millimetres of topsoil. If a significant site is located, excavation of an area may be greater.</p>
<p>Pipeline Route</p>	<p>The pipeline route is the proposed location of the pipeline, following the securing of necessary easements and approvals pursuant to the Pipelines Act. Any potential variation to the approved route would be subject to agreement with landowners affected by the change.</p>

Appendix E Consultation report

NOTE: Consultation Report to be provided in advance of Pipeline Licence approval.

Draft

Appendix F Stakeholder engagement matrix

Draft

CONSULTATION PLAN

Western Outer Ring Main



Target Group	Example of Stakeholders	Responsibility	Contact Schedule	Contact Method	Desired Outcomes
Landowners and occupiers	Owners and occupiers impacted by the pipeline construction/operation Neighbouring owners and occupiers of land (not directly impacted)	APA	As per Section 6. of Consultation Plan	As per Section 6. of Consultation Plan	As per Section 6. of Consultation Plan
Asset/infrastructure owners impacted by pipeline route	Melbourne Water, Department of Transport, VicTrack (owners of land)	APA	Ongoing Construction, operation	Email, phone and face-to-face	Agreement of pipeline corridor and construction specification
	Telstra, AusNet Gas Services, Water service providers	APA's Construction Contractor	Finalisation of detailed design, Construction	Email and phone	Construction specification
Regulatory authorities (State)	DELWP, Aboriginal Victoria, ESV, Parks Victoria, Heritage Victoria	APA	Ongoing Construction, operation	Email, phone and face-to-face	All regulatory requirements met prior to construction and compliance with approval documents
Regulatory authorities (Commonwealth)	Department of Water, Agriculture and Environment	APA	Ongoing Construction, operation	Email, phone and face-to-face	All regulatory requirements met prior to

CONSULTATION PLAN
Western Outer Ring Main



					construction and compliance with approval documents
Registered Aboriginal Parties and Traditional Owner Groups	Wurundjeri Land and Compensation Cultural Heritage Council Aboriginal Corporation	APA	Ongoing Construction, operation	Email, phone and face-to-face	All regulatory requirements met prior to construction (negotiation of CHMP) and compliance with approval documents
Elected Representatives – All levels	Relevant local, State and federal members of Parliament	APA	Progress updates at key milestones	Letter and face-to-face	Members fully informed and supportive of the project
Local councils	Melton City Council, Hume City Council, Mitchell Shire Council and Whittlesea City Council as owners of land and specialist input	APA	Ongoing Construction, operation	Email, phone and face-to-face	Agreement of construction specification
	CEO and high-level personnel	APA	Progress updates at key milestones	Letter and face-to-face	Council is fully informed and supportive of Project

CONSULTATION PLAN
Western Outer Ring Main



Culturally and Linguistically Diverse (CALD) communities	Members of the community who speak a language other than English	APA	As part of broader community consultation, translate factsheets, offer translated meetings	Factsheets, meetings	CALD communities are fully informed and aware of their opportunities to engage with the project
Community, Environment and Action Groups	Clubs, Land Care Groups, Friends of Parks groups	APA	As part of broader community consultation then as required	Letter, email, phone and face-to-face	Group is fully informed and supportive of the project
Media	News organisations – print, television, digital	APA	As required – response to requests	Letter, email and phone	News organisations are fully informed of the Project and have balanced reporting

Appendix G Project information brochure

Draft

western outer ring main **project.**



Improving Victoria's energy security.



What is the Western Outer Ring Main Project?

Natural gas is an essential source of energy for Victoria with approximately two million customers using gas every day for domestic applications including cooking, heating and hot water. Natural gas is also a critical fuel for approximately 60,000 industrial and commercial users throughout Victoria including manufacturers, and gas fired power generation plays a key role in ensuring a reliable electricity network. In Victoria, the Victorian Transmission System (VTS) is owned and maintained by APA and consists of some 2,267km of gas pipelines.

The Western Outer Ring Main project is a proposed high pressure, buried, gas transmission pipeline approximately 51km in length. It will address a key capacity constraint in the 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.

Addressing this missing link will deliver improved network reliability by increasing the amount of natural gas that can be stored for times of peak demand and ensuring sufficient volumes of natural gas can be moved where it is needed most. Importantly, the Australian Energy Market Operator (AEMO) has forecast that Victoria will face natural gas shortages should the WORM not be in-service by late 2022.

The Western Outer Ring Main will help to deliver sufficient natural gas to Victorian homes for heating and cooking on very cold days, as well as supplying natural gas for power generation during times of peak electricity demand.

The Western Outer Ring Main project will ensure that all Victorians can continue to benefit from a reliable natural gas transmission system that meets the needs of the community both now and into the future.

Further information:

 **project hotline:** 1800 951 444

 WORM@apa.com.au

 apa.com.au/worm

Pipeline stats

length	Approximately 51 kilometres
material	Epoxy coated high strength steel line pipe
diameter	500 millimetres
minimum cover	750 millimetres
design principles	Strictly in accordance with the latest version of Australian Standard (AS) AS2885 Pipelines Gas and Liquid Petroleum.
temporary construction corridor	Generally 30 metres, plus ancillary areas to facilitate safe construction
easement width	Typically 15 metres

Project benefits:

- Addressing forecast gas shortages
- Improved network performance and resilience
- Increased gas supply capacity for power generation
- Improved supply options for urban growth areas

APA is a leading Australian energy infrastructure business. We've been connecting Australian energy since 2000. From small beginnings we've become a top 50 ASX-listed company, employing 1,800 people, and owning and operating the largest interconnected gas transmission network across Australia. We deliver smart, reliable and safe solutions through our deep industry knowledge and interconnected infrastructure. Visit www.apa.com.au to learn more about how we are connecting Australia to its energy future.

energy. connected.

Proposed project timeline

Note: timeline is indicative only and will be subject to further discussions and agreement with state and federal governments.

Community and stakeholder engagement

2020 – 2022

- Consultation with government agencies, local councils and other stakeholders.
- Ongoing consultation with landowners where the pipeline is located on their property.
- Consultation with the wider community.

Field surveys

2020 – early 2021

Undertake any additional investigations of the preferred pipeline route, such as ecology, cultural heritage, feature surveys, and hydrology.

EES Process and Regulatory approvals

2020 – early 2022

- EES Scoping Requirements.
- EES Consultation.
- EES Investigations.
- EES Exhibition.
- Seek all other relevant federal and state government approvals.

Project construction

Q2 2022 – Q1 2023

Construction of the pipeline and compressor unit at Wollert.

Alignment selection

In late 2018 and early 2019, APA undertook initial consultation to determine the key constraints to consider for a pipeline route between Plumpton and Wollert. The initial consultation included relevant local governments in order to ensure that community issues were understood and taken into account. APA identified a preferred pipeline route for the Project, based on an assessment of such key constraints including environmental values, cultural heritage, terrain, existing and proposed infrastructure corridors, watercourses, and land use.

The preferred pipeline route has sought to minimise impacts on individual properties by following existing pipeline easements as well as the proposed Outer Metropolitan Ring transportation corridor that has previously been identified for reservation by the Department of Transport.

APA's pipeline route selection report is available to download from the Western Outer Ring Main project website.

APA has been liaising with landholders, stakeholders and the community to seek their feedback regarding the preferred pipeline route and the likely impacts on their property. This feedback has been used to refine the pipeline alignment and agree on other design and construction commitments to minimise the impact on individual properties wherever possible.

Approvals process

APA will need to obtain a Pipeline Licence under the *Pipelines Act 2005 (Vic)* to allow for the construction and operation of the Project. An Environmental Management Plan has been developed to demonstrate how the impacts of the project will be managed.

In December 2019, the Minister for Planning determined that an Environment Effects Statement (EES) is required for the Western Outer Ring Main Project.

A referral for the Project was also submitted to the Commonwealth Department of Agriculture, Water and Environment (DAWE) under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act). In February 2020, DAWE determined that the Project is a 'controlled action', to be assessed under a bilateral agreement between the Commonwealth and Victorian governments.

The EES for the Project has been finalised and is available to read on our website. For more information about how to access the EES or leave a submission on the project, go to apa.com.au/worm/ees.

Land Access and Compensation

Since March 2019, APA has been obtaining landholder agreement to access land along the preferred pipeline route so that detailed investigations regarding the route could be undertaken. These investigations have been necessary to confirm the preferred alignment and inform the detailed environmental assessment.

APA has now commenced negotiations with landholders to obtain easements to contain the pipeline. An easement is an agreement registered on the title of the land that sets out the rights of a pipeline owner to install and maintain the pipeline and also defines the restrictions on the landowner in the area of the easement. Compensation for the easement is payable to the landowner and APA will also pay landowner legal and valuation costs reasonably incurred in negotiating an easement agreement.



Example of a pipeline under construction, prior to being lowered into the ground.



The same pipeline easement, after reinstatement.

Appendix H Project communication - written notices (examples)

Draft

LAND SURVEY ENTRY AGREEMENT
WESTERN OUTER RING MAIN PIPELINE PROJECT



Ref No:

BETWEEN

APA VTS Australia (Operations) Pty Limited (ACN 083 009 278) ("**APA**")

Address: Level 14, 60 City Road, Southbank, VIC, 3006

Phone: (03) 8626 8400 **Fax:** (03) 8533 2053

AND

(the "**Landowner/Occupier**")

Of (Address)

Contact name &
phone

LAND DESCRIPTION

Lot/plan

Title Description

(the "**Land**")

PURPOSE OF THE AGREEMENT / AUTHORISED ACTIVITIES

APA is investigating the feasibility of locating a buried steel high pressure gas transmission pipeline (the "**Pipeline**") in the vicinity of the Land.

The purpose of this Agreement is to allow access to the Land so that APA can survey the Land and investigate its suitability for the Pipeline route. This survey may include the placement of pegs and markers on the Land on the understanding that they will be removed if necessary for safety reasons or for your necessary activities. This survey may also include geotechnical, environmental and cultural heritage investigations which may necessitate the minor excavation of land (the "**Access Purposes**").

AGREEMENTS

The Landowner/Occupier agrees to allow APA and its authorised consultants to enter the Land at their risk, at any time from 12 months of the date of this Agreement and with such vehicles and equipment as may be reasonably required.

Entry on the Land by APA and its authorised consultants must only be for the purpose of the Access Purposes and will be subject to any Special Entry Conditions written on this Agreement below.

The Landowner/Occupier will not be responsible for any injury to persons or damage to property of APA, its officers and employees or authorised consultants which was caused by the negligent or wilful act or omission of APA or its authorised consultants.

APA will indemnify the Landowner/Occupier against any loss or damage incurred by the Landowner/Occupier directly arising from the exercise of entry rights under this Agreement by APA or its authorised consultants (including any damage to improvements or personal injury), except to the extent that the loss or damage was caused, or contributed to, by the negligent or wilful act or omission of the Landowner/Occupier or the Landowners/Occupiers employees, agents and permitted invitees.

SPECIAL ENTRY CONDITIONS (If any):

SIGNED BY LANDOWNER/OCCUPIER

SIGNED BY APA

an authorised officer of Landowner/Occupier

an authorised officer of APA

DATE: _____

Information obtained is for the purposes of the above project and may be provided to other APA personnel, its clients and contractors, prospective contractors and government agencies, only where necessary, or required by law, in accordance with the Privacy Act 1988 (Cth).

Notice under section 27 of the Pipelines Act 2005 to owners and occupiers of land in a pipeline corridor

Regulation 7

Pipelines Act 2005

Pipelines Regulations 2017

To:

I APA VTS Australia (Operations) Pty Limited am considering applying for a licence to construct and operate a pipeline over the following land:

Land Description		
Title Particulars	Volume	Folio
Address:		
Parish:		
Local Government Area:		
Planning Zone:		

A copy of a plan showing the pipeline corridor is attached to this Notice.

The proposed pipeline is a high pressure, buried, gas transmission pipeline between Plumpton and Wollert, approximately 51 kilometres in length. It 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.

Information regarding the proposed pipeline, including the processes that will be followed for obtaining required approvals and details of how APA VTS Australia (Operations) Pty Limited proposes to consult with you was given to you with the notice of intention to enter land for survey issued on: *[insert date that written notice of intention to enter land for survey was given to owner or occupier under section 19 of the Act]*

Signature of the proponent:

Date:

Note 1

A pipeline corridor is a corridor of land within which a pipeline is proposed to be constructed under the **Pipelines Act 2005**. The final route of the proposed pipeline within the corridor is subject to consultation and approval under the **Pipelines Act 2005**.

Note 2

Under section 27(3) of the **Pipelines Act 2005** this Notice lapses after 12 months from the date of this Notice, unless the Minister administering that Act, extends that period in writing.



Date:

Landowner
Address
Suburb
Vic, XXXX

Dear Landowner/Occupier,

Western Outer Ring Main Gas Pipeline Project

During 2019, APA made significant progress on the Western Outer Ring Main gas pipeline project by undertaking field surveys associated with the proposed alignment. We thank you for your willingness to permit APA to carry out those studies and your patience during the latter half of the year.

As a result of the Victorian State Government considering the project impacts in greater detail, the Minister for Planning has determined that an Environment Effects Statement (EES) will be required to fully assess the environmental, economic and social effects of the project.

To further inform the EES submission, it may be necessary to conduct additional specific and detailed surveys in some parts of the proposed alignment. This may include more studies for endangered fauna and flora species, and potentially seasonal assessments for those targeted species.

However, not all properties on the proposed alignment are expected to be affected.

APA's Land Access Officers may have already spoken with you about extending the voluntary Land Survey Entry Agreement (LSEA) over your land in case your property is identified for further surveys. You are not obliged to enter into, or extend any voluntary agreement for access to conduct further surveys. However, under the Pipelines Act 2005 (Vic) APA may apply to the Minister for consent to enter your land for the purposes of conducting those surveys if we cannot reach an agreement.

Section 19 Notice of Intention to Enter Land for Survey

We enclose a Notice of Intention to Enter Land for Survey under section 19 of the Pipelines Act 2005 (Vic) in respect of your land parcel, for the purpose of undertaking further surveys if required, for the reasons explained above.

Please note that a copy of the template voluntary LSEA is one of the required attachments to the Section 19 Notice. Please disregard the template LSEA if you have already confirmed your willingness to grant further access for surveys.

As the survey schedule is developed in more detail, APA's Land Access Officer (insert name) will contact you to advise of the intended dates of access, and to discuss the process in more detail.

Section 27 Notice of Intention to Apply for a Licence to Construct and Operate a Pipeline

APA also now intends to proceed with an application for a licence to construct and operate a pipeline on land affected by the preferred alignment, which includes the land parcel which you own or occupy.

APA Group comprises two registered investment schemes, Australian Pipeline Trust (ARSN 091 678 778) and APT Investment Trust (ARSN 115 585 441), the securities in which are stapled together. Australian Pipeline Limited (ACN 091 344 704) is the responsible entity of those trusts. The registered office is Level 25, 580 George Street, Sydney NSW 2000.

As a requirement of Section 27 of the Pipelines Act 2005 (Vic), a Notice must be issued to landowners and occupiers of affected land, and the Notice is enclosed herewith for your information and consideration.

As the pipeline proponent, APA must comply with the Pipelines Act 2005 (Vic). For independent information on the Act, or if you have questions or concerns with how APA complies with the Act, please contact Pipeline Regulation at:

Pipeline Regulation
Department of Environment, Land, Water and Planning
PO Box 500
EAST MELBOURNE VIC 8002

Email: pipeline.regulation@delwp.vic.gov.au
Phone: 0439 799 598

Otherwise, if you have any enquiries in relation to the project, please contact your Land Access Officer in the first instance **(Insert name)** on **(phone number)**, by email at **(email address)**.

APA's complaints resolution process

APA is committed to positively engaging with landowners and occupiers in relation to this project. We encourage you to raise any concerns or issues you have regarding the project with your designated Land Access Officer. They should be familiar with the local issues affecting you and your property. If you have further concerns, or if you have any complaints you wish to raise with APA, then please contact us on 1800 951 444 or send an email via the project's online portal at: <https://www.apa.com.au/about-apa/our-projects/western-outer-ring-main/contact-details/>. We will seek to address any issues or complaints raised by landowners and occupiers in a professional and courteous manner. If we are unable to resolve your issue, or if you are otherwise unsatisfied with APA's response, then you can contact the Victorian Department of Environment, Land, Water and Planning (DELWP) on the contact details provided above.

Yours sincerely

Enclosures:

- Section 19 Notice of Intention to Enter Land for Survey
- Details of the proposed survey activities
- Map showing the proposed route of the pipeline on the affected land
- Survey fact Sheet
- Introducing APA Brochure
- Land Survey Entry Agreement (LSEA)
- Section 27 Notice Of Intention to Apply for a Licence to Construct and Operate a Pipeline



<DATE>

Our Ref: <DOC_NUMBER> / <PROP_CODE>

<OWNER/OCCUPIER>

<ADDRESS1>

<ADDRESS2>

<ADDRESS3>

Dear <SALUTATION>,

RE: WESTERN OUTER RING MAIN PROJECT – NOTICE OF PIPELINE LICENCE APPLICATION

APA VTS Australia (Operations) Pty Limited, a subsidiary of the APA Group (APA) is proposing the construction and operation of a 500mm diameter steel, high pressure buried gas pipeline between Plumpton and Wollert to connect the eastern and western gas pipeline networks of the Victorian Transmission System (VTS).

Following completion of the required investigations and surveys, APA has selected an alignment for the proposed Western Outer Ring Main Pipeline Project. On <insert date> APA made an application to the Minister for Energy, Environment and Climate Change for a licence to construct and operate the pipeline under Part 5, Division 1 of the *Pipelines Act 2005* (Pipelines Act).

<Insert paragraph containing a short description of the pipeline and route – including use of the pipeline, dates of construction / operation commencement>.

As part of the Pipeline Licence application process, APA is required to provide notice of the application to all owners and occupiers of land directly affected by the proposed pipeline. I can confirm that the proposed alignment affects land owned by you or land in which you have an interest. The relevant land parcels which are impacted by the proposed pipeline are shown in the below table:

Volume	Folio

A route map of the proposed pipeline alignment has been provided with this correspondence.

APA has published a notice of pipeline licence application in the <insert newspaper name> on <insert date>. A copy of this notice is enclosed for your information. Any person who may be affected by the grant of a licence may make a submission to the Minister about the application for a licence. As outlined in the attached notice submissions are required to be submitted on or before <insert date> to the locations listed on the notice.

You may inspect a copy of the application at the following locations during office hours until the closing date of the submission period:

APA Group comprises two registered investment schemes, Australian Pipeline Trust (ARSN 091 678 778) and APT Investment Trust (ARSN 115 585 441), the securities in which are stapled together. Australian Pipeline Limited (ACN 091 344 704) is the responsible entity of those trusts. The registered office is Level 25, 580 George Street, Sydney NSW 2000.

<insert locations where a copy of the application may be viewed>.

If you have any questions or require further information please do not hesitate to contact <insert nominated contact and contact details>.

Yours faithfully,

<NAME>

<Title of Authorised Officer>

APA Group

Enc: Plan of proposed pipeline alignment

Public notice of pipeline licence application

Draft

APA Transmission Pty Ltd
PROPERTY INSPECTION REPORT
WESTERN OUTER RING MAIN PROJECT



APA Representative:	Phone No.:	Easement/Prop Number:	
		Owner(s):	
		Occupier(s):	
APA Project Office:		Name of Contact:	
		Phone:	
Contractor Rep.:	Phone No.:	Address:	
		Email:	
		Document No.:	
Date of Initial Meeting:		Revision:	

Use of Pipeline Corridor: <i>(Include notes on current condition)</i>	
Construction access requirements <i>(e.g. temp gateways/fencing)</i>	
Stock / vehicle trench crossings required	
Water channels, control banks, drains, creek crossings	
Water points, pipes and valves, etc.	
Weed and seed specification / requirements	
Trees in pipeline corridor – specific requests and timber waste	
Request for surplus spoil (if available)	
Reseeding specification requests	
Any other special instructions:	

WHERE APPROPRAITE LANDOWNER REQUESTS SHOULD BE REFERENCED TO THE SKETCH OF THE PROPERTY ON THE FOLLOWING PAGE

Should Owners or Occupiers of land have any issues, complaints or problems during the construction programme they should promptly report these to their designated land access representative or the broader project team on:

- <insert phone>
- <insert email address>

Property Sketch:



Signed for APA:		Signed for Owner:	
Signed for Contractor:		Signed for Occupier:	
Date:			

COPIES OF THIS REPORT ARE TO BE DISTRIBUTED TO ALL PARTIES

Attachment 5 – Design Basis Manual

Privacy Statement

Any personal information about you or a third party in your correspondence will be protected under the provisions of the Privacy and Data Protection Act 2014. It will only be used or disclosed to appropriate Ministerial, Statutory Authority, or departmental staff in regard to the purpose for which it was provided, unless required or authorised by law. Enquiries about access to information about you held by the Department should be directed to the Privacy Coordinator, Department of Environment, Land, Water and Planning, PO Box 500, East Melbourne, Victoria 8002



4 May 2021

WESTERN OUTER RING MAIN PIPELINE PROJECT

To whom it may concern,

The Design Basis Manual (WPT.2373-DBM-A-0001) was developed at the commencement of detailed design phase on the Western Outer Ring Main Project (Rev 0.3 April 2021). The referenced document is subject to change through the development of the Project and does not reflect detailed design completion.

Regards,

Rubi Turna

Rubi Turna
Project Manager
www.apa.com.au



DESIGN BASIS MANUAL

GENERAL

WORM Project

WPT.2373

Project No		18035			
Document No		WPT.2373-DBM-A-0001			
Rev	Date	Status	Originated	Checked	Approved
0.3	In Draft	Interim Issue			
0.2	28/2/20	Issued for Design			

© Copyright APA



Approvers

Role	Name	Signature
Team Lead EI&C		
Team Lead Mechanical		
Team Lead Process		
Manager Projects Engineering (East)		
Project Manager		
Asset Manager - VTS		

Draft - Proof of Concept

TABLE OF HOLDS

Hold No.	Section	Description
1	2.2.7 and 9.3	location of city gate stations not required to be concurrent with MLV locations. — Final city gate locations to be confirmed
2	9.4	Location of MLV 2 and MLV3
3		Requirement to modify Truganina pig trap
4		Solar fire & gas control system — include in Solar or APA scope.
5	4.4 and 4.5	Environmental conditions (humidity and rainfall) to be specified
6	5.7	Station attendance frequency
7	6.3.5	Maximum transient design flow for WORM
8	6.10	Confirm aftercooler design pressure
9	6.17	Requirement to relocate WCSB vent stack, design of new vent stack and requirement for vent silencer on new WCSB vent (if applicable)
10	7.1	Confirm Solar supply of Coriolis meter and exhaust stack
11	7.2.4	Confirm element type and potential use of hydroscopic elements from Donaldson
12	9.8	HDD coating
13	10.6	confirm pressure cycles to be used in fatigue assessment – advised by AEMO to use Brooklyn pressure values as a guideline to future pressure cycles at Wollert
14		Buffer Air Isolation for existing compressor units
15	4.7	Far field noise restriction requirements subject to final noise assessment
16	6.19.5	Service Water supply to new compressor unit.
17	8.1.2	Existing station piping design pressures and temperatures
18	8.7.1	Pipeline assembly fabrication specification
19	9.17.4, 15.3, 15.6	Soil properties for design and behaviour under flooding condition
20	9.6	Pipeline depth of cover

Hold No.	Section	Description
21	11.2.1	Scope of MCC upgrade — existing room is non-compliant for personnel escape. — Options to add another escape door and relocate WGSB incomer to new control equipment building
22	11.2.1 and 15.14	Requirement for separate battery room to control equipment building.
23	11.6.1.1	Location of MEN Link
24		CP FEED SOW issued for definition of expected design and requirements
25	14.7	confirm final design for earthing and personnel protection associated with areas subject to high tension power line interference – Potential requirement for additional earthing beds along the parallel section and potential clamps to be confirmed during detailed design
26	15.3	Geotech report to be finalised
27	9.5	insert reference to urban planning guidance document
28	9.17.4	confirm the flood recurrence interval for use in design of crossings per AS/NZS 2885.1 at completion of hydrological investigations
29	6.18	Blowdown rates at MLV's and Wollert, temporary vs permanent installations at MLV's and Wollert, need for vent at Truganina. Worst case concurrent pressure and temperature conditions to be documented in Pipeline Isolation Plan.
30	2.2.4	Changes may be required at the Truganina pig trap to enable higher rate of pipeline venting as part of the WORM project (as part of the Pipeline Isolation plan
31	13.6	Comms methods to be used for new MLVs and CP Test Posts
32	6.17	WCSA vent modifications for personnel safety
33	9.2	CVN full size specimen values
34	9.8	Coating adjacent to HV powerlines
36	10.1	Confirm pipeline design input parameters
37	10.1	Confirm buoyancy conditions
38	15.9	Terrain Category for use in wind design
39	App B	Confirm applicable FM Global Standards



Hold No.	Section	Description
40	6.18	Document Number: Venting Design Philosophy — Pipeline and Station
41	ALL	Pipeline Size (DN600 or DN500)

Draft - Proof of Concept



Table of contents

1	INTRODUCTION	16
1.1	Purpose	16
1.2	Order of Precedence	16
1.3	Terms & Abbreviations	16
1.4	References	16
1.5	Superseded Documents	17
2	PROJECT INFORMATION	18
2.1	Background, project drivers, objectives.....	18
2.2	Scope	18
2.2.1	Pipeline	18
2.2.2	Wollert.....	19
2.2.3	Plumpton	20
2.2.4	Truganina	20
2.2.5	Other Sites	20
2.2.6	Ownership.....	20
2.2.7	Sites	20
2.3	Station components and battery limits	21
2.3.1	Wollert.....	21
2.3.2	Plumpton.....	21
2.3.3	Exclusions	21
3	GENERAL REQUIREMENTS.....	22
3.1	Safety Requirements.....	22
3.1.1	General	22
3.1.2	Fire & Gas Philosophy.....	22
3.1.3	Separation distances	23
3.2	Design Life	24



4	ENVIRONMENTAL REQUIREMENTS.....	26
4.1	Flood Levels.....	26
4.2	Ambient Conditions.....	26
4.3	Ground Temperatures.....	26
4.4	Relative Humidity.....	26
4.5	Rainfall.....	27
4.6	Noise Requirements.....	27
4.7	Far Field Noise Criteria.....	27
4.8	Occupational Noise Limits.....	28
4.9	Emissions Limits.....	28
4.10	Waste collection.....	29
4.11	Visual amenity.....	29
4.12	Security.....	29
5	OPERATING PHILOSOPHY.....	30
5.1	General.....	30
5.2	Start-up / shutdown.....	30
5.3	Isolation.....	30
5.4	ESDs.....	31
5.5	Remote vs local control.....	31
5.6	Expected normal operations.....	31
5.7	Expected site attendance.....	31
5.8	Black starts.....	32
5.9	Maintainability.....	32
5.10	Reliability.....	33
6	PROCESS DESIGN AND PROCESS ENGINEERING.....	34
6.1	Gas Specification requirements.....	34
6.2	Gas Composition.....	34
6.3	Process Parameters.....	35



6.3.1	WCSB Discharge	35
6.3.2	VNI (T119) Discharge	36
6.3.3	WORM Discharge	37
6.3.4	WCSB Suction	38
6.3.5	WORM Pipeline Inlet	39
6.3.6	WORM PRS to Pakenham Header	39
6.3.7	WCSB Vent System	40
6.3.8	WORM Pipeline Vent	41
6.4	Pipe Sizing Criteria	41
6.5	Control Scheme – WCSB	42
6.5.1	Overview of Existing and New Control Schemes	42
6.5.2	Flow Control	44
6.5.3	WCSB Discharge Pressure Control	45
6.5.4	T119 and WORM Pipeline Pressure Control	45
6.5.5	WCSB Discharge Temperature Control	45
6.5.6	Sizing of DFC Control Valves	46
6.6	Control Scheme – WORM PRS	46
6.7	Overpressure Protection	47
6.7.1	General	47
6.7.2	Overpressure Protection - WCSB	47
6.7.3	Overpressure Protection – WORM PRS	49
6.7.4	High and Low Temperature Protection	51
6.8	Future Expansion Considerations	53
6.8.1	Additional WCSB Compression	53
6.8.2	WORM Discharge Piping and DFC	53
6.8.3	T119 Discharge Piping and DFC	53
6.8.4	WORM PRS	53
6.8.5	Future T74 DFC	53



6.8.6	Future T74 PRS.....	53
6.9	Bypass and Redundancy Requirements	53
6.10	Unit Aftercooler.....	54
6.11	Gas Quality Monitoring	55
6.12	Heating	55
6.13	Gas treatment	55
6.14	Filtration.....	55
6.15	Odorant	55
6.16	Station Blowdown and Vent Sizing	55
6.17	Station Vents	55
6.18	Pipeline Blowdowns	56
6.19	Utilities.....	56
6.19.1	Instrument Air.....	56
6.19.2	Instrument Gas	56
6.19.3	Oily Water	56
6.19.4	Storm Water.....	57
6.19.5	Service Water	57
6.19.6	Sewage	57
6.20	Affected Assets.....	57
6.21	Process Isolation Philosophy Gap Analysis	58
6.22	MAOP Standard Gap Analysis	58
7	GAS TURBINE COMPRESSOR.....	58
7.1	Major Equipment and Process Equipment	58
7.2	Compressor Utilities	58
7.2.1	Fuel Gas	58
7.2.2	Lube Oil	59
7.2.3	On-Crank Cleaning.....	59
7.2.4	Air Inlet Filtration	59



7.3	Electrical Equipment.....	59
7.4	Instrumentation.....	59
7.5	Hazardous Areas	60
7.6	Control Systems	60
7.7	Skid and Structural	60
7.8	Gas Compressor Close Fit Acoustic Enclosure	61
7.9	Safety Features	61
8	PIPING	62
8.1	Piping Design	62
8.1.1	Design Standard	62
8.1.2	Pressure and Temperature Design	62
8.1.3	Corrosion Allowance.....	62
8.1.4	Jointing	62
8.1.5	Buried Piping.....	63
8.2	Piping Material Classes.....	63
8.3	Valves.....	64
8.3.1	Ball Valve Type and Details.....	64
8.3.2	Other Valve Types	64
8.3.3	Valve Configuration	65
8.4	Vent Valves	65
8.5	Check Valves.....	65
8.6	Actuators	65
8.6.1	Actuator Type	65
8.6.2	Actuator Torque.....	65
8.6.3	Maximum Actuator Torque	66
8.6.4	Stroking Times	66
8.7	Pipe Fabrication and Construction	66
8.7.1	General	66



8.7.2	Welding	66
8.7.3	Inspection and Testing	66
8.7.4	Flange Management.....	66
8.7.5	Piping Installation	66
8.8	Coatings	67
8.9	Pipe Supports	67
8.10	Stainless Steel	67
8.11	Vibration Induced Fatigue	67
8.12	Insulation.....	68
8.12.1	Thermal Insulation	68
8.12.2	Noise Insulation	68
8.13	Special Piping Items.....	69
8.14	Piping and Pipeline Stress Analysis.....	69
9	PIPELINE GENERAL DETAILS	70
9.1	Description	70
9.2	Line Pipe	70
9.3	Future City Gate Stations	71
9.4	MLV and Barred Tees.....	71
9.5	Location Classification	72
9.6	Pipeline Assemblies	72
9.7	Depth of Cover.....	72
9.8	Coating and Corrosion Protection	74
9.9	Bends.....	75
9.10	Induction Bends.....	76
9.11	Roped Bends	76
9.12	Cold Field Bend	76
9.13	In-Line Inspection Facilities.....	76
9.13.1	Existing Pig Trap – Truganina	77



9.13.2	Proposed New Pig Trap – Wollert Station	77
9.14	Pipeline Valves.....	78
9.15	Trench and Backfill.....	78
9.16	Trench Breakers	79
9.17	Pipeline Crossings	79
9.17.1	General	79
9.17.2	Railway Crossings.....	80
9.17.3	Road and Highway Crossings.....	80
9.17.4	River and Stream Crossings.....	80
9.17.5	Buried Services	81
9.18	Pipeline Marking	82
9.18.1	Marker Signs.....	82
9.18.2	Marker Tape	82
9.19	Buoyancy Control	82
10	PIPELINE DESIGN	84
10.1	Design Factor.....	84
10.2	Pipeline Safety Management Study	84
10.2.1	External Interference Protection	85
10.2.2	Pipeline Failure Consequences.....	85
10.3	Pipeline Penetration Resistance	87
10.4	Pipeline Protection Measures.....	87
10.4.1	Physical Protection Measures	88
10.4.2	Procedural Protection Measures.....	88
10.5	Fracture Control	88
10.5.1	Fracture Initiation	88
10.5.2	Brittle Fracture	88
10.5.3	Tearing Fracture	88
10.6	Pipeline Fatigue	89



10.7	Stress Corrosion Cracking (SCC).....	89
10.8	Hydrogen Induced Cracking (HIC).....	89
10.9	Stress and Strain Analysis.....	90
10.10	Strength De-rating.....	90
11	ELECTRICAL.....	91
11.1	General.....	91
11.2	Power Supply Requirements.....	91
11.2.1	Wollert Facility Power Supply.....	91
11.2.2	Battery Backup System (DC Supply).....	92
11.2.3	Main Line Valve (MLV) Station Power Supply.....	92
11.3	Control Equipment Building and Associated Building Services	92
11.4	Plant Lighting Design.....	93
11.5	Junction Boxes and Cabling.....	94
11.5.1	Junction Boxes.....	94
11.5.2	Cable Support Systems and Conduits.....	94
11.5.3	Cable Sizing.....	94
11.6	Earthing.....	95
11.6.1	Earthing System.....	95
11.6.2	Instrument Earth.....	95
11.7	Lightning Protection.....	96
11.8	Electrical Interference.....	96
11.9	Hazardous Area Design.....	97
11.10	Heat Tracing.....	97
12	INSTRUMENTATION.....	98
12.1	General.....	98
12.2	Actuator Motive Power.....	98
12.3	Instrument Tubing.....	98
12.4	Instrument Support Stands.....	99



12.5	Pneumatically-Controlled Equipment	99
12.6	Pressure and Differential Pressure Measurement	99
12.7	Temperature Measurement	99
12.8	Thermowells.....	100
12.9	Flow Measurement Instruments	100
12.10	Level Measurement Instruments	100
12.11	Actuated Valves	101
12.12	Control Valves	101
13	CONTROL AND SAFETY SYSTEMS.....	103
13.1	General.....	103
13.2	Compressor Station Controller	103
13.3	Expansion Compressor Station Controller	104
13.4	Unit Control System	104
13.5	DEA Control System	105
13.6	Modifications to Existing Control System	105
13.7	SCADA & Communications.....	105
14	CORROSION AND CATHODIC PROTECTION	106
14.1	General Requirements	106
14.2	Interface Cathodic Protection	107
14.3	Temporary CP	107
14.4	CP Monitoring at Facilities	107
14.5	Electrical Insulation and Continuity.....	108
14.6	Lightning Protection.....	108
14.7	Electrical Interference Effects	108
15	CIVIL / STRUCTURAL ENGINEERING & DESIGN	109
15.1	Site Conditions	109
15.2	General.....	109
15.3	Geotechnical	109



15.4	Earthworks	109
15.5	Roads, Access and Site Finishing	110
15.6	Drainage.....	110
15.7	Security Fences and Gates	110
15.8	Structural design inputs	111
15.9	Wind Design Criteria	111
15.10	Seismic Design Criteria	111
15.11	Concrete and Foundations Design.....	112
15.12	Structural.....	112
15.13	Control Equipment Building	112
15.14	Battery Room	113
APPENDIX A ABBREVIATIONS AND DEFINITIONS.....		114
APPENDIX B REFERENCES		116
APPENDIX C SCOPE SCHEMATIC.....		122
APPENDIX D AS/NZS2885.1 DBM CONFORMANCE CHECKLIST ..		123
APPENDIX E PIPE SIZING CRITERIA		131

1 Introduction

1.1 Purpose

This document sets out the design scope, intent and requirements for the WORM Project, comprised of:

- 51km pipeline from Wollert to Plumpton,
- new compressor unit at Wollert
- new discharge flow controls into VNI and the new WORM pipeline
- upgraded power supply and generation

Any identified discrepancies shall be reported to the project engineering manager for resolution.

All hard copies of this document shall be considered uncontrolled.

1.2 Order of Precedence

All works performed in accordance with this document, are to comply with the requirements of the relevant local Acts, Regulations, Standards and Codes of Practice of all authorities having jurisdiction over the work.

When conflict exists between the various applicable documents, the following order will apply, in decreasing order of precedence. Where APA requirements are more stringent, they are to take precedence.

- Acts of law or other legislation;
- Government licences and permits;
- Australian Standards;
- International Standards;
- APA Engineering Standards and Specifications;
- Project specific documents.

Refer to Appendix B for an abbreviated listing of relevant documentation.

1.3 Terms & Abbreviations

The Generic APA Terms and Abbreviations are listed in the Engineering Glossary.

Refer to Appendix A for Terms and Abbreviations used in this DBM

1.4 References

All work performed in accordance with this document shall be in conformance with the current issue, including amendments, of those national and international standards, codes of practice, guidelines and APA document/s listed in Appendix B

Refer to Appendix B for APA, Australian and International Standards and other relevant procedures and documents referenced by this DBM.

1.5 Superseded Documents

This document replaces the previously used document/s listed in Table 1.

Table 1 Superseded Documents

Superseded Document	
18035-SOW-A-0002	WORM Development SOW
PIP	WORM PIP

2 Project Information

2.1 Background, project drivers, objectives

The WORM project is the missing link in the VTS configuration which brings many benefits to the VTS. The main benefit of the WORM is system security which would enable east-west flows between Longford and Iona, and also gas to and from the VNI.

Due to the low pressure inner ring mains around Melbourne, there is a limitation on how much the South West Pipeline can bring gas from Iona or to Iona though Melbourne. With the WORM, there would be an alternative route for gas from Iona to flow into the Northern and Gippsland regions, higher refilling rate for WUGS, better linepack management (particularly for expected increase in GPG operation) and increased security of supply in the event of Longford or Iona outages.

2.2 Scope

The scope of the WORM detailed is the interconnecting pipeline between Plumpton and Wollert and associated facilities:

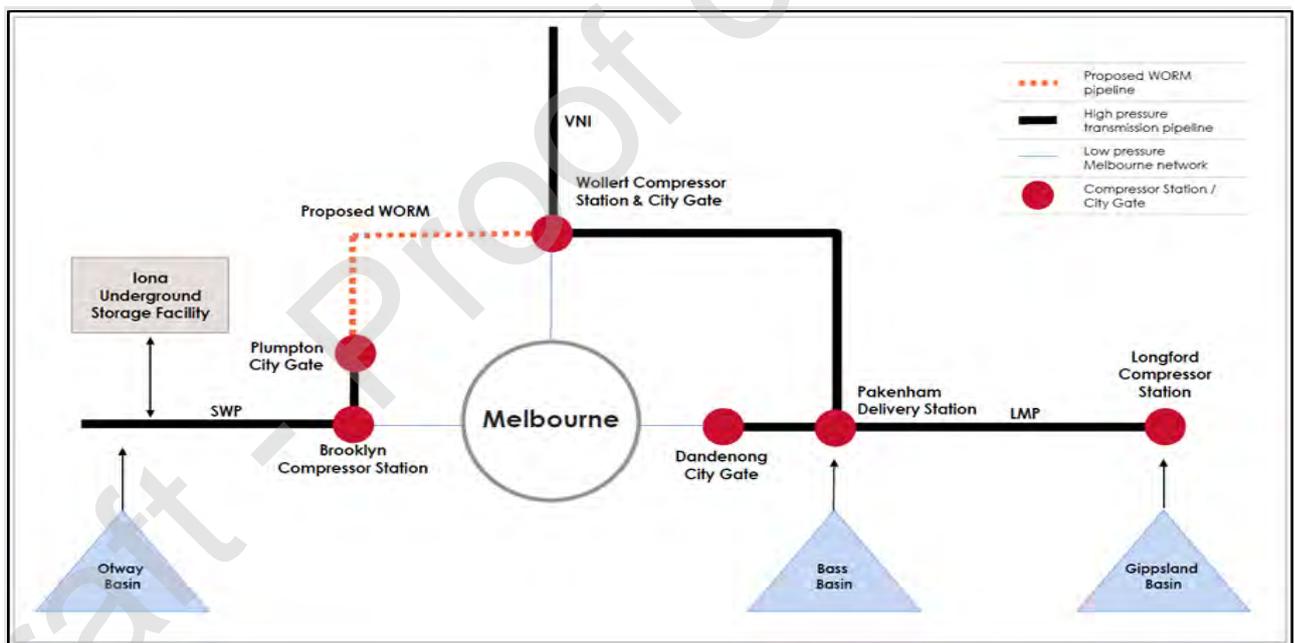


Figure 1 VTS System Overview Schematic

2.2.1 Pipeline

A short 8.3 km section of the WORM was laid in 2012 between Truganina/Rockbank (on the BLP pipeline) and Plumpton. The remaining 51 km pipeline from Plumpton to Wollert will be built with pigging facilities at Wollert.

Three (3) new remotely actuated MLVs will be installed along the pipeline.



Figure 2 WORM Location

2.2.2 Wollert

Wollert Station facilities will include:

- new Solar Centaur C50 turbine and C33 compressor package
- extension of the existing WCSB suction and discharge headers as common headers
- installation of separate discharge flow control skids for VNI and WORM
- Installation of a new PRS for flows from the WORM to the Pakenham pipeline header.
- New pig trap at Wollert
- New control equipment building
- Upgraded power supply and new DEA.

Flows from the common header will be split towards the VNI via a new Discharge Flow Control system and towards the WORM via a new Discharge Flow Control system.

Flows from the WORM will be pressure controlled into the Pakenham to Wollert pipeline (T61) to help manage pressures in the Pakenham header during peak periods.

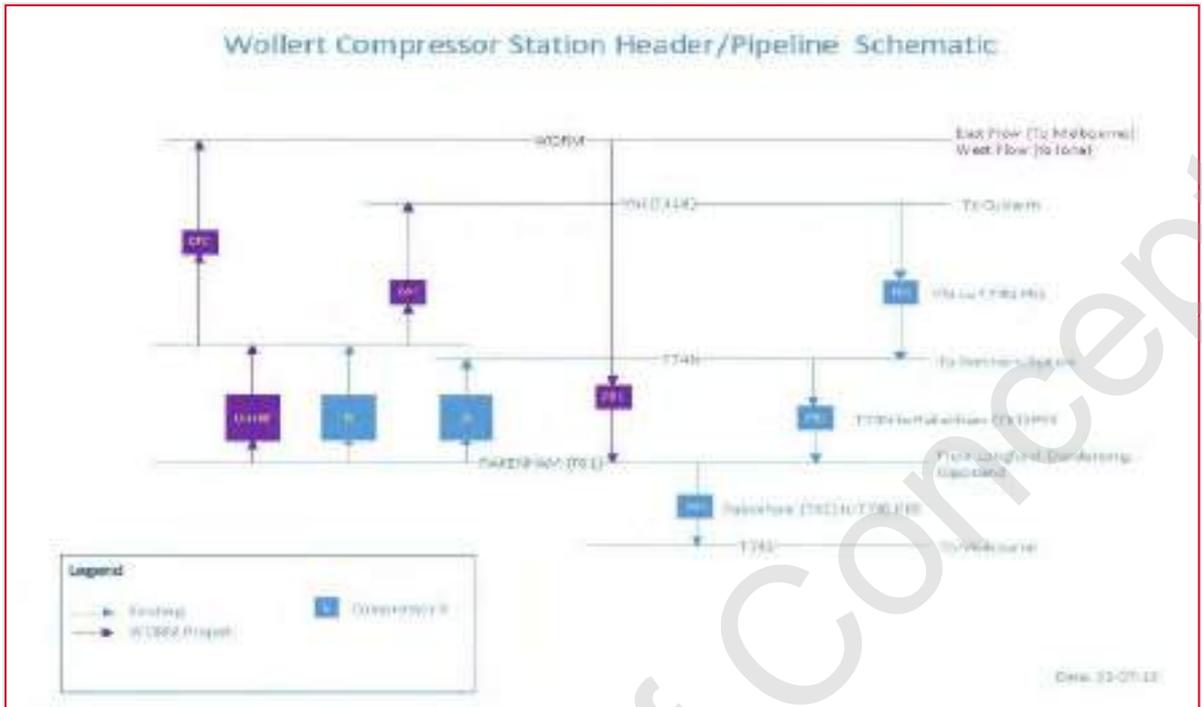


Figure 3 Wollert Process Scope Schematic

2.2.3 Plumpton

Tie in to an existing buried connection at Plumpton will utilise an existing buried stopple connection.

2.2.4 Truganina

The existing pig trap has been confirmed to be sufficiently sized for required Magnetic Flux Leakage (MFL) tools subject to limitations on velocity. **(HOLD 30- Changes may be required at the Truganina pig trap to enable higher rate of pipeline venting as part of the WORM project (as part of the Pipeline Isolation plan)).**

2.2.5 Other Sites

The VTS from Wollert to Iona will be assessed for potential impacts due to the WORM project. These may include assessment of inline equipment such as thermowells and sample probes or gas processing equipment such as filters and heaters for higher flows and/or pressures.

2.2.6 Ownership

APA will own the pipeline and all related facilities.

2.2.7 Sites

Existing sites affected by the project are:

- Wollert;

WORM Project

- Plumpton
- Truganina

Three (3) new MLV sites will be created.

[HOLD 1 – potential to be city gate sites to be confirmed]

2.3 Station components and battery limits

2.3.1 Wollert

The following station components will apply at Wollert:

- WCSB discharge header;
- WCSB suction header;
- WCSB fuel gas header;
- WCSB instrument air header;
- WCSB vent header;
- WCSB oily water system;
- Incoming power supply (cutover to new control equipment building);
- WCSB discharge isolation to VNI (tie-in of new VNI discharge flow control);
- Existing V511 buried connection for tie-in of WORM PRS;
- WCSB discharge to WORM pipeline
- WORM pipeline vent
- Existing WCSB vent stack;

2.3.2 Plumpton

- Plumpton buried pipeline tie-in;

2.3.3 Exclusions

- Modifications to the existing Wollert A compressor station are excluded from the Project, with the excepting of change out of suction and discharge header blowdown RO's;
- Other offsite modifications at Euroa, Springhurst or other intermediate locations;
- Installation of city gate offtake connections.

3 General Requirements

3.1 Safety Requirements

3.1.1 General

During design the safety consideration will extend to:

- Include the necessary features and precautions to ensure the safety of employees, APA and its contractors, servants, agents, members of the public, livestock and property;
- Comply with all Occupational Health, Safety and Welfare Acts, requirements and regulations of State and Local Government and of Statutory Authorities, applicable to the Works;
- Employ Safety In Design principles throughout the project execution and at appropriate times of the execution;
- Separate equipment to reduce potential for escalation of fires on one piece of equipment onto others or onto safe areas (see below);
- Ensure reasonable and safe access is available for all components that will be frequently accessed by operators during operation and maintenance
- Ensure access to the facility by the public, whether authorized or not, is prevented as far as practical;
- Ensure safe site access egress for personnel in the event of emergencies;
- Ensure all hot or cold surfaces and rotating parts that can be accessed by personnel are provided with insulation or guarding for personnel protection;
- Ensure safety showers and eye washes are provided at locations where exposure can be reasonably predicted; and
- Consider impact of high noise levels on personnel health and wellbeing;
- Consider impact of project execution on the safety of site personnel;

3.1.2 Fire & Gas Philosophy

Refer to 530-PHL-R-0001, APA Fire and Gas Philosophy for detailed requirements.

Passive fire protection through separation of equipment and systems is the primary method for fire protection. Site separation distances have been established to be consistent with this approach. It is noted though actual separation distances from equipment to the perimeter fence can be reduced from recommended distances as there is no perceived threat to the general public since APA owns the land outside the perimeter fence for a considerable distance in all directions. Also, the property on which the station is located is a fenced area. In regards to the external risk from bush fire, the landscape consists of low shrubbery with very few trees representing a very low risk which is supported by the fact that APA facilities that have been exposed to bushfires have experienced minimal to no impact from these events.

Compressor units shall be monitored with a combination of UV/IR, thermal and gas detectors. [Control system interaction shall be provided by the Unit Control System and the associated fire and gas system \(provided by the SCS\).](#)

On confirmed detection of a fire, the unit will immediately shutdown and vent all gas. A water mist system supplied by Solar will be initiated to suppress any fire within the package.

New control equipment building will be supplied with smoke detection (ionization, photovoltaic and VESDA) and fire suppression system.

In addition to the above, portable fire extinguishers to prevent small fires from escalating in size shall be located as follows, as a minimum:

- Adjacent to gas turbine package enclosure;
- Adjacent to diesel engine alternator (DEA);
- Adjacent to air cooled heat exchanger (ACHE), for consistency with existing equipment;
- Inside control equipment building;

Location of extinguishers for protection of new equipment to mirror the location of extinguishers protecting similar/identical equipment as close as practical.

Extinguishers shall be clearly sign-posted and maintained in accordance with AS/NZS 1841 series of standards.

Location of fire protection equipment, including portable fire extinguishers, shall be identified on the safety/evacuation layout.

3.1.3 Separation distances

Site layout drawings shall be developed to describe the site location as accurately as possible with respect to the existing facilities. It shall depict the project and all adjacent existing buildings, roads, storage facilities, ignition sources and equipment for consideration, relative to loss prevention and efficient operations and maintenance of the facility.

The site layout shall incorporate the following information:

- All buildings, equipment, coolers, valve skids, compressor units, control rooms, transformers and pipe ways that are inside the fenced limits;
- All areas assigned for roads, parking, right-of-ways, access ways for heavy equipment, curbing, paving, ditches, trenches, canals, drainage, maintenance space, lay down areas and exclusion zones;
- Prevailing winds, flammable storage and ignition sources with acceptable minimum separations between non-compatible items noted;
- Hazardous area zones and classifications to AS 60079.10.1 shown on a separate drawing;
- All plant sections, control rooms and equipment must be accessible for operations and maintenance and emergency response equipment; and
- Licensed areas.

Separation distances between equipment and plant shall be analysed as part of the risk assessment process and shall be incorporated into the detailed design

commensurate with the requirements of the appropriate Australian Standards, Environmental Management Plan and the laws of Victoria. Refer to 18035-TN-A-0004.

The intent of effective separation distances and buffer zones is to minimise exposure to potential losses from fire and explosion and allow necessary access / egress.

3.2 Design Life

The buried pipeline and facility system components shall have a design life as nominated in Table 2 Pipeline and Equipment Design Life.

Table 2 Pipeline and Equipment Design Life

Equipment	Design Life (Years)
Mainline and pipeline valves	60
Pipeline assemblies excluding Scraper Traps	60
Scraper traps and end closures	40
Building structures	40
Station Equipment	25
Station piping	25
Station vents	25
Control panel equipment (electrical and instrumentation)	15
Station Instrumentation (electrical and instrumentation)	15
Station Instrumentation (non-electronic)	15
Diesel Engine Alternator (genset)	15
Monolithic Insulating Joints	60
CP fixtures, such as test points, cabling and junction boxes	60 where practical



Equipment	Design Life (Years)
Cathodic protection consumables such as impressed current anode	20 (minimum)
Sacrificial anodes shall have a design life	10 (minimum)

The structural integrity of the facilities will be assessed and the remaining life of the assets will be reviewed and confirmed for continued service at an approved interval as per AS2885.3 and AS3788

Draft - Proof of Concept

4 Environmental Requirements

4.1 Flood Levels

Refer to Civil and Structural design for flood levels

4.2 Ambient Conditions

Wollert has a temperate oceanic climate (Köppen climate classification Cfb) with warm to hot summers and cool winters.

The site conditions are mainly arid conditions with periods of extreme hot or cold weather during the year.

Table 3: Ambient Conditions

Parameter	Unit	Value	Basis
Site Elevation	m AHD	209	Wollert Augmentation DBM
Temperature – Max	°C	44	Wollert Augmentation DBM
Temperature – Min	°C	-2.5	Wollert Augmentation DBM
Relative Humidity - Min	%	27	Wollert Augmentation DBM
Soil Temperature - Max	°C	25	Wollert Augmentation DBM
Soil Temperature - Min	°C	9	Wollert Augmentation DBM
Black Bulb Temperature	°C	65	Wollert Augmentation DBM
Design Wind Speed	m/s	41	Wollert Augmentation DBM

4.3 Ground Temperatures

The average minimum and maximum ground temperatures (as per recent historical data) are as follows. These are to be used for design:

- Maximum (Summer): 25°C
- Minimum (Winter): 9°C

4.4 Relative Humidity

The following results are based on results from BOM Bundoora weather station.

Table 4 Relative Humidity

Statistics	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mean 9am relative humidity (%)	66	69	70	73	81	84	83	76	71	65	66	64	72
Mean 3pm relative humidity (%)	46	46	48	52	60	68	64	58	55	56	49	48	54

Source: BOM website.

NOTE: Use of relative humidity shall consider concurrent temperatures. Mixing of maximum temperatures and Relative Humidities may result in excessively conservative outcomes.

4.5 Rainfall

The following results are based on results from BOM Bundoora weather station.

Statistics	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mean rainfall (mm)	45.6	42.7	43.5	55.8	51.5	56.1	48.8	56.0	58.2	63.2	69.0	66.3	671.7
Decile 5 (median) rainfall (mm)	41.2	32.0	40.6	52.9	50.6	48.4	49.5	56.0	47.6	59.8	62.8	60.8	670.2
Mean number of days of rain \geq 1 mm	6.1	4.7	6.2	7.7	9.1	9.3	10.2	11.0	10.3	9.6	8.6	7.1	99.9

4.6 Noise Requirements

Where applicable, piping shall be designed to allow for either initial or future insulation installation.

Specific areas of high noise generation shall be addressed, including but not limited to:

- Control valve trims and associated downstream piping
- Compressor unit piping
- Aftercooler and other ventilation fan noise
- Inline noise generators (including in-line strainers)

Pipe supports where metal-to-metal contact occurs has not been proposed on the WORM project).

4.7 Far Field Noise Criteria

Far field noise limits have been established as part of the Environmental Assessments.

There are around 30 noise sensitive receivers close to the compressor station and the current planning scheme allows for additional residential development near the site.

The modelling and analysis undertaken for the assessment show that noise levels for the expanded facility would fall below the SEPP-N1 limits. Modelled receiver noise

levels for the facility operating at the maximum operational scenario and under adverse meteorological conditions were up to 36.8dB(A), which is below the most stringent noise limit (39dB(A)).

Modelling during the project Develop phase has assumed that the proposed Unit 6 will have an overall package sound power level of 111dB(A), the same as that of the existing Units 4 and 5. The report concluded that the noise levels for the expanded facility would not meet the requirements of SEPP-N1 if the Unit 6 package sound power level exceeded 116dB(A).

In order to remain below the noise requirements, Unit 6 compressor maximum overall package sound power level shall be limited to 111dB(A). This would require an acoustic enclosure for the compressor and turbine; and turbine exhaust and combustion air attenuators. The turbine exhaust and combustion air attenuator shall dampen the emitted noise to 76 dB(A).

4.8 Occupational Noise Limits.

Noise levels during normal operation shall not exceed 85 dB(A) (averaged over an 8 hour working day) at 1m from a noise source on site. If there are localised noise levels above 85 dB(A), these will be sign posted to ensure Maintenance and Operation staff do not enter these areas without suitable ear protection.

Higher limits will typically be expected for short term operation of equipment such as fast stop and anti-surge valves and emergency station venting.

Noise emission tests will be carried out to confirm installed equipment does not exceed the stated limit.

In addition to the localised noise limits above, the project design shall employ reasonable best endeavours to limit noise emissions such that the project operation does not add to the discernible background noise in the area.

4.9 Emissions Limits

Current industry practice shall be utilised to ensure exhaust and process gas fugitive emissions are minimised and kept as low as practicable.

The exhaust gas emissions have been modelled to verify that the turbo-compressor package NO_x and CO emissions comply with the National Environment Protection (Ambient Air Quality) Measure and the requirements of the Victorian EPA, as part of the Project design and approvals.

Other emissions shall be limited to the infrequent venting of gas during compressor venting and purging on shutdown or for maintenance, and minimisation of PSV usage by application of instrumented protective systems.

4.10 Waste collection

Existing station waste collection facilities will be utilised for the new project.

Refer to process design for additional details regarding oily water and waste water collection.

4.11 Visual amenity

Station design shall be consistent with the current building and station design colour schemes.

Finish colours of the project equipment and piping will be selected to follow the current paint colour as required by APA Painting Specification and as outlined in Table 5 Surface Finishes & Labelling.

Table 5 Surface Finishes & Labelling

Item	Surface Finish
Gas Piping	Biscuit colour to AS 2700 "X42"
Air Piping	Stainless steel with blue banding
Fire Protection System	Signal Red to AS 2700 "R13"
Personal Protection	Raw aluminium, galvanised or beige to AS 2700
Steelwork	Galvanised (hot dipped) or beige to AS 2700
Roofing, Building	Powder coated finish, colour beige
Handrails	Galvanised (hot dipped)
Bollards	Yellow colour to AS 2700 "Y14"

NOTE: Appropriate signage and labeling will be provided in accordance with AS 1345.

4.12 Security

Site security shall be as per the existing station. Any existing philosophies for monitoring of site activities, such as door switches, shall be extended to the new facility.

5 Operating Philosophy

5.1 General

Refer to the WORM Process and Control Description, 18035-SOW-Q-0001.

The pipeline and facilities installed will be designed to be operated as an unmanned facility with remote control by AEMO or if required by Dandenong Control Room via the ClearSCADA system. It will also be provided with full local control facilities for flexibility of operation and maintenance trouble-shooting.

The systems will be designed for fully automated, safe operation with optimised maintenance routines, in keeping with APA General Procedure for Operability, Maintainability and Reliability Requirements (530-PR-A-0001).

The gas compressor station operating philosophy shall have the following points in respect of design and construction of the facility:

- The facility is to be normally unmanned and remotely operated by AEMO with monitoring by APA Dandenong Control Room. No site attendance shall be required for normal operation of the station.
- All 3 compressors (2 existing and one future) shall be capable of operating and delivering to the common station header to supply either pipeline.
- The Gas Turbine driven gas Compressor (GTC) is to be operated at the most economic operating mode that achieves the demand or contractual throughput and pressure.
- Performance and operating data is to be transmitted by SCADA to allow effective remote control, monitoring, analysis and troubleshooting of the station.
- Additional remote functions to facilitate actuated valve isolations, reversal of flow direction and equalisation across the station as required.
- High level target for availability and reliability of the compressor station.

5.2 Start-up / shutdown

The new unit start and shutdown behaviour will be consistent with the existing two compressors in WCSB.

WCSB start up and shutdown will be an occasional requirement. This will typically be driven by specific maintenance requirements or due to a station emergency shutdown. As such, station start-up will be a manual process.

WORM PRS will be operated by AEMO as required.

5.3 Isolation

Unit isolation shall be consistent with the existing compressor units.

All Discharge Flow Control systems shall be installed within the station boundaries. No free flow without compression through these systems are anticipated.

The pipeline isolation valve system shall comply with the requirements of AS/NZS 2885.1, while also ensuring that flow to customers is not interrupted by spurious trips.

5.4 ESDs

Site ESD philosophy shall be consistent with the existing site philosophy.

In the event of an ESD:

- All gas sources will be isolated from the associated pipelines.
- Units will be isolated from compressor station piping.
- Compressor station inventory will be vented immediately.
- The balance of the station (WCG) will remain pressurised unless manually vented.

5.5 Remote vs local control

Remote operation by AEMO will be the normal operating control mode.

Operation of the pipeline will be available through the APA Dandenong Control Centre in the event that AEMO control is unavailable.

Site control will be available in the event that remote communications are unavailable. Site control will generally involve any required intervention to stop and start units due to changing conditions.

Local operation will be available for maintenance activities (e.g. test running of compressors, stroking control valves) or to prevent operation of equipment while under maintenance.

5.6 Expected normal operations

The compressor station is expected to operate as required by AEMO for delivery of gas either independently or concurrently to Iona and other western consumer or to VNI and associated consumers.

Operations for Iona refill during summer are anticipated.

Operations for VNI and WORM line pack storage during winter are also anticipated. This will likely result in twice daily increases to line pack with subsequent withdrawal to meet peak morning and evening demands.

5.7 Expected site attendance

- Site attendance by a field technician for routine maintenance and inspections is expected to occur 3-4 times per week for between 5-8 hours per visit.
- A one hour minimum response time for an operator to attend site by road.

5.8 Black starts

Following a total station outage, the following step would normally be taken:

- Restart power (diesel generator for black start if distributor metered power is unavailable)
- Restart instrument air systems
- Reopen station boundary valves to pressurise the Wollert compound
- Repressurise compressor station headers through manual bypass at suction inlet and compressor bypasses.
- Restart compressors and relevant services

5.9 Maintainability

The design shall incorporate minimal maintenance requirements through the selection of reliable, readily available (or supported in Australia) equipment and equipment configurations.

Where practicable, commonality with existing VTS equipment will be considered to achieve spares synergies and familiarization benefits with other APA facilities. The station shall be designed so that equipment which requires removal for maintenance can be readily isolated and removed in a safe manner without operational outages (where practical) or obstruction from other equipment. All proprietary equipment will have maintenance schedules and procedures in accordance with the supplier's recommendations.

During the formulation of maintenance schedules and practices, APA will consult equipment vendors and the users of similar equipment around Australia, to assist in preparing an appropriate maintenance regime for each equipment item. Equipment redundancy or a suitable number of appropriate critical and operational spare parts will be maintained on site to ensure the achievement of availability and reliability targets are not hindered by the absence of spare parts.

All maintenance and servicing requirements will be outlined in the appropriate Maintenance documentation, to be updated as part of the Project, by the Project team.

APA will be responsible for the maintenance of the compressor station.

Spare parts and tools shall be reviewed in consideration of the existing spares availability and utilization.

The new facilities shall include the following features to ensure maintainability:

- Be arranged with access to valving, instrumentation, sampling and injection points and controls by operation and maintenance personnel, preferably from grade level and without the necessity for temporary platforms or ladder (gas

WORM Project

- sampling probes, WORM pipeline vent and control valves excluded) or the need to climb over piping or cable trays;
- The WORM pipeline vent will require an approximately 1.5m high platform ladder to access the vent tip for replacement of weather cap. This ladder is required to be supplied by the project since there are no suitable ladders available on site;
 - Access to the positioners of the new flow and pressure control valves will be provided using existing ladders on site;
 - Access for vehicles and personnel for all maintainable equipment;
 - Pig Launchers/Receivers to be orientated in such way that a pig accidentally released into the facility will not impact pressure equipment or piping or high density areas;
 - Provide remote and local isolation to maintain gas supply during abnormal operations and local isolation for maintenance activities to allow the safe shutdown and reduction in pressure of the station piping system;
 - Provide a by-pass around the MLVs to allow field testing of these valves without disrupting supply of gas.

5.10 Reliability

The station shall be designed with high reliability principles in mind.

All compressor units will be designed to be capable of delivering to either or both the WORM and VNI (T119) pipelines simultaneously.

Where sparing is not provided then a method for remote monitoring of system performance shall be provided.

Maximum annual permissible interruptability of the facilities will be confirmed following a Reliability Availability Maintainability (RAM) Review.

Total annual loss of production will be confirmed following a Reliability Availability Maintainability (RAM) Review.

6 Process Design and Process Engineering

6.1 Gas Specification requirements

Gas specification shall be in accordance with AEMO Gas Quality Standard and Monitoring Guidelines (Declared Transmission System) and AS4564

Table 6 Gas Quality Requirements

Parameter		AS4654	AEMO Gas Quality Guidelines				Units
			Confirm	Notify	Mitigate	Curtail	
Temperature	max.	-	45	50	55	60	°C
Temperature	min.	-	3	2	-2	-10	°C
Elemental Sulphur	max.	1 ⁽¹⁾	-	1 ⁽²⁾			µm/Sm ₃
Mercury	max.	1 ⁽¹⁾	-	1 ⁽²⁾	4	7	µm/Sm ₃
Radioactivity	max.	600 ⁽¹⁾	-	600 ⁽²⁾	2,500	5,000	Bq/Sm ³

Notes:

1. Informative only
2. Offline limit

6.2 Gas Composition

The following gas compositions Table 7 shall be used for design.

Table 7 Gas Compositions Used

Component	Rich Gas (Culcairn)	Normal Gas (Longford)	Lean Gas (QLD CSG)	Units
C1	88.57	90.93	98.52	mol%
C2	5.91	5.24	0.02	mol%
C3	1.30	0.74	0	mol%
iC4	0.13	0.03	0	mol%
nC4	0.17	0.04	0	mol%

Component	Rich Gas (Culcairn)	Normal Gas (Longford)	Lean Gas (QLD CSG)	Units
iC5	0.0217	0.0100	0	mol%
nC5	0.0191	0.0100	0	mol%
C6	0.0158	0.0100	0	mol%
C7+	0	0.0200	0	mol%
N ₂	0.6751	0.8700	1.24	mol%
CO ₂	3.19	2.10	0.22	mol%
Molecular Weight	18.37	17.74	16.26	kg/kmol
Standard Density	0.7788	0.7521	0.6888	Kg/Sm ³
Higher Heating Value	39.07	38.71	37.23	MJ/Sm ³

6.3 Process Parameters

6.3.1 WCSB Discharge

Design parameters for the WCSB discharge shall be as per Table 8.

Table 8 WCSB Discharge Process Parameters

Parameter	Unit	Value	Basis
Flow – maximum	kSm ³ /h	525	PIP Attachment B, Case 2b
Pressure – Max operating	kPag	10200	PIP Section C
Pressure at Max Flow	kPag	9573-9721	PIP Attachment B, Case 2b
Pressure – Min for design	kPag	4500	SCADA data for SWP

Parameter	Unit	Value	Basis
Pressure – Design Max	kPag	10200	A06C01 Pipe Spec
Temperature – Max	°C	60	VNIE and WORM pipeline coating maximum temperature. High temperature trip setpoint.
Temperature – Min	°C	9	Wollert Augmentation Project DBM
Temperature - Design	°C	-28.9/65	A06C01 Pipe Spec

6.3.2 VNI (T119) Discharge

Design parameters for the VNI (T119) discharge shall be as per Table 9.

Table 9 VNI (T119) Discharge Process Parameters

Parameter	Unit	Value	Basis
Flow – maximum for control valve sizing	kSm ³ /h	285 Note 2	PIP Attachment B, Case 2b
Flow control setpoint limit	kSm ³ /h	Note 1	
Pressure – Max operating	kPag	10200	PIP Section C
Pressure at max control valve sizing flow	kPag	9578 - 9771	PIP Attachment B, Case 4
Pressure – Min for design	kPag	4500	SCADA data for T119
Pressure – Design Max	kPag	10200	A06C01 Pipe Spec
Temperature – Max	°C	60	VNIE and WORM pipeline coating maximum temperature.

Parameter	Unit	Value	Basis
Temperature – Min	°C	-10	Low low temperature trip to protect VNI pipeline
Temperature - Design	°C	-28.9/ 65	A06C01, A09C01 Pipe Spec

Notes:

1. Flow set-point limits based on maximum allowable velocity to prevent Acoustic-Induced Vibration: 243 kSm³/h with one run online, 344 kSm³/h with two runs online. Refer WPT.WOLL-CAL-Q-0011
2. Higher non-steady state flows shall be allowed via split-range flow control between the two runs. Control valves to be sized on the basis of 2 x 75% sparring.

6.3.3 WORM Discharge

Design parameters for the WORM discharge shall be as per Table 10.

Table 10 WORM Discharge Process Parameters

Parameter	Unit	Value	Basis
Flow – maximum for control valve sizing - initial	kSm ³ /h	285 Note 2	PIP Attachment B, Case 2b
Flow – maximum for control valve sizing - future	kSm ³ /h	410	PIP Attachment B, Case 3
Flow control set-point limit	kSm ³ /h	Note 1	
Pressure – Max operating	kPag	10200	PIP Section C
Pressure at max control valve sizing flow - initial	kPag	9573-9721	PIP Attachment B, Case 2b
Pressure at max control valve sizing flow - future	kPag	9731-9968	PIP Attachment B, Case 3
Pressure – Min for design	kPag	4500	SCADA data for SWP
Pressure – Design Max	kPag	10200	A06C01 Pipe Spec
Temperature – Max	°C	60	VNI and WORM pipeline coating maximum temperature.

Parameter	Unit	Value	Basis
Temperature – Min	°C	-10	Low low temperature trip to protect WORM pipeline
Temperature - Design	°C	- 28.9/65	A06C01 Pipe Spec

Notes:

1. Flow set-point limits based on maximum allowable velocity to prevent Acoustic-Induced Vibration: 243 kSm³/h with one run online, 486 kSm³/h with two runs online. Refer WPT.WOLL-CAL-Q-0011.
2. Higher non-steady state flows shall be allowed via split-range flow control between the two runs. Control valves to be sized on the basis of 2 x 75% sparing.

6.3.4 WCSB Suction

Design parameters for the WCSB suction shall be as per Table 11.

Table 11 WCSB Process Parameters

Parameter	Unit	Value	Basis
Flow – Max	kSm ³ /h	525	PIP Attachment B, Case 2b
Pressure – Max operating	kPag	6400	SCADA
Pressure at Max Flow	kPag	5239- 5428	PIP Attachment B, Case 2b
Pressure – Min for design	kPag	3500	PIP Attachment B, Case 5
Pressure – Design Max	kPag	10200	A06C01 Pipe Spec
Temperature – Max	°C	25	Max soil temperature - Wollert Augmentation Project DBM
Temperature – Min	°C	9	Min soil temperature - Wollert Augmentation Project DBM
Temperature - Design	°C	- 28.9/65	A06C01 Pipe Spec

6.3.5 WORM Pipeline Inlet

Design parameters for the WORM pipeline inlet at Wollert (applying to flow from the WORM into Wollert) shall be as per Table 12.

Table 12 – WORM Pipeline Inlet Process Parameters

Parameter	Unit	Value	Basis
Flow – maximum for control valve sizing	kSm ³ /h	285 ^{Note 2}	PIP Attachment B, Case 6
Flow control setpoint limit	kSm ³ /h	^{Note 1}	
Pressure – Max operating	kPag	10200	WORM Pipeline MAOP
Pressure at Max Flow	kPag	5703-5337	PIP Attachment B, Case 6
Pressure – Min for design	kPag	4500	SWP MINOP pressure
Pressure – Design Max	kPag	10200	A06C01 Pipe Spec
Temperature – Max	°C	25	Max soil temperature - Wollert Augmentation Project DBM
Temperature – Min	°C	9	Min soil temperature - Wollert Augmentation Project DBM
Temperature - Design	°C	-28.9/65	A06C01 Pipe Spec

Notes:

1. Flow set-point limit to be based on maximum allowable velocity to prevent Acoustic-Induced Vibration. Set-point to take account of the number of runs online.
2. Higher non-steady state flows shall be allowed via split-range flow control between the two runs. Control valves to be sized on the basis of 2 x 100% sparing.

6.3.6 WORM PRS to Pakenham Header

Design parameters for the Pakenham header for design of the WORM PRS shall be as per Table 13.

Table 13 WORM PRS to Pakenham Header Process Parameters

Parameter	Unit	Value	Basis
Flow – maximum for control valve sizing	kSm ³ /h	285 ^{Note 2}	PIP Attachment B, Case 6
Flow control setpoint limit	kSm ³ /h	^{Note 1}	
Pressure – Max operating	kPag	6400	SCADA
Pressure at Max Flow	kPag	5325-5686	PIP Attachment B, Case 6
Pressure – Min for design	kPag	3500	PIP Attachment B, Case 5
Pressure – Design Max	kPag	10200	A06C01 Pipe Spec
Temperature – Max	°C	25	Max soil temperature - Wollert Augmentation Project DBM
Temperature – Min	°C	0	Low low temperature trip to protect T61 pipeline
Temperature - Design	°C	-28.9/65	A06C01 Pipe Spec

Notes:

1. Flow set-point limit to be based on maximum allowable velocity to prevent Acoustic-Induced Vibration. Set-point to take account of the number of runs online.
2. Higher non-steady state flows shall be allowed via split-range flow control between the two runs. Control valves to be sized on the basis of 2 x 100% sparing.

6.3.7 WCSB Vent System

Parameter	Unit	Value	Basis
Flow – Max	kg/h	75200	WPT.WOLL-CAL-Q-0003 ^{Note 1}
Pressure – Max	kPag	^{Note 2}	
Pressure – Design Max	kPag	1960	A01C02 Pipe Spec. Applies to new vent system piping.
Temperature – Min	°C	^{Note 3}	To be calculated based on WCSB blowdown

Parameter	Unit	Value	Basis
Temperature - Design	°C	-28.9/65	A01C02 Pipe Spec

Notes:

1. Flow was calculated based on sizes of existing and new (Unit 6) blowdown RO's. Unit 6 RO bores to be the same as for corresponding RO's on Units 4 and 5.
2. Pressure coincident with minimum temperature to be calculated to determine material suitability.

6.3.8 WORM Pipeline Vent

Parameter	Unit	Value	Basis
Flow – Max	kg/h	145000	WPT.WOLL-CAL-Q-0013 Note 1
Pressure – Upstream of RO - Design Max	kPag	10200	A06C01 Pipe Spec.
Pressure – Downstream of RO - Design Max	kPag	800	Calculated backpressure at maximum flow
Temperature – Upstream of RO - Design	°C	-28.9/65	A06C01 Pipe Spec
Temperature – Downstream of RO - Design	°C	-45 ^{Note 3}	WPT.WOLL-CAL-Q-0012

Notes:

1. Flow calculated based on 4.7 KW/m² maximum radiation at vent valve (located at WORM pig trap)

6.4 Pipe Sizing Criteria

The process design for the compressor station main process pipework shall keep velocities within the acceptable range based on the sizing parameters given in Appendix E, in order to minimise negative effects from noise, vibration and possible erosion. Note that flow limits on DFC's and the WORM PRS were based on the sizing criteria applicable at the start of the project, which allowed higher velocities.

Additional mechanical analysis and design measures shall ensure that the new velocity criteria are satisfied at these flow limits.

6.5 Control Scheme – WCSB

6.5.1 Overview of Existing and New Control Schemes

WCSB currently ships to the T119 pipeline, (and to the T74N pipeline via the T119 PRS) via two C33 compressors (driven by Centaur 50 engines). After commissioning of the WORM project it will also ship to the WORM pipeline, with the addition of a third compressor. Flow to each of the two pipelines will be controlled by Discharge Flow Control (DFC) stations, with backup flow control via compressor speed / capacity control. Modifications to the existing control and pressure / temperature protection scheme will be a result of the addition of these stations and of the WORM pipeline as a second destination.

Figure 4 and Figure 5 below illustrate the existing and WORM control configurations:

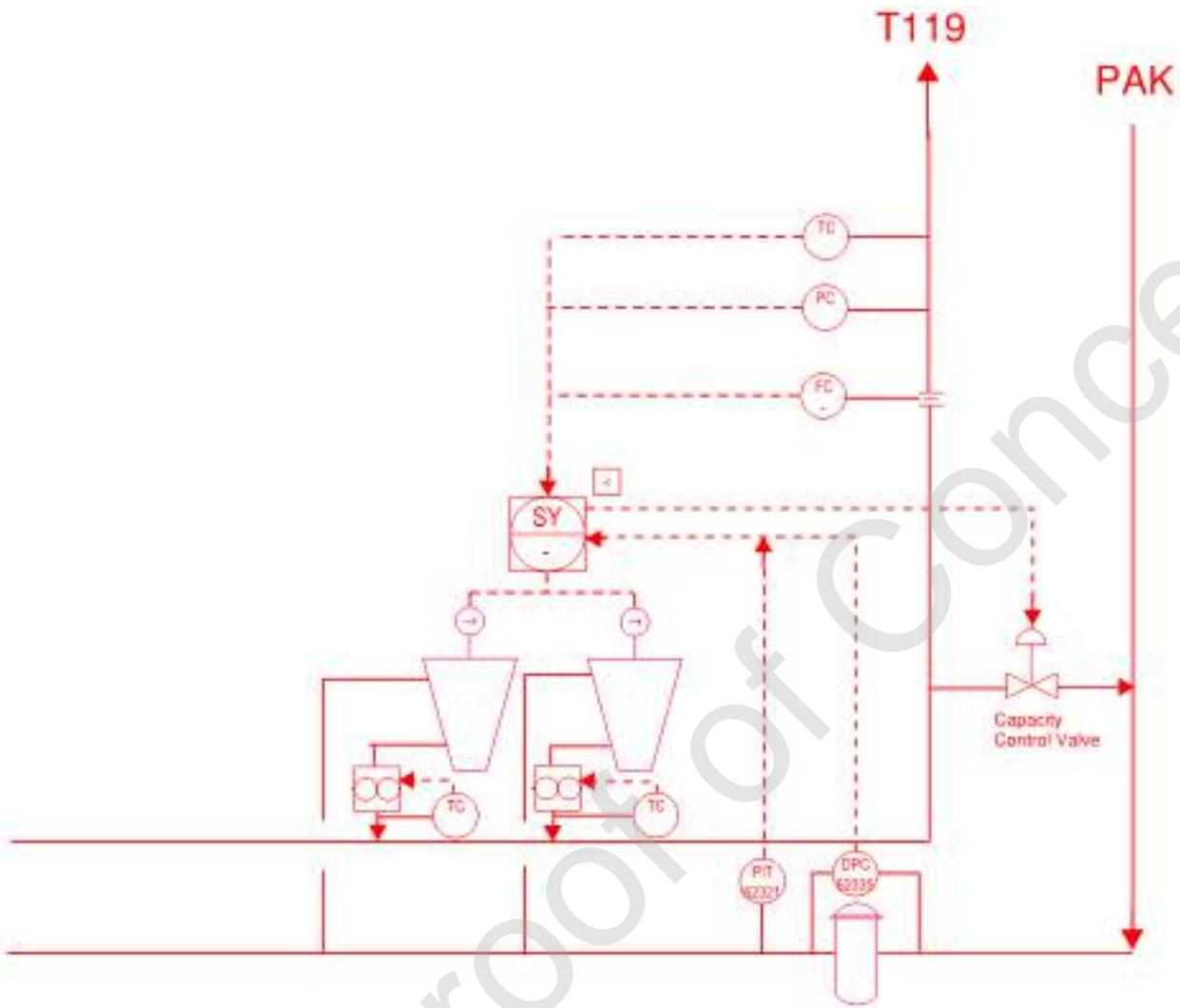


Figure 4 Existing WCSB control configuration

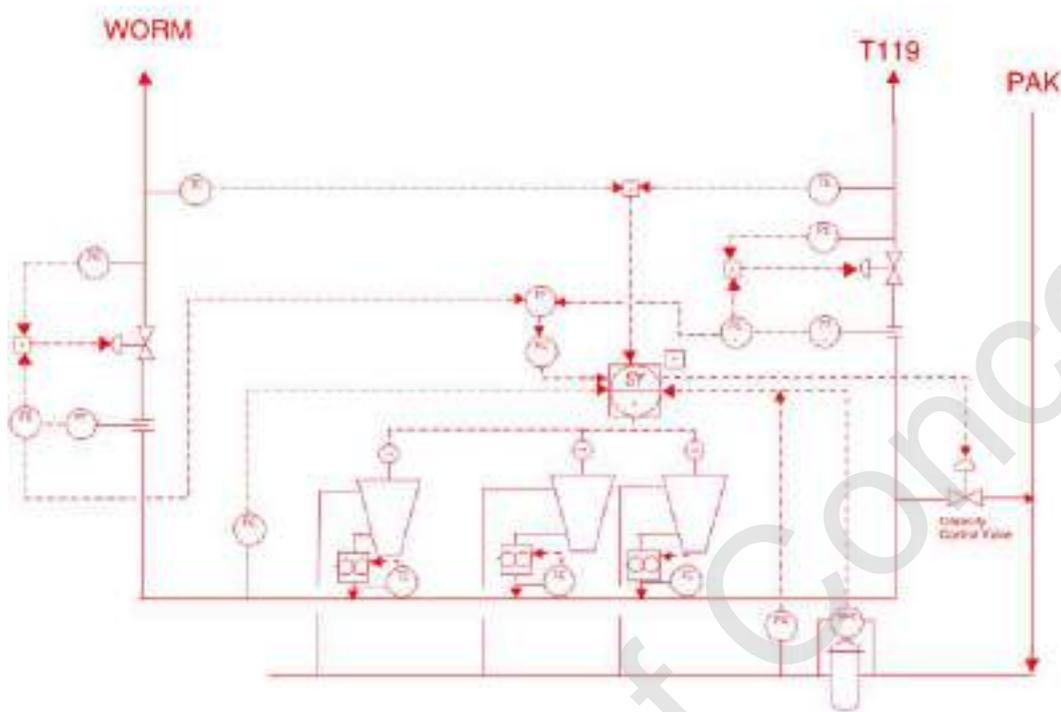


Figure 5 WORM WCSB control configuration

6.5.2 Flow Control

Currently, WCSB discharge flow is controlled via combined compressor speed and capacity control valve. In the WORM scheme, flow to each of the two pipelines will normally be via their respective DFC stations. The ability to control total WCSB flow via compressor speed / capacity control will be retained, with the flow signal derived by summing the WORM and VNI flows. The flow setpoint for flow control via compressor speed / recycle will be the sum of the WORM and VNI flow setpoints plus 10%. When both DFC's are controlling flow, the output of the compressor flow controller will be high and non-determining. Flow control via the compressors will become effective on failure open of one or both control valves in a DFC station.

The VNI DFC will take its flow signal from existing venturi flowmeter FE-62304. A new orifice flowmeter will be installed for the WORM DFC.

DFC Flow controllers will control the DFC control valves via a minimum select along with downstream pressure.

The DFC control valves will control in a lead-lag configuration, with each valve sized for 75% of design DFC flow (ie 75% of 285 kSm³/h for both DFC stations), and flow apportioned between the two control valves via a flow sharing algorithm.

Maximum allowable DFC flow control set-points will be based on maximum allowable velocities in piping to the two destinations at minimum operating pressure. The flow control valves will not be specified to control accurately at these flows.

6.5.3 WCSB Discharge Pressure Control

Currently, WCSB discharge pressure is controlled via compressor speed/ capacity control, based on the pressure signal from PY-62314 on the T119 flow-path. Since this pressure will be on the pipeline side of the VNI DFC in the WORM scheme, WCSB pressure for compressor speed / capacity control will be derived from the PIT's upstream of the flowmeters, via a maximum select. The maximum allowable discharge pressure control set-point will be 10200 kPag.

The WCSB discharge pressure control set-point will be automatically set at 200 kPa above the maximum of the WORM and VNI pipeline pressure control setpoints (no remote manual input of set-point). This is intended to minimise compressor fuel consumption whilst giving sufficient pressure drop across DFC control valves to maintain stable control.

6.5.4 T119 and WORM Pipeline Pressure Control

Control of WORM and T119 pipeline pressures will be via their respective DFC stations. The T119 pipeline pressure signal will be taken from a median select of the existing 3 PIT's (via PY-62314) which will be downstream of the VNI DFC. The WORM pipeline pressure signal will be taken from a single PIT downstream of the WORM DFC.

Pressure controllers will control the DFC control valves via a minimum select along with flow.

The maximum allowable discharge pressure control set-point for the WORM and VNI DFC's will be 10200 kPag.

6.5.5 WCSB Discharge Temperature Control

Currently, WCSB discharge temperature is controlled via a combination of two methods:

1. compressor speed control, based on the temperature signal from TY-62315 on the common discharge, and
2. Control loops on the aftercooler outlet of each compressor which switch aftercooler fans on and off.

Setpoints for the two methods of control are such that the second method normally operates without the need to reduce station capacity.

In the WORM scheme, where flow could be to either or both of the destination pipelines, the temperature signal for the speed control will be taken from downstream of both the WORM and VNI DFC's, via a maximum select. Temperature control via switching aftercooler fans on and off will be retained, with low fan switch-off temperature calculated to prevent low pipeline temperatures at maximum JT cooling across the DFC control valves.

The T119 pipeline temperature signal will be taken from the 3 existing TIT's (via TY-62315) which will be downstream of the VNI DFC. The WORM pipeline temperature signal will be taken from a single new TIT downstream of the WORM DFC.

6.5.6 Sizing of DFC Control Valves

The maximum CV sizing case for the DFC control valves shall be for 200 kPa pressure drop at 75% of the maximum flows and coincident pipeline pressures given in Tables 9 and 10 above.

The minimum CV sizing case shall be for 50 kSm³/h at 10200 kPag compressor discharge pressure and minimum pipeline pressure.

6.6 Control Scheme – WORM PRS

The control valves in the WORM PRS runs will control the following via minimum select:

- Flow
- Upstream (WORM) pressure
- Downstream (T61) pressure
- Downstream (T61) temperature.

The PRS control valves will control in a lead-lag configuration, with each valve sized for 100% of design DFC flow (ie 100% of 285 kSm³/h), and flow apportioned between the two control valves via a flow sharing algorithm.

Maximum allowable flow control set-point will be based on maximum allowable velocities in piping at minimum operating pressure. The flow control valves will not be specified to control at these flows.

Figure 6 shows the control configuration for the WORM PRS:

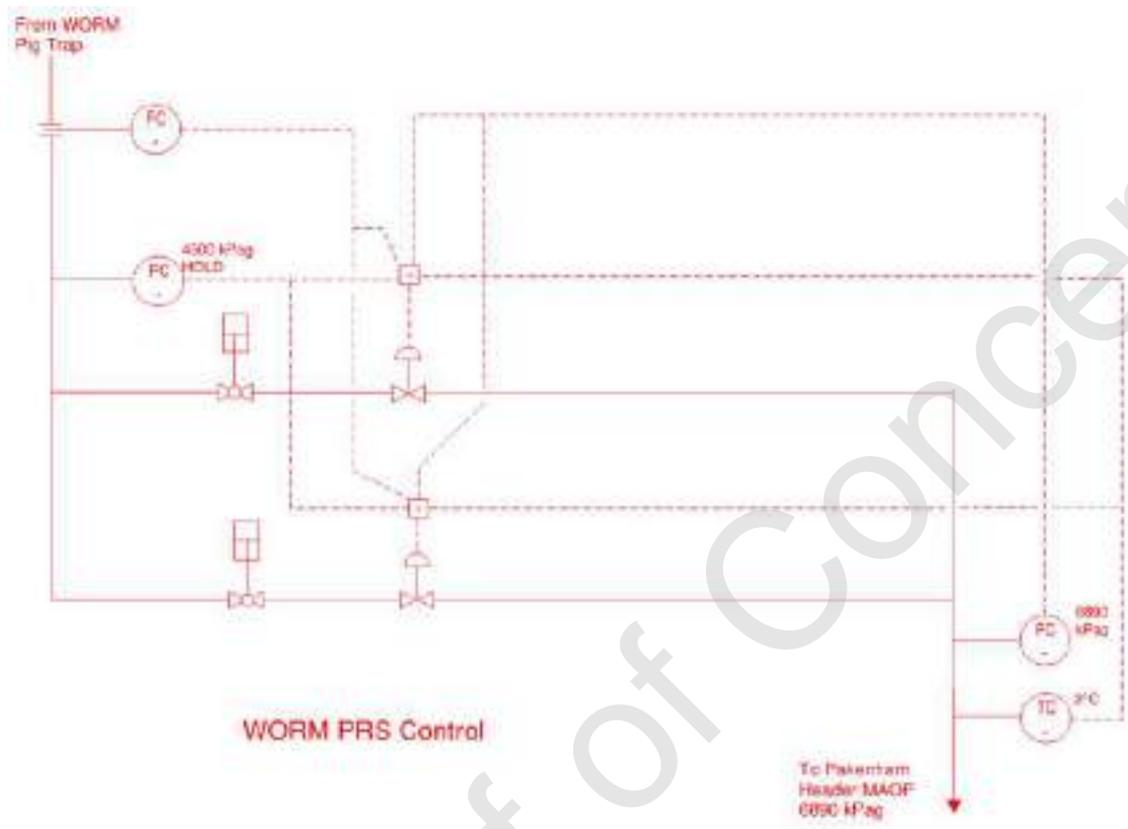


Figure 6 WORM PRS Control Configuration

6.7 Overpressure Protection

6.7.1 General

The use of full flow pressure relief valves for over pressure protection should be avoided where practical. The use of safety instrumented systems for over-pressure protection, if deemed appropriate, shall be assessed during a SIL LOPA assessment workshop which would determine the appropriate SIL level but may not necessarily result in a maintainable SIL if there are sufficient independent layers of protection.

6.7.2 Overpressure Protection - WCSB

Subject to SIL LOPA assessment, WCSB as modified by the WORM project will maintain the existing control and trip layers and set-points to protect discharge piping from overpressure by the WCSB compressors. Due to the addition of discharge flow control, the T119 and WORM pipelines will have pressure control via the DFC control valves as an additional layer of protection. Figure 7 and Figure 8 below illustrate the existing and WORM overpressure protection configurations:

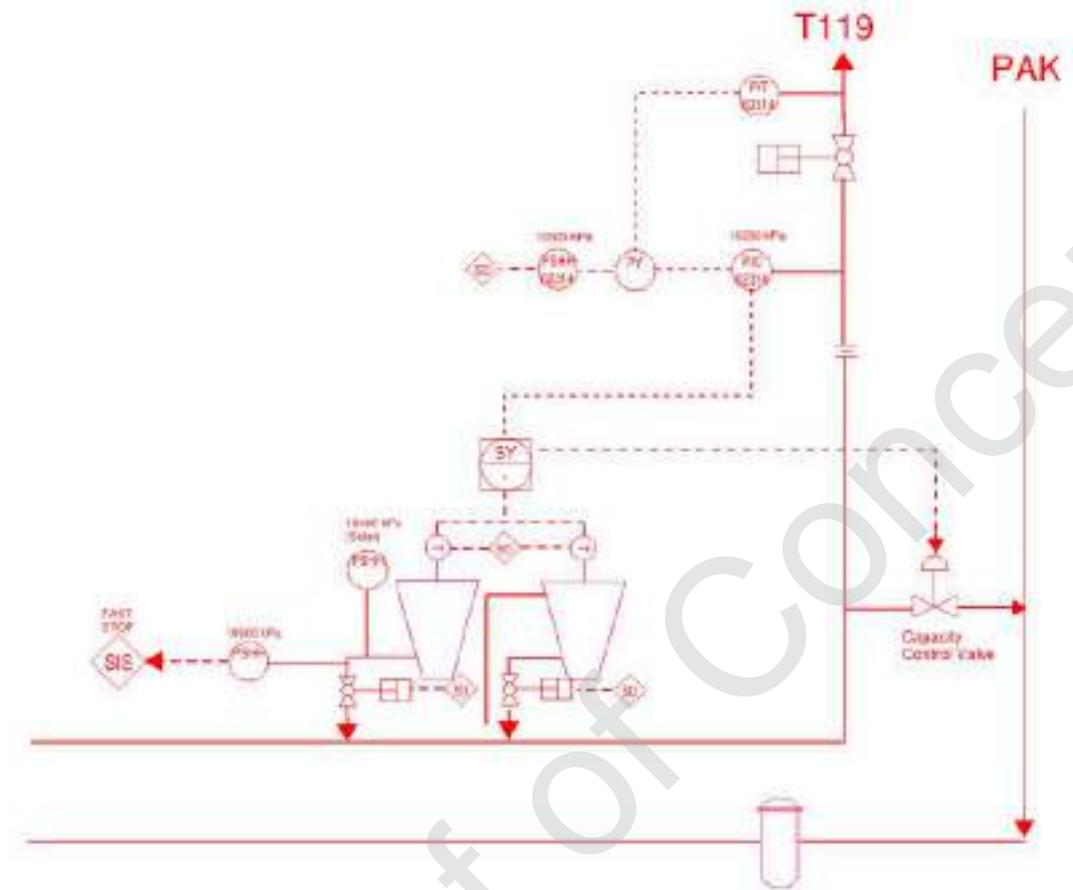


Figure 7 Existing WCSB overpressure protection configuration

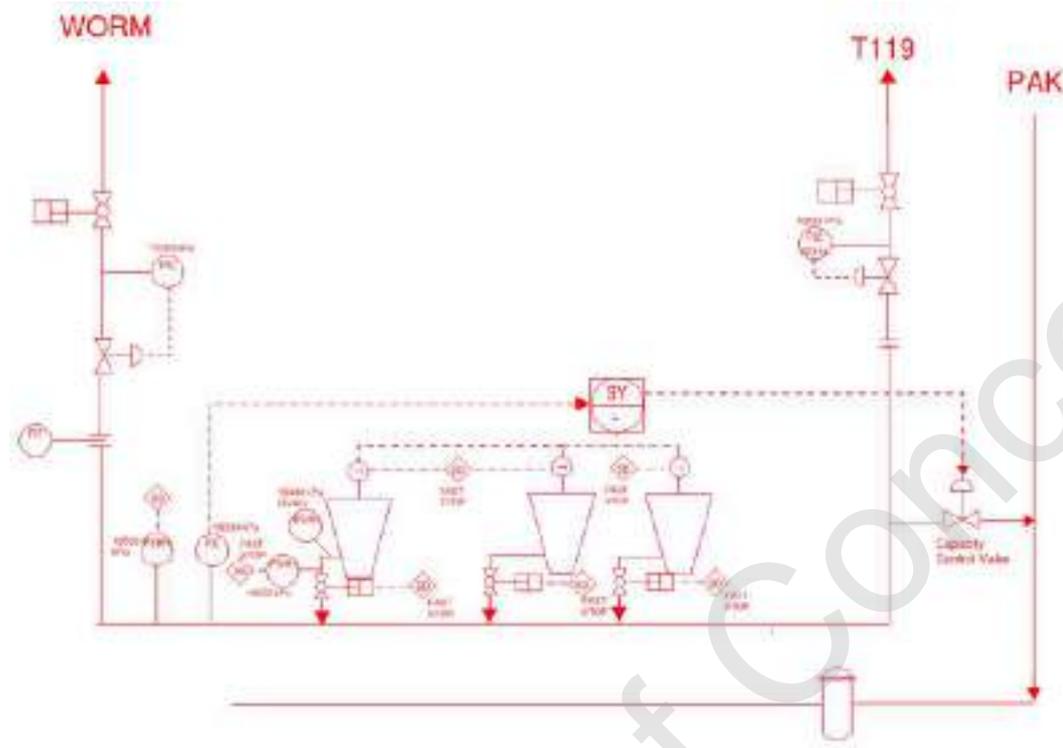


Figure 8 WORM WCSB overpressure protection configuration

Existing high pressure trips are as follows:

- Unit 4/5 discharge PSHH-4364 / 5364 (part of Solar package) – set at 10,400 kPag
- Unit 4/5 discharge PSHH-62341 / 62344 – set at 10,500 kPag – Unit fast stop
- Discharge header PSHH-62314 – set at 10,500 kPag – Unit normal stop

Unit high pressure trips will be retained and duplicated for Unit 6.

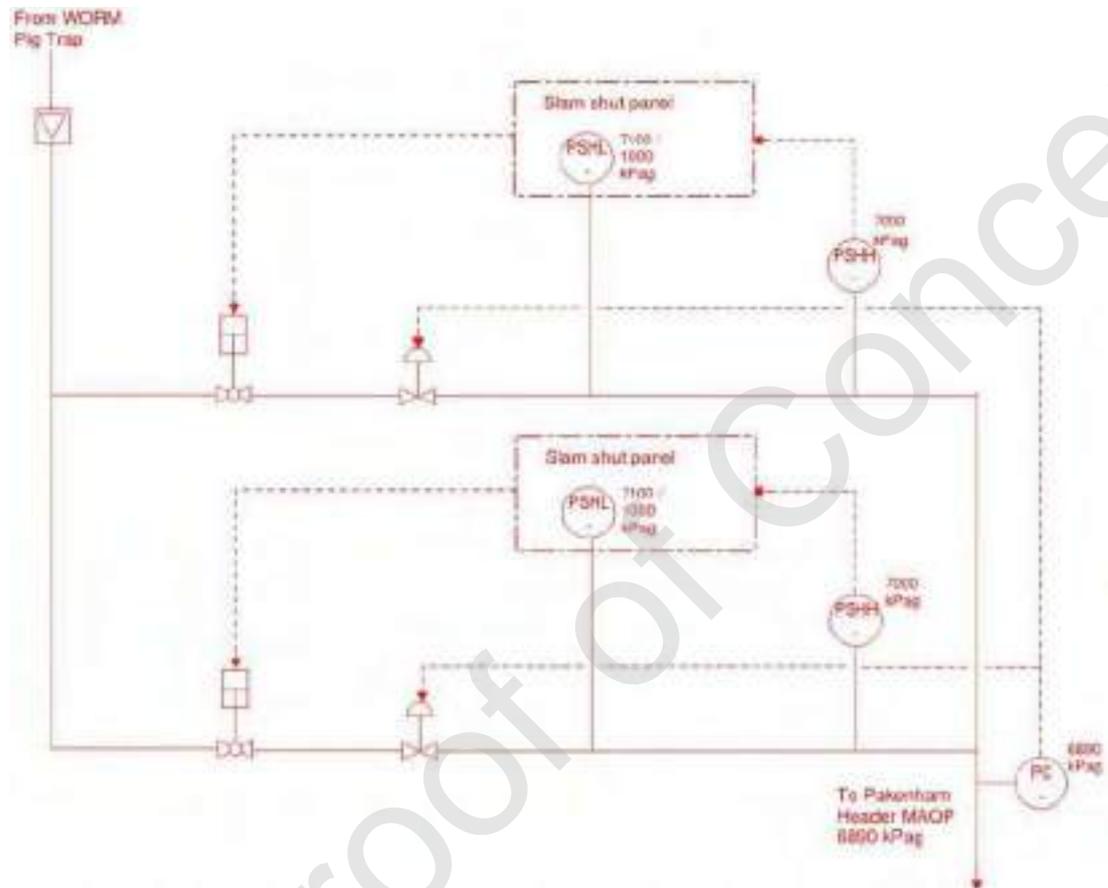
The existing header high pressure trip is derived from transmitters which will be downstream of the VNI DFC, and hence can no longer serve this purpose. Hence the WORM project will derive the discharge header high pressure trip from a single new PIT on the new discharge piping, along with the PIT's upstream of the VNI (existing) and WORM (new) flowmeters, via 2 out of 3 voting.

6.7.3 Overpressure Protection – WORM PRS

The WORM PRS will connect the WORM pipeline (MAOP 10200 kPag) and T61 pipelines (MAOP 6890 kPag). Subject to SIL LOPA assessment, protection for the T61 will be in the form of an actuated ball valve with slam shut panel. A second (monitor) regulator shall be considered as an additional protective layer if required by the SIL / LOPA. The panel will provide both electronic trip (set at 101.6% of T61 MAOP) and pneumatic trip (set at 103% of T61 MAOP).

Figure 9 shows the WORM PRS overpressure protection configuration:

Figure 9 WORM PRS overpressure protection configuration



6.7.4 High and Low Temperature Protection

High – Low Temperature Protection – WCSB

Subject to SIL LOPA assessment, WCSB as modified by the WORM project will maintain the existing control and trip layers to protect discharge piping from high temperature. Additional protection will be provided against low temperatures downstream of the DFC stations due to high pressure drop. Figures 10 and 11 below illustrate the existing and WORM temperature protection configurations:

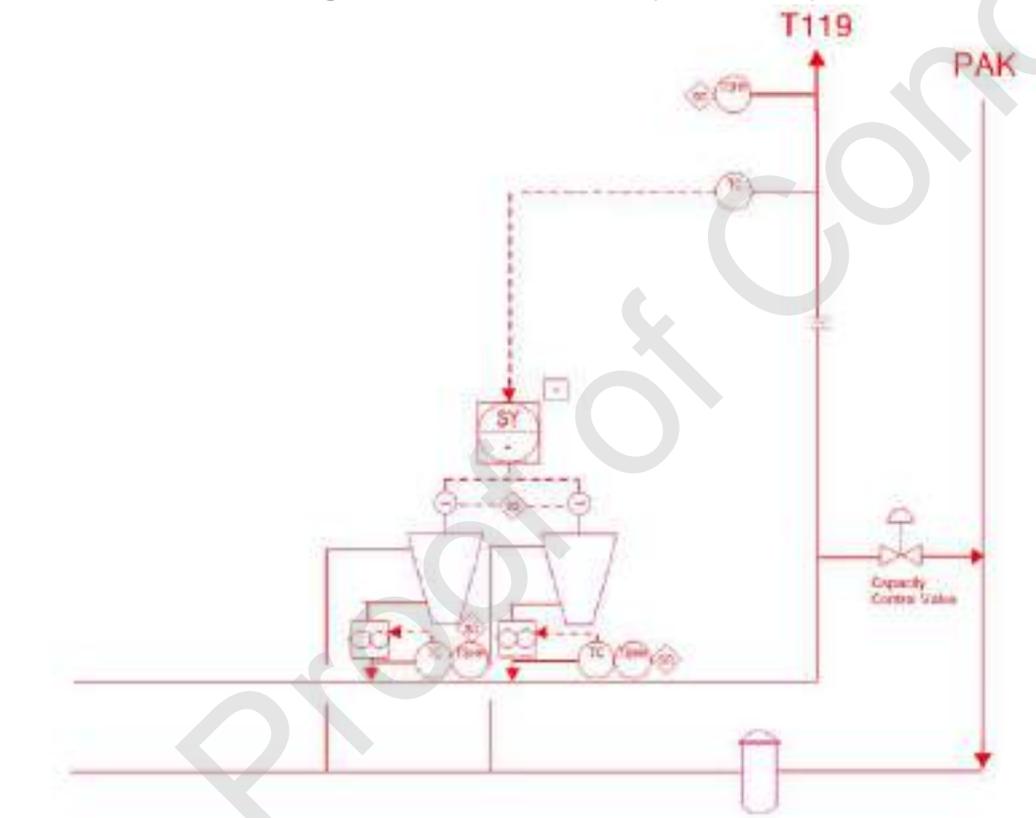


Figure 10 Existing WCSB Temperature Protection configuration

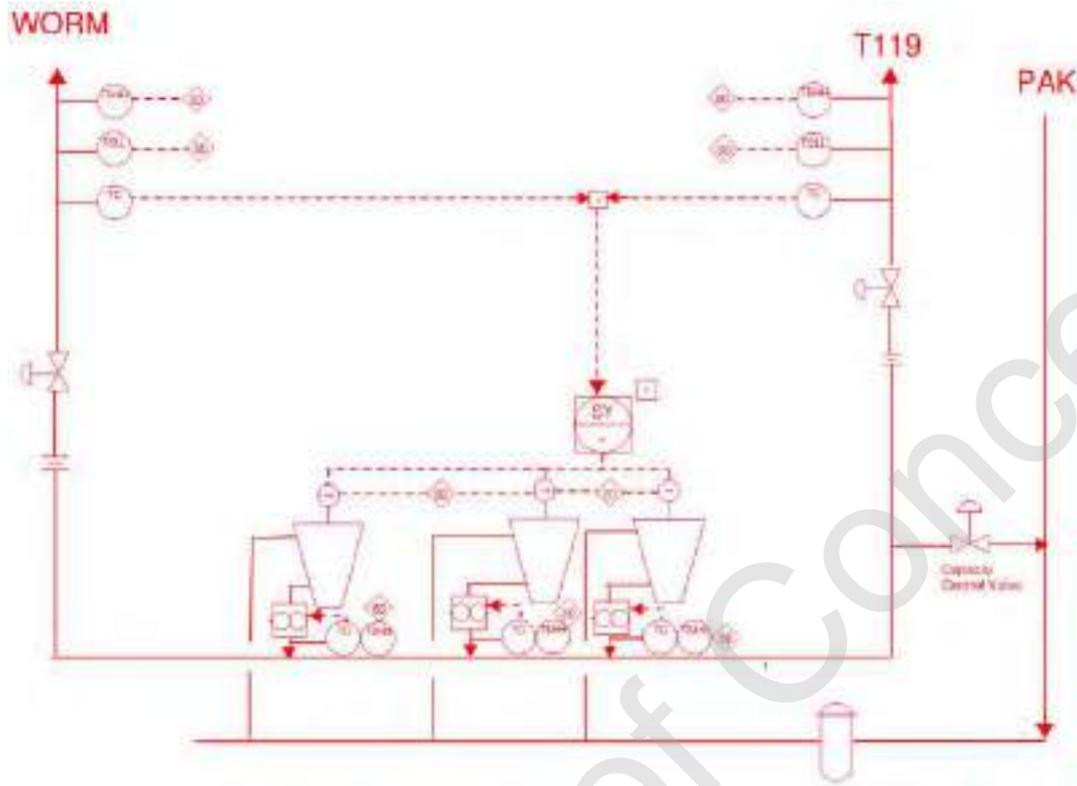


Figure 11 WORM WCSB Temperature Protection configuration

The existing high-high discharge temperature trip TSHH-62315 takes its signal from transmitters which will be downstream of the VNI DFC. In the WORM scheme, where flow could be to either or both of the destination pipelines, the DFC outlet high temperature control and trip functions will take their signal from downstream of both the WORM and VNI DFC's, via a maximum select. High-high temperature trips on each unit outlet will be retained.

In the WORM scheme, an additional TSL trip will be provided on DFC outlet temperature, causing normal stop of units 4, 5 and 6.

Existing VNI discharge piping is protected against low temperature during pressure-up from the T119 pipeline. This is in the form of TSL-62315 which will close the VNI loading valve and open the discharge header vent if the temperature is at or below $-16.5\text{ }^{\circ}\text{C}$.

Low Temperature Protection – WORM PRS

Subject to SIL LOPA assessment, protection of the T61 from low temperatures arising from high pressure differential between the WORM and T61 pipelines will consist of the following:

- Control at 2°C which will drive control valves to 0% if temperature is below set-point
- Trip of the over-pressure protection valves at 0°C .

6.8 Future Expansion Considerations

6.8.1 Additional WCSB Compression

No provision is required for additional compressors at WCSB beyond Unit 6.

6.8.2 WORM Discharge Piping and DFC

Initial WORM DFC control valve provision shall be based on a maximum flow of 285 kSm³/h, with connections to install additional identical run(s) to achieve 410 kSm³/h. Headers shall be sized for 410 kSm³/h.

6.8.3 T119 Discharge Piping and DFC

No provision is required for additional control runs or increased flow to the T119 pipeline.

6.8.4 WORM PRS

Provision shall be made for the future installation of a heater and filter upstream of the WORM PRS.

Provision shall also be made for future PRS bypass and control runs.

6.8.5 Future T74 DFC

A flanged spool connection upstream of the T119 DFC has been identified for provision for future connection to the T74. Removal of the spool is outside of the WORM project scope.

6.8.6 Future T74 PRS

Flanged connections shall be provided both upstream and downstream of the WORM PRS to allow for connection of the WORM pipeline to the T74N pipeline, either via a dedicated T74 PRS or via the WORM PRS.

6.9 Bypass and Redundancy Requirements

The WORM and VNI discharge flow control runs shall both be partially spared to give an optimal balance between control valve size and DFC availability. Each run shall be sized for 75% of maximum flow.

Pressure, temperature and flow instrumentation shall be shared between runs for the WORM and VNI DFC stations.

The VNI DFC station shall have a manual bypass. No bypass shall be provided for the WORM DFC station.

The WORM PRS shall have 2 x 100% regulating runs. Pressure measurement for control shall be via transmitters downstream of each run (outside block valves), with a single

WORM Project

signal derived via maximum select. The runs shall share a common flowmeter and temperature instrumentation.

Provision shall be made for the installation of a future full-flow bypass around the WORM PRS.

6.10 Unit Aftercooler

An Air Cooled Heat Exchanger (gas cooler) shall be installed to cool the gas discharging into the WORM and VNI pipelines. Thermal and hydraulic sizing cases shall be identical to those used to specify the Unit 4 and 5 after-coolers, summarised in Table 14

Table 14 Unit Aftercooler Design Parameters

Parameter	Thermal Case	Thermal Case	Hydraulic Design
	1	2	(startup)
Flow (kSm ³ /h)	131.7	171.7	322.2
Inlet Temp (°C)	105	62.6	50
Outlet Temp (°C)	40	45	50
Air Temp (°C)	15	35	45
Inlet Pressure (kPag)	8899	8900	7000
Max Pressure Drop (kPa)	50	50	2071

The gas cooler shall be designed and constructed in accordance with APA standard Specifications, API 661, and AS1210 where applicable and have ASME Class 900 flange connections suitable for maximum process temperatures and maximum design pressure (11,200 kPag at 120°C)

The compressor discharge piping shall have adequate protection to prevent against burns to operators and maintenance personnel.

Cooler standard features shall include:

- Forced draft;
- 2 pass cooler;
- Carbon steel tube with embedded aluminium fins;
- Electric motors with IECEx certification for use in Australia;
- MCC mounted soft starters to be utilised;

- Fans are belt driven, manual pitch adjustable with aluminium fan blades;
- 316SS fan shafts;
- Intrinsically safe 4-20mA vibration transmitters;
- <85 dBA at 1 m noise level external to the ACHE enclosure;
- Insect screens to be provided at all openings.

The compressor aftercooler functional requirements shall be consistent with the existing Wollert B unit aftercooler designs.

6.11 Gas Quality Monitoring

No additional gas composition or gas quality monitoring shall be provided as part of the Project.

6.12 Heating

Existing fuel gas heating is provided by the station water bath heater.

No additional heating is required.

6.13 Gas treatment

No gas treatment is applicable to the Project

6.14 Filtration

Existing Dual station gas filter / separators (dust filters) have been assessed for capacity – refer 18035-TN-Q-0006. No changes or additional filtration are required.

Each filter has a liquid drop out section. The filter operating philosophy is for both filters to be normally online, and for opening of the bypass (with conical strainer) during element changeout. The filter elements shall be 3 µm horizontal dust filters.

6.15 Odorant

No odourisation will be performed at this site. Existing gas odourisation at other VTS injection points will be relied upon.

All gas containing equipment shall be compatible with odourised gas.

6.16 Station Blowdown and Vent Sizing

The existing station blowdown strategy will be extended to the new compressor unit and associated facilities.

Existing RO's will be retained, with Unit 6 RO bores (discharge and fuel gas) being the same as those for Units 4 and 5.

6.17 Station Vents

The existing WCSA and WCSB vent locations produce theoretical 4.7kW/m² radiation zones that include plant operating areas.

A Risk Assessment workshop has been held to determine any modifications necessary to the WCSA and WCSB vents – refer WPT.WOLL-RP-R-0002. The following are the main outcomes from the workshop:

- The WCSB vent can remain unmodified and in its current location.
- The WCSA vent can remain unmodified and in its current location. Bores of blowdown RO's on the suction and discharge headers to be reduced to give a 15 minute blowdown.

Refer also Technical Note 18035-TN-Q-0005 Vent and Blowdown System Assessment.

6.18 Pipeline Blowdowns

Blowdown of the WORM pipeline will be possible at MLV's and via a hard-piped vent at Wollert. No blowdown provision will be made at Truganina. The pipeline segment between Truganina and MLV1 will be blown down at one end of the segment only (i.e. MLV1). All other segments will be blown down at each end simultaneously. Blowdown at MLV's will require fitting of an actuator to the plug valve, and tubing to a portable compressor to provide actuation air.

Blowdown RO's at the MLV's shall be sized for 125 tonnes per hour, subject to confirmation on the basis of mechanical strength vs thrust forces. A sterile radius based on this flowrate will need to be established around MLV's prior to venting. The blowdown RO for the WORM pipeline vent at Wollert shall be sized to limit radiation at the pig trap vent valve to 4.7 KW/m².

Refer to 18035-TN-Q-0008 Worm Pipeline Blowdown Technical Note.

6.19 Utilities

6.19.1 Instrument Air

The existing Instrument air system has sufficient capacity for all 3 compressor units.

Installation of automatic buffer air isolation to the new and existing compressor units will be provided to reduce peak instrument air consumption during station operation and therefore demand on the air compressor system.

6.19.2 Instrument Gas

All equipment located outside of the compressor station boundary will utilise instrument gas for motive power.

Stand-alone or locally grouped instrument gas systems will be provided. No reticulation of instrument gas will be provided.

6.19.3 Oily Water

All new oily water sources will be directed to the existing station oily water system. No upgrades to this system are included in the scope of work.

6.19.4 Storm Water

The existing storm water system will be extended to pick up any new storm water.

Minimisation of collection of storm water into the oily water system is required to reduce the potential for overwhelming the existing triple-interceptor system.

Refer to the Civil/ Structural section for more details regarding site drainage and run-off.

6.19.5 Service Water

Service water shall be extended to the new compressor unit for wash-down from the existing water system.

6.19.6 Sewage

No changes to the existing site sewage system are required.

6.20 Affected Assets

In increasing flowrates and pressures in the Victorian Transmission network, the WORM project has the potential to impact existing assets both within and outside the scope of the project. These impacts were reviewed and assessed in 18035-TN-Q-0009 "Affected Assets Review". In summary, the main actions to be implemented by the WORM project are:

- Replacement of AE-41 on the T61 pipeline at Pakenham Dore Rd, as the WORM project will increase flows in the eastern (T60 and T61) and western (T118, T112 and T92) pipelines.
- Replacement of four existing thermowells per table below, as the WORM project will increase flows at the Wollert Hub.

Table 15 Existing Thermowell for Replacement

Tag	Location	P&ID
TT-62346	Wollert - Upstream of VNI DFC, ie WCSB Discharge	1300-PB-173
TT-62315 A/B/C	Wollert - Downstream of VNI DFC	1300-PB-173
TE-60308	Wollert – Fuel Gas Control Valve Outlet	1300-PB-182
TE-60309	Wollert – Fuel Gas Heater Outlet	1300-PB-181

6.21 Process Isolation Philosophy Gap Analysis

Xxxx

6.22 MAOP Standard Gap Analysis

Xxxxx

7 Gas Turbine Compressor

The gas turbine driven gas compressor (GTC) unit shall be suitable for service in the environmental conditions defined in this DBM. The GTC shall be capable of continuous operation over all load ranges under the conditions presented in Section 6.

One Solar Turbines package consisting of a Centaur 50 Gas Turbine, C33 Compressor Body will be supplied. An Application Check Sheet (ACS) has been provided by Solar Turbines to define the Solar Turbines scope of supply (including custom features).

The GTC has the following functionalities and specifications:

7.1 Major Equipment and Process Equipment

- Centaur 50-6102S - two shaft standard combustion industrial gas turbine rated at 4,500 kW (nominal, ISO conditions);
- Solar Turbines C334EL housing configuration, centrifugal compressor fitted with dry gas seals;
- Dry coupling of flexible disc type;
- "Cold" recycle control valve with process control and anti-surge control interface to the Solar Turbines control system;
- "Cold" fast stop valve;
- Exhaust system including exhaust transition bellows and stack/silencer

7.2 Compressor Utilities

7.2.1 Fuel Gas

- Solar Turbines SoLoNOx natural gas fuel gas system;
- Type B (AS3814) compliant fuel gas system, associated controls and safeguards;

7.2.2 Lube Oil

- Lubrication system including engine driven lube oil pump and AC pre / post lube oil pump and DC (120V DC with 2 stage starter) emergency backup lube oil pump;
- Off skid lube oil cooler capable of operation in exposed (black bulb) temperature of 60°C, without detriment to engine horsepower;
- Lube oil tank heater system capable of maintaining lube oil temperature above the minimum operating point specified by the Solar Turbines Lube Oil Specification;
- Loose-shipped, platform-mounted lube oil demister to coalesce and drain back to the lube oil tank any oil mist, while venting any pressurized gas via flame arrestor;

7.2.3 On-Crank Cleaning

- Provision of an engine (gas producer) on-crank cleaning system

7.2.4 Air Inlet Filtration

- Donaldson up-draft self cleaning turbine air inlet filter, fitted with synthetic spiderweb media elements
- Instrument air cleaning enabled.
- Standard barrier enclosure air inlet filter, fitted with a dual (duty / standby) fan ventilation system.

7.3 Electrical Equipment

- Electric Variable Frequency Drives (VFD) shall be utilized for the engine starting motor and pre-post lube oil pump;
- Wiring shall be in accordance with AS/NZS 3000 and any other referenced standard within;
- 20% spare terminal strips in the unit control panel of the control console and turbine control box shall be allowed for;
- The enclosure is fitted with fluorescent hazardous area rated lighting and on/off switch. Egress lighting will be provided by means of battery backed up fluorescent fittings; and

7.4 Instrumentation

- Compressor unit flow measurements shall utilise a flow measurement Venturi located in the unit suction pipework;
- Compressor suction and discharge pressure transmitters;
- Fuel Gas measurement shall utilise a Solar supplied Coriolis flow meter;
- Sight gauges and bearing drain RTD in engine lube oil drain line shall be used;
- Vibration monitoring of gas turbine and compressor shall be implemented; and
- Limit switches mounted to the enclosure doors to detect entry and for remote monitoring of intruder access.

7.5 Hazardous Areas

- Electrical devices installed within hazardous areas shall be IECEx or ANZEx certified. Equivalent standards to be accepted subject to a conformity assessment; and
- Enclosure shall be designed to achieve a modified non-hazardous area (Zone 2 NE) by means of forced air ventilation for purge of gas releases and additional layers of protections.

7.6 Control Systems

- A standalone 3-bay 'Turbotronics™' unit control panel complete with a human interface shall be installed and shall conform to APA Specification 530-SP-J-0013 "Instrument Control Panels";
- Alarms and shutdowns as protective systems of the gas turbine and gas compressor and its ancillary systems shall be implemented;
- Appropriate supervisory control system interface compatible with SCADA system (Modbus TCP) shall be provided;
- Turbine and Compressor performance maps display shall be provided;
- Load share capability with other two existing compressor units shall be implemented;
- Compressor suction pressure, discharge pressure, flow and discharge gas temperature process control and surge control shall be controlled by the unit control panel;
- A standalone control system for off-skid equipment shall be installed in the new Control Equipment Building, refer to Section 11.3;
- Compressor operating conditions are provided in the Process Design Specifications;
- The Solar Turbines control system interfaces with the motor starter systems in the Motor Control Centre (MCC) housed in the control building for operation and control of the unit drives;
- The compressor unit control panel will be off skid with HMI and unit control panel housed in the control building. The Solar Turbines supplied IO in the unit control panel interfaces with the MCC, Station Control panel (SCP) and Compressor Station Controller (CSC). The Solar Turbines supplied PLC communicates with the Local SCADA Server directly; and
- Hard-wired signals for control and safety trips.

7.7 Skid and Structural

- Standard Solar Turbines base frame skid assembly with acoustic enclosure;
- Purpose built platform with ladder access, to maintain the air filter solenoids associated with the self-cleaning Huff/Puff system;
- A standard Solar Turbines close-fit enclosure is assessed as suitable for the determined noise limitations.
- A removable gantry crane (aka A-Frame or Engine Removal Beam) is provided for removal of the gas turbine engine and the electric starter motor; removal of the compressor is via a mobile yard crane.

WORM Project

- Access platforms around enclosure and stairs to allow access to the skid from both sides. Removable handrails to be supplied to permit engine removal when required.
- External access and hardstand work areas will be provided adjacent to the enclosure for overhaul level maintenance, compressor and turbine removal;

7.8 Gas Compressor Close Fit Acoustic Enclosure

The gas compressor enclosure has the following functional description:

- Provides sound attenuation to achieve required noise emissions in accordance with the relevant state and federal requirements, regulations and compliance codes;
- Individually house and fully enclose the GTC and on-skid ancillary equipment;
- Provides adequate and continuous ventilation during operation consistent with vendor requirements. This ventilation is to:
 - Maintain the enclosure interior temperature at less than 60°C (Solar typical enclosure temperature HH trip is 85°C, and H alarm is 75°), the maximum temperature for instrumentation; The main source of heat is turbine compressor package;
 - Create a modified non-hazardous rated environment (Zone 2 NE) by dilution of the compressor enclosure atmosphere in the event of a gas leak or fugitive emission(s); and
 - Provide slight positive pressure to reduce the chance of dust entering the enclosure.

7.9 Safety Features

- Fully enclosed coupling guards to protect personnel from rotating machinery and hot surfaces;
- UV/IR gas detectors and thermal detectors mounted strategically to detect fire;
- Fire and Gas detection and fire suppression systems connected to the Compressor Station Control (CSC) system for monitoring and control; and
- The starting purge period is sufficient to displace the volume of the exhaust system (gas turbine, exhaust duct and stack) consistent with the relevant Solar Turbines Service Bulletin guidance and AS3814 Type B Appliance requirements.

8 Piping

8.1 Piping Design

8.1.1 Design Standard

All piping shall be designed in accordance with ASME B31.3 and the APA Standard Piping Specifications. The design philosophy for the high pressure process piping systems should take into account the flange de-rating requirements as allowed by AS/NZS 2885.1.

8.1.2 Pressure and Temperature Design

Appropriate pressure temperature rated piping specifications shall be selected from APA's standard pipe specifications library.

The impact of low temperatures in any pipework shall be assessed for all commissioning and operational activities including blowdown, venting, start-up and shutdown sequences.

Refer APA Standard Pipe Class Specification Index 530-LI-P-0001.

8.1.3 Corrosion Allowance

Corrosion allowance to be applied to piping shall be in accordance with the nominated APA standard piping specifications.

A nominal 1.5mm is included in all carbon steel pipe specifications used.

8.1.4 Jointing

Screwed and socket welded piping joints are to be avoided for gas services where practical.

For flange connections to the pressure equipment where the applicable design standards do not allow flange strength de-rating (eg pressure vessels), then higher rated flanges shall be used.).

Insulated Joints shall be installed to separate the compressor station and the relevant earth grids.

Piping spools are to be designed with considerations of transportability and constructability.

In addition to above, piping spools directly connected to equipment such as filters, compressors etc. are to be removable for maintenance purpose. Where it is required as above, pipe spools are to be broken into smaller spools using a breaking flanges pair.

8.1.5 Buried Piping

Generally, where practicable, buried pipework should be avoided except road crossing or locations where above ground piping is not practicable. Corrosion protection of carbon steel pipe is to be provided by tape wrap or epoxy coating with magnesium anodes on buried pipe. Insulation joints are to be installed at either end of the underground sections. Above ground pipework shall be painted in accordance with the APA coating specifications.

8.2 Piping Material Classes

Piping material classes (designed to ASME B31.3) shall be selected from Table 16 Piping Material Classes.

Piping class shall be rationalised where practical to minimise complexity in procurement and construction.

Table 16 Piping Material Classes

Material Code (Spec No.)	Pressure Rating Class	Temp / Limit (°C)	Material	Service	Datasheet No.
A01C01	1,960 kPag ASME CL 150	-29 / 65	Carbon Steel	Natural Gas, Mains Gas, Vent Gas, Closed Drain	530-SP-P-0004
A03C01	5,110 kPag ASME CL 300	-29 / 65	Carbon Steel	Natural Gas, Mains Gas, Vent Gas, Closed Drain	530-SP-P-0006
A06C01	10,210 kPag ASME CL 600	-29 / 65	Carbon Steel	Natural Gas, Mains Gas, Vent Gas, Closed Drain	530-SP-P-0008
A06C02	10,210 kPag ASME CL 600	-45 / 65	Low Temp. Carbon Steel	Natural Gas, Mains Gas, Vent Gas, Closed Drain	530-SP-P-0009
A09C04	10210 kPag ASME CL 900	-29/160	Carbon Steel	Natural Gas, Compressor Discharge Piping	530-SP-P-0024
A01S01	1,770 kPag ASME CL 150	-101 / 65	Stainless Steel	Instrument Air	530-SP-P-0030

Notes:

1. Mating flanges with equipment or packages, special valves or any other components not forming a part of the piping material classes shall be considered special piping items and be specified in data sheets and included in special piping items list.

8.3 Valves

The design, manufacture, inspection and testing of all manual valves shall be in accordance with the requirements of 530-SP-P-0036. Actuated Valves shall be in accordance with the requirements of 530-SP-P-0037.

The piping material class specifications referenced in Table 16 specify valve types, pressure classes and constructions. Project specific valve data sheets shall be developed for the piping material classes listed in Table 16 and shall include the requirements of referenced specifications, 530-SP-P-0036 and 530-SP-P-0037.

Instrument isolation valves on high pressure piping shall be DN20 and of the single block type, welded one end threaded other end (Instrument end threaded). Small bore drain and bleed valves on high pressure piping shall generally be DN25 and of the single block type, welded one end threaded other end (open end threaded).

The Vendor shall verify and warrant that the selected valves meet the nominated design temperature and pressure.

Station valves and bypass valves shall be identified for safe and reliable operation. Throttling through large bore ball valves shall be avoided.

Project preference is to install locks on all valves (including MLVs) to protect from intruders and tampering.

8.3.1 Ball Valve Type and Details

All valves shall be suitable for the minimum temperature conditions as per the applicable piping specification for the specified process conditions and the intended use.

Ball valves shall typically be full bore valves.

Ball valves shall utilise self-relieving seats with the exception of valves identified as needing to provide double isolation and bleed (DIB), including station boundary valves. DIB valves shall utilise double-acting piston seal isolations (DIB in accordance with API 6D).

Refer to Section 9.14 for additional requirements for pipeline valves.

8.3.2 Other Valve Types

Globe valves are recommended for manual pressurising services

Plug valves are recommended for manual pipeline blowdown and pig trap kicker lines.

8.3.3 Valve Configuration

Bypass valves shall be provided for large bore valves.

Station isolation valves shall be provided with manual pressurisation valves

Unit isolation valves shall be provided with actuated pressurisation valves. Operation of pressurisation valves shall be an automated function of unit start-up commands.

Cavity bleed valves shall be ball valves. Connection of cavity bleed valves to the process shall be considered where high differential pressures may reduce the reliability of valve operations.

8.4 Vent Valves

Blowdown valves shall be located such that they can also be used in conjunction with the pressurising / purge valves for purging the units and the station pipework of air prior to pressurising. Compressor unit purge and pressurisation process shall be automated. Station purge and pressurisation shall be local manual operations.

Actuated vent valves that require station outage for maintenance should be provided with downstream isolation to allow removal without affecting station availability

8.5 Check Valves

Compressor unit discharge check valves shall be axial-flow non-slam check valves only. No other type shall be permitted.

8.6 Actuators

Refer to additional requirements in Section 12.11 for actuator response times, instrumentation and failure types.

8.6.1 Actuator Type

Actuators on station isolation and blowdown valves are to be pneumatic or gas piston spring return configured for fail safe operation.

Actuators on pipeline MLVs shall be gas-over-oil type actuators. Refer to Section 9.14 for additional requirements for pipeline valves.

8.6.2 Actuator Torque

Specification and calculation of required actuator torque shall be in accordance with APA Standard specification, 530-SP-P-0037

8.6.3 Maximum Actuator Torque

Calculated maximum output torque from the actuator shall be calculated by the Supplier in accordance with APA Standard specification, 530-SP-P-0037.

8.6.4 Stroking Times

Actuated valve stroking times shall be calculated by the Supplier in accordance with APA Standard specification, 530-SP-P-0037.

8.7 Pipe Fabrication and Construction

8.7.1 General

Station piping fabrication work shall be carried out in accordance with 530-SP-P-0002, Piping Fabrication, Installation and Testing.

Pipeline Assemblies shall be fabricated and tested in accordance with 530-SP-L-0002, Offsite (Shop) Fabrication and Testing of Pipeline Assemblies.

Cleaning of piping and pipeline assemblies shall be carried out in accordance with 530-SP-M-9610 (Mechanical Plant and Pipework Cleaning Specification).

8.7.2 Welding

Welding for station piping shall be in accordance with 530-SP-P-0002 and approved WPSs' to ASME BPVC IX and ASME B31.3 requirements, as nominated in the piping isometrics and fabrication drawings.

Welding for the pipeline assemblies shall be in accordance with approved WPSs' to AS2885.2 and 530-SP-L-0002.

8.7.3 Inspection and Testing

The inspection and testing of piping shall be in accordance with 530-SP-P-0002.

Pipeline Assemblies NDT and associated acceptance shall be as per AS 2885.2

8.7.4 Flange Management

Flange Management shall be in accordance with 530-SP-P-0002.

8.7.5 Piping Installation

All pipework, including pipeline assemblies, pipe supports, valves and other equipment shall be installed as shown on the fabrication drawings and piping isometrics and in accordance with 530-SP-P-0002, Piping Fabrication, Installation and Testing.

8.8 Coatings

Above ground and buried station pipework and pipeline assemblies shall be coated to 530-SP-M-9602 and 530-SP-M-9601 respectively.

After all NDT and leak testing has been completed, all piping spools shall be shop painted in accordance with 530-SP-M-9602 and 530-SP-M-9601 as nominated on the fabrication drawings and piping isometrics.

8.9 Pipe Supports

Piping supports shall be designed in accordance with 530-SP-P-0096, Piping Design Criteria.

APA pipe support standards shall generally apply for the project.

Project specific piping support details shall be developed where not covered by the above and shall consider all applicable loading and site conditions.

8.10 Stainless Steel

Direct contact between carbon steel and stainless steel materials is not permitted.

Insulating gaskets and sleeves shall be provided where mating of stainless and carbon steel fittings is unavoidable.

8.11 Vibration Induced Fatigue

Piping and equipment susceptible to vibration induced fatigue shall be adequately designed following the good engineering design practices i.e. Energy Institute's Guidelines for the Avoidance of Vibration Induced Fatigue Failure in Process Pipework, Technical Module T13.

Refer to 530-SP-P-0096, Piping Design Criteria for general design requirements for avoidance of vibration induced fatigue.

Typical installations that can potentially experience vibration induced fatigue include:

- Piping downstream of significant pressure drops such as pressurising and blowdown lines
- Piping subject to high flow/velocities such as blowdown and vent lines
- Pressure and flow control valve lines
- Process/Instrument probes protruding into the process stream such as thermowell and sample probes
- Small Bore Connections (SBC) and in particular the ones with heavy masses such as valves

The following good engineering design practices shall be adopted for the above installations exposed to flow induced vortexes as required:

WORM Project

- Piping shall be fitted with adequate pipe supports
- Heavy masses such as valves on SBCs need to be properly supported
- The free span between pipe supports shall be conservatively selected to minimise the unsupported lengths
- The mass of small bore unsupported valves and instrumentation should be minimised by the use of compact key-block valves or low-weight weld-end valves.
- The diameter of small bore connections shall be maximized
- Clamping and bracing shall be applied when deemed necessary
- Wake frequency calculations shall be performed for thermowells and sample probes protruding into the process stream
- Threaded connections shall not be used
- Where possible, use of Weldolets should be avoided

8.12 Insulation

8.12.1 Thermal Insulation

Pipe surfaces required to be insulated for thermal conservation shall be insulated in accordance with APA General Specification for Insulation of Piping, Equipment, Valves and Others, 530-SP-M-9605.

There is no project requirement to provide personnel protection for cold or hot piping due to the maximum and minimum normal operating temperatures do not exceed 65°C and – 6°C respectively.

During blowdown events where temperatures below the normal operating envelope can be expected, personnel to wear PPE in accordance with operational procedures.

8.12.2 Noise Insulation

Noise insulation shall be specified and installed in accordance with APA General Specification for Insulation of Piping, Equipment, Valves and Others, 530-SP-M-9605

Noise Insulation is expected to cover areas similar to that applied to the existing WCSB Units 4 and 5.

Additionally, noise insulation is expected to be installed at the following locations:

- WORM PRS runs
Valve selection will consider the requirement to minimise noise generation, however allowance for post commissioning insulation installation shall be made.

Noise insulation of the WORM and VNI discharge flow control runs is not expected to be required due to their remoteness to noise sensitive receivers, however allowance for post commissioning insulation installation shall be made.

There is no requirement for inspection ports to inspect for corrosion under insulation as this potentially introduces a pathway for moisture to enter the closed cell foam

structure. Non-intrusive NDT technics are to be applied to inspect for corrosion under insulation

8.13 Special Piping Items

Piping components which are not included in the applicable piping material classes shall be denoted as a special piping item. All SP items as a minimum shall be detailed on the special piping items list. Data sheets will be developed where additional details or design information relating to the SP item is required.

8.14 Piping and Pipeline Stress Analysis

Facility piping and pipeline stress analysis shall be performed in accordance with APA General Specification - Piping Stress Analysis, 530-SP-P-0095.

9 Pipeline General Details

9.1 Description

The pipeline shall be designed to be inspected by intelligent tools. The pipeline shall be designed with no mid line scraper stations.

9.2 Line Pipe

Line pipe supply will be in accordance with APA Standard and Project Specific Specifications for ERW Line Pipes Material (530-SP-L-0016 and WPT.2373-SP-L-0001) and Dual Layer FBE Line Pipe Coating and Internal Lining (530-SP-M-9606 and WPT.2373-SP-L-0002).

The line pipe shall be as described in Table 17 Line Pipe Design Details.

Table 17 Line Pipe Design Details

APA is conducting an "open season" to determine whether there is market interest in constructing a larger pipeline (upto DN600) now to accommodate future expansion requirements of the market. This process will not be completed until mid 2021. Consequently, the base design is a DN500 pipeline, however the option for a DN600 will be carried forward. [HOLD 41]

Description		Value		Comment
		BASE CASE	FUTURE OPTION	
			[HOLD 41]	
Nominal Size		DN 500	DN600	
Outside Diameter		508 mm	610 mm	
Steel Grade		API 5L PSL2 Grade X52 M		
SMYS		360 MPa		
Heavy Thickness	Wall	12.70 mm	[HOLD 41]	
Standard Thickness	Wall	10.31 mm	[HOLD 41]	
Manufacturing Method		HFW		

Description	Value	Comment
CVN – Full Size Specimen	Pipe Body: 75J (Individual), 100J (Average) Weld Line: 21J (Individual), 27J (Average)	[HOLD 41]
DWTT	The average shear fracture area of the two test specimens shall not be less than 85%. The shear fracture area of each specimen shall not be less than 70%	Required at - 10°C
Design Factor	Pressure Containment: 0.72 Designated Road Crossing: 0.90	
Mill Test Pressure	WT=12.7mm: 17.1MPag	[HOLD 41]
Pipeline Hydrotest Pressure (Min.) at High Point	18.0 MPag	Pressure at 100% SMYS (at WT=12.7mm)

9.3 Future City Gate Stations

The following provisions for future expansion shall be provided as part of this project:

- Identification of potential offtakes for supply to the domestic and industrial markets along the pipeline route.

~~[HOLD 1 – location of city gate stations not required to be concurrent with MLV locations. Final city gate locations to be confirmed]~~

9.4 MLV and Barred Tees

- MLV pipeline assemblies will be designed with barred tee's on all bypass offtakes.
- All line valves shall be full bore, fully welded ball valves with visual valve position indicators as per 530-SP-M-0036.
- The mainline valves (MLV) proposed for the WORM project are to be remotely actuated valves isolation of the pipeline, and monitoring from remote control room (Refer 18035-TN-L-0003).
- Barred tees shall be fabricated from standard high strength tees welded with a pup with pigging bars.

[HOLD 2 – location of MLV2 and MLV3 to be confirmed]

Table 18 MLV Locations

WORM MLV	Approx. MLV KP Location	Location
MLV1	6.0	Holden Road (northern side)
MLV2	22.0	Oaklands Road
MLV3	35.0	South west of Gunns Gully Road

9.5 Location Classification

The location classification of the pipeline will be reviewed in the detailed design, validated in the pipeline safety management study, and will be documented as per AS/NZS 2885.6 and [HOLD 27 - insert reference to urban planning guidance document]

The primary location class of the pipeline has been classified as per the following based on the Echelon Planning Report (Planning Considerations for the High Pressure Gas Pipeline Corridors) up to 60 years design life, commissioned by APA.

- Approx. 92% of the pipeline route in T1 (Residential).
- Approx. 8% of the pipeline route in R1 (Rural)

The secondary location classes of the pipeline are Sensitive Use (S), Industrial (I), Common Infrastructure Corridor (CIC) and Crowd (C), where applicable.

Additional protective measures shall be employed subject to the requirements of detailed design and the pipeline safety management study.

9.6 Pipeline Assemblies

The Pig Launcher/Receiver and main line valves (MLV) facilities including barred tees, shall be considered as pipeline assemblies and designed in accordance with AS/NZS 2885.1.

9.7 Depth of Cover

The minimum depth of cover shall be as per AS/NZS 2885.1 and as verified by design and the Pipeline Safety Management Study.

WORM Project

Additional depth of cover shall be used as a physical protection measure where required by detailed design, local land owner requirements and the pipeline Safety Management Study.

The minimum depth of cover to top of pipe shall be as nominated in Table 19.

Table 19 Minimum Design Depth of Cover [HOLD 20]

Location Class	Minimum Depth of Cover Normal Excavation
R1	750 mm (Note 1)
R1-CIC	900 mm (Note 1)
R1-I	900 mm (Note 1)
R1-C	900 mm (Note 1)
T1	900 mm (Note 1)
Parallel to existing Sunbury Pipeline along same pipeline easement	1200 mm (To match with depth of cover of existing pipeline)
Unmade Gazetted Road (i.e. Future or paper council/ government roads)	1200 mm
Unsealed Gazetted Road (i.e. Open cut government/ council roads)	1200 mm (Note 2)
Sealed Gazetted Road (i.e. Bored main government/ council roads)	1200 mm (Note 2)
Formed Non-Gazetted Track (i.e. maintained, frequently used farmers track)	1200 mm
Unformed Non-Gazetted Tracks (i.e. Unmaintained, infrequently used farmers track)	1200 mm (Note 1)
Major Sealed Road Bored Crossings	2000 mm
Rail Crossings (to underside of ballast)	3000 mm
Water Courses – Minor – Type 2	1500 mm (Note 3)

Location Class	Minimum Depth of Cover Normal Excavation
Water Courses – Intermediate / Minor Type 1	1500 mm (Note 3)
Water Courses – Major	1500 mm (Note 3)
Contour Banks (Existing)	1200 mm (Note 3)
1 in 100 Year Flooding Area	1500 mm (Note 3)

Notes:

1. To be confirmed by Safety Management Study
2. 1200 mm minimum cover under the invert of the table drains
3. Subject to the findings of the hydrology and erosion study in detailed design

9.8 Coating and Corrosion Protection

Line pipe coating shall be in accordance with 530-SP-M-9606 and associated project technical specifications. Selection of the line pipe external coating will be confirmed via a coating selection study to be completed at the commencement of detailed design. The base concept presented in this section is Dual Layer Fusion Bonded Epoxy.

Pipeline assemblies shall be coated to 530-SP-M-9602 and 530-SP-M-9601 respectively.

No corrosion allowance is to be included in the line pipe wall thickness design. The pipeline shall be designed to transport natural gas meeting the process specification.

The new pipeline shall be primarily protected against corrosion by external coating with secondary corrosion protection utilising a cathodic protection system.

The pipeline coating system shall be as described in Table 20.

Table 20 Pipeline Coating and Corrosion Protection Details

Item	Details
External Coating	Min. 600µm dual layer fusion-bonded epoxy

Item	Details
Horizontal Directional Drilling where bending stresses are imposed on the pipeline.	Dual Layer FBE 600µm with additional abrasion and Impact Protective coating
Horizontal Boring/ Drilling (slick Bores) where NO bending stresses are imposed on the pipeline.	Dual Layer FBE 600µm with additional abrasion and Impact Protective coating
Open Cut Road Crossings	Min. 600µm dual layer fusion-bonded epoxy
Open Cut Waterways (not requiring external buoyancy control)	Min. 600µm dual layer fusion-bonded epoxy. Rockshield or equivalent to be provided where appropriate as determined by the site conditions.
Internal Coating	50µm thick internal lining as per 530-SP-M-9609 with a maximum absolute surface roughness of 7µm
Field Joint Coating	1000µm field applied Liquid High Build Epoxy (HBE) or field applied FBE to a minimum thickness of the line pipe coating as per 530-SP-M-9601
Coating Adjacent to HV Powerlines	1.5mm HDPE "yellow jacket" applied over factory applied FBE coating [HOLD 34]

9.9 Bends

All pipeline bends shall be designed in accordance with AS/NZS 2885.1.

All bends shall be carried out in accordance with a qualified bend procedure developed in accordance with AS/NZS 2885.1.

Details for each type of bend shall be confirmed during detailed design.

No mitre joints will be used in the pipeline and no instrumentation shall protrude into the pipeline bore.

Wherever possible bends on the pipeline will be undertaken using roped or cold field bends. Bend requirements shall be confirmed during detailed design.

The pipeline shall be designed to accommodate inline inspection by commercially available intelligent inspection tools with minimum 5 x OD radius bends.

Risers in and out of stations shall be induction bends with 5 x OD minimum radius.

Bends with 19° and greater shall be induction bends.

9.10 Induction Bends

The minimum bend radius for induction bends shall be 5 x OD with 1m straight tangent length on each side of the bend.

Induction bends shall be prepared in accordance with APA Specification for Induction Bends, SP-P-0018.

9.11 Roped Bends

Bends made using the natural flexibility of the pipe shall not exceed the roping stress and strain limits as defined in AS/NZS 2885.1. The minimum bend radius shall be 250 x OD.

9.12 Cold Field Bend

Cold field bends are permitted.

Cold field bends shall be limited by the more stringent requirement of either the radius in accordance with AS/NZS 2885.1 or maximum deformation of 1.5 degrees per diameter to prevent damage to the coating.

A Field Bending Procedure shall be developed and qualified.

9.13 In-Line Inspection Facilities

The pipeline shall be designed to allow for inspection by commercially available inspection tools.

Pig trap assembly (Launcher/Receiver) is required at both tie-in end of the WORM pipeline to allow of operation of the in-line inspection tools. Therefore the existing Truganina pig trap assembly (See T118-10-1) at Hopkins Road tie-in end and the proposed new pig trap Receiver at the Wollert tie-in end will be used to facilitate the inline inspection operation of the pipeline

The pig traps are to be considered as pipeline assemblies, they shall be designed and constructed in accordance with AS/NZS 2885.1. No mitre joints shall be used in the pipeline and no instrumentation shall protrude into the pipeline bore.

The pig traps shall have Quick Opening Closure (QOC), local vents and kicker pipework. QOC shall have mechanical interlock to prevent opening when balancing valve is closed. Isolation for pig trap entry shall be single isolation valve with energised seals and cavity bleed.

9.13.1 Existing Pig Trap – Truganina

There will be no modification to the existing pig trap at Truganina as advised by Asset/Integrity Engineering based on the following justifications:

- Latest tool specifications from GE (MFL4) which includes triaxial sensor interpretation, geometry and XYZ all fit in the existing pig hatch (tool length 2.5m).
- Rosen MFL-A, Geometry and XYZ all fit in current pig hatch (tool length 3.5 m).
- Rosen MFL-C cannot be run in combination with the MFL-A, so therefore would require two separate inspections runs if required.

Should there be need to run longer tool such as the GE TranScan (TFI) in the future, only the pig trap at Truganina will require modification as the new pig trap at Wollert is being specified to suit required length.

9.13.2 Proposed New Pig Trap – Wollert Station

The new pig trap assembly at Wollert station will be designed and installed to the dimensions stipulated below per requirement of the Asset Engineering group and based on datasheet provided by GE for a 20" TranScan – TFI (magnets orientated circumferentially) pigging tool. **[HOLD 41]**

[HOLD 41]

Major Bore (O.D – 24")	5,230 mm
Minor Bore	4,762 mm
Ecc. Reducer	508 mm
Total Length	10,500 mm

Both existing and new pig trap assembly at Truganina and Wollert facilities will function as a launcher / receiver to aid bidirectional ILI activities for all tools listed in section 1.1.1 including:

- GE's MFL4 which includes combination of triaxial sensor interpretation, geometry and XYZ
- Rosen MFL – A combined with Geometry and XYZ
- Rosen MFL – C combined with Geometry and XYZ (Note: MFL A and MFL C cannot be combined, two separate runs is required)

Where GE's 20' TranScan **[HOLD 41]**– TFI ILI tool is required for ILI activity, only the new pig trap assembly at Wollert can function as a launcher / receiver, the existing pig

trap at Truganina CANNOT be used as a Launcher or a Receiver, further modification would be required if the tool becomes required.

Future upgrade of the existing trap to be executed in event of future requirement for EMAT pigging (unlikely requirement).

Refer to 18035-TN-L-0002 for documented Technical Note for more background information on the agreed philosophy about the design of both the existing pig trap assembly at Truganina and the proposed new pig trap assembly at Wollert station.

9.14 Pipeline Valves

All valves shall be as per 530-SP-M-0036 and 530-SP-P-0103. All valves not isolatable from the pipeline shall be of fully welded design with butt welded end connections to the pipeline.

Isolating (ball) valves in the main flow paths (including bypasses) shall be double block and bleed and cavity bleed type (body seals on both sides of the isolation ball with bleed valve in between for valve body cavity blowdown) with high-pressure containment and leak integrity features.

Buried valves shall be of fully welded design with butt weld end connections to the pipeline and shall have body bleed and grease fitting extensions for access above ground. The fitting extensions shall be seal welded where they join to the valve body, and the integrity of these joints shall be confirmed by pressure testing. These extensions shall be single piece without barrel unions or screwed/flanged connections.

All large bore ball valves (DN50 and greater) shall be:

- Trunnion mounted;
- Double block and bleed, unless otherwise noted;
- Tubed to allow for pressurisation of the body cavity from upstream pipe work and venting to atmosphere as identified in the PandIDs;
- Body vents on aboveground bleed points shall have a ball valve with hex plug. Refer to API 6D.

9.15 Trench and Backfill

The minimum trench width shall be the pipe diameter +300mm. Trench depth will be sufficient to ensure minimum cover is achieved after placement of the bedding material.

Trenches shall be as per APA Typical Trench Detail Drawings 530-DWG-L-7002 and 530-DWG-L-7007.

Bedding and padding shall be well graded, fine-grained soil material with a well-distributed particle size, maximum particle size of 20mm and shall be free of sharp

WORM Project

stones or sharp objects likely to damage the coating. It may be native excavated material where such material meets this requirement or may be produced from appropriate excavated material by screening through a maximum screen size of 13mm.

Imported padding and bedding materials shall have resistivity of not less than 30 ohm/meter, be free flowing, and not slurry. The pH of the imported padding material must be greater than pH5.

Topsoil shall not be used as bedding or padding material.

If the trench spoil does not meet this requirement then any of the following measures may be adopted:

- Process trench spoil to meet the bedding specification (e.g. By padding machine)
- Import material, which meets the bedding specification (e.g. Sand)
- Provide coating protection
- Coarse backfill may be returned to the trench above the padding subject to the constraint that it be no closer than 150 mm to the top of the pipe.

9.16 Trench Breakers

Trench breakers shall be installed where necessary to prevent scour of the trench.

Trench breakers shall be installed in accordance with 530-DWG-L-7003, 530-DWG-L-7005 and 530-DWG-L-7006.

9.17 Pipeline Crossings

9.17.1 General

Where the pipeline crosses 3rd party assets standard designs are to be used wherever possible, however, specific design and drawings may be developed for any particular locations if determined by detailed design or the pipeline safety management study.

Table 21 Crossing Depth and Separation Summary

Parameter	Value	Comments
Pipeline Minimum Depth of Cover	Minimum depth of 750 mm	All crossing values subject to location specific assessment.
Buried 3 rd party Crossing Clearance	500mm minimum	

9.17.2 Railway Crossings

Railway crossings will be designed in accordance with AS/NZS 2885.1 and API RP 1102 Steel Pipelines Crossings Railroads and Highways. Pipeline girth welds are not permitted within 1.5 m each side of the rail lines.

Uncased crossings are not acceptable unless specifically approved by the rail authority.

Railway crossings shall be designed to comply with the requirements of Victorian Railways. All construction approvals shall be obtained by the pipeline installation contractor.

Detailed drawings for railway crossings shall be project specific and will be developed during detailed design.

9.17.3 Road and Highway Crossings

Requirements for road crossings will be agreed with the responsible authorities or owners.

Road crossings will be designed in accordance with AS/NZS 2885.1 and API RP 1102 Steel Pipelines Crossings Railroads and Highways, APA Standard drawings and other requirements identified in the safety management study.

9.17.4 River and Stream Crossings

The pipeline route currently crosses major watercourses and ephemeral streams / water courses.

A hydrological assessment of the area will be performed during plan phase to assess flood and scour risk, and confirm the minimum required depth of cover and associated method of pipeline protection if required. [HOLD 28– confirm the flood recurrence interval for use in design of crossings per AS/NZS 2885.1 at completion of hydrological investigations]

The design and construction methodology of major water course crossings shall be determined during detailed design in consultation with the relevant authorities.

Minor watercourses that will not require significant profiling works that will be undertaken by the mainline crew and maintain a depth of cover of 1200mm. These watercourses will be classified Minor Type 2 in accordance with Standard Drawing 530-DWG-L-5007. Marker Tape shall be provided for Minor Type 2 water crossings.

Minor watercourses that require profiling works and that will be undertaken by the specials crew will consist of heavy wall pipe and maintain a depth of cover of 1500 mm. These watercourses will be classified Minor Type 1 in accordance with Standard

WORM Project

Drawing 530-DWG-L-5006. Marker Tape shall be provided for Minor Type 1 water crossings.

Major watercourses that require significant profiling works and that will be undertaken by the specials crew and maintain a depth of cover of 1500mm. These watercourses will be classified Major in accordance with Standard Drawing 530-DWG-L-5006. Marker Tape shall be provided for Major water crossings.

Contour banks and significant erosion / scouring shall be treated as Minor Type 2 water crossings.

Where standard designs are not suitable, an appropriate crossing will need to be designed for those crossings.

Minimum depth of cover will be 1500 mm but greater cover will be required where the depth of scour is estimated to approach this level.

All crossings shall be designed and constructed to mitigate environmental impact and will be in accordance with the Environmental Management Plan. The design of major watercourse crossings will be appropriate for specific scour potential, bank stability and stream meander potential. This may increase depth of cover at certain sites.

Soil properties for design and behaviour under flooding condition detailed in 18035-RP-L-0005 (WORM Hydrogeological Assessment) and 18035-RP-GEO-0003 (MLV Geotechnical Report).

9.17.5 Buried Services

Where the pipeline crosses third party buried services it will be installed below these services where ever possible. Clearance between the pipe and foreign utility should be maximised and will not be less than 500 mm.

Standard Drawing 530-DWG-L-5009 shall be used for all service crossings except that the minimum separation shall be increased from 300 mm to 500 mm.

Where required, concrete slabs and marker tape will be placed at a minimum distance of 300 mm above top of the pipe. Slabs and marker tape will be below the other service, except at deep crossings where the pipe is above the other utility in which case the concrete slabs and marker tape will be installed at least 500 mm above the pipe.

Buried services and pipeline protection requirements will be reviewed in the detailed design and the pipeline safety management study.

9.18 Pipeline Marking

9.18.1 Marker Signs

Pipeline signage shall be located in accordance with 580-GD-L-0001 and 530-DWG-L-0500. Marker signs shall have the relevant VTS emergency contact details.

Markers shall be installed in accordance with the requirements of AS/NZS 2885.1 as determined in detailed design and the pipeline safety management study. Final sign types and locations shall be reviewed and approved by APA Field Services.

9.18.2 Marker Tape

Marker tape shall be installed along the entire pipeline wherever practically possible.

Marker tape shall be positioned at a minimum depth of 300 mm below grade and a minimum distance of 300 mm above top of pipe in accordance with 530-DWG-L-0504.

Marker tape shall be a minimum width of 200 mm wide, display lettering which clearly identifies the presence of a gas pipeline, and comply with the requirements from AS/NZS 2885.1 and 530-DWG-L-0504.

Refer to crossing design details above for application specific requirements.

9.19 Buoyancy Control

The pipeline design and construction shall ensure that the pipeline shall not be subject to displacement from its installed location as a result of short or long term inundation at locations where the pipeline crosses rivers, swamps, floodplains or other areas subject to inundation.

The extent and type of buoyancy controls shall be reviewed during detailed design, and be based on the geotechnical investigations and the actual soil properties.

Buoyancy control methods shall be:

- In cohesive soils, stability may be provided using the compacted trench backfill and additional depth of cover, as recommended by geotechnical investigation of the soil characteristics.
- In non-cohesive soils, and in areas where the pipeline is permanently submerged, positive flotation control measures shall be provided using one of the following:
 - Fabric-encapsulated backfill. This design may be applied in any open trenched location, except river and stream crossings.
 - Concrete weight coating.
 - Saddle bag weights.
 - Set on weights.
 - Screw anchors

Where inundation is experienced during construction, it may be necessary to install in a flooded trench requiring buoyancy control and coating protection against imperfections in the bedding that cannot be inspected.

Buoyancy calculations shall be performed to verify the measures adopted.

Draft - Proof of Concept

10 Pipeline Design

10.1 Design Factor

The design factor for pressure design of pipeline and pipeline assemblies are summarised below as per AS/NZS 2885.1 Clause 5.2.4.

Table 22 Design Factors

Location	Maximum Design Factor
Mainline Pipe	0.72
Pipeline Assemblies and Hot Bends	0.67

10.2 Pipeline Safety Management Study

Pipeline Safety Management studies will be undertaken as per the SMS plan below developed in accordance with AS/NZS 2885.6, Clause 5.4.1 and Table 5.1.

Table 23 WORM Pipeline SMS Plan

Project Phase	Type	AS/NZS 2885.6 Requirements	WORM - SMS Required	WORM - Validation Workshop
Concept Design	Preliminary Design SMS	Non-essential for all projects. However, may be required for regulatory approvals	WORM Preliminary SMS (Completed)	Yes (Completed)
Front end engineering design (FEED)	FEED SMS	Non-mandatory but recommended	To be covered under detailed design SMS	Yes (Completed)
Detailed Design	Detailed Design SMS	Mandatory	Required for the project	Yes (Completed)
Pressure Test Design	Pressure Test Design SMS	Mandatory - If a pipeline pressure test section is in a location where a leak or burst during testing could impact the public or harm the environment.	Required for the project	Yes
Pre-construction Review	Pre-Construction Review of Detailed Design SMS	Non-mandatory but required if there has been significant change or new information at the completion of design and prior to commencement of construction	May be required for the project if there has been significant change or new information at the completion of design and prior to commencement of construction	No (but SMS may still be required)
Construction Change Revision	Construction Changes Revision SMS	Mandatory - For Significant changes to the pipeline design during construction	May be required for the project if there has been significant design change during construction	No (but SMS may still be required)

Project Phase	Type	AS/NZS 2885.6 Requirements	WORM - SMS Required	WORM - Validation Workshop
Prior to Commissioning	Pre-commissioning SMS	Mandatory	Required for the project	Yes

Pipeline safety management study during detailed design will confirm the depth of cover and location classification based on the final pipeline alignment.

The Pipeline Safety Management Study shall ensure the design eliminates or reduces the risk of failure to As Low As Reasonable and Practicable for all credible threats identified.

Pipeline wall thickness at specific crossings and location class changes shall be validated in the pipeline safety management study and recorded in the pipeline GIS and on pipeline alignment sheets.

Identification of threats to the pipeline shall be carried out during FEED and detailed design.

Data sources shall include DBYD, site survey data, field data collections and collective knowledge of personnel at the validation workshop.

10.2.1 External Interference Protection

The pipeline section shall be designed with a Primary Location Class of T1, Residential, in accordance with AS/NZS 2885.1. The pipeline location class shall be verified by the pipeline Safety Management Study.

The number of physical and procedural protection measures applied to pipeline design shall be in accordance with AS/NZS 2885.1.

10.2.2 Pipeline Failure Consequences

The following data shall be used for assessment in the Pipeline SMS.

Table 24 Pipeline Failure Data Summary

Description	Value	Comments
Full Bore Rupture Radiation Contour 4.7kW/m ² (measurement length)	526 m (DN500) 659m (DN600) [HOLD 41]	WPT.2373-CAL-L-0004 Pipeline Heat Radiation Release Calculation

Description	Value	Comments
		(Injury may occur, especially after 30 seconds. Second degree burns. Pain threshold reached in 16s.)
Full Bore Rupture Radiation Contour 12.6kW/m ²	321 m [HOLD 41]	WPT.2373-CAL-L-0004 Pipeline Heat Radiation Release Calculation (Typical fatality threshold, for normally clothed people, resulting in third degree burns after 30 seconds exposure. Significant chance of fatality for extended exposure. Pain threshold reached in 3-4s.)
Hole Size required to exceed 1GJ/s limit 12.6kW/m ² Contour = 40m 4.7kW/m ² Contour = 65m	39 mm hole size [HOLD 41]	WPT.2373-CAL-L-0004 Pipeline Heat Radiation Release Calculation
Hole Size required to exceed 10GJ/s limit 12.6kW/m ² Contour = 126m 4.7kW/m ² Contour = 206m	123 mm hole size [HOLD 41]	WPT.2373-CAL-L-0004 Pipeline Heat Radiation Release Calculation
Critical Defect Length (CDL)	WT=12.7mm: 179mm [HOLD 41]	WPT.2373-CAL-L-0003 Penetration Resistance Calculation
No Rupture	[HOLD 41]	Hoop stress exceeds 30% of the SMYS.

Description	Value	Comments
Hoop stress requirement	WT=12.7mm: Hoop Stress=204 MPa (57% SMYS)	
No Rupture CDL is not less than 150% of largest equivalent defect	[HOLD 41] WT=12.7mm (B Factor = 1.3) The pipe is "No Rupture" pipe except for 35T excavator (and above) equipped with Penetration Tooth 35T excavator equipped with Penetration Tooth can puncture the pipeline and create a leak. 150% of the defect size (125mm) is larger than the CDL, hence fail to the "No Rupture" requirement. [Note: CDL/(Max tooth length) = 179/125 = 1.432, ~150% for two significant figures]	WPT.2373-TN-A-0001, penetration tooth is considered credible scenario for concern on this pipeline due to rocky areas.

10.3 Pipeline Penetration Resistance

The wall thicknesses in have been calculated in accordance with the requirements of AS/NZS 2885.1.

Resistance to penetration calculations have been completed in accordance with AS/NZS 2885.1 to determine the wall thickness requirements for the purpose of this design basis, refer to document 18027-CAL-L-0105 **[HOLD 41]** for the calculations and the results.

The type of equipment and teeth to be used along the pipeline will be verified in the detailed pipeline safety management study.

The 12.70 mm pipe was found to provide adequate resistance to penetration (except for penetration tools) in the R1-I, R1-C and T1 (high consequence) areas for machine size up to 55 T. **[HOLD 41]**

10.4 Pipeline Protection Measures

Where required, additional protective measures shall be employed subject to the requirements of the pipeline safety management study.

10.4.1 Physical Protection Measures

The primary physical protection measures for the pipeline shall be wall thickness in conjunction with depth of cover.

Additional depth of cover will be applied as identified by Pipeline Safety Management Study.

Slabbing protection shall be provided as defined in the project specific drawings, APA standard drawings and if required by the Safety Management Study.

10.4.2 Procedural Protection Measures

The procedural protective measure for the pipeline shall include a combination of:

- pipeline markers,
- one-call system,
- marker tape,
- weekday pipeline patrols,
- third party and landowner liaison.

10.5 Fracture Control

A fracture control plan shall be developed in accordance with AS/NZS 2885.1 with an MAOP of 10,200 kPag and minimum design Temperature of -10 °C.

The Fracture Control Plan shall consider the possible gas compositions the pipeline may transport during the design life.

For the purposes of Fracture Control calculations, the most stringent of the project gas compositions shall be analysed.

Where applicable, the fracture control plan shall meet the requirements of AS/NZS 2885.1 Section 4.9 high consequence areas.

10.5.1 Fracture Initiation

The longitudinal weld seam (weld metal and HAZ) of line pipe shall have adequate levels of fracture toughness to minimise the likelihood of fracture initiation.

10.5.2 Brittle Fracture

Brittle fracture control shall be managed in accordance with AS/NZS 2885.1 Figure 5.3.2 Fracture Control Plan Decision Tree.

The resistance to brittle fracture propagation shall be determined from measurements of the fracture appearance using Drop Weight Tear Test (DWTT) at -10deg C as required by AS/NZS 2885.1

10.5.3 Tearing Fracture

Tearing fracture toughness shall be determined in accordance with AS/NZS 2885.1.

Arrest of a tearing fracture of the pipeline shall be designed for by specifying sufficient toughness in the line pipe to ensure the gas decompression velocity exceeds the velocity of the crack propagation within the required number of pipe lengths. The design fracture arrest length shall be as per AS/NZS 2885.1. Tearing fracture toughness was determined in accordance with AS/NZS 2885.1. Refer to calculation [18027-CAL-L-0103](#). [HOLD 41]

10.6 Pipeline Fatigue

The pipeline pressure profile for design shall be determined during detailed design.

A pipeline fatigue assessment shall be carried out in accordance with the requirements of Appendix I of AS/NZS 2885.1 for the developed pressure profile using the following design criteria

[HOLD 13 – confirm pressure cycles to be used in fatigue assessment – advised by AEMO to use Brooklyn pressure values as a guideline to future pressure cycles at Wollert].

10.7 Stress Corrosion Cracking (SCC)

SCC is not expected to be a threat for the new pipeline due to the use of abrasive blasting and FBE line pipe coating, generally considered to be immune to SCC. Further, APA will maintain a cathodic protection system and carry out regular monitoring of the CP system and the pipeline coating condition through ILI surveys.

SCC calculations will be developed during detailed design.

[The threat of SCC shall be considered in the safety management study.](#)

A pipeline integrity management plan shall be implemented for the new pipeline. The PIMP shall identify anomalies or areas of metal loss or SCC risk areas in the pipe and the associated management program. The pipeline shall be operated in accordance with APAs pipeline management system.

10.8 Hydrogen Induced Cracking (HIC)

Any risks from HIC shall be considered in the safety management study.

Weld procedures shall be developed and approved by a certified welding engineer and reviewed by an APA approved welding engineer. Welding shall be undertaken under the supervision of a certified welding supervisor approved by APA and inspection shall be completed by an APA agreed certified welding inspector. All pipeline girth welds shall be 100% NDT examined by X-ray or automated ultrasonic examination.

10.9 Stress and Strain Analysis

Stress and strain analysis shall be undertaken in accordance with the requirements of AS/NZS 2885.1 during detailed design.

10.10 Strength De-rating

No strength de-rating will be applied to the pipeline systems as per Clause 3.5.3 of AS/NZS 2885.1.

11 Electrical

11.1 General

Electrical engineering design shall conform to the appropriate APA Technical Specifications, Australian Standards, Statutory Regulations and industry practice. Electrical, control and instrumentation equipment and all components shall comply with the requirements of all applicable Australian Standards, Acts, Regulations and bylaws as a minimum. The design and construction of the electrical, instrumentation and control works shall be in accordance, but not limited to, the codes and standards listed in Appendix B.

All electrical equipment shall be rated for the installation environment, such as ingress protection level, operating ambient temperature range and hazardous area certification (if applicable).

11.2 Power Supply Requirements

11.2.1 Wollert Facility Power Supply

Supply authority metered electrical power shall be provided by AusNet, the distributor servicing the existing 315kVA transformer at Wollert. An upgrade in transformer size is required for the project and shall preferably be located outside the compound where the existing distribution pole is. The nominated upgraded size (500kVA) shall provide spare capacity for all the various running scenarios expected, as detailed in the maximum demand study (WPT.WOLL-CAL-E-0001), as well as allow a like-for-like upgrade of the existing pole mount transformer.

Additionally, a suitably-sized Diesel Engine Alternator (DEA) shall be installed to provide redundant power in the event of a distribution power supply failure by the supply authority.

APA shall install a Main Switchboard (MSB) within a new control room hut for the purposes of supplying LV three phase power to the entire Wollert facility. Refer to 18035-RP-E-0001 Power Supply Options Report for further details on the intended arrangement.

The relocation of the MEN link in the existing MCC does not warrant the need to bring the existing MCC up to the latest AS/NZS 3000:2018 requirements for accessibility and egress. Refer to WPT.WOLL-TN-E-0001 for further detail.

Furthermore, a mains and generator supply failure alarm and a suitably sized load bank shall be provided.

APA Technical Specifications 530-SP-E-0003/0014 and AusNet specifications shall be adhered to.

11.2.2 Battery Backup System (DC Supply)

For the new equipment installed at the Wollert facility, Extra Low Voltage (ELV) loads required for process safety and facility operation will be supplied by a commercially available Battery Backup System, installed in the new Control Building described in Section 11.3. The Battery Backup System shall be designed in accordance with APA Specification 530-SP-E-0013, utilising redundant supplies capable of delivering 100% of the load via either supply and complete with sealed batteries to ensure 50% back up capacity.

As a minimum the following alarms shall be included:

- Mains Failure;
- Loss of A.C. Supply to Charger;
- Charger Failure;
- Low Battery Voltage; and
- High Battery Voltage.

The backup battery system sizing criteria shall be defined in detailed design.

Equipment connected to either the new or existing back-up power supply shall be determined based on cable route length and size, as DC voltage drop is significant over long cable routes.

11.2.3 Main Line Valve (MLV) Station Power Supply

Where possible, supply authority metered electrical power shall be installed in the first instance for Main Line Valve (MLV) stations. If metered electrical power is not possible, alternative renewable energy sources shall be installed, this may include solar power or thermoelectric generation.

Back-up DC batteries shall be provided in the event of mains power failure and no sun days. Battery sizing shall be greater than 16 hours autonomy which will allow technicians ample time to attend site and provide back-up power if the reticulated supply is still out of service.

MLV control panels shall have the ability to install metered electrical power or DC battery powered supply, either by battery chargers or alternatives.

APA Technical Specification 530-SP-E-0003 and the respective electricity distributor specifications shall be adhered to.

11.3 Control Equipment Building and Associated Building Services

The facility shall be supplied with a new control equipment building to house a compressor Motor Control Centre (MCC), compressor control system, communications panel, and the facility MSB described in Section 11.2.

WORM Project

Control cabinets for equipment located in the control room shall be fully enclosed with lockable (Rittal key or equivalent) access doors. The control equipment building shall be laid out to provide access allowing for the cabinet doors being open.

As a minimum, one single door and one double door egress point with security door switches shall be provided for the control building. F-lock keyed doors shall be supplied.

A workstation, including a PC and desk phone, shall be made available to facilitate infrequent planned and unplanned maintenance activities.

APA Technical Specifications 530-SP-E-0001, 530-SP-S-0001, 530-SP-S-003 and 530-SP-E-0004 shall be adhered to.

Furthermore, the building shall conform to the electrical installation requirements contained within Building Code of Australia (BCA) and AS/NZS 3000.

The building shall be constructed from 2 hour fire rated materials.

11.4 Plant Lighting Design

The facility shall be supplied with the following lighting systems:

- Control room building internal normal and emergency lighting as required by the Building Code of Australia (BCA) and AS/NZS 3000;
- General Area lighting (field);
- Local Area / Task lighting (field); and
- Emergency lighting (field)

Field lighting (noted above) shall adhere to APA Technical Guideline 530-GD-E-0002.

Field lighting fixtures shall be on mid-hinged poles and shall adequately illuminate the site for general visibility only in accordance with BCA and AS/NZS 3000 as appropriate. Where possible, the use of LED lighting fixtures offering an equivalent level of illuminations are preferred.

Outdoor lighting to personnel access ways shall be sufficient to allow safe movement into and out of buildings, and along roadways. Roadway lighting will be provided by spill from building mounted fittings for roads within the plant fence line only.

Local area lighting shall be provided within the plant to supplement shadows and maintain a minimum lux level of 5 Lux.

Lighting types shall be consistent with the existing site lighting.

Light pole locations shall consider future expansion layout requirements as far as possible in order to avoid having to modify, remove or relocate in future.

Station lighting controls shall maintain the existing functionality, using the Station Control System.

Local lighting to be provided at one end of the WORM PRS, WORM DFC and VNI DFC skids.

No field lighting is intended for the MLV stations.

11.5 Junction Boxes and Cabling

11.5.1 Junction Boxes

All junction boxes shall adhere to APA Technical Standards 530-SP-E-0001, 530-SP-E-0004 and 530-SP-J-0005 shall be adhered to.

11.5.2 Cable Support Systems and Conduits

Electrical, control and instrumentation cable reticulation are routed through an underground conduit and cable pit system where possible. The cable support system shall be positioned to maximise the utility of the site by providing unobstructed access to process areas, whilst meeting cable minimum bending radius requirements.

Where above ground cable runs are required on skids or pipe racks, the cables are installed on cable ladder/tray with peaked covers to prevent UV damage and rain water collection, and shall have correct segregation of power and instrument cables installed.

The control room shall have a single layer reinforced rung cable ladder constructed underneath. All cable entries shall be through floor mounted gland plates. Power and instrument cables shall be segregated where possible.

APA Technical Specifications 530-SP-E-0002 and 530-SP-E-0004 shall be adhered to.

11.5.3 Cable Sizing

Cables shall be sized for the full load current of the load to be supplied for motors or single loads, and the full rating of the supply protection device for distribution boards and equipment with more than one load.

Cable capacities shall be calculated in accordance with AS / NZS 3008.1 taking into consideration the installation and climatic conditions affecting the cable. Generally the following criteria shall be applied for voltage drop calculations:

- Maximum Volt Drop for MCC/Main supply circuits 2%
- Maximum Volt Drop for sub-circuits 3%
- Maximum Volt Drop at motor terminals on start 8%

11.6 Earthing

11.6.1 Earthing System

11.6.1.1 Wollert Facility

The main Multiple Earthed Neutral (MEN) link shall be installed at the MSB and in accordance with AS/NZS 3000 and the supply authority technical specifications.

An above ground earthing system shall be utilised as the ground is comprised primarily of hard rock and shall be tied to a single earthing system for potential equalisation.

All metallic equipment including piping, welded pipe supports, vessels, tanks, equipment, equipment supports, junction boxes, junction box supports, cable ladder, cable ladder supports, fences, gates and structures shall be connected to the grid.

The minimum size of main earth conductor shall be 35mm² and the minimum size of equipotential bonding conductor shall be 10mm².

There shall be two independent earth conductors for all system earths and test points to enable earth testing without loss of earthing continuity.

APA Technical Specifications 530-SP-E-0001 and 530-SP-E-0004 shall be adhered to.

11.6.1.2 MLV Stations

A direct-buried Main Earth Grid (MEG) system shall be utilised for MLV stations.

All metallic equipment including piping, welded pipe supports, vessels, tanks, equipment, equipment supports, junction boxes, junction box supports, cable ladder, cable ladder supports, fences, gates and structures shall be connected to the grid.

The minimum size of main earth conductor shall be 35mm² and the minimum size of equipotential bonding conductor shall be 10mm².

There shall be two independent earth conductors for all system earths and test points to enable earth testing without loss of earthing continuity.

A cathodic de-coupler for Impressed Current Cathodic Protection (ICCP) systems, pipelines and personnel protection shall be provided at MLV stations.

APA Technical Specifications 530-SP-E-0001 and 530-SP-E-0004 shall be adhered to.

11.6.2 Instrument Earth

An instrument earth system shall be/is provided in the control cabinet, insulated from the power / chassis earth. All instrumentation cable screens shall be terminated to this earth through insulated earth systems in junction boxes and instrumentation/equipment. All armoured cables shall be earthed to the chassis of

equipment / instrumentation and form part of the power system earth, cable glands shall facilitate the bonding.

The instrument earth system is earthed to the MCC main earth bar in two places.

11.7 Lightning Protection

A lightning risk assessment in accordance with AS/NZS 1768 shall be performed. The resulting risk levels shall determine whether lightning protection is required. Refer to 18035-TN-R-0002.

In any case, surge protection shall be provided across all insulated flanges and Monolithic isolation joints. Refer to drawing 530-DWG-E-0001.

Surge protection shall be provided for all incoming power supplies where significant indirect lightning strike risk is identified.

Communications, SCADA equipment and field instrument signals shall be protected with surge protection to reduce impact of lightning strikes.

Upon completion of the noted AS 1768 assessment, APA Technical Specifications 530-SP-E-0001 and 530-SP-E-0004 shall be adhered to.

If further lightning protection is required, the system shall include the following:

- An air termination system mounted on the yard lighting poles, incorporating: dyno spheres, high current triaxial down conductors, lightning strike counter and dedicated lightning protection crows foot arrangement with earth rods driven into the ground;
- The lighting/lightning protection poles shall be earthed to the main earth system; and
- Lighting/lightning protection poles shall be of the see-saw type to facilitate inspection and maintenance of the lightning protection system.

11.8 Electrical Interference

The likelihood of electrical interference shall be evaluated, including stray currents and telluric effects. Where such interference effects are anticipated or detected during commissioning, appropriate mitigation measures shall be applied and tested in accordance with AS/NZS 4853.

Low frequency induction (LFI) and Earth Potential Rise (EPR) shall be evaluated and appropriate mitigation measures applied and tested in accordance with AS/NZS 4853 during detailed design.

11.9 Hazardous Area Design

Hazardous area (HA) classification of plant areas shall be determined in accordance with AS/NZS 60079.10.1 and AS/NZS 60079.20.1. If necessary, dispersion calculations shall be produced to assess extents of hazardous areas (i.e. vents).

Hazardous area classification drawings shall be produced during design and/or existing drawings to be modified to include changes made by the Project.

All new hazardous area classifications generated by the Project shall be added to the existing drawings and Schedule of Release document.

All equipment provided for a hazardous area shall be ANZEX OR IECEx-certified. Where this cannot be achieved a conformity assessment document shall be obtained.

Unless specified otherwise, the preferred HA protection technique for the various Hazardous Area zone types shall be:

- Zone 0: Ex'i' (intrinsic safety)
- Zone 1: Ex'e' (increased safety), Ex'd' (flameproof)
- Zone 2: Ex'e' (increased safety), Ex'd' (flameproof), Ex'n' (non-sparking).

Certification and inspection records relating to new equipment shall be incorporated into a consolidated site wide Hazardous Area Dossier at completion of works.

The hazardous area dossier shall be updated during design and construction; and maintained during operation and in accordance with AS/NZS 60079.17.

Design and equipment selection for hazardous areas shall be in accordance with APA Technical Specifications 530-SP-E-0001, 530-SP-E-0004 and 530-GD-H-0002.

11.10 Heat Tracing

Electric Heat tracing shall be implemented where identified on the PIDs and shall be self-regulating Low Voltage.

Heat tracing design and equipment selection shall be validated by calculation against the process conditions and shall be in accordance with Australian Standard AS/NZS 60079.30.2.

12 Instrumentation

12.1 General

Instrumentation equipment complies with the codes and standards as appropriate for the application, service and the requirements of any statutory or local authority.

Design approval and certification are in accordance with the current requirements of applicable Australian and relevant State codes, standards, laws and regulations.

All instruments shall be rated for the installation environment, such as ingress protection level, operating ambient temperature range and hazardous area certification (if applicable).

12.2 Actuator Motive Power

All new control valves and actuated valves within the WCSB boundaries utilise the station instrument air supply, this includes:

- Unit 6 Compressor Utilities
- Unit 6 Compressor Isolation Skid
- WORM Discharge Flow Control Skids
- WORM Isolation Valve
- VNI Discharge Flow Control Skids

All new control valves and actuated valves outside of WCSB boundaries shall utilise instrument gas supply. Individual instrument gas systems or grouped systems shall be provided.

12.3 Instrument Tubing

The following design and functional requirements shall be considered:

- All instrument tubing and fittings shall be in accordance with APA Technical Specifications 530-SP-J-0001 and 530-SP-J-0005 (flare fittings are not accepted);
- All tubing shall be adequately supported, and fixed in a manner and location that avoids the possibility of damage from heat, vibration or interference; and
- Isolation and vent manifolds shall be supplied to allow ease of maintenance without spillage of oil, and test connections are fitted to all impulse tubing to facilitate maintenance.

12.4 Instrument Support Stands

Instrument support stands shall be constructed using 2" galvanised welded piping with galvanised gussets and base plates per the APA standard detail. For multiple instruments, support stands shall be spaced adequately to accommodate multiple sunshades.

Bulk Type 125-N or approved equivalent anti-static instrument sunshades shall be installed for all transmitters in the field.

All instrument support stands shall be in accordance with APA Technical Specifications 530-SP-J-0001 and 530-SP-J-0005.

12.5 Pneumatically-Controlled Equipment

When selecting pneumatically-controlled equipment, consideration shall be given to the selection of non-corrosive materials that are directly exposed to process gas.

Pneumatically-controlled equipment shall be selected in accordance with APA Technical Specification 530-SP-J-0001.

12.6 Pressure and Differential Pressure Measurement

Pressure and differential pressure instruments shall be in accordance with APA Technical Specification 530-SP-J-0001.

Pressure gauges above 2,500kPag in gas services shall feature an internal restrictor of 0.1mm² maximum area as required by AS 1349.

12.7 Temperature Measurement

All embedded temperature sensing elements installed on the rotating equipment which require disassembly of mechanical equipment to remove the element shall, as a minimum, be duplicated once (hot spare). The spare element(s) are terminated to terminals external to the mechanical equipment to enable rapid swapping of measurement element without disturbing the mechanical assembly.

A compressor enclosure temperature transmitter shall be **provided**. An existing ambient temperature transmitter is available for use.

Temperature instruments shall be in accordance with APA Technical Specification 530-SP-J-0001.

12.8 Thermowells

Thermowells are of the flange type and tapered design in the first instance. Wake frequency analysis shall be conducted on all thermowells to ensure suitability for the service conditions.

Thermowells must conform to the piping spec and the maximum velocity limits in the specification shall be adhered to.

Wake frequency calculations, in accordance with ASME PTC 19.3, shall be carried out for all thermowell and instruments protruding into the pipe flow. Calculations shall be performed for both maximum pressure and maximum velocity cases.

If flange-tapered type thermowells are subjected to velocities greater than 30m/s, consideration for alternative thermowell designs shall be given (i.e. helical strake / twisted square); in which case, Vendor thermowell design calculations shall be in accordance to ASME PTC 19.3 for process pressure, steady state and dynamic drag stress and frequency limit. For vortex induced vibrations, Finite Element Analysis is an acceptable verification method.

Locations of thermowell in the new piping for the WORM project has been designed to ensure at least 6D distance from a flow restricting element. Further checks of the existing Wollert Compressor Station flow paths affected by the WORM Project to ensure thermowells are located at least 6D distance from a flow restricting element has been completed and no issues found.

12.9 Flow Measurement Instruments

Unit flow is used for anti-surge control systems, and is measured with a suitably-sized orifice plate and an associated Differential Pressure Transmitter. The transmitter shall be configured to have zero dampening.

Flow measurement for flow control shall also use a suitably-sized orifice plate type flow meter. Where higher accuracy is required, consideration for Ultrasonic type flow meters shall be given.

Utility gas flow and pipeline flow are measured for gas reconciliation. Total utility gas flow is measured with the package meter, and calculated in the station flow computer.

Orifice plates shall be in accordance with APA Technical Specification 530-SP-J-0001.

12.10 Level Measurement Instruments

Where level measurement is required, level transmitters is preferred over level switches.

Level instrument shall be selected in accordance with APA Technical Specification 530-SP-J-0001.

12.11 Actuated Valves

Refer to APA Technical Specification 530-SP-P-0037 for additional requirements for design and supply of Actuated Valves and the relevant piping specification datasheet.

All on/off valves shall assume a predetermined position of either open, closed or last -position on loss of solenoid or pneumatic power as defined on P&IDs, designated Fail Open (FO), Fail Closed (FC) or Fail Last (FL) respectively.

All on/off valve actuator accessories shall be supplied fully piped, with an air filter and solenoid valve. All fittings shall be Swagelok 316 stainless steel.

On/off valves shall be provided with closed and open limit switches indicating valve status to the SCS PLC, where indicated on the P&IDs. While the valve is operating, valve indication outside of open and closed limits will be shown as transient (valve travelling). In addition, valves should report an error/fault status when valves fail to close or open within a prescribed duration.

Station and Unit suction and discharge isolation valves are single acting control with position feedback.

Stroking time selected shall be confirmed against documented requirements in the Safety Requirements Specification, prepared as part of the Safety Integrity Level process.

Actuated valve hookups shall be in conformance with APA standard valve hookup details.

Valve supply shall comply with the requirements of Section 8.3.

12.12 Control Valves

Refer to APA Technical Specification 530-SP-P-0039 for additional requirements for design and supply of Control Valves and the relevant piping specification datasheet.

All control valves shall assume a pre-determined position, either open or closed, on loss of signal or pneumatic power as defined on P&IDs, designated Fail Open (FO) or Fail Closed (FC) respectively.

All control valves actuator accessories shall be supplied fully piped, with an air filter and positioner. All fittings shall be Swagelok 316 stainless steel.

In general, the stroking times of control valves shall be in accordance with the following values:

WORM Project

- Critical analogue control systems less than 1 sec (e.g. surge control of compressors);
- Normal process analogue systems 5 sec but not longer than 10 sec.

Control valves shall meet full flow and minimum flow tests within the required station noise limitations.

Stroking time selected shall be confirmed against documented requirements in the Safety Requirements Specification, prepared as part of the Safety Integrity Level process.

Flow control I/O shall be terminated across multiple I/O cards for redundancy.

Control valve position feedback shall be obtained via a HART signal and split into separate analogue signals using a HART filter circuit arrangement.

13 Control and Safety Systems

13.1 General

The control systems and level of control required satisfies the requirements of the appropriate Australian Standards, Statutory Regulations, operating philosophy, HAZOP studies, and Safety Integrity Level (SIL) review and risk assessments.

ESD and compressor station control functionality are to be addressed in the function specification during detailed design.

The following control systems are installed:

- Compressor Station Controller (CSC) – Performs majority of the critical safety instrumented functions and overall station control. The system is based on a Triconex platform. There will be some station level communications interface between the CSC and other control systems as required;
- Expansion Compressor Station Controller (ECSC) – Performs a subset of the critical safety instrumented functions, primarily the isolated WORM project equipment (i.e. WORM DFC skid). The system is based on a Triconex platform. The signals will be communicated back to the CSC via a form of communications protocol to be determined during detailed design;
- Wollert City Gate Controller (WCGCS) – Performs all the pressure reduction functions (via PRS) for the WORM project. The system is based on a Triconex Trident platform;
- Station RTU – Collects data from compressor station controller. The Station RTU communicates with the APA remote SCADA system (ClearSCADA) using DNP3 protocol over a redundant satellite communication link. This unit is based on the Emerson Controlwave Micro platform;
- Compressor Unit Control System – Supplied as part of the Solar Turbines Compressor package housed in the Unit Control Panel (UCP). This system is based on the Allen Bradley ControlLogix XT Platform; and
- DEA Control Systems – Supplied as part of the DEA package. The control system platform will be confirmed during detailed design.

13.2 Compressor Station Controller

The existing Compressor Station Controller (CSC) functionality will remain largely unchanged, with the exception of the following equipment:

- All VNI (T119) Discharge Flow Control (DFC) skid functions;
- Additional ESD hand switches identified as required during detailed design; and
- Station suction, discharge, loading and blowdown valve controls.

13.3 Expansion Compressor Station Controller

The Expansion Compressor Station Controller (ECSC) includes the following design functionality and is physically located inside the Expansion Station Control Panel in the new Control Equipment Building installed as part of the WORM project:

- All safety critical and selected control functionality associated with the WORM DFC, including start, stop, reset and monitoring of selected package data;
- All safety critical and selected control functionality associated with the DEA including start, stop, reset and monitoring of selected package data;
- Monitoring of Battery Back-up System;
- Fire & gas detection systems for the new Control Equipment Building;
- Fire suppression systems for the new Control Equipment Building;
- Functions for security and lighting of the respective area in Station B;
- Monitor and control of cathodic protection systems;
- Instrument air pressure monitoring for the WORM equipment;
- Monitor and control of utilities including power distribution; and
- Monitor limit switches on the new control equipment building doors.

13.4 Unit Control System

The Unit Control Systems are provided as part of the Solar Compressor Unit package. Items provided as part of the package include the unit PLC hardware, software and back-up relay-based shutdown system and physically housed inside the off-skid Unit Control Panel in the Control Room.

The Unit Control System has the following features:

- PLC monitored by a 'watchdog timer' to detect lockup;
- Human Machine Interface (HMI) to allow local control, monitoring, trending and alarming of gas turbine, gas compressor and ancillaries;
- Interface with the CSC. Protocol is Modbus TCP/IP for non-critical functions and hard wired signals for critical safety and control functions;
- Executes remote start / stop / reset signals from the CSC;
- Compressor automatic process control of compressor suction pressure, discharge pressure, discharge temperature and flow;
- Provides for all local control, and can be operated locally by a set speed, suction pressure, discharge pressure, discharge temperature or flow set point;
- Scans the unit instrumentation and sends information to its own HMI and to the CSC via Modbus TCP;
- Provides protection to the unit by comparing analogue and digital inputs to pre-determined alarm and shutdown limits;
- Controls majority of unit devices with the exclusion of fire and gas detection devices;
- On loss of communication with the CSC the unit control system will continue to control and protect the unit in auto mode at the last good set point received;
- Provides gas cooler fans starts/stop requests to the CSC;
- Provides anti-surge control and protection;
- Provides communication interface to engineering network.

13.5 DEA Control System

The DEA Control System is provided as part of the DEA package. Items provided as part of the package include the hardware, software and indications physically housed inside DEA Control Panel.

The DEA control system has the following features:

- The DEA controls consists of individual microprocessor based local control units;
- Provides control of DEA operation for local start / stop and responds to remote start / stop requests from the CSC;
- Provides monitoring and protection of the DEA;
- Enables local and remote selection, starting and stopping;
- Communicates with the CSC via modbus TCP/IP;
- On loss of communication with the CSC, the DEA control system continues to control and protect the unit in auto mode.

13.6 Modifications to Existing Control System

The existing Triconex Control System at WCS has limitations on the controller scanning time with the existing I/O loads. This is expected to be further impacted with addition of WORM Project I/O loads, resulting in slower scanning and response times.

A new control system processor will be installed to ensure the response time is not impacted by the additional WORM Project I/O loads.

The WORM PRS I/O loads will connect to the existing Trident control system adjacent to the WCG and expanded to accommodate the additional I/O.

The Expansion Control System architecture (i.e. standalone or expansion rack) shall be determined during Detailed Design.

13.7 SCADA & Communications

The existing communications architecture and systems at Wollert will be used to convey additional signals introduced by the WORM Project to the relevant remote Control Centres (APA Dandenong Control Centre and AEMO VTS Control Centre).

New communications utilising proprietary URSYS equipment and satellite will be provided to each MLV station control panel.

Remote monitoring of CP test posts through the mobile network will be implemented. Aegis proprietary CP data loggers shall be utilised.

APA OT will be responsible for back-end design of the ClearSCADA, Transmission Historian, Operation Pi systems to capture the new equipment.

AEMO will be responsible for development of their own remote SCADA operating screens and database.

14 Corrosion and Cathodic Protection

14.1 General Requirements

The design and installation of the CP shall be carried out by suitably qualified and experienced personnel.

Any interference or stray currents will be mitigated in accordance with AS 2832 or AS/NZS 2885.1.

Table 25 Corrosion Protection Details

Item	Details
Cathodic Protection	Cathodic protection of the pipeline is to be provided via a combination of cross-bonds to existing CP systems and the installation of an impressed current system at either MLV2 to be determined during detailed design.
Polarisation coupons to be placed at critical CP test points if required	For example at water pipeline crossings

The pipeline primary corrosion protection system shall be its external coating. As a secondary protection, cathodic protection will also be employed to protect the pipeline from corrosion where buried steel is exposed due to coating defects or damage.

The cathodic protection design will be reviewed in conjunction with the earthing design to ensure compliance with AS 4853.

The buried pipeline will be protected against corrosion by a CP-system designed and installed in accordance with AS/NZS 2885.1, AS 2832.1, APA specification 530-SP-E-0005 and Victorian Electrolysis Regulations. Additional protection will be provided to mitigate the effects of electrical interference from external sources including stray current from traction systems and interference from 3rd party CP systems.

The CP system will be designed to use both impressed current and sacrificial anodes.

The CP system will be designed for voltage attenuation and anticipated current densities at 20 years with the coating specified.

Telluric stray current effects will be considered possible and consequently auto-controlled CP Systems shall be considered.

Foreign structure interference will be assessed with the provision of foreign crossing structure test points. With possible mitigation methods being localised sacrificial anodes and possible cross-bonding. Anodes will only be connected as required based on testing.

Cathodic Protection shall be designed with the following characteristics:

- Long term reliable operation in a remote elevated temperature environment,
- System capacity of four times (4x) the current determined by calculations in design to allow for mitigation of stray currents,
- Maximum voltage output to be determined in detailed design, however shall not exceed 50VDC.
- CP units to be consistent along line for spares and operational continuity.

Temporary CP shall be applied to the pipeline as it is constructed. When construction is complete the temporary CP will be disconnected and the impressed current CP system energised. CP test points will be placed as defined in Table , depending on accessibility and features.

CP Test posts shall all be capable of installation of remotely monitored, permanently installed dataloggers.

14.2 Interface Cathodic Protection

Location of insulating flanges and interference from adjoining systems and potential cross bonding needs to be considered during detailed design for the Crib Point facility.

14.3 Temporary CP

Temporary CP may be provided by either zinc or magnesium anodes connected to the pipeline at test points. Temporary CP shall be installed on the pipeline within 48 hours of backfilling. At monthly intervals during construction a check of pipeline potentials will be undertaken. If any potential reading indicates a lack of protection additional anodes will be installed or cross bonds will be made so that protection is re-established. As a result, no section of pipeline will be unprotected for a period in excess of one month.

14.4 CP Monitoring at Facilities

CP potential will be monitored via telemetry at all facilities using a pipe to soil voltage instrument loop.

The telemetered data loggers being rolled out across the VTS will be utilised.

14.5 Electrical Insulation and Continuity

Monolithic insulating joints (MIJ) will be provided for electrical isolation between buried pipeline sections and above-ground facilities. MIJ materials selection and design shall make allowance for the high and low pipeline design temperatures (-10°C to 60°C) such as depressurization, re-pressurization and compressor discharge.

Any pipe support on the pipeline side of an insulating joint will include electrical insulation to maintain potential isolation.

Each insulating device shall be fitted with surge protection devices. These shall be installed as per the APA standard ESS drawings.

14.6 Lightning Protection

Exposure to lightning shall be risk assessed in accordance with the recommendations in AS1768, with any mitigation measures implemented in design.

14.7 Electrical Interference Effects

An initial LFI study was carried out during initial route selection. Subsequent route selection has reduced the exposure of the pipeline to LFI from areas still adjacent to overhead powerlines.

The likelihood and consequences of electrical interference shall be evaluated for the final pipeline route, including stray currents and telluric effects. Where such interference effects are anticipated or detected during commissioning, appropriate mitigation measures shall be applied and tested in accordance with 530-SP-E-0005.

Low frequency induction (LFI) and Earth Potential Rise (EPR) shall be evaluated and appropriate mitigation measures applied and tested in accordance with AS/NZS 4853 during detailed design.

MLV CP and earthing design shall include protection for personnel in contact with equipment at pipeline potential from electrical interference checks.

[**HOLD 25** – confirm final design for earthing and personnel protection associated with areas subject to high tension power line interference – Potential requirement for additional earthing beds along the parallel section and potential clamps to be confirmed during detailed design]

15 Civil / Structural Engineering & Design

15.1 Site Conditions

The elevation of the site is approximately 206 m above sea level.

All new facilities except for the WORM pipeline vent will be located within the same compound, with compressors and new headers to the west of the existing WCSB compressors unit and WORM PRS facilities directly to the north of the existing Wollert Station. The WORM pipeline vent will be located in a separate compound east of the existing northern part of the plant.

The new facilities will be located within the existing hardstand area, other than the WORM inlet facilities outside the fence on the north side.

15.2 General

The site facilities shall include the following:

- Termite protection for all timber structures if applicable;
- The constructed facility, where necessary, shall be preserved in an appropriate paint scheme;
- Permanent existing facilities include workshop, control room, battery room, oil store and waste treatment.

15.3 Geotechnical

Civil foundation design shall be based on the Project Geotechnical and Hydrological Reports, 18035-RP-L-0005 (WORM Hydrogeological Assessment), 18035-RP-L-0006 (WORM Surface Water Assessment) and 18035-RP-GEO-0003 (Geotechnical Report) [HOLD 26 – report to be finalised]. Soil properties for design and behaviour under flooding condition, refer to above mentioned reports.

15.4 Earthworks

All earthworks shall be conducted in accordance with the Construction Environmental Management Plan (CEMP).

The following measures shall be undertaken:

- Extent of site disturbance shall be minimised and disturbed land has been progressively rehabilitated since completion of construction;
- Catch drains and diversion drains shall be installed as required to spread the flow on to undisturbed land or vegetated land where erosion effects are minimised;
- Existing roads or tracks shall be utilised wherever possible.
- The design of the earthworks shall conform to the appropriate Australian Standards and regulations and shall consider the following:

- Trenching, installation of underground services, cables, conduits, pipes and drains with backfill and compaction shall be completed as necessary;
- Testing of gravel and compaction to ensure required standard shall be achieved;
- After disturbed areas are vacated and after spreading topsoil, scarifying shall be undertaken to a depth of approximately 100mm;
- Earthworks and foundations are appropriately designed for the geotechnical data and site conditions;

15.5 Roads, Access and Site Finishing

- Hard standing, non-sealed access roads within the site boundary, unless local conditions require or concrete finishing;
- Site areas shall comprise of compacted gravel within the perimeter, with the exception of areas requiring loose gravel or concrete sealing;
- Sufficient walkways over pipe work;
- Concrete pathways provided between all buildings;
- 50mm thick blue metal to be distributed in all other areas subject to vehicle or pedestrian movements that are not specifically designated as pathways or roadways.

15.6 Drainage

- The compressor station design shall consider 1 in 100 year flood. No area, roadway or building within the Facilities shall be inundated to a level that reduces the reliability, availability, operability, safety or access during the 1-in-100 years flood condition. Elevation of the adjacent existing facilities shall also be considered in the detail design.
- Levels shall generally be consistent with the existing station
- Area within the fenced boundary shall be elevated in relation to the surrounding ground to ensure localised flooding and water erosion does not occur. Required levels shall be determined by flood assessments;
- Drains and pits shall conform to the CEMP;
- Rainwater collected from building roofs shall be discharged to grade. Services and amenities shall be supplied from the bore, collected in storage tanks and reticulated and filtered for use in the plant;
- Drainage and pits shall be utilised where appropriate, in plant areas not serviced by the closed liquids drain system;

15.7 Security Fences and Gates

- Fencing shall be provided as an extension to the existing station and follows the boundary of the compressor station, workshop and hardstand areas. The fencing shall be personnel-proof, of the chain wire security type to a height of 2.4m as required by AS 2885. Standard type fencing shall be provided for the new WORM pipeline vent compound;
- Double 3m wide gates shall be provided for vehicle access. Location of the access gates to be confirmed in detail design;

- Emergency access and egress gates are to be provided as identified at AS 2885 SMS workshops;
- Fencing and gates shall be hot dip galvanised;
- Warning, station prohibition and site signs shall be provided as per AS 2885 and risk assessment process;
- The facility sign shall be located in view of the normal road access approach;
- MLV fencing shall utilize APA standard fencing per 530-DWG-S-4053.

15.8 Structural design inputs

Loading conditions for the various structures shall be determined in accordance with the requirements of AS / NZS 1170.

15.9 Wind Design Criteria

Wind loading shall be assessed according to AS 1170.2 utilising the following design criteria:

Wind loads shall be calculated in accordance with AS 1170.2 and the following design parameters at the sites:

- Region A5 (Wollert)
- Terrain Category 2
- Average recurrence interval 500 years (Refer AS 1170.0 – Appendix F, Table F2)
- Regional wind speed based on 3 second gust wind speed $V_{500} = 45\text{m/s}$ for Wind Region A
- These are Ultimate Limit State wind speeds; (Refer AS 1170.2 - Table 3.1)
- $M_d = M_s = M_t = 1.0$ unless information is available to the contrary.

15.10 Seismic Design Criteria

Earthquake loading shall be assessed according to AS 1170.4 utilising the following design criteria:

- Importance Level 3 (High consequence of failure)
- Annual Probability of Exceedance: 1/500 years
- Probability Factor: $k_p = 1.0$
- Hazard Factor: $Z = 0.052$
- Site Sub-Soil Class: C_e (Shallow soil)
- Earthquake Design Category: II (for structure height, $h_n < 50$)

15.11 Concrete and Foundations Design

Reinforced concrete footings will be utilised for the equipment and pipe supports and shall be designed to satisfy the stability, strength and requirements for each of the components they support. Footings are to be designed to take into consideration the recommendations of the geotechnical site report.

Designs for new footings for pipe supports shall consider existing station support design. Careful attention shall be paid to potential for buried rock and difficulty with excavating for deep foundations.

APA standard drawings shall be used wherever practical.

15.12 Structural

All structural design shall conform to the appropriate Australian Standards and regulations and shall consider the following:

- Thermal expansion and displacement;
- Installation methods;
- Transfer of load to other structures or equipment;
- Electrical isolation, corrosion protection and cathodic protection;
- All steel structures shall be hot dip galvanised (HDG) in accordance with AS4680. Design and construction methods shall minimise disturbance of the HDG coating on site. Where practical, structural steel shall be delivered to site modularised and only required bolting on site (with minimal or no grinding and welding);
- Maintenance;
- All metal structures shall be provided with a suitable method for connection of the equipotential bonding system.

15.13 Control Equipment Building

The Control Equipment Building shall be classified as Class 10A under the BCA as it is non-habitable and generally unmanned. The building has the following functional descriptions:

- Combined control equipment building and switch room in one building separated by internal walls, partitions and doors;
- Provides housing for the station control and monitoring equipment, Station Control Panel (SCP) and Unit Control Panels (UCPs), main switchboard (MSB), Motor Control Centre (MCC), DEA Control Panel and battery charger;
- Provides adequate operation work space for two people side by side at a time;
- Located outside the hazardous areas with adequate separation distances as identified in risk assessments and HAZOP studies;
- Pre-fabricated, modular design conforming to the appropriate standards and regulations;

WORM Project

- Pre-installation of equipment shall be undertaken where practical and within vendor warranty and insurance parameters;
- Atmospherically controlled to satisfy the equipment's continuous operating requirements;
- Have lockable and secure doors adequate for equipment and personnel access;
- Provides adequate normal and emergency egress lighting;
- Have adequate fire protection consistent with HAZOP studies and risk assessments. It is protected by smoke detectors and a Novec 1230 or similar fire suppression system;
- The access walkways into the control building are designed to have provision to mitigate differential ground settlement;
- It is equipped with equipment double doors, equipment loading platform, two single personnel access door, window, lighting, emergency lighting, fire protection and split air conditioning systems;
- 2 hour fire rating;
- Building egress exit paths shall be reviewed in accordance with AS/NZS 3000.

15.14 Battery Room

A separate Battery Room is not required.

APPENDIX A ABBREVIATIONS AND DEFINITIONS

Item	Definition
AC	Alternating Current
AEMO	Australian Energy Market Operator
CP	Cathodic Protection
DC	Direct Current
DEA	Diesel Engine Alternator
DFC	Discharge Flow Control
EC	Energy Components (APA Enterprise Billing System)
EPS	Expanded Polystyrene
GTC	Gas Turbine Compressor
HA	Hazardous Area
ICCP	Impressed Current Cathodic Protection
ILI	Inline Inspection
I/O	Input/Output
IOC	Integrated Operations Centre
IS	Intrinsically Safe
LV	Low Voltage
MACDB	Main AC Distribution Board
MEN	Multiple Earthed Neutral
MFL	Magnetic Flux Leakage
MLV	Main Line Valve
OT	Operational Technologies

Item	Definition
PIP	Project Implementation Plan
PRS	Pressure Regulating Skid
SCP	Station Control Panel
SCS	Station Control System
SIB	Stay In Business (minor capital works)
SIL	Safety Integrity Level
SIS	Safety Instrumented System
UCP	Unit Control Panel
UPS	Uninterrupted Power Supply
VNI	Victorian Northern Interconnect
VSD	Variable Speed Drive
VTS	Victorian Transmission System
WCS	Wollert Compressor Station
WCSA	Wollert Compressor Station A
WCSB	Wollert Compressor Station B
WCG	Wollert City Gate
WORM	Western Outer Ring Main

APPENDIX B REFERENCES

References All work performed in accordance with this [Subject] are to be in conformance with the current issue, including amendments, of those national and international standards, codes of practice, guidelines and APA documents listed below.

Referenced Document	
Legislation and Regulation	
	Gas Safety Act
	Electricity Safety Act 1998
	Pipelines Act 2005
APA Standards	
530-GD-J-0001	APA Fire and Gas Philosophy
530-LI-P-0001	APA Standard Pipe Class Specification Index
530-PR-A-0001	General Procedure for Operability, Maintainability and Reliability Requirements
530-SP-C-0002	General Specification for Concrete Supply
530-SP-C-0003	General Specification for Bulk Earthworks
530-SP-C-0004	General Specification for Earthworks
530-SP-C-0005	General Specification for Concrete Construction
530-SP-E-0001	General Specification - Electrical Equipment
530-SP-E-0002	Electrical, Instrumentation and Communication Cables
530-SP-E-0003	Technical Specification Power Supplies
530-SP-E-0004	Electrical and Instrumentation Equipment Installation
530-SP-E-0005	General Specification for Cathodic Protection

Referenced Document	
530-SP-J-0001	Instrumentation Equipment (including Analysers, Chromatographs)
530-SP-J-0002	Custody Transfer Meters
530-SP-J-0005	Skid Mounted Packages Unit (Electrical & Instrumentation)
530-SP-L-0002	Offsite (Shop) Fabrication and Testing of Pipeline Assemblies
530-SP-L-0016	
530-SP-M-0507	Pressure Vessel
530-SP-M-9601	General Specification - Coating Specification for Buried Pipework Valves & Fitt
530-SP-M-9602	General Specification - Coating Specification for Above Ground Pipework Valves
530SP-M-9605	General Specification for Insulation of Piping, Equipment, Valves and Others
530-SP-M-9606	Dual Layer FBE Line Pipe Coating and Internal Lining
530-SP-M-9610	Mechanical Plant and Pipework Cleaning Specification
530-SP-P-0002	Piping Fabrication, Installation and Testing
530-SP-P-0004	Piping Specification A01C01 Class ASME 150#CS
530-SP-P-0006	Piping Specification A03C01 Class ASME 300#CS
530-SP-P-0008	Piping Specification A06C01 Class ASME 600#CS
530-SP-P-0009	Piping Specification A06C02 Class ASME 600#LTCS
530-SP-P-0024	Piping Specification A09C04 Class ASME 900#CS
530-SP-P-0030	Piping Specification A01S01 Class ASME 150#SS

Referenced Document	
530-SP-P-0036	Technical Specification for Manual Valves
530-SP-P-0037	Technical Specification for Actuated Valves
530-SP-P-0039	Technical Specification for Control Valves & Regulators for General and Special Services
530-SP-P-0095	General Specification - Piping Stress Analysis
530-SP-P-0096	Piping Design Criteria
530-SP-S-0001	Technical Specification for Control Room Building
530-SP-S-0003	General Specification Prefabricated Buildings
530-SP-S-0004	General Specification Steel Supply and Fabrication and Erection
Australian Standards	
AS 1349	Bourdon Tube Pressure & Vacuum Gauges
AS 1379	Specification & Supply of Concrete
AS 1657	Fixed Platforms, Walkways, Stairways & Ladders- Design, Construction & Installation
AS 1726	Geotechnical Site Investigations
AS 1841	Portable Fire Extinguishers
AS 2700	Colour Standards for General Purposes
AS 2832.1	Cathodic Protection of Buried Metallic Structures
AS 2885	Pipelines Gas & Liquid Petroleum, Parts 1, 2, 3, 4 & 5
AS / NZS 3000	Electrical Wiring Rules
AS 3008	Electrical Installation – Selection of Cables
AS 3190	Approval & Test Specification – Residual Current Devices (Current-Operated Earth-Leakage Devices)

Referenced Document	
AS 3600	Concrete Structures
AS 3725	Design for installation of buried concrete pipes
AS 3788	Pressure Vessels – In Service Inspection
AS 3798	Guidelines on Earthworks for Commercial & Residential Developments
AS 3920	Pressure Equipment - Conformity Assessment
AS 3947	Low Voltage Switchgear & Control Gear
AS 3990	Mechanical Equipment – Steelwork
AS 3992	Pressure Equipment – Welding & Brazing Qualification
AS 4100	Steel Structures
AS 4343	Pressure Equipment – Hazard Levels
AS 4853	Electrical Hazards On Metallic Pipelines
AS / NZS 60079 (series)	Explosive Atmospheres
AS 60269.1	Low Voltage Fuses – General Requirements
AS 60529	Degree of Protection Provided by Enclosures for Electrical Equipment (IP Code)
AS 61204.1	Low Voltage Power Supplies Devices, DC Output – Performance Characteristics
AS / NZS 61439 (series)	Low Voltage Switchgear & Control gear Assemblies
AS 61508	Functional Safety of Electrical/Electronic/Programmable Electronic Safety Related Systems
AS 61511	Functional Safety, Safety Instrumented Systems for the Process Industry Sector, Framework, Definitions, Systems, Hardware & Software Requirements

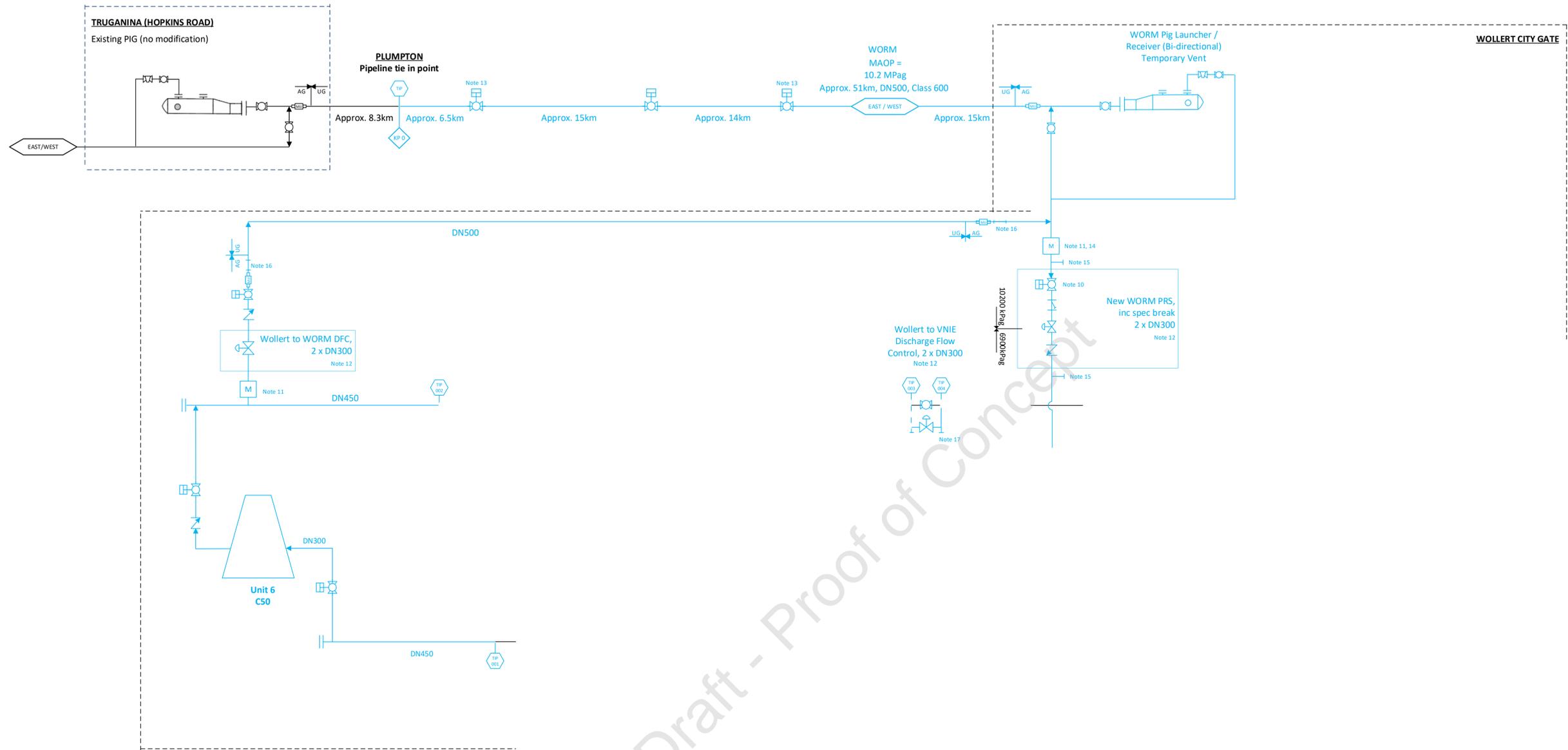
Referenced Document	
AS / NZS 1554.1	Welding of Steel Structures
AS / NZS 1768	Lightning Protection
AS / NZS 4680	Hot Dipped Galvanised (Zinc) Coatings on Fabricated Ferrous Articles
AS / NZS 4853	Electrical Hazards on Metallic Pipelines
International Standards	
ASME BPVC Section VIII	Boiler & Pressure Vessel Code – Rules for Construction of Pressure Vessels: Division 1
ASME BPVC Section V	Boiler & Pressure Vessel Code – Non Destructive Examination
ASME BPVC Section IX	Boiler & Pressure Vessel Code - Qualification standard for Welding & Brazing Procedures, Welders, Brazers and Welding and Brazing Operators
ASME B16.5	Pipe Flanges & Flanged Fittings
ASME B16.9	Factory-Made Wrought Steel Butt Welding Fittings
ASME B16.11	Forged Fittings, Socket Welding & Threaded
ASME B16.34	Valves-Flanged, Threaded & Welding End
ASME B31.3	Process Piping
ASME B36.10	Welded & Seamless Wrought Steel Pipe
ASME PTC 19.3	Thermowells
API 5L	Specification for Line pipe
API 6D	Specification for Pipeline Valves, End Closures, Connectors & Swivels
API RP 520	Sizing, Selection & Installation of Pressure-Relieving Systems in Refineries

Referenced Document	
API RP 521	Guide for Pressure-Relieving & Depressurising Systems
API Std. 600	Steel Gate Valves, Flanged & Butt Welding Ends
API Std. 2003	Protection Against Ignitions Arising out of Static, Lightning & Stray Currents
AEMO	
	Gas Quality Standard and Monitoring Guidelines (Declared Transmission System)
	Gas Quality Guidelines v 10
	Gas Metering - CTM Data Requirements
	Technical Guide to the Victorian Declared Wholesale Gas Market
Other	
APGA	Investigations of land use around pipelines to guide initial location classification under AS2885 guideline. Aug 2014
FM Global	[HOLD – confirm FM Global standards]
BCA	Building Code of Australia
Project Studies	
	Planning Considerations for High Pressure Gas Pipeline Corridors (by Echelon Planning)



APPENDIX C SCOPE SCHEMATIC

Draft - Proof of Concept



Draft - Proof of Concept

DWG NO	TITLE	NO	DATE	TITLE	DRN	CHKD	ENG	QA	APPRV
		1.1	04.10.19	Updated in accordance with design review, VIP workshops and scope clarifications	CS	TS			BJC
		0.2	09.07.19	Added additional details to existing flowpaths	AL	MN		BJC	
		0.1	20.06.19	PIP Rev 3 / PIP Rev 4 - Options to T74N	AL	BJC			
REFERENCE DRAWINGS					REVISIONS				



DRAWN: 04/10/2019
 CHKD: 04/10/2019
 ENG: DATE:
 QA: DATE:
 APPRV: 04/10/2019
 PRJ NO: 18035

APA WORM PROJECT
SCHEMATIC and FLOW PATHS
 Issued for Information

SCALE: NTS DRAWING NO: 18035-SK-A-0003.01 REVISION: 1.1



APPENDIX D AS/NZS2885.1 DBM CONFORMANCE CHECKLIST

The following sections are required to be documented in the DBM as described in AS/NZS2885.1. The relevant section of the DBM is cross referenced.

Clause	Subclause No.	Requirement	Conformance or Approval Required?	Verification / Action Required?	Relevant Section of DBM
4.2 SYSTEM DESIGN	4.2.1 Design Basis	<p>The basis for design of the pipeline, for each station, and for each modification to the pipeline or station SHALL be documented in the Design Basis.</p> <p>The Design Basis SHALL be revised during the development of the project to record changes required to the Design Basis as a result of additional knowledge of the project requirements as the detailed design is developed.</p> <p>The Design Basis SHALL be revised at the completion of the project to reflect the as-built design.</p> <p>The Design Basis SHALL record, as a minimum, the following:</p> <p>(a) A description of the project covered by the Design Basis.</p> <p>(b) Statutory legislation and industry codes and Standards applicable to the pipeline and facilities.</p> <p>(c) Specific physical criteria to be used in the design including at least:</p> <p>(i) The design capacity of the pipeline and of each associated STATION and PIPELINE ASSEMBLY, and where applicable the pressure and temperature conditions at which this applies, and including initial and final capacity where this is significant to the design.</p> <p>(ii) Design life of PIPELINE SYSTEM and design lives of subsystems as applicable.</p> <p>(iii) DESIGN PRESSURE(S), internal and external.</p> <p>(iv) Design temperature(s).</p> <p>(v) Corrosion allowance, internal and external.</p> <p>(vi) Fluids to be carried.</p> <p>(vii) Where required, the maximum fluid property excursion and the duration of any excursion beyond which the fluid shall be excluded from the pipeline.</p> <p>(viii) Damage resistance requirements including special requirements for HIGH CONSEQUENCE AREAS</p> <p>(ix) Pipeline MEASUREMENT LENGTH</p>	Conformance	Review for compliance at Design Completion	<p>a) This Document</p> <p>b) Appendix B</p> <p>c) i) Section 6</p> <p>ii) 3.2</p> <p>iii) 6.3</p> <p>iv) 6.3</p> <p>v) 8.1.3 and 9.8</p> <p>vi) 6.1</p> <p>vii) 6.1</p> <p>viii) 10.2</p> <p>ix) 10.2.2</p>



Clause	Subclause No.	Requirement	Conformance or Approval Required?	Verification / Action Required?	Relevant Section of DBM
4.2 SYSTEM DESIGN	4.2.2 Maximum velocity	The design SHALL establish the presence in the fluid of any contaminants that could reduce the pipe wall thickness during the pipeline design life through erosion or erosion-corrosion. Where erosion or erosion-corrosion mechanisms exist and where these mechanisms can be controlled by limiting the maximum velocity in the PIPELINE SYSTEM, the maximum velocity in the MAINLINE PIPE and in PIPING within PIPELINE ASSEMBLIES and STATIONS SHALL be determined and documented in the Design Basis .	Conformance	No	Refer Section 6.4 for piping Limit not applicable to pipeline except pigging operations – Refer Section 2.2.42.2.4
4.5 LOW TEMPER- ATURE EXCUR- SIONS	4.5	<p>A PIPELINE SYSTEM design SHALL define safe combinations of high stress and low temperature. These limits and their basis SHALL be documented in the design basis. Where operation within these limits relies on operating procedures, the procedures SHALL be included in the PIPELINE MANAGEMENT SYSTEM.</p> <p>Excursions below the temperature for brittle fracture control (TBFC), SHALL not be coincident with operating HOOP STRESS greater than 85 MPa. See also Clause 5.3.5</p> <p>The design SHALL address each operating condition that has the potential to cause temperatures lower than the applicable design temperature for continuous operation. The design SHALL document the controls incorporated in the design, and any operational procedures required to conform with the high stress-low temperature limits.</p>	Conformance	No	Refer Section 6.18



Clause	Subclause No.	Requirement	Conformance or Approval Required?	Verification / Action Required?	Relevant Section of DBM
5.2 WALL THICKNESS	5.2.3 Required wall thickness (tW)	<p>The required wall thickness (tW) SHALL be the greatest of the following:</p> <p>(a) The thickness required for pressure containment (tP).</p> <p>(b) The thickness required for resistance to penetration by the design threat, if this is used as a method of providing external interference protection in accordance with Clause 5.5. In T1 and T2 location classes, where thickness is the method chosen to provide penetration resistance, the thickness necessary to provide a minimum level of penetration resistance.</p> <p>(c) The thickness required to provide the minimum critical defect length needed to prevent rupture in location classes T1 and T2 in accordance with Clause 4.9.2, or elsewhere if required by the Design Basis.</p> <p>(d) The thickness required to satisfy the stress and strain criteria.</p> <p>(e) The thickness required for fracture control</p> <p>(f) The thickness required for 'special construction (see Clause 5.8)</p> <p>(g) The thickness required to satisfy the stress criteria in Clause 5.7.3.2 for pipelines crossing railways and roads.</p> <p>(h) The thickness required to achieve a design stress level selected for its contribution to SCC mitigation at locations where the SCC likelihood is increased by operation at temperatures above 45°C, and at locations subject to high operating pressure range.</p> <p>(i) The thickness required to achieve adequate fatigue life where this is determined to be relevant to the operating life of the pipeline, including particularly pipeline assemblies subject to conditions that favour vibration.</p> <p>(j) The thickness required to prevent collapse from external pressure.</p> <p>NOTE: Where calculations in this standard include wall thickness as independent variable, the value to be used is the required wall thickness (tW) unless specified otherwise.</p>	Conformance	Yes	Refer Sections 9.2 and 10



Clause	Subclause No.	Requirement	Conformance or Approval Required?	Verification / Action Required?	Relevant Section of DBM
5.8 SPECIAL CONSTRU C- TION	5.8.6.2 Submerged Crossings - Design	<p>The flood recurrence interval to be used as the basis for design SHOULD be selected after review through the Safety Management Process of the likelihood and consequences of damage to the pipe as a result of flooding</p> <p>Using the above criteria, engineering designs SHALL be developed on a generic or location-specific basis, as applicable. The design SHALL detail the pipe location, wall thickness and material, the methods of stabilising the pipe in the trench, and protecting the pipeline from external interference, the presence of adjacent structures and corrosion.</p> <p>Where applicable, the design drawings SHALL show the relationship of the pipeline to the natural bottom of the crossing. The engineering designs SHALL include generic and, where applicable, specific methods of restoring the site after completion of construction. The flotation design and safety margin against flotation SHALL be justified and documented.</p> <p>For open cut crossings, the pipe SHOULD be laid horizontal at the design depth for the full width of the crossing.</p> <p>The design SHALL provide specific attention to the location of the pipeline in banks of crossings and to the position of the pipeline across the bottom. In particular, the location of over and sag bends SHALL be designed to accommodate the restoration method proposed at each crossing. Where there is a potential for bank erosion, the design SHOULD locate these bends beyond the extent of anticipated erosion;</p> <p>NOTES: EPCRC Report RP6.3-01, Geotechnical Guidelines for Pipeline Design and Construction - Buoyancy Loading EPCRC Report RP6.3-05, Pipeline Shore and Water Crossing Guideline</p>	Conformance	No	Refer Section 9.17.4 for flood level criteria



Clause	Subclause No.	Requirement	Conformance or Approval Required?	Verification / Action Required?	Relevant Section of DBM
5.12 DESIGN FOR PRESSURE TESTING	5.12.2.1 Pressure Test Design Requirements - General	<p>[new requirement] A preliminary pressure test design for the pipeline SHALL be developed. The pressure test design SHALL be documented as part of the pipeline design basis and SHALL be provided to the construction contractor and to the TEST SIGNATORY.</p> <p>As part of the pressure test design, and prior to commencement of the STRENGTH TEST, the pipeline design SHALL be critically reviewed to confirm that all aspects of the design are suitable for the target STRENGTH TEST pressure</p>	Conformance	Yes	Refer Section 9.2 for design pressure details
5.12 DESIGN FOR PRESSURE TESTING	5.12.2.3 Pressure Test Design Requirements - Final pressure test design and conformance	<p>The test signatory is responsible for the development of the final pressure test plan based on the design received from the design basis documentation, formulation of the test plan and conduct of the test in accordance with the requirements of the design and AS/NZS 2885.5.</p> <p>The test signatory may propose an alternative test section design.</p> <p>Should that occur, the alternative design SHALL be reviewed for conformance to the requirements of this standard.</p> <p>If PTMIN was not achieved (a premature end point), the LICENSEE shall APPROVE a reduced MAOP based on the maximum pressure achieved</p>	Approval	Yes	Refer Section 9.2 for design pressure details



Clause	Subclause No.	Requirement	Conformance or Approval Required?	Verification / Action Required?	Relevant Section of DBM
5.12 DESIGN FOR PRESSURE TESTING	5.12.3 Strength test types	<p>The STRENGTH TEST types SHALL be as follows (see clause) The design basis SHALL nominate the Strength Test type (or potential types for each test section).</p> <p>The strength test type SHOULD always achieve PTMIN, since this provides the basis for determining MAOP.</p> <p>However, where data required to support a Type 2 or Type 3 test is unavailable, or corrupt, the only alternative is to conduct a Type 1 test. Under this circumstance, the design PTMIN cannot be achieved and the MAOP of the pipeline SHALL be derated consistent with the achieved test pressure</p> <p>For a Type 2 Test, the yield strength of the lowest yield strength pipe (AYSmin) in the population SHALL be estimated by analysis of yield strength data for the bare pipe. The test data population shall be characterised using an appropriate statistical distribution. Where the population is characterised by an alternate distribution, AYSmin SHALL likewise the strength where 99.865% of the predicted results are greater.</p>	Conformance	1	Refer Sections 9.2 and 10.6
7.1 BASIS OF SECTION	7.1	The design parameters for the control system SHALL be defined in the design basis . The engineering design life of some control items may differ from the system design life of the pipeline. Where this occurs, the engineering design life of control items with a shorter life SHALL be identified.	Conformance	No	Refer Section 3.2



Clause	Subclause No.	Requirement	Conformance or Approval Required?	Verification / Action Required?	Relevant Section of DBM
7.3 FLUID PROPERTY LIMITS	7.3	<p>Where the properties of the fluid may exceed the limits for which the pipeline was designed—</p> <p>(a) appropriate instrumentation SHALL be installed on a pipeline to enable each relevant fluid property to be monitored; or</p> <p>(b) where suitable data is available from upstream systems, that data may be used.</p> <p>Where the pipeline facility does not incorporate equipment to control the quality, the control system SHALL be capable of excluding non-conforming fluid from the pipeline.</p> <p>Where the pipeline facility does not incorporate equipment to control the quality, the control system SHALL be capable of excluding non-conforming fluid from the pipeline. The design basis SHOULD document the maximum fluid property excursion and duration of that excursion, which, if exceeded, will require the exclusion system to be activated. The maximum excursion and duration of that excursion SHOULD be assessed in the pipeline Safety Management Study prior to commencement of operation.</p>	Conformance	No	N/A at project level
7.5 COMMUNI- CATION	7.5	<p>A communication system is normally required for the operation of a SCADA system. The communication system SHALL have a reliability and speed, documented in the design basis, appropriate to the data acquisition, control response and emergency / safety response required for the pipeline.</p> <p>The design SHOULD consider the use of multiple communication routes.</p> <p>Distributed devices SHALL be capable of safely operating the process systems and equipment under their control, and acquiring data for future recovery by the SCADA system in the event that communication with the SCADA master station and control room is lost.</p> <p>The design SHOULD consider the need for voice communications between the operations centre(s) and field personnel.</p>	Conformance	No	Refer Section 13.7



Clause	Subclause No.	Requirement	Conformance or Approval Required?	Verification / Action Required?	Relevant Section of DBM
10.7 CHANGES IN DIRECTION (BENDS)	10.7.2 Internal access	The type and radius of a bend SHALL not impede the passage of an in-line inspection tool of the type and size that may be specified by the Design Basis .	Conformance	No	Section 9.9 and 9.13
13.2 RECORDS	13.2	b) Design and approval records. The following design and APPROVAL records SHALL be prepared: i) Design basis ii) Design drawings revised to as-built status iii) Relevant project specifications and data sheets iv) Design calculations v) Fracture control plan vi) Isolation Plan vii) location class viii) Records of land ownership easement and tenure ix) Safety management study including supporting documents, and evidence of action items being closed out and the location and type of protection measures and operating procedures that form part of the pipeline management system x) operating procedures that form part of the design xi) Approval structure outlined in AS 2885.0 xii) Documentation of Approvals and relevant correspondence with regulatory authorities.	Approval	Refer above	This document



APPENDIX E PIPE SIZING CRITERIA

Draft - Proof of Concept

From:

Sent: Tuesday, 1 December 2020 8:23 AM

To:

Cc:

Subject: Revised Gas Velocity Limits

All,

Following to our previous discussions on this subject and testing the published velocity criteria for an actual project (WORM), it was deemed useful to explore opportunities that allow eliminating any built-in conservatism in the methodology leading to these criteria.

As previously explained, the criteria were derived by lower bound data fitting for all diameters, thicknesses and pressures in four common Piping Class Specifications (CL150, CL300, CL600 and CL900) and the final equation which was very similar to NORSOK equation, was a function of Density only. Although this approach guarantees that the criteria would be valid for all diameters, thicknesses and pressures in the range, like any simple curve fitting, it can potentially introduce conservatism which in some projects may not be affordable (requires more detailed assessments).

I have revisited the whole analysis and instead of grouping all diameters, thicknesses and pressures into one simple equation, the curve fitting was done for pressure only. This means for every diameter and the relevant Piping Class Specification (CL150, CL300, CL600 and CL900), we will have an "A" factor in equation $V < A * (1/\text{Rho})^{0.43}$.

I have also performed analyses for target LOF < 0.3 and LOF < 0.5 where the LOF < 0.3 eliminates Small Bore Connection assessment.

Finally, I have limited the "A" to 175 because I am not comfortable to go beyond NORSOK equation until we have a better understanding how they derived the equation.

As you see in the following tables, the limits are quite generous and if these figures don't work for projects, unfortunately there is nothing else that can be done and either the flow must be restricted or the pipe size increased. In some cases changing support arrangement can help. Hopefully, these will reduce the required effort by Engineering teams to almost zero in this subject.

These tables will replace the simplified table we have in the current revision of standard specification.

V < A * (1/Rho) ^{0.43} , LOF < 0.3 No Small Bore Connection (SBC) assessment required													
A													
		DN50	DN80	DN100	DN150	DN200	DN250	DN300	DN350	DN400	DN450	DN500	DN600
CL900	Stiff	175	175	175	175	175	175	175	175	175	175	175	175
	M Stiff	125	140	160	170	165	175	175	175	175	175	175	175
	Medium	95	105	115	120	120	140	135	140	155	165	165	165
	Flexible	50	55	65	65	65	70	65	70	75	80	80	80
CL600	Stiff	175	175	175	175	175	175	175	175	175	175	175	175
	M Stiff	135	120	150	160	165	175	175	175	175	175	175	175
	Medium	105	90	110	110	120	130	135	140	145	150	155	165
	Flexible	55	45	55	60	60	65	65	65	70	70	75	75
CL300	Stiff	165	175	175	175	175	175	175	175	175	175	175	175
	M Stiff	115	135	135	140	125	135	150	150	170	170	170	175
	Medium	85	100	95	100	90	100	110	110	125	125	125	145
	Flexible	45	50	50	50	45	50	50	50	60	55	55	65
CL150	Stiff	175	175	175	175	175	175	175	175	175	175	175	175
	M Stiff	125	145	145	150	135	130	130	130	130	130	130	165
	Medium	95	110	105	110	95	100	95	95	95	95	95	115
	Flexible	50	55	55	55	50	45	45	45	45	40	40	50

V < A * (1/Rho)^0.43, LOF < 0.5 Small Bore Connection (SBC) assessment required														
A														
CL900		DN50	DN80	DN100	DN150	DN200	DN250	DN300	DN350	DN400	DN450	DN500	DN600	
	Stiff	175	175	175	175	175	175	175	175	175	175	175	175	175
	M Stiff	160	175	175	175	175	175	175	175	175	175	175	175	175
	Medium	125	135	155	160	155	175	175	175	175	175	175	175	175
	Flexible	65	70	80	85	80	85	85	90	100	100	105	105	100
CL600		DN50	DN80	DN100	DN150	DN200	DN250	DN300	DN350	DN400	DN450	DN500	DN600	
	Stiff	175	175	175	175	175	175	175	175	175	175	175	175	
	M Stiff	175	155	175	175	175	175	175	175	175	175	175	175	
	Medium	135	115	145	150	155	170	175	175	175	175	175	175	
	Flexible	70	60	75	80	80	80	85	85	90	90	95	100	
CL300		DN50	DN80	DN100	DN150	DN200	DN250	DN300	DN350	DN400	DN450	DN500	DN600	
	Stiff	175	175	175	175	175	175	175	175	175	175	175	175	
	M Stiff	145	175	175	175	160	175	175	175	175	175	175	175	
	Medium	115	130	125	125	115	130	145	140	165	160	160	175	
	Flexible	55	65	65	65	60	60	70	65	75	75	75	85	
CL150		DN50	DN80	DN100	DN150	DN200	DN250	DN300	DN350	DN400	DN450	DN500	DN600	
	Stiff	175	175	175	175	175	175	175	175	175	175	175	175	
	M Stiff	160	175	175	175	175	170	170	170	170	170	170	175	
	Medium	125	140	140	140	125	130	125	125	125	125	125	150	
	Flexible	65	70	70	70	65	60	60	55	55	55	55	70	

Regards

Principal Piping/Pipeline Engineer

APA Group

Infrastructure Engineering & Strategy
 Level 14, IBM Building
 60 City Road
 Southbank, VIC 3006

d

m

e

w www.apa.com.au

Attachment 6 – General Layout Plan – Wollert Compressor Station

Privacy Statement

Any personal information about you or a third party in your correspondence will be protected under the provisions of the Privacy and Data Protection Act 2014. It will only be used or disclosed to appropriate Ministerial, Statutory Authority, or departmental staff in regard to the purpose for which it was provided, unless required or authorised by law. Enquiries about access to information about you held by the Department should be directed to the Privacy Coordinator, Department of Environment, Land, Water and Planning, PO Box 500, East Melbourne, Victoria 8002

