AGNEW GAS PIPELINE

CONSTRUCTION ENVIRONMENT PLAN / MINING PROPOSAL

Summary Document

Pipeline Licence: PL 120

Tenements: M36/62, M36/63, M36/53, M36/391, M36/384, M36/367, M36/273

L36/224 and L36/227

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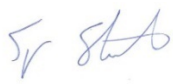
2.0	20/02/2019	Issued for Use			
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1. Introduction

This Environment Plan (EP) Summary provides an overview of the environmental management requirements for the construction of the Agnew Gas Pipeline (AGP) (the Project), which will be located within the pipeline licence area (PL 120), Gold Fields Australia (Gold Fields) Miscellaneous Licences L36/224 and L36/227 and Gold Fields Mining Leases M36/63, M36/62, M36/53, M36/391, M36/384, M36/367 and M36/273. Collectively, these tenements make up the Agnew Gas Pipeline Environmental Group Site (Group Site Code S0237202). The pipeline tenure also overlies the Leinster Downs pastoral station. The AGP includes the pipeline and associated infrastructure to facilitate gas transport from the existing Goldfields Gas Pipeline (GGP) to the Agnew mine, presently operated by Gold Fields. The AGP will be operated by APT Pipelines (WA) Pty Limited (APA). The pipeline will be approximately 25 km long; beginning approximately 12 km south-south-east of Leinster, running west to the Agnew mine site (Figure 1).

1.1 Purpose and Scope

The purpose of this EP Summary is to provide information to the general public regarding AGP environmental considerations and management requirements. This EP Summary outlines the construction works and management defined in the combined Construction Environmental Management Plan (CEP) and Mining Proposal (MP).

1.2 Objectives

The overall environmental objectives of the CEP/MP are to:

- Outline proposed measures to manage potential environmental impacts associated with construction of the AGP.
- Facilitate approvals under the *Pipelines Petroleum Act 1969* (Pipelines Act) and *Mining Act 1978* (Mining Act).
- Provide direction to project personnel in meeting APA's environmental obligations and commitments.
- Ensure compliance with project approval, pipeline licence, tenement and other conditions.

2. Site Description

The AGP will begin (AGP KP 0) at a hot tap onto the existing GGP (at GGP KP 1035.5). An offtake station will be installed at this point. The AGP will terminate at KP 24.5, on the Agnew Gold Mine, adjacent to the proposed power station, where a metering and delivery station (Agnew delivery station) will be installed.

Selected pipeline coordinates and kilometre points (KPs) are summarised in Table 1. All pipeline coordinates are provided in the spatial data accompanying this submission.

Table 1: Pipeline coordinates

	GPS Coordinates (GDA94 51J)	
Feature / Kilometre Point (KP)	**Easting (mE)**	**Northing (mS)**
Start Point – KP 0	279873	6900147
KP 10	269873	6900135
KP 20	259887	6900184
End Point – KP 24.5	255647	6900572

The pipeline will be designed for a minimum operating life of 40 years, with the surface stations designed for a minimum operating life of 25 years.

APA has selected a route for the AGP to, as far as practicable, avoid:

- Topographic features, including hills, ridges, sand dunes, and watercourses that present difficult, risky, or costly challenges for construction or reinstatement.
- Disruption to third party infrastructure and services, such as roads, other pipelines, or cables.
- Disturbance to places of environmental or social significance, such as Aboriginal heritage sites, or priority flora.

The pipeline will lie within Pipeline Licence PL 120, which occupies a corridor within existing Miscellaneous Licences and Mining Leases all held by Gold Fields. APA will be the sole holder of Pipeline Licence PL 120, granted under the *Petroleum Pipelines Act 1969*.

The boundary of Pipeline Licence PL 120 forms the disturbance envelope for construction of the AGP; this boundary also forms the limits of the native vegetation clearing permit (NVCP) application area. All new disturbance associated with construction will be confined to this envelope. The Project will also make use of existing cleared areas and infrastructure such as third party access roads and laydown yards where possible.

In this document the "construction right-of-way" (ROW) refers to a subsection of the pipeline envelope (the pipeline licence area) where vegetation clearing will be required for pipeline construction. APA expects the construction ROW to be approximately 25 m wide, with the width reduced in some sections to avoid or minimise disturbance to areas of particular environmental (e.g. Priority flora) or heritage value.

The location of ancillary disturbances along the construction ROW, such as access roads, vehicle turnaround bays, temporary storage and laydown areas are yet to be finalised however they will be placed to utilise existing cleared or degraded areas where possible, and to avoid areas of higher environmental or social value, as far as practicable. Turnaround bays will be located approximately every 2 km along the corridor and where practical, connect the ROW with existing roads.

Provision for two "turkey's nest" dams has been made for the storage water sourced from Leinster for construction.

Camp facilities for construction workers will be established at the Agnew Gold Mine and/or near KP0.

Total disturbance for the project will not exceed 92 ha.

Disturbance will be temporary, with reinstatement and rehabilitation to follow closely behind construction. The only exceptions to this will be a 3 m wide access track along the pipeline corridor (7.5 ha) and the two surface stations (the GGP offtake station and a metering/delivery station) (2 ha), which will remain for the life of the asset.

Portions of the original pipeline route that overlie M36/53, M36/62 and M36/63 fell within the area of the determination of the Tjiwarl People (NNTT number WCD2017/001). Gold Fields does not have an agreement with the Tjiwarl People regarding the tenements affected by the pipeline route. Following the referral of the pipeline licence application to the Goldfields Land and Sea Council (GLSC), Tjiwarl (Aboriginal Corporation) RNTBC (Tjiwarl AC) and the Wutha People, an objection was raised by the Tjiwarl People on 20 November 2018. The pipeline licence area and pipeline route have been amended to avoid any intersection with the Tjiwarl determination area.

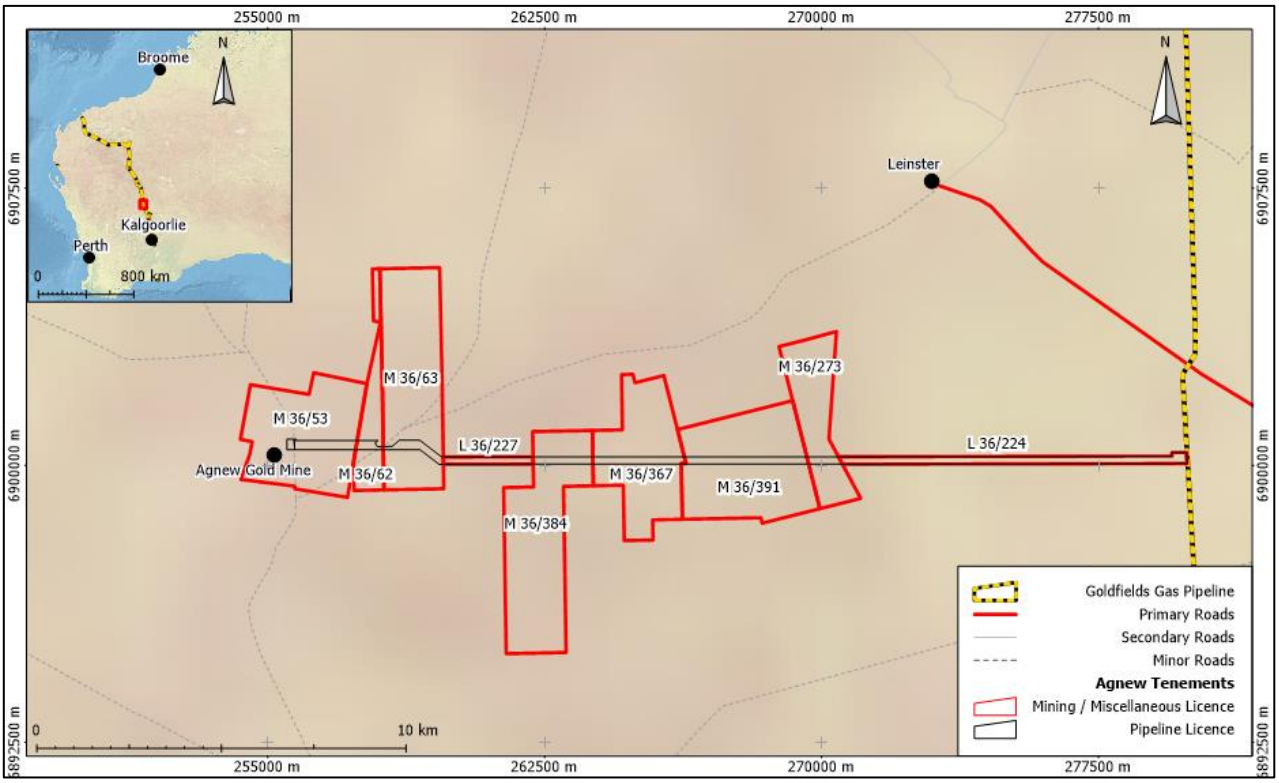

Figure 1: AGP route

3. Construction Activities

The AGP construction Project has an estimated construction duration of 5 months (December 2018 to April 2019), with commissioning to follow shortly after.

Works associated with the AGP construction are summarised in Table 2.

Table 2: AGP Activity Summary

Activity	Description
Mobilisation	Transport of construction machinery, plant and equipment to site, establishment of laydown and site support workspaces including temporary construction camp.
Survey	The pipeline centreline, limits of the construction ROW and any ancillary workspaces will be surveyed and marked out ahead of ground-disturbing works.
Clear and grade	Removal of vegetation in accordance with the NVCP. Topsoil stripped to a minimum depth of 100 mm and push into windrows. Vegetation will be stockpiled separately.

Activity	Description
Excavation and trenching	Excavation of trenches including the those for the pipeline, the hot tap to the GGP, the offtake station, the main line valve and metering and delivery station at the Agnew Gold Mine. Trench spoil will be placed on the trench side of the construction ROW, separate to the topsoil and vegetation stockpiles from clear and grade
Blasting	Where material cannot be removed with conventional rock breaking plan and equipment, targeted blasting may be required. Blasting will be carefully controlled, and carried out by a specialist team
Horizontal Directional Drilling	If open cut trench methods are not suitable for specific crossings, horizontal directional drilling (HDD) methods will be the preferred means of trenchless construction.
Wet trenching	Depending on rainfall, saturated or inundated ground may be encountered, particularly in lower-lying areas. In such areas, the trench may be dug into wet ground, and allowed to flood, without dewatering.
Dewatering	In some inundated areas, dewatering methods may be used in preference to wet trench methods.
Hot Tapping	Safely drilling and welding a new fitting to allow connection of the off-take into the operating GGP.
Pipe Assembly	Pipe will be delivered to the construction ROW and laid out end-to-end alongside the trench. Individual pipe segments will be placed on raised timber skids or sandbags to protect them from damage, and facilitate welding into continuous lengths (pipe strings). The pipeline will be bent in places to follow the pipeline route, and/or conform to the terrain. Pipe segments are welded into continuous lengths before being laid in the trench. Welded joints will be x-ray tested and garnet-blasted to remove surface scale and rust, and then coated with a high build epoxy (HBE) to provide a continuous external coating and prevent corrosion.
Pipe Lowering	Once welded, the pipe strings will be placed into the trench by side-boom pipe-layers (or equivalent). Fine bedding and padding sand will be placed around the pipe to prevent any sharp objects (such as rocks in the trench spoil) from damaging the pipe coating. Bedding and padding material will be sourced from the trench spoil itself by screening, wherever possible.

Activity	Description
Backfilling	Suitable stockpiled trench spoil will be returned to the trench and compacted after the pipe is lowered in. If required, clean, approved locally-sourced fill will be imported to make up any shortfall where trench spoil is deemed unsuitable for backfill. Topsoil removed during clear and grade will then be re-spread and contours reinstated.
Construction of Permanent Above-ground Facilities	Civil works including: • Pad construction, installation of control hut and meter and filter skids, piling works and placement of concrete slabs; • Installation of underground conduits and earth cable; • Placing aggregate over the ground, to prevent vegetation regrowth, and erection of site security fencing. • Assembling equipment and lifting into position; • Installing free-standing equipment and structural steel work, interconnected piping and cable trays and gas utility lines; and • Installing electrical power distribution and control components, power and control cables between the equipment and a Remote Terminal Unit (RTU) or Control Hut.
Testing	Non-destructive testing, functional testing of all manual valves, hydro-testing of pipework; hazardous area checks, earthing compliance checks and continuity point to point testing of circuits.
Commissioning	Pre-testing all mechanical and electrical equipment and instrumentation. Commissioning communications and control systems prior to introduction of gas. Progressive introduction of gas and commissioning each item of equipment sequentially until the whole system is capable of operating as a unit.
Demobilisation	Disassembly of any temporary infrastructure, machinery and equipment.
Site reinstatement and Clean- up	Removal of waste and stockpiled materials, scarification of disturbed areas, replacement of topsoils over disturbed areas, redistribution of stockpiled vegetative material removed for construction.

Supporting services required for the activity include water supply, power generation and chemical storage and waste management. These aspects of the Project are summarised in the sections below.

3.1 Water Supply

Water will be mainly required for camp / potable use, dust suppression, and hydrotesting.

It is anticipated that water for the Project will sourced from the Leinster town mains. Any groundwater abstraction (not anticipated) will occur in accordance with relevant licence/s to take water, issued under the *Rights in Water and Irrigation Act 1914*.

To facilitate the supply of water to sections of the construction ROW that are a long way from Leinster, APA may construct a number of "turkey's nest" dams at intervals along the route. Turkey's nests will typically be 60 m x 60 m x 2 m (length x width x depth), lined with low density polyethylene and fenced to prevent fauna ingress.

3.2 Power Generation, Fuels and Chemical Storage

Electricity will be supplied at construction areas by diesel generators. Power at the camp(s) will be sourced from the Agnew Gold Mine, and if necessary Leinster. Diesel storage for power generation and automotive use will incorporate:

- Double-walled (self-bunded) transportable fuel tanks, each up to 110,000 L, put in place at the construction camp laydown areas.
- Mobile 12,000 L heavy rigid fuel trucks, travelling the construction ROW daily, to refuel vehicles and mobile and fixed plant.
- Miscellaneous jerry cans, each up to 20 L.

Other hydrocarbon and chemical storage for the construction will incorporate:

- Engine, gearbox, hydraulic and other oil and greases, in a variety of containers, including 10,000 L tanks, 1,500 L intermediate bulk containers (IBCs), 200 L drums, and 20 L containers.
- Various other chemicals for construction use, including brake and radiator fluids paints, concrete retarders, formwork release agents, paints, solvents, thinners, acetone, anti-seize, cleaning agents, and others, in containers of less than 50 L.

In addition, AGP construction works may make use of the hydrocarbon and chemical facilities at the Agnew Gold Mine. Any such use would be subject to agreement with Gold Fields, and comply with relevant licences and approvals.

3.3 Waste

Project wastes are expected to principally comprise:

- Inert waste, including packaging, wooden pallets, steel (e.g. pipe off-cuts), builder's rubble, formwork, welding rods etc., and minor quantities of waste concrete.
- Putrescible waste, predominantly food scraps.
- Small quantities of contaminated waste, including fuel, oil, and chemical containers with residual material, and coating / sand blasting wastes (including used garnet, plastic, and coating residues).

Collection points for waste will be established at the camp. Wastes will be brought back from construction areas along the ROW, daily. Wastes will be appropriately contained (with bins, skips, etc.) and segregated for collection by waste contractors licensed for the classes of waste. Putrescible wastes will be contained in bins with secure lids to so that feral animals are not encouraged to forage. Contaminated or hazardous wastes will be kept in secondary containment.

4. Existing environment

4.1 Biographic Region and Land Use

The AGP falls within the Murchison region and the Murchison – Eastern (MUR1) sub-region as defined by the *Biogeographic Regionalisation for Australia* version 7 (IBRA; DoEE 2012). This sub-region is characterised by internal drainage systems and extensive areas of elevated red sandplains with minimal dune development (Cowan 2001). Dominant vegetation is Mulga Woodlands with hummock grasslands, saltbush shrublands and Halosarcia shrublands. The dominant landuse within the subregion is native pasture grazing.

4.2 Topography and Soils

Topography along the AGP is relatively flat, ranging from approximately 490 m AHD to 530 m AHD). The route intersects six soil systems as described by Pringle et al 1994 (Table 3).

Table 3: Soil Systems Intersected by the AGP (Pringle et al 1994)

Soil System	Description
Bullimore	Gently undulating sandplain with occasional linear dunes and stripped surfaces supporting spinifex grasslands with mallees and acacia shrubs.
Bevon	Irregular low ironstone hills with stony lower slopes supporting mulga shrublands.
Desdemona	Plains with deep sandy or loamy soils supporting mulga tall shrublands and wanderrie grasses.
Jundee	Hardpan plains with variable gravelly mantles and minor sandy banks supporting weakly groved mulga shrublands.
Nubev	Gently undulating stony plains, minor limonitic low rises and drainage floors supporting mulga and halophytic shrublands.
Tiger	Gravelly hardpan plains and sandy banks with mulga shrublands and wanderrie grasses.
Violet	Gently undulating gravelly plains on greenstone, laterite and hardpan, with low stony rises and minor saline plains; supporting groved mulga and bowgada shrublands and occasionally chenopod shrublands.

Soils and geology along the AGP route have been reviewed in context with potential for acid sulphate soils (ASS), and the likelihood of proposed works intersecting ASS is considered to be low. Similarly, there are no known or suspected contaminated sites in the vicinity of the route.

4.3 Surface Water and Groundwater

Watercourses and drainage lines in the region are generally weakly defined and ephemeral, with flows occurring only after heavy rains, and rapidly dissipating and evaporating (Johnson et al 1999). The AGP only crosses a few ephemeral watercourses, which only manifest as sheetflow during large rainfall events.

Limited quantities of brackish to saline groundwater (2,000 to 14,000 mg/L total dissolved solids [TDS]) occur in elevated areas of the major paleodrainages; however groundwater is generally saline to hypersaline away from the drainage divides. Recharge is limited due to low rainfall, high evaporation, heavy soils and vegetation cover, and tends to occur along rocky outcrops where rain can infiltrate fractures and eventually establish regional flow gradients which broadly mirror the prevailing topography (Johnson *et al.* 1999).

Groundwater levels measured in bores near the AGP route are typically 20 - 25 metres below ground level (mBGL), but have been recorded as shallow as 2.5 mbgl. It is expected that groundwater level will be well below the base of excavation (excavation to about 1 m).

4.4 Conservation Reserves and Environmentally Sensitive Areas

There are no Bush Forever sites, conservation reserves or Department of Biodiversity, Conservation and Attractions (DBCA) Managed Lands within or adjacent to the Project. The nearest DBCA Managed Land is the Wanjarri Nature Reserve, located approximately 58 km north of the AGP. The nearest Environmentally Sensitive Area (ESA) protected under the *Environmental Protection Act 1986* (*EP Act*) is located approximately 39 km west of the AGP.

4.5 Vegetation and Flora

Seventeen vegetation communities occur within the AGP pipeline corridor, all characterised by low open woodlands or tall open shrublands dominated by mulga (*Acacia aneura*) and other Acacia species, which are common throughout the Goldfields region. Typically vegetation is aligned with landforms present (Astron Environmental Services 2012).

No Threatened Ecological Communities (TEC) listed under the *EPBC Act* or *WC Act*, or Priority Ecological Communities (PEC) mapped by the Department of Biodiversity Conservation and Attractions (DBCA), occur within the AGP pipeline corridor.

Vegetation condition within the pipeline corridor ranges from 'completely degraded' to 'excellent', with the majority of the pipeline corridor in 'very good' to 'excellent' condition. At the western end of the pipeline corridor there are extensive areas of vegetation in 'completely degraded' and 'degraded' condition. Impacts influencing

vegetation condition in the region have been attributed previous land uses such as borrow pits, tracks and exploration drilling (Stantec 2018).

No Threatened flora species listed under the *EPBC Act* or *WC Act* have been identified within 50 km of the AGP. Six Priority Flora species listed by DBCA are considered to have potential to occur in the pipeline corridor (Table 4).

Table 4: Priority Flora Species with Potential to Occur in Project Footprint

Taxa	Conservation Status (DBCA)	Recorded in local area?	Habitat
Eremophila pungens	Priority 4	Yes	Sandy loam, clayey sand over laterite. Plains, ridges, breakaways.
Grevillea inconspicua	Priority 4	Yes	Loam, gravel. Along drainage lines on rocky outcrops, creeklines.
Baeckea sp. Sandstone	Priority 3	No	Flat. Dry orange sand/loam.
Hybanthus floribundus subsp. chloroxanthus	Priority 3	No	Dark red-brown soil, never sandy, rich in iron oxide, laterite. Rocky areas, creek banks, along drainage lines.
Verticordia jamiesonii	Priority 3	No	Sandy clay soils. Lateritic breakaways.
Thryptomene sp. Leinster	Priority 3	No	Upper slopes of low granitic hills. Quartzitic pebbles.

One introduced flora species has been recorded adjacent to, but outside the pipeline corridor, **Cenchurus ciliaris* (Buffel grass). Four additional introduced flora species were recorded at the nearby Lawlers Airstrip and have potential to occur at the AGP (Stantec 2018):

- **Bidens bipinnata* (Bipinnate Beggartick).
- **Malvastrum americanum* (Spiked Malvastrum).
- **Cynodon dactylon* (Couch).
- **Citrullus colocynthis*.

None of these introduced species are listed as Declared Plants under the *Biosecurity and Agriculture Management Act 2007*, or Weeds of National Significance listed by the Federal Department of the Environment and Energy.

4.6 Fauna and Habitat

Four fauna habitats have been identified along the proposed AGP route (Astron Environmental Services 2012 and Stantec 2018). These include:

- Plain with Acacia aneura open woodland over tussock grassland on sandy clay or clay, with some gravelly sandy clay.
- Plain with Acacia aneura groves over hummock grassland on sandy clay.

- Breakaway/hill with very open Acacia aneura woodland over tussock grassland on loamy sandy clay.
- Drainage line.

All fauna habitats present are considered common and widespread throughout the Goldfields region and not restricted to the pipeline corridor. No conservation significant fauna species are reliant on habitats within the pipeline disturbance area.

No fauna species of conservation significance were recorded during a Level 1 survey of the Project area (Stantec 2018). Habitat mapping and database searches identified six species of conservation significance with a 'possible' likelihood of occurrence in the Project area (Table 5).

Table 5: Fauna of Conservation Significance Possibly Occurring in AGP Footprint

Taxa	Conservation Status		Broad Habitat Type
	EPBC Act	*WC Act*	
Brush-tailed Mulgara (Dasycercus blythi)	-	P4	Spinifex grass plains within the arid zone (van Dyck and Strahan 2008).
Long-tailed Dunnart (Sminthopsis longicaudata)	-	P4	Rocky, hilly areas, occasionally open areas with a stony, rocky mantle (van Dyck and Strahan 2008).
Fork-tailed Swift (Apus pacificus)	Migratory	S5	Aerial species, which forages high above the tree canopy and rarely lower (Johnstone and Storr 1998). Occurs over a range of habitats including islands, open country, coasts, semi-deserts, urban and forests (Pizzey and Knight 2007).
Peregrine Falcon (Falco peregrinus)	-	S7	The species occurs along cliffs, gorges, wooded rivers, wetlands, plains and open woodlands, as well as in association with pylons and buildings (Pizzey and Knight 2007). Nests on cliffs, in crevices, large tree hollows or on building ledges (Pizzey and Knight 2007).
Idiosoma clypeatum	-	P3	Widely distributed throughout arid areas of the Murchison and Yalgoo bioregions (Rix et al. 2018).

It is considered unlikely that any conservation significant fauna species are reliant on habitat in the pipeline corridor, on the basis that their nearest records are from at least 80 km away, or they are highly mobile avifauna. The conservation status of these species is not likely to be impacted by the Project.

4.7 Heritage

Ethnographic and archaeological surveys have identified two Aboriginal heritage sites of significance along the AGP (within the pipeline licence area) that will be avoided in accordance with agreements between Gold Fields and the Wutha claimant group. No Aboriginal heritage sites will be disturbed during construction works.

No sites of significance for European heritage have been identified within the pipeline licence area.

4.8 Native Title

Portions of the original pipeline route that overlie M36/53, M36/62 and M36/63 fell within the area of the determination of the Tjiwarl People (NNTT number WCD2017/001). Agnew Gold Mining Company Pty Ltd (Gold Fields) does not have an agreement with the Tjiwarl People regarding Gold Fields' tenements affected by the pipeline route. An objection was raised by the Tjiwarl People on 20 November 2018 in response to DMIRS notification of the pipeline licence application. The pipeline licence area and pipeline route have been amended to avoid any intersection with the Tjiwarl determination area in order to address this objection.

5. Environmental Management

Environmental management will be implemented in compliance with the APA ISO14001 accredited Health, Safety and Environmental (HSE) Management System which provides for:

- Communication of policies, objectives and roles and responsibilities.
- Inductions, training and competency of personnel.
- Monitoring, auditing, record keeping and reporting, including dedicated hazard and incident reporting system.
- Management of non-conformances and corrective actions.
- Development, tracking and ongoing maintenance of documentation.
- Emergency preparedness and response.
- Toolbox talks.

A risk based approach has been adopted to manage potential threats to the environment. This process involved initial identification of environmental interactions (aspects) resulting from Project activities followed by an environmental risk assessment (ERA) workshop attended by key personnel. The ERA process involved:

- Assessment of environmental risks in terms of likelihood and consequence.
- Identification of mitigating factors and management measures to reduce environmental risks to ALARP.
- Risk ranking according to severity.

A summary of the key environmental hazards, control measures and mitigating factors identified for the AGP has been provided in Table 6. Table 6 only provides an indication of major hazards and controls and is not a comprehensive summary of all commitments associated with the AGP.

Table 6: Key environmental hazards and control measures

Environmental Hazard	Control Measures and Mitigation Factors
Disturbance of Heritage Site or Exclusion Zones	• Heritage stakeholders consulted. Consultation with relevant stakeholders to continue during construction. • Construction boundaries clearly delineated to prevent encroachment of works on heritage sites or associated exclusion zones, including flagging and/or fencing, on advice from heritage stakeholders; exclusion measures checked and maintained for duration of works in each area. • Cultural heritage monitors to attend earthworks in high risk areas. • Works to cease and DPLH notified immediately if suspected heritage artefacts identified. • AGP Traffic Management Plan (TMP) to address CEP/MP requirements, including access along specific approved routes only. • Inductions, toolbox talks, training, and site procedures address heritage, including protection of sites and exclusion zones, requirement to stop work if suspected artefacts found. • Implementation of APA Cultural Heritage Procedure. • No encroachment on Tjiwarl determination area (NNTT number WCD2017/001).
Loss of vegetation, habitat, biodiversity or land use from disturbance to vegetation	• Pipeline alignment, construction ROW, access roads, extra workspace and other Project infrastructure laid out via internal clearing procedures to minimise clearing and use existing disturbance as far as practicable. • Pipeline alignment, construction ROW, access roads, extra workspace and other Project infrastructure laid out via internal clearing procedures to avoid Priority flora and heritage sites, and maintain exclusion zones. • Construction boundary clearly marked out to prevent over-clearing. • Vegetation and topsoil cleared for construction and stockpiled separately in adjacent areas for use in rehabilitation. At completion of works, all disturbed areas (with exception to plant sites and a 3 m wide access track for operations) to be scarified, stockpiled topsoils re-spread, then stockpiled vegetation respread to encourage regrowth. • Inductions, toolbox talks, pre-starts and site procedures address vegetation, including remaining within construction boundaries, and locations of Priority flora. • Hazard and incident reporting to include disturbance beyond marked or approved boundaries or damage to vegetation/ habitat marked for retention; substantial incidents reported to DMIRS.
Injury or disturbance to native fauna or stock from vehicle and mobile plant movements	• Traffic Management Plan (TMP) to control vehicle movements to reduce likelihood / severity of injury / disturbance to fauna, including access along approved routes only; speed limits; restrictions on night driving; IVMS in vehicles to track speed and location. • Established roads used for access where practicable. • Night works limited, and subject to additional risk assessment including hazards to nocturnal fauna. • Inductions, toolbox talks, training, and procedures address vehicle/ plant hazards to fauna, including TMP requirements; drivers to be properly licensed and trained.

Environmental Hazard	Control Measures and Mitigation Factors
Death of native fauna or stock from entrapment in pipeline trench, other excavations, turkey nests or pipe strings	• Gaps left in trench every 1 km or less with ramps at ~45 degrees providing fauna egress points. • Fauna shelters (e.g. hessian bags) placed every 50 m or less in open trench. • Trench inspected in the morning, within three hours of sunrise, and immediately before pipe laying and backfilling; any entrapped fauna retrieved and released. • Trench inspections, and fauna retrieval and release, by licensed handlers meeting training requirements of DBCA. • Trench backfilled (to at least cover pipe) as soon as practicable after pipe laying. • Open trench to be kept to length that can be inspected within three hours by trained and licensed fauna handlers available on site at that time, including during construction breaks. • HDD entry and exit pits will be bunded, ramped and fenced, and inspected (inclusive of the bunded area) for fauna at the start of each work day. • Retrieved fauna released into suitable habitat near point of rescue, at appropriate (as determined by trained fauna handlers) distance from trench/HDD entry and exit pits and bunded area, as soon as practicable, except where they need to be held for treatment (dehydration, hypothermia, etc.), or are a nocturnal species best released in the evening. • Fauna unfit for release referred to qualified carers; carer contact details maintained on site; severely ill/ injured fauna to be euthanised on advice from carers or other qualified persons. • Pipe sections inspected for fauna before welding; end caps kept on pipe strings (sections of 2 or more welds) to prevent fauna entering before pipe laying. • Landholders with stock consulted; gates to be left open/closed and cattle grids installed as required. • Turkey nests will be fenced to limit fauna access and potential death of larger animals. • Turkey nests will have fauna egress ramps to allow smaller fauna to escape.
Disturbance to native fauna from light spill	• Night works generally limited to hydrotesting and occasional movement of equipment along ROW; lighting generally only required at camp. • Lighting directed to minimise spill. • Inductions, toolbox talks, training, and procedures address fauna including hazards to fauna, incident reporting, and procedures for injured fauna.
Loss or degradation of topsoil resources from earthworks, vehicle movements, wind or water erosion	• Topsoils stripped from construction areas and stockpiled adjacent, for use in rehabilitation. • Topsoils stockpiled away from vehicle access points, watercourses, and areas prone to flooding; stockpile heights limited to 2 m to minimise erosion; breaks left in stockpiles to allow surface water flows. • At completion of works, topsoils to be re-spread over disturbed areas (with exception to plant sites and a 3 m wide access track for operations), then cleared vegetation re-spread over topsoil to promote revegetation and prevent erosion. • No driving / parking permitted over soil stockpiles / windrows; signs placed to protect stockpiles/windrows. • Inductions and toolbox talks address topsoil management and preservation. • Hazard and incident reporting to include loss of or damage to topsoil resources. • Other measures to prevent water erosion as set out under “water”.

Environmental Hazard	Control Measures and Mitigation Factors
Soil erosion from inadequate drainage control on disturbed surfaces or uncontrolled release of water from hydrotesting	• Watercourse crossing procedure and dewatering procedure developed and implemented as required to manage erosion hazards, including drainage / sediment controls, and controlled release of water, to be supervised by contractor environmental personnel. • Hazard and incident reporting to include substantial observations of erosion, poorly controlled discharge, or poorly controlled drainage on construction areas. • Flush/ hydrotest water captured for re-use off-site (Agnew Gold Mine) or returned to a lined turkey's nest dam for controlled release. • If disposal of flush/ hydrotest water is necessary, discharge managed by: releasing via turkey's nest to control rate of release; use of flow diffusers to prevent erosion; release within construction boundary only; monitoring of erosion and remediation where necessary.
Impacts to soils from storage or use of saline water for dust suppression	• Water quality / salinity from sources to be used evaluated, and suitability / restrictions for use determined, • Use of saline water for dust suppression kept to minimum necessary, and only within ROW. • Dust suppression with saline water kept to roads/ tracks only; sprays adjusted to prevent overspray onto adjacent vegetation or topsoil stockpiles. • Saline water stored in lined turkey's nests; standpipe areas shaped to drain inwards to prevent runoff into surrounding areas. • Hazard and incident reporting to include soil salinisation / vegetation death from water storage / dust suppression.
Impacts to soils from unplanned exposure of contaminated materials due to trenching	• Hazard and incident reporting to include unexpected contamination identified during earthworks.
Impacts to soils from spills or leaks from drilling fluids/ grouting used in boring (if HDD necessary)	• Specific HDD environmental management plan to be developed, and project-specific HDD procedures to be followed. • Drilling materials to be contained within entry /exit pits or other containment; additional containment equipment kept on hand. • Earthen bunds to be established around HDD entry and exit pits. • Only bentonite mud-mix used; any additional chemicals used only with approval from DMIRS. • Experienced specialist HDD contractor to be engaged. • Bore and drilling fluids to be continuously monitored during procedure; watch kept for spills, frack-outs and leaks, works stopped immediately if they occur. • Incident reporting to include substantial spills of HDD grouting / drilling fluids.
Impacts on land use / third parties from road / land degradation due to site access	• TMP to manage vehicle movements to reduce likelihood / severity of road / land damage, including access along approved routes only; speed limits (reduced in wet conditions); IVMS in vehicles to track speed and location. • Site assessments to determine additional controls for specific access routes (upgrade / maintenance/ repairs, specific speed limits, vehicle restrictions, etc.) • Consultation with landholders and other relevant stakeholders to determine requirements / restrictions for use of access routes including maintenance; consultation to continue for duration of works. • Access route maintenance / repairs carried out as required. • Inductions, toolbox talks and site procedures address access including approved routes, speed limits, restrictions, and driving to conditions; drivers trained and competent; pre-starts to address road conditions. • Hazard and incident reporting to include damage to roads / lands from access.

Environmental Hazard	Control Measures and Mitigation Factors
Impacts on surface water quality from release of sediment due to earthworks	• Cleared vegetation stockpiled away from drainage lines. • Construction corridor rehabilitated as soon as practicable to stabilise disturbed surfaces and restore resistance to erosion. • Incident reporting to include substantial observations of sediment transport, or poorly controlled drainage on construction areas.
Land disturbance and impacts to groundwater resources from bore installation and operation	• If new water supply infrastructure necessary: 26D/5C permits obtained from DWER, existing disturbed areas used for bore / pipelines/ tanks/ dams where necessary or approvals to disturb obtained; experienced, licenced bore driller used; bores operated to licence conditions, including allocation and monitoring.

Environmental Hazard	Control Measures and Mitigation Factors
Contamination of soils by hydrocarbons or chemicals	• Diesel fuel storage ≤110,000L within a bunded compound or self-bunded (double-hulled) tank; mobile fuel trailer double-skinned; generators self-bunded. • Hydrocarbons, chemicals, and other hazardous material kept in dedicated, ventilated area, away from busy construction areas and sensitive environments; all hydrocarbons; containment bunds have capacity >110% of largest container and >25% of total storage (whichever greater). • Portable bunded containers (spill pallets) used when handling hydrocarbons and chemicals outside of bunded areas; hydrocarbons, chemicals, and other hazardous materials returned to designated central storage area when not in use. • Bulk fuel storage incorporates lined and bunded refuelling pad; drip trays used for transfers/ refuelling on ROW (except tracked vehicles); transfers/refuelling to be attended; refuelling on ROW only. • Spill response equipment kept on site, including containment and recovery equipment; spill kits strategically located and clearly identified for easy access; light spill kits kept with light vehicles and all mobile plant; substantial spill kits and drip trays kept with fuel and service trucks, driver /operator trained in use. • SDS and register kept for all hydrocarbons, chemicals and hazardous substances on site. • Inductions, toolbox talks, training, and procedures address hydrocarbon and chemical transport, storage, handling, transfers, inspections, maintenance, spill response, and waste disposal; additional training for higher-risk roles (e.g., fuel and service truck operators). • Hydrocarbon and chemical spills addressed in ERP and OSCP, including spills from transport. • JHAs to consider any tasks involving hydrocarbon or chemical transport, storage, handling, or transfers, and address associated hazards, including management of any wastes / contaminated materials. • Tanks inspected as part of daily pre-starts; suppliers check tanks before refilling; large tanks have lockable valves (pin code or other) to limit access. • Vehicles and fixed and mobile plant inspected before mobilisation, checked daily as part of pre-starts, and maintained according to manufacturer's specifications. • Traffic Management Plan (TMP) to control vehicle movements to reduce likelihood / severity of collision resulting in spill, including access along approved routes only; speed limits observed (10kph around equipment and working areas, or as set in TMP); IVMS in vehicles to track speed and location; fatigue and journey management plans to reduce risk of incident; access roads maintained to remain safe; inductions and training to address safe driving; all driving to conditions. • Contracts require compliance with CEP/MP and TMP, including requirements for hydrocarbon and chemical transport, storage, and handling; hydrocarbon and chemical suppliers / transporters properly licensed, drivers and operators properly licensed and trained. • Weld coating applied with reasonable care to minimise overspray/ drips; plastic sheeting placed to capture overspray/ drips; substantial loss to ground recovered with shovels and material disposed of at facility licensed for class of waste; delivery hoses to be correctly rated for use; spill kits to hand in case of hose failure. • Pre-cast slabs to be used for civil works / pipeline protection; procedures / training for use of minor quantities of quickset concrete for post installation. • Hazard and incident reporting to include leaks and spills, including location, size, and nature of spill, and details of cleanup/ remediation; substantial spills reported to DMIRS. • Other measures for management of contaminated and hazardous wastes, as set out under "wastes".

Environmental Hazard	Control Measures and Mitigation Factors
Contamination of surface waters	• Bulk and intermediate hydrocarbon and chemical storage / containment areas sited well away from drainage lines. • Refuelling carried out as far as practicable from drainage lines, and not permitted within 100 m. • Vehicles and mobile plant to be parked up away from drainage lines when not in use. • JHAs to consider any specific hazards to surface water in tasks involving hydrocarbon or chemical transport, storage, handling, or transfers. • Hydrocarbon and chemical waste storage / containment areas sited well away from drainage lines.
Impacts on surrounding land use, vegetation, habitats, and fauna from improper disposal of inert wastes	• Bins, skips and other appropriate containment with lids used for holding wastes till collection. • Wastes removed from ROW frequently (daily) and returned to collection points at main laydown. • Wastes segregated as required by waste collection contractor; industrial wastes stockpiled in designated areas. • Wastes collected progressively from site collection points by licensed contractor for disposal off-site. • All remaining wastes removed from site at completion of works; confirmed by practical completion checklist. • Wastes segregated and collected for recycling where practicable. • No disposal of wastes (e.g. sawdust bags) to trench. • Incident reporting to include substantial observations of uncontained / poorly contained wastes or poorly segregated waste.
Attraction / encouragement of feral pests from improper disposal of food wastes	• Rubbish bins with lids for putrescible waste. • All putrescible wastes (including fruit scraps/ decomposable material) brought back from ROW daily for disposal in bins at camp/laydown. • Putrescible wastes frequently removed from site by contractor for disposal at a licensed landfill. • Waste kitchen grease segregated and collected by licensed contractor. • Camp operator to have food management systems; food wastes minimised as far as practicable. • Camp operator to have pest management systems; pest management implemented if need indicated by monitoring. • Inductions and toolbox talks address management of food wastes, including no feeding of animals. • Incident reporting to include substantial observations of pests / improperly contained food wastes.
Pollution of soil or water, bacterial health risk, and odour from improper disposal of sewage	• Portable toilets placed along ROW and moved with workfront on trailer; emptied and maintained by supplier weekly or as required. • Inductions and toolbox talks address use of toilets.

Environmental Hazard	Control Measures and Mitigation Factors
Contamination of soils and/or surface water from improper management of contaminated wastes and residues	• Contaminated wastes including empty containers with hydrocarbon or chemical residues, or contaminated materials from spills, kept in dedicated, bunded containment, segregated from other wastes; empty containers managed as for full containers until removed from site, including storage and labelling. • Hydrocarbon and chemical wastes to be removed from site progressively and at completion of works, confirmed in practical completion checklist; wastes to be removed by contractor licensed for class of waste. • Incident reporting to include substantial observations of improperly segregated contaminated or hazardous wastes.
Impacts on flora, fauna, land use, and third parties from unnatural bushfire due to unguarded / uncontained source of ignition	• Fire response equipment maintained on site; 1000L firefighting trailers located close to higher-risk works (clear and grade; welding); fire extinguishers in or on all vehicles or mobile plant; construction equipment (grader, dozer, water truck) to be commandeered for firefighting (clearing firebreaks, pushing up bunds, wetting surfaces, etc.) where practicable and safe to do so. • All vehicles and plant parked up in designated areas when not in use; all stockpiled equipment, materials and waste stored in areas of low fire risk. • Flammable materials to be removed from areas around ignition sources, such as welding or grinding; site housekeeping to keep potentially flammable materials stored away from hot work areas or other fire hazards. • Local fire response addressed in ERP; additional services at Leinster and Agnew site; emergency contact details available to all Project personnel. • Permit system in place for hot works (including welding and grinding), hot tapping, and commissioning works; fire spotter in place for hot / higher fire risk works, • JHAs and pre-starts to consider fire risks; weather monitored for fire risk (hot, dry, and/or windy conditions); DFES alerts and fire bans monitored, exemptions from fire bans sought where necessary, • Hydrocarbons and flammable chemicals kept in dedicated, marked containers and storage areas, • Smoking only permitted at designated areas at camp, laydown, and ROW; bins and "butt bags" provided for safe disposal; no open / camp fires permitted. • Construction works confined to ROW and other areas cleared of vegetation. • Inductions, toolbox talks, training, and procedures address fire hazards, fire response, and use of firefighting equipment. • Incident reporting to include any accidental fires started.

Environmental Hazard	Control Measures and Mitigation Factors
Impacts on native flora, vegetation, habitats, and land use from Introduction and/or spread of weeds	• Construction footprint kept as small as practicable to minimise disturbed area prone to colonisation by weeds. • Vehicles to be certified clean of soil clumps and vegetative matter before entry to site; requirement included in contracts; vehicles to be cleaned often (included in pre-start checks). • TMP to control vehicle movements, including access along approved routes only; IVMS in vehicles to track speed and location; movements minimised where practicable (e.g. use of crew bus/ shared vehicles). • Landholders and other relevant stakeholders consulted on weed management requirements / expectations; requirements dictated to construction contractor. • Known weed locations marked on ELLs. • Schedule managed to clear and grade into rather than out of known weed areas (if possible); clear and grade mobile plant and vehicles cleaned down often, and after working through known weed locations, certified by suitably qualified personnel. • Washdown bays to be established and properly maintained. • Fill material to be certified clean and free of weeds, brought from local source, if practicable. • Inductions and toolbox talks address weeds, including vehicle hygiene and information on weeds known to occur in Project area.
Impacts on native flora, vegetation, habitats, and land use from Introduction and/or spread of pest animals / vermin	• Buildings, containers, and other structures to be certified clean and free of pests before mobilisation to site. • Buildings, containers, and other structures to be sourced locally as far as practicable. • Incident reporting to include substantial observations of pests; pests to be dealt with promptly. • Other measures for management of pest species as set out in "wastes" and "reinstatement".
Impacts on vegetation and/or third parties from dust	• Water truck on site for dust suppression as required; site supervisors to direct additional dust suppression as required by conditions (hot, dry, and/or windy). • Speed limits as set out in TMP, including driving to conditions; access along approved routes and ROW only; IVMS to track vehicle locations and speeds; pre-starts to address road conditions; drivers trained and competent; vehicle and plant movements minimised where practicable. • Gravel placed on access roads to minimise dust in sandy areas as determined site by site. • Ongoing consultation with landholders/ other stakeholders for duration of works. • Inductions, toolbox talks, training, and procedures address dust, including speed restrictions, driving to conditions, and dust suppression. • Incident reporting to include unreasonable/ excessive dust generation.
Contribution to global greenhouse effect from unplanned / accidental gas release	• Fuel use and estimated venting volumes recorded; emissions estimated for reporting to DMIRS, NPI, and NGER. • Vehicles and fixed and mobile plant inspected and maintained according to manufacturer's specification to minimise emissions; daily pre-start checks and regular servicing kept up. • Inductions, toolbox talks, training, and procedures address emissions, including vehicle and plant inspections and maintenance. • Incident reporting to include unreasonable/ excessive exhaust / gas emissions.

Environmental Hazard	Control Measures and Mitigation Factors
Local air pollution and contribution to global greenhouse effect, from vehicle and plant operation, and pipeline venting / gas release	• Specific excavation and hot-tap procedure developed for connection onto GGP • Commissioning risk assessment (HAZID) completed and Project commissioning plan developed to minimised risk of unplanned release during commissioning; • Valves, pipework, and connected systems tested prior to installation. • Permit system in place for working on / near live line, including JHA, isolation, and tagging. • Venting for commissioning kept to practicable minimum; surrounding landholders and other stakeholders notified before venting (if likely to be affected). • Live above-ground pipework fenced and signed according to AS2885. • Reporting DMIRS, NPI, and NGER to include unplanned / accidental releases. • Incident reporting to include unplanned/ accidental release of gas.
Disturbance to native fauna and third parties from noise and vibration	• All vehicles and fixed and mobile plant equipped with noise reduction measures such as mufflers or enclosures, maintained according to manufacturer specifications. • Works generally limited to daytime hours; night works subject to site-specific risk assessment. • Venting for commissioning kept to practicable minimum; surrounding landholders and other stakeholders notified before venting (if likely to be affected). • Extent and size of blasts limited to the minimum practicable for pipeline corridor excavations. • All blasting carried out by licensed and experienced specialist contractor. • Incident reporting to include unreasonable/ excessive noise or vibration, and any third-party complaints.

Erosion of soils, weed proliferation, and impacts to land uses due to inadequate reinstatement	• At completion of works, rehabilitate disturbed areas not required for operations, except where otherwise agreed with landholders:
	  ○ Scarified across contours, to trap seed and water, aiding reestablishment of vegetation.
	  ○ Evenly respread with stockpiled topsoils to a depth representative of that which was stripped.
	  ○ Respread with stockpiled vegetation over topsoils, to encourage vegetation re-establishment (except directly over trench line and inspection track).
	• Rehabilitation requirements and responsibilities included in contracts and access agreements.
	• Practical completion checklist to include rehabilitation acceptance; 12 months contractor defects liability period.
	• Ongoing monitoring / inspection during operations according to OEP.

6. Stakeholder Consultation

APA is committed to maintaining positive relations with all stakeholders throughout the duration of its activities. A brief summary of engagement to date is provided in Table 7.

Consultation with government has involved meetings with agencies to generally advise them of the Project, and discuss approval requirements (including information requirements), and timeframes. APA notes that no major issues of concern in regard to potential Project environmental impacts have been raised to date.

Liaison with land holders commenced at Project conception and is ongoing. A comprehensive line list will be generated for land holders and occupants to address concerns over land access, potential impacts and reinstatement. Where applicable, property inspection reports will be prepared to record agreements between APA and land holders or occupants, and to ensure conditions of agreements are met.

Stakeholders will be kept aware of scheduled activities and impacts as the Project progresses. Ongoing consultation will occur for this Project via email/letters, meetings and circulation of updates to relevant stakeholders.

Feedback from all interested parties will be encouraged and monitored during the entire Project. A register will be maintained to record actions taken to address any issues/feedback received.

Table 7: Summary of stakeholder interactions

Stakeholder	Consultation	Key Dates
Government		
DMIRS	Ongoing meetings and phone calls have taken place with regards to licencing Including amendment of the pipeline licence area to remove any intersection with the Tjiwarl determination area), safety and environment, with both the Petroleum and Mines divisions. Reporting will be ongoing throughout the project and into operations. It is anticipated that audits from multiple divisions will also take place throughout the project. Liaison throughout CEP review, assessment and acceptance period.	23/05/2018 Ongoing
Shire of Leonora	Contact with CEO regarding pipeline licence notification, provision of land use survey information by shire. Consultation with shire will be ongoing throughout the project.	25/05/2018 Ongoing
DFES	Contacted as a part of the ERP development and implementation process.	Ongoing
GLSC	Communication with GLSC has been made due to the pipeline licence application being considered a Future Act under the Native Title Act. Concerns raised on behalf of Tjiwarl people and pipeline route amended to avoid Tjiwarl Native Title area.	15/06/2018 20/11/2018
DPLH	Communication with DPLH has been made regarding the pipeline licence application. A land use survey has also been provided. The Department will continue to be consulted and updated throughout the project, as required.	Ongoing
Non-Government		
Native title parties	Communication with the Wutha and Tjiwarl peoples as part of the pipeline licence notification requirement under the Native Title Act 1993 and PP Act 1969. An objection to the pipeline licence/route was raised by the Tjiwarl people on 20 November 2018. The pipeline licence/route has been revised to avoid intersecting the Tjiwarl Native Title determination area (NNTT number WCD2017/001) as a response to this objection.	25/06/18 28/06/18 Ongoing
Gold Fields Australia Pty Ltd	Liaison has been ongoing since project conception as the pipeline is being built for the Agnew Gold Mine. Interactions have broadly revolved around commercial contracts and access agreements, pipeline licence applications, environmental aspects and approvals, safety planning, land use survey and heritage surveys to name a few. Communication channels remain open with all key contacts as the approvals process progresses towards practical kick-off. Reporting lines will be established for ongoing works together throughout construction, and then into operational contracts.	27/04/18 Ongoing

Stakeholder	Consultation	Key Dates
Tenement Holders	Contact has been with letter communication regarding the pipeline licence notification. A land use survey has also been provided to the tenement holders and feedback has been received. No concerns raised.	07/06/18 Ongoing
Miscellaneous Licence Holders	Contact has been with letter communication regarding the pipeline licence notification. A land use survey has also been provided and feedback received. TransAlta will continue to be consulted and updated throughout the project.	Ongoing
Leinster Downs Pastoral Station	Contact has been with email communication regarding the pipeline licence notification. A land use survey has also been provided to the pastoral station. No concerns raised.	07/06/18

7. References

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