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1. Introduction

1.1 Project description

Westside Corporation Limited (Westside) operates a number of Petroleum Leases (PL), Pipelines (PPL) and Authorities to Prospect (ATPs) which are held by wholly-owned subsidiaries of Westside and their respective joint venture partners. The operations include the following tenures:

- PL94
- ATP769
- ATP 688
- PPL61
- PL1048
- ATP2027 (PLA1050)
- ATP602 (PLA1061)
- PPL182
- PL1049
- ATP2047
- PPL26

The Westside tenures are primarily located within the Banana Shire, located in the Bowen Basin in Central Queensland near the township of Moura. The fields are located directly to the west of, and in parts overlap, the Anglo Coal Dawson Coal Mine mining leases (the co-development area) which occupy a 30km long north-south length section adjacent to PL94.

Westside tenure outside the Banana Shire includes ATP 688, which is within the Bowen Basin and approximately 110km west of Mackay. ATP 2047 is also within the Bowen Basin and is 20km east of the township of Taroom.

Westside Queensland tenures are depicted in Figure 1 below.

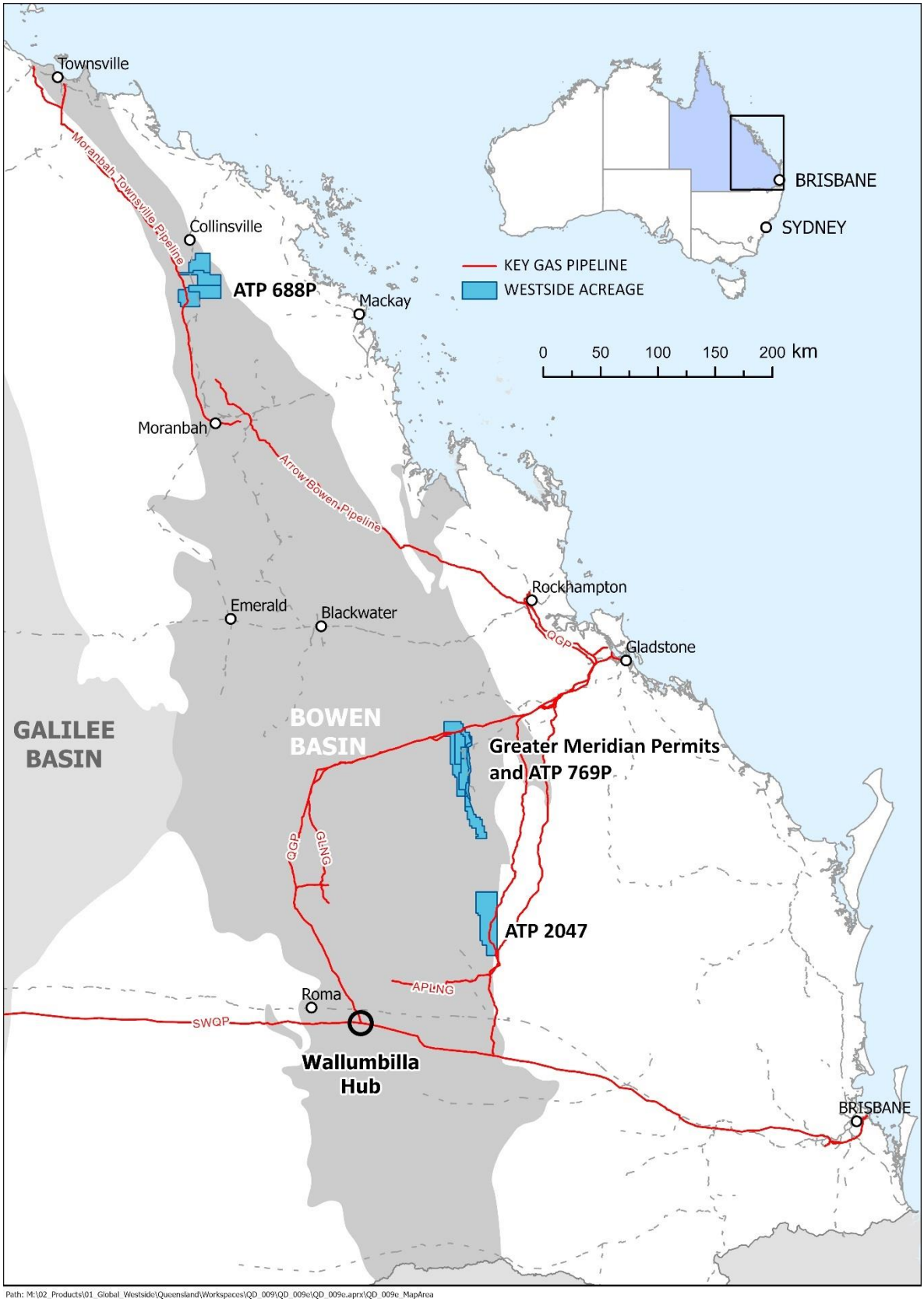

Figure 1 – Location map for Westside Tenure Areas

The Environmental Authorities (EAs) that this Rehabilitation Plan covers includes:

- EPPG00783713 (PL94)
- EPPG00622613 (ATP2027)
- EPPG00805913 (ATP602)
- EPSX01908114 (PPL182)
- EA002230 (PL1048 & 1049)
- EA0002048 (ATP2047)
- EPPG00551013 (PPL26)
- EPPG00693213 (ATP769)
- EPPG00704113 (ATP688)
- EPPG00486113 (PPL61)

The authorised petroleum activities to be carried out under the EAs generally includes:

- Seismic
- Exploration, appraisal and production wells
- Gas and water gathering networks
- Water treatment plants
- Gas sales pipelines
- Compressor stations
- CSG water containment facilities
- Laydown and stockpile areas
- Access tracks
- Workforce accommodation

2. Purpose

This Rehabilitation Management Plan ('plan') has been prepared to address rehabilitation activities within the Westside tenure areas. The plan has considered State Government legislation and approval conditions relating to rehabilitation activities. Specifically, this plan has been developed to address approval conditions within the relevant EAs. In addition, it also covers rehabilitation of EPBC matters, where applicable.

This plan has been prepared to describe how the Westside tenure areas will be rehabilitated following the cessation of petroleum activities, by providing the following:

- Rehabilitation strategy
- Rehabilitation criteria
- Rehabilitation methods
- Rehabilitation monitoring

Westside's rehabilitation efforts will aim to achieve a stable landform with self-sustaining vegetation cover and species that are similar to adjoining undisturbed areas.

2.1 Document use

The function of this document is to identify the range of rehabilitation methods (section 4) that may be required to successfully undertake shaping and rehabilitation of land to a stable landform suitable for its designated land use. During the field development a variety of disturbance types (section 5) are undertaken and within this document the disturbance type is described and the rehabilitation objective outlined for the disturbance type, taking into consideration the rehabilitation methods from section 4.

Sections 7 identifies the methods to return land to a particular land use (pasture, cropping, native vegetation), identifying the variety of rehabilitation types and objectives that are necessary to achieve the designated land use and function. Section 8 identifies the success criteria to be used to identify if the rehabilitation has achieved the desired outcome. Section 9 covers the rehabilitation monitoring and reporting requirements.

3. Scope

3.1 Geographical extent

The Westside tenures listed in the project description are all located in the Queensland Bowen Basin. The tenures stretch from Collinsville in the north to Taroom in the south. The total tenure covers approximately 323,324 ha in the regional councils of Banana Shire, Western Downs Regional Council and Whitsunday Regional Council.

3.2 Land uses and tenure

The underlying land tenure within the Westside tenements is mostly freehold, with leasehold, reserve and State land also present. Land tenure is shown in Tables 8 – 16.

The dominate land use within the Westside tenures is agriculture with grazing as a significant portion of the agricultural activity as indicated in Tables 1 - 8.

Table 1: Land usage within ATP 2027

Total area (ha)	**50,505**
Land use category	**% of development area**
Nature conservation (national park/other conserved area)	0.45
Grazing natural vegetation/minimal use	88.58
Industry, manufacturing, utilities, transport and stockyards	1.99
Dry-land cropping	5.72
Irrigated cropping	1.60
Reservoir/dam/wetlands	10.54

Table 2: Land usage within ATP 2047

Total area (ha)	**74,200**
Land use category	**% of development area**
Nature conservation (national park/other conserved area)	0.01
Grazing natural vegetation/minimal use	96.24
Industry, manufacturing, utilities, transport and stockyards	0.16
Dry-land cropping	3.58
Irrigated cropping	0
Reservoir/dam/wetlands	0.02

Table 3: Land usage within ATP 602

Total area (ha)	**21,342**
Land use category	**% of development area**
Nature conservation (national park/other conserved area)	1.52
Grazing natural vegetation/minimal use	93.21

Industry, manufacturing, utilities, transport and stockyards	1.84
Dry-land cropping	2.84
Irrigated cropping	0
Reservoir/dam/wetlands	0.59

Table 4: Land usage within ATP 688

Total area (ha)	**95,937**
Land use category	**% of development area**
Nature conservation (national park/other conserved area)	3.96
Grazing natural vegetation/minimal use	94.79
Industry, manufacturing, utilities, transport and stockyards	0.22
Dry-land cropping	0
Irrigated cropping	0
Reservoir/dam/wetland	1.02

Table 5: Land usage within ATP 769

Total area (ha)	**23,391**
Land use category	**% of development area**
Nature conservation (national park/other conserved area)	0.06
Grazing natural vegetation/minimal use	91.26
Industry, manufacturing, utilities, transport and stockyards	1.12
Dry-land cropping	4.81
Irrigated cropping	1.33
Reservoir/dam/wetland	1.43

Table 6: Land usage within PL1048

Total area (ha)	**19,500**
Land use category	**% of development area**
Nature conservation (national park/other conserved area)	0.71
Grazing natural vegetation/minimal use	91.95
Industry, manufacturing, utilities, transport and stockyards	3.05
Dry-land cropping	3.8
Irrigated cropping	0
Reservoir/dam/wetland	0.49

Table 7: Land usage within PL1049

Total area (ha)	**17,500**
Land use category	**% of development area**
Nature conservation (national park/other conserved area)	0.04
Grazing natural vegetation/minimal use	93.07
Industry, manufacturing, utilities, transport and stockyards	1.36

Dry-land cropping	3.9
Irrigated cropping	0.68
Reservoir/dam/wetlands	0.94

Table 8: Land usage within PL94

Total area (ha)	**20,949**
Land use category	**% of development area**
Nature conservation (national park/other conserved area)	0.22
Grazing natural vegetation/minimal use	93.07
Industry, manufacturing, utilities, transport and stockyards	1.77
Dry-land cropping	3.14
Irrigated cropping	1.25
Reservoir/dam/wetland	1.42

The predominant land tenure in the development area is freehold, with the exception is ATP688 where leasehold is the dominant land tenure. The percentage of the total areacomprised by each land tenure category is summarised in Tables 8 – 16.

Table 9: Land tenure within ATP 2027

Tenure category	**% of development area**
Freehold	90.16
Leasehold	3.85
Reserve	0.65
State Forest	0
State Land	0.11
Roads and Easements	5.23
Water resource	0

Table 10: Land tenure within ATP 2047

Tenure category	**% of development area**
Freehold	65.18
Leasehold	26.62
Reserve	0.55
State Forest	5.37
State Land	0
Roads and Easements	2.28
Water resource	0

Table 11: Land tenure within ATP 602

Tenure category	% of development area
Freehold	82.58
Leasehold	10.84
Reserve	0.34
State Forest	0
State Land	0
Roads and Easements	1.53
Water resources	0
Profit a Prendre	4.71

Table 12: Land tenure within ATP 688

Tenure category	% of development area
Freehold	25.72
Leasehold	67.85
Reserve	0.14
State Forest	0
State Land	0.97
Roads and Easements	5.32
Water resource	0

Table 13: Land tenure within ATP 769

Tenure category	% of development area
Freehold	85.11
Leasehold	10.54
Reserve	1.36
State Forest	0
State Land	0.02
Roads and Easements	2.97
Water resources	0

Table 14: Land tenure within PL1048

Tenure category	% of development area
Freehold	96.38
Leasehold	1.14
Reserve	0.22
State Forest	0
State Land	0

Roads and Easements	2.15
Water resources	0

Table 15: Land tenure within PL1049

Tenure category	% of development area
Freehold	86.58
Leasehold	5.91
Reserve	0.58
State Forest	0
State Land	0.1
Roads and Easements	6.52
Water resources	0

Table 16: Land tenure within PL94

Tenure category	% of development area
Freehold	81.27
Leasehold	10.42
Reserve	0.58
State Forest	0
State Land	0.18
Roads and Easements	0
Water resources	0

4. Rehabilitation methods

4.1 Rehabilitation hierarchy

The overall goal of rehabilitating significantly disturbed areas that are no longer required for petroleum activities is to achieve the pre-disturbance land use – unless otherwise agreed with the landholder or other overlapping tenure holder and approved by the State government administering authority.

All significant disturbances are to be rehabilitated in a way that will meet the final acceptance criteria when compared to the adjacent land use or pre-disturbance land use – unless there is an alternative intended land use to be utilised by the landholder or an overlapping tenure holder. The alternative option away from the final acceptance criteria does not apply if the disturbance is a category A, B or C environmentally significant area where specific rehabilitation objectives are to be achieved.

Final rehabilitation goals will be determined according to the following hierarchy, in order of preference and prior condition:

1. Reinstatement and rehabilitation of the pre-disturbance land use.
    a) Where existing pre-disturbance: reinstating a self-sustaining and progressive native ecosystem with predominant species of the ecologically dominant layer where disturbance occurred within an environmentally sensitive area.
2. Establishing an alternative outcome for a higher environmental value than the prior land use
3. Reinstatement of the prior land use such as for the purpose of grazing or cropping
4. Establishing a beneficial use where land is intended to be utilised by the landholder or an overlapping tenure holder.

4.2 Reinstatement objectives

Reinstatement refers to restoration and stabilisation of land following project disturbance or maintenance activities to establish a stable landform suitable for the operational phase of the project. Reinstatement is a precursor to rehabilitation. Reinstatement is evaluated using criteria for progressive rehabilitation defined in the gas field Environmental Authorities.

4.3 Rehabilitation planning

4.3.1 Reinstatement planning

A site specific reinstatement plan will be developed by a suitably qualified person, addressing site specific measures to be implemented as part of the construction works to establish a stable area for the operational land use and support achieving the final rehabilitation objectives.

The site specific rehabilitation plan must include the following:

- Reinstatement and/or rehabilitation land use in accordance with the rehabilitation hierarchy
- Revegetation species and methods
- Land stabilisation and soil amelioration requirements

4.3.2 Final rehabilitation planning

A site specific decommissioning and rehabilitation plan will be developed by a suitably qualified person, addressing the site specific measures to be implemented as a part of the decommissioning and rehabilitation works to maintain/establish the desired operational land use. Attention to the environmental requirements are:

1. Exploring opportunities for reuse or retention of infrastructure for a beneficial use
2. Removing surface and/or underground infrastructure that may impede final rehabilitation
3. Decontaminating and rehabilitating surroundings, and as required from disturbance
4. Stabilising the landform and revegetating with consideration to the rehabilitation objective (e.g. pasture, cropping or native vegetation establishment)
5. Rehabilitation methods

For many infrastructure types, certain areas will be required to remain treeless during operations or may be intended to be utilised by the landholder or an overlapping tenure holder. These areas will be reinstated after construction.

It is important to recognise the rehabilitation objectives described in section 4.2 are applied only where they can be achieved for operating infrastructure or decommissioned infrastructure. Reinstatement may involve the return of soil, mulch, re-seeding with pasture grasses or native grasses and ground cover species or reliance upon natural regeneration. In some situations final reprofiling of the land form may not take place during reinstatement. An example of this is a well pad where a cut and fill is required to create a level surface for infrastructure, operational and maintenance requirements, and the well pad is required to remain open and free of shrubs and trees during operations.

Final rehabilitation may include return of woody native vegetation, where required in an environmentally sensitive area. This will take place once infrastructure is no longer required and is decommissioned. Any decommissioning plan for infrastructure should be informed by all environmental requirements.

4.4 Vegetation clearing

Woody vegetation will be collected during vegetation clearance for replacement and used during reinstatement. The following requirements must be adhered to for the clearing and stockpiling of vegetation:

- Prior to commencing clearing in timbered areas, consult with the landholder to agree any timber harvesting requirements such as setting aside felled logs for landowner use
- Habitat features including logs, hollow bearing trees and rocks will be identified and retained for habitat recreation through relocation adjacent to the disturbed area
- Woody vegetation (other than habitat features) will be use in rehabilitation
- Cleared vegetation must be stockpiled to facilitate spreading or salvaging within the disturbance area in a location that facilitates later use in rehabilitation. Gaps will be left in stockpiles to avoid impeding vehicle, stock or wildlife movements
- Vegetation stockpiles will be managed to reduce fire fuel loads at the base
- Vegetation stockpiles are to be stored separately to subsoils and kept free of waste and weeds

- Cleared vegetation should be stockpiled separately from topsoil where practicable and necessary to preserve topsoil
- Vegetation stockpiles will not be placed where they could obstruct flow or be washed away in a flow event
- Fire breaks will be established around non-linear and longer-term vegetation storages

4.5 Waste management and removal

Waste products with no further use may be generated during the rehabilitation process. All waste will be removed on the completion of rehabilitation and appropriately disposed of, including flagging, signage, surplus pipeline, litter, tree guards and stockpiles of unsuitable or surplus material.

Opportunities to eliminate the generation of wastes from the rehabilitation process will be sought through the monitoring of the types and volume of wastes generated with a view to substitute a product/or material where possible. Opportunities to reuse waste streams or recycle wastes whether internally or via an external service provider will be assessed. Where no other option is available wastes are to be disposed of in accordance with the relevant regulatory requirements and the requirements of the Westside Environmental Management Plan.

4.6 Natural regeneration

Trees and shrubs will be allowed to regenerate naturally on cleared areas not required to be kept tree free for the purpose of operation and maintenance, where this is consistent with the final land use objective. This will reduce barriers to fauna movement, especially to ground-dwelling fauna.

4.7 Soil management

4.7.1 Soil management groups

A range of soil types occur across the Westside tenures. For the purposes of this Rehabilitation Plan, the wide range of soils has been amalgamated into a series of soil groups (Table 17). Each soil group consists of soil types that have similar profile features as well as similar chemical and physical properties.

Table 17: Soil management groups

Major group	Soil family	Brief description	ASC (Isbell & NCST, 2016)
Alluvial soils	Clematis	Uniform coarse textures	Tenosols, Dermosols, Ferrosols
	Warrinilla	Medium to fine textures on coarse-textured substrata	Tenosols, Kandosols, Dermosols
	Moolayember	Coarse to medium textures on fine-textured substrata	Tenosols, Dermosols, Ferrosols, Kandosols
	Consuelo	Stratified soils with coarse- to fine-textured layers	Rudosols, Tenosols, Dermosols
Cracking clay soils	Teviot	Dark grey to very dark grey-brown, self-mulching soils on various sedimentary rocks (>90 cm)	Vertosols

Major group	Soil family	Brief description	ASC (Isbell & NCST, 2016)
	Pegunny	Gilgaied, very deep, mainly dark grey-brown soils on Tertiary weathered zone materials	Vertosols
	Rolleston	Non-gilgaied, deep, dark grey-brown to black soils on Tertiary weathered zone materials	Vertosols
	Vermont	Dark grey to grey-brown soils on alluvial materials	Vertosols
Dark, brown and grey-brown soils	Kinnoul	Shallow, uniform, medium- to fine-textured soils, alkaline subsoils	Dermosols, Ferrosols
	Cheshire	Deep, uniform or gradational, medium- to fine-textured soils, moderately to strongly alkaline subsoils	Dermosols, Ferrosols, Vertosols
	Carraba	Deep, uniform or gradational, medium- to fine-textured soils, strongly acid subsoils	Dermosols
Texture-contrast soils	Southernwood	Shallow soils (<60 cm), sandy or loamy surface soils, acid to mildly alkaline subsoils	Kurosols, Sodosols, Chromosols
	Medway	Shallow soils (<60 cm), sandy or loamy surface soils, moderately to strongly alkaline subsoils	Sodosols
	Taurus	Moderately deep to deep soils (>60 cm), thin sandy surface soils (<40 cm), moderately to strongly alkaline subsoils	Sodosols
	Luxor	Moderately deep to deep soils (>60 cm), thick sandy surface soils (>40 cm), acid to mildly alkaline subsoils	Kurosols, Sodosols, Chromosols
	Wyseby	Moderately deep to deep soils (>60 cm), thin loamy surface soils (<40 cm), acid to mildly alkaline surface soils	Kurosols, Sodosols, Chromosols
	Retro	Moderately deep to deep soils (>60 cm), thin loamy surface soils (<40 cm), moderately to strongly alkaline subsoils	Sodosols
Red and yellow earths	Dunrobin	Loamy red earths	Kandosols
	Struan	Loamy yellow earths	Kandosols
Uniform coarse-textured soils	Highmount	Deep sandy soils (>90 cm)	Rudosols, Tenosols
Shallow rock soils	Rugby	Very shallow, uniform, medium- to fine-textured soils	Rudosols, Tenosols, Dermosols, Ferrosols, Calcarosols

The Westside tenures are located in the Brigalow Belt North bioregion, Dawson River Downs subregion, in central Queensland. The Brigalow Belt North bioregion covers an area of 59,824 km^2 and is comprised of rugged ranges and alluvial plains. Dawson River Downs is an undulating area with outcrops of Tertiary and Bowen Basin sediments. Tertiary soils form flat to undulating plains and are dominated by brigalow (*Acacia harpophylla*) and softwood vegetation communities, and the exposed rocks of the underlying sedimentary basin form plains and hills with softwood scrub.

4.7.2 Topsoil management

Topsoil contains the majority of nutrients and water required by plants and supports seed growth and germination. The chemical and physical properties of topsoil can be easily altered by handling and storage methods.

For the proposed infrastructure site clearance and construction involving stripping of topsoil and associated vegetation to create areas for the new infrastructure. This can result in the loss of topsoil quantity and quality through incorrect stripping, prolonged soil exposure, erosion, nutrient leaching and loss of fertility.

Prior to commencing soil stripping, it is necessary to plan the source of topsoil for rehabilitation to maximise direct re-spreading and to minimise the length of time that soil is stockpiled. Topsoils will be stripped with care and where practicable, stripped topsoil will be re-used by application to areas where a similar soil type is required for rehabilitation. Where this is not practicable, the topsoil will be separated and stockpiled on-site in piles no greater than 2m high to maintain the biological integrity. Topsoil piles will have appropriate breaks to allow surface water to flow through the site.

Where any follow up rehabilitation work is proposed, a shortage of topsoil is inevitable in some areas. This is particularly the case in the shallow stony soils, shallow texture contrast soils, and those within soil where clay content is significant in the surface material. In such areas, additional topsoil may need to be sourced from zones with substantial topsoil depths or alternative management measures may be required to overcome the potential shortfall.

4.7.3 Subsoil stripping

The objectives of subsoil management are to:

- prevent contamination of topsoil
- prevent degradation of the subsoil structure
- ensure reinstatement in the correct location and in the correct order
- ensure effective management of unused subsoil.

Subsoil will be removed and stockpiled separately from topsoil to prevent blending with topsoil and, ideally, stockpiles will be located close to where they are sourced.

4.7.4 Stockpiling

The objectives of stockpiling are to:

- minimise damage to and maintain fertility of stockpiled material
- ensure soil is stockpiled in a manner that will preserve its biological and chemical integrity
- ensure soils are used for rehabilitation purposes ensure stockpiles have minimal impact on surrounding environmental values.

In cases where the subsoil must be disturbed, it is essential that subsoil and topsoil be stockpiled separately, with a separation distance to ensure they are not mixed during construction or rehabilitation works.

Any backfill/subsoil material not utilised may be stockpiled in locations approved by landholders or removed prior to topsoil placement. Designated subsoil and topsoil stockpile locations will be determined prior to construction work. The following actions will be implemented when creating stockpiles, although site specific requirements, determined from analogue surveys, will be implemented where necessary as determined by the Environment Advisor in precedence to those outlined below:

- Topsoil stockpiles within strategic cropping land (SCL) will be managed in accordance to relevant approvals
- Gaps will be left at appropriate intervals to allow for drainage, and permit the movement of vehicles and fauna
- Topsoil stockpiled for an extended period (longer than three months) should be revegetated as soon as possible, by direct seeding with grasses to maintain biological activity and prevent weeds from growing, and to prevent soil loss through erosion, with consultation with landholders
- Where both topsoil and subsoil are stripped and stockpiled, topsoil stockpiles will be clearly sign-posted for easy identification and to avoid any inadvertent losses
- Topsoil will be stockpiled within well leases or right of ways (ROWs) and will not be stockpiled against fence lines or vegetation to be retained, and will be stockpiled separately from mulch
- Weeds on the stockpiles will be monitored and controlled to prevent establishment and spread
- Soil will be stockpiled close to where it is stripped in a manner that does not block diversion or natural drainage flow paths
- Long-term stockpiles will be located above historic flood levels (Q50) where possible
- Stockpiles will be located where they will not be disturbed by other activities
- Erosion and sediment control measures will be implemented where stockpiles are to be located within 200m of watercourses to prevent contamination of waterways.

4.7.5 Backfilling

The following actions will be implemented in backfilling of pipeline trenches:

- Pipeline trenches will be backfilled as soon as practicable after pipe laying
- Backfilled excavations should be suitably compacted to prevent subsidence while not impeding establishment of vegetation
- Excavated subsoils will be used for backfilling
- Backfill materials (i.e. padding sand and subsoil) will not be contaminated with general rubbish or any foreign material
- Subsoils will not be used as a surface capping layer
- Topsoil will not be used for backfill.

The following actions will be implemented in backfilling of trenches and other areas, although site specific requirements will be implemented where necessary in precedence to those outlined below:

- Pipeline trenches will be backfilled within three months after pipe laying

- During backfilling of pipeline trenches, soil must be replaced so that soil topsoil has limited mixing with subsoils
- Subsoil will not be contaminated with general rubbish or any foreign material
- Topsoil will not be used for backfill
- A suitable, clean backfill material will be imported where subsoils cannot be reused
- Excess subsoil material will be disposed of appropriately or stockpiled for use in future rehabilitation or respread elsewhere in consultation with landowners, avoiding mixing.

4.7.6 Re-profiling

The objective of re-profiling is to reinstate soils to a stable landform, which includes addressing the following landform design principles:

- Re-establishing surface drainage lines
- Reinstate the land to a land surface that is visually consistent with surrounding land features
- Re-profile to original contours and established drainage lines
- Minimise the potential for subsidence or erosion gullies to occur
- Replace top soil over subsoil.

Landform reinstatement involves surface contouring to create a stable land formation consistent with the surrounding landform. This ensures water flow over the surface is in cohesion with the surrounding landscape and minimises the risk of potential erosion. It also ensures that the final landform is consistent with the surrounding land features. Where required following decommission, surface contouring should be completed prior to re-spreading of topsoil. Contouring should pay particular attention to drainage lines for surface water flows to ensure erosion potential is minimised.

Earthworks may have impacted the existing landform through the re-profiling of local topography, alteration of drainage paths and soil de-stabilisation. In turn, this could change the local drainage patterns, visual character and degrade downstream water quality. General mitigation measures will be addressed throughout the Westside tenures to minimise potential impacts. These measures are:

- In areas of site leveling works, proposed formation levels will be set to reduce the need for significant cut and fill areas
- In areas where access tracks have been constructed the landform will be re-profiled to establish a landform consistent with the surrounding landscape and ensure it is in a stable condition
- Re-use of construction materials will be implemented to minimise the volume required from borrow pits
- Pipeline backfill and compaction of the fill will be controlled to minimise subsidence and the need for excessive temporary soil mounding.

4.7.7 Ripping and scarification

Prior to the re- spreading of the topsoil (where it has been retained), the ground surface may be ripped. Ripping assists with binding of the soil layers, increases retention time of water on the slope, aids water infiltration intothe soil increasing the opportunity of seed germination success and reduces the volume and velocity of runoff generated from the slope. Ripping may be undertaken along contours, particularly on heavily trafficked areas such as temporary access tracks, camps and hardstands and other areas compacted by construction activities. Areas with hard-set mud or clay such as drilling mud pits may also be ripped. Ripping depth should be reduced to no greater than 400mm in areas where pipelines are buried, as ripping any deeper could potentially result in the rupture of buried pipelines.

After topsoil is spread the surface may be lightly scarified to assist with relief of compaction, binding of the soil layers, water penetration and plant establishment. Scarification should be completed prior to seeding (after topsoil is spread) and should ensure no subsoil is ripped to the surface. The scarification should be completed using the rear mounted ripping tyres of a grader or a purpose designed harrowing implement rear mounted on a tractor. Scarification can also be achieved by ploughing of the sub-surfacematerial prior to topsoil reinstatement. A figure eight or zigzag rip lines may be appropriate to preventrill erosion in flat to low gradient areas.

4.7.8 Soil amelioration

Soil amelioration may be required where grazing and cropping is the final desired land use, as the addition of fertiliser to soils required for native vegetation may not be beneficial to native species and could instead create conditions suitable for weed growth. Soil amelioration techniques that may be used include:

- Addition of organic or inorganic fertilisers
- Addition of gypsum or lime
- Incorporation of mulch, compost or other organic matter.

4.7.9 Topsoil re-spreading

For all disturbances where soil has been removed, soil preparation may include the re-application of topsoil from the original clearing. Where applicable, topsoil will be re-spread to the following specifications, although site specific requirement will be implemented where necessary as determined by the Environment Advisor in precedence to those specifications outlined below:

- Topsoil will be respread over watered and scarified or ripped subsoils in even layers at a thickness appropriate for the intended land use of the area to be rehabilitated
- Topsoil is to be spread back over in an even layer and left ‘rough’ (rather than smooth and compacted) to minimise potential erosion, increase water infiltration and to trap seed or alternatively will be scarified as outlined in section 4.7.7
- Topsoil will cover the entire width of the disturbed area so that there is no exposed sub-surface material. This will ensure seeding and germination has the best opportunity to ‘take’, enabling establishment of groundcover with weather permitting
- A greater amount of topsoil may be re-spread over exposed areas if conditions permit

- If insufficient topsoil exists, additional materials may be sourced from other locations but confirmation of the source and quality, including that it is weed free, must be obtained by the Environment Advisor. The importing of topsoil must be approved by landholders
- Topsoil application will only take place following initial reinstatement of the subsoil, construction of contour banks on steep slopes and compaction of subsoils to account for subsidence
- Topsoil stockpiled for extended periods will be turned over and mixed prior to replacement. However, this is only required if thorough mixing is unlikely to occur during re-spreading
- Vehicle movement will be restricted following topsoil re-spreading.

4.8 Erosion and sediment control

Erosion can have an adverse effect on soil productivity and the associated agricultural value. Additional effects can include, but are not limited to, undermining of structures (such as fences), exposure of pipelines, stream bank erosion, downstream sedimentation, and decline in fertility through loss of soil structure, and increased dust generation and poor rehabilitation. Further rehabilitation works may be required to stabilise eroded areas.

Erosion levels are expected to be more significant in the coarser textured soils, where there is little structure and organic matter to assist in binding the soil. Deep clay soils have a low to moderate erosion rating where undisturbed. However, as the subsoils can be sodic to strongly sodic, these soils will erode due to clay dispersion where soil is exposed through vegetation removal. Such soils can be particularly prone to gully and tunnel erosion.

Where applicable, the following erosion and sediment control measures are proposed:

- Where diversion of runoff water around an infrastructure site is required, design will need to be mindful of possible erosion effects, including the instigation or exacerbation of gully and tunnel erosion
- Sediment basins will be constructed on the downhill side of major facility sites, such as temporary accommodation facilities, when they are near sensitive water courses
- Drainage lines and areas of concentrated water flow near major facilities will be inspected regularly for erosion and to determine whether remedial action is required
- Sediment and erosion control measures and areas receiving concentrated flows will be inspected on a regular basis, replaced where damaged and emptied following rainfall events, if required
- Erosion and sediment control measures, such as contour banks, will be placed at frequent intervals along flow paths, where appropriate, and multiple discharge locations will be created to ensure discharges have low velocities and volumes, rather than channelling discharges to a central point, which can exacerbate erosion
- Point source discharges of runoff will be directed into stable waterways and/or drainage lines with engineering controls, such as scour protection and flow velocity limits, where required
- Vegetation will be progressively cleared to minimise the area of soil exposed
- Slopes will be re-vegetated as soon as possible after disturbance
- Stockpiles and/or exposed soil areas, such as unsealed access tracks, which are exposed for prolonged periods or have been identified as problem soils (erosive/dispersive) will be stabilised

as required. This will be done using chemical surface stabilisers, physical alternatives such as crushed rock, or direct seeding with grasses

- Diversion and erosion and sediment control devices will be fully implemented to provide effective erosion control prior to land disturbance activities, and will be kept in place and maintained fully functional until the area has been effectively rehabilitated
- Tracks will preferably be aligned across slopes, but where this is not possible, contour banks will be used at intervals appropriate to the slope and soil type to control the flow of surface water
- Where pipelines are located along slopes, trench breakers will be installed in the backfill at intervals appropriate to the steepness of the slope to prevent water tunnelling along the buried pipe and contour banks will be installed on the surface to divert water away from the disturbed areas
- Erosion and sediment control devices are to be constructed in accordance with *IECA Best Practice Erosion and Sediment Control Guidelines 2008*.

Site specific erosion and sediment control plans will be prepared by a suitably qualified person to direct the application of erosion and sediment control measures. Erosion and sediment control plans will identify the measures undertaken to manage erosion and sediment, the type and location of erosion and sediment control devices and management.

The construction and monitoring of erosion and sediment control devices to ensure they are installed and appropriately designed to the specifications of the site specific erosion and sediment control plans will be the responsibility of the principle contractor on-site who has suitably qualified personnel to inspect and monitor the operation of erosion and sediment control devices.

Inspection and maintenance of erosion and sediment control devices will be the applicable method in mitigating effects to water quality downstream from these devices. Water quality monitoring may be conducted downstream from erosion and sediment control devices if there is a major weather event based failure of the erosion and sediment control device.

4.9 Revegetation

4.9.1 Pasture establishment

For progressive rehabilitation or decommissioning, areas where grazing or cropping is the required final land use will be sown with appropriate pasture species as agreed with landholders e.g. via conduct and compensation agreements (CCAs). This will be undertaken irrespective of whether the site is to undergo re-instatement or final rehabilitation. Local native grasses such as *Dicanthium sericeum* (Queensland Blue Grass) may be used in some situations, such as where it is desirable to return an area to grazing on unimproved native pasture or stabilisation prior to revegetation.

A direct seeding method can be undertaken using a spreader attached to the rear of a tractor which delivers seed onto the soil. Seeding is to take place after ploughing, but before harrowing. When harrowing is undertaken after seeding, the seed is covered with a small layer of soil to assist in the germination process. Alternatively a drill seeder with press wheels may be used. In this case harrowing is not required as drilling allows the depth of seed burial to be controlled. Using machinery such as tractors on steep slopes should be

avoided. Hand seeding is recommended on steep slopes due to safety concerns regarding the use of machinery in these areas. Rehabilitation crews should assess each site on a case-by-case basis, according to the topography and level of risk involved if machinery is utilised. Hydro-seeding and hydro-mulching may be used on steep slopes to encourage more rapid revegetation, and therefore stabilisation of the rehabilitated area.

4.9.2 Seeding for reinstatement to achieve pre-disturbance condition

In situations where an area is required to remain treeless during operations such as gathering lines and pipelines, the species selected will include native grasses and groundcover species only if native vegetation is the final land use objective. If pasture or cropping is the final land use objective, the area will be seeded with pasture grasses as outlined in the above section.

4.9.3 Direct seeding of native species for final rehabilitation

The selection of species that will be used in the rehabilitation process where native vegetation is the final land use objective will be guided by adjoining undisturbed areas. Species selection will also be guided by soil conditions, micro-climate and aspect of the new land form. Seed will be sourced from reputable local seed suppliers that provide local provenance seed stock.

Where applicable, seeding is to be undertaken as soon as practicable after the topsoil has been re-spread and natural profile restored, and topsoil has been spread, but before spreading mulch. Sowing will take advantage of the most appropriate season for germination and establishment of seedlings (i.e. immediately before the commencement of the wet season). Direct seeding will be undertaken following the technique outlined in section 4.9.1 above.

Direct seeding with grasses may be undertaken in areas where the rapid re-establishment of vegetation cover is required (e.g. watercourse crossings, steep slopes and other potential high erosion areas). In such situations, and on batters and dam embankments, hydro-seeding or hydro-mulching may be undertaken to enable ground cover to establish rapidly on erosion prone areas. The need for hydro seeding and hydro-mulching will be assessed on a site-by-site basis. Native grasses or sterile exotic grasses must be used to ensure exotic grasses do not become established. Ground cover as a rehabilitation indicator will be monitored.

Where practicable fencing off from stock may be required, depending on adjacent land use, to facilitate revegetation and regrowth until site stability is established.

4.9.4 Planting

There may be certain situations where tubestock planting will also be required, such as where species unsuited to direct seeding must be established to meet the pre-disturbance vegetation conditions. Requirements for tubestock planting are as follows:

- Species to be selected for planting will be sourced from local provenance seed
- Tubestock will be planted in the early wet season (December – February)
- Spacing will be determined according to the species, but will typically be 2m apart for most tree species

- Tubestock will be watered immediately following planting
- Mulch will be placed around tubestock, but should not touch the stems
- Fencing will be required following planting to prevent browsing damage.

Where tubestock is required it should be obtained from local nurseries or contract grown locally. The seed for tubestock must be obtained from local provenance seed (refer to section 4.10 below). Tubestock must be free of weeds before planting.

Transplanting may be appropriate for certain species such as stoloniferous grasses and native species that sucker from an underground rhizome or other rootstock. This has the advantage of establishing a root system rapidly in erosion prone areas, and enabling some species that do not readily set seed to be re-established. However this can only occur where a suitable source of transplants is located nearby, for example an adjacent area that is to be cleared. In undertaking transplanting, the following should be considered:

- Undertake transplanting in the early wet season (December – February)
- Ensure that the source site is located close to the recipient site
- Ensure that soil is removed at sufficient depth with the transplant so as to retain most of the root system
- Ensure as much topsoil as possible is retained with the transplant
- Minimise the time between transplant removal and planting to prevent drying out
- Water transplants immediately following planting

4.10 Seed procurement

To meet Project requirements for direct seeding, seed will need to be purchased for pasture and native species, with a preference for local provenance seed of species adapted to local conditions. For pasture grasses, both native and exotic species will be considered in consultation with landholders.

Westside will ensure that seed is procured from parties that follow sound seed collection methodologies, such as *FloraBank Guideline 6: Native seed collection methods* (Mortlock and the Australian Tree Seed Centre, 1999). Such guidelines recommend the collection of good quality seed from an appropriate source, which is critical to the successful of the project planting programs. This will ensure that seed is collected in a sustainable manner, from well documented locations.

It is desirable that procured seed is collected as locally as possible, preferably from undisturbed naturally occurring remnant vegetation within the Project site, and in the vicinity of the intended rehabilitation areas. For this reason, seed may be procured from a range of individuals and organisations that have the local knowledge and site access, to be able to collect suitable local provenance seed.

When procured seed is not of local provenance, efforts should be made to match the key environmental characteristics of the intended rehabilitation sites, including rainfall, temperature and simple soil characteristics (e.g. soil texture).

Seed should be procured from parties that can vouch that the seed is of good genetic quality, viable and has been collected in a manner that supports this. Seed should have been collected from healthy and viable

natural populations. Where practical, collection should be from at least 10-20 plants widely spaced across individual populations.

4.11 Vegetation re-spreading

For new excavations in existing disturbances or proposed infrastructure where native vegetation and other fauna habitat elements (surface rocks and felled timbers) have been stockpiled, they will be re-spread after seeding as follows:

- Material will be evenly spread over the area to assist in the distribution of seed stock and provide shelter for fauna
- To prevent weed and soil pathogen spread and assist with appropriate re-vegetation and soil micro-organism recovery, topsoil, mulch and habitat elements will be sourced from salvage specific to that site
- Felled vegetation will not be burnt unless directed by the regulatory authority
- Any large logs or hollows will be returned to provide habitat for local species. On steep slopes these will be re-laid along the contour
- Mulch should be spread evenly once seeding and planting has been completed. It is important that mulch is spread in a thin layer (50mm or less). This will allow seeds to germinate and will not inhibit seed growth and therefore groundcover establishment. If the mulch is spread too thick, the seeds will take longer to germinate slowing the rehabilitation process
- If excess mulch needs to be utilised, contour banks and erosion control structures can be constructed using mulch instead of soil.

4.12 Weed management

4.12.1 Weed species

Declared weeds are present within the Westside tenures and are recognised weeds of national significance. Of particular importance are Parthenium (*Parthenium hysterophorus*), a Class 2 pest plant and a weed of national significance. Parthenium is known to occur within the Westside tenure areas and must be managed to prevent spread (section 4.12.2).

Some weed species are a potential threat to rehabilitation, given the nature of the proposed activities (particularly clearing and soil disturbance during construction).

4.12.2 Prevention of spread

Prevention is considered the most effective way of minimising the introduction of new weed species, and the spread of existing weed species across the project area. The movement of vehicles and plant equipment are significant contributors to the introduction and spread of weed species. Preventing weed introduction and spread will be achieved through:

- controlling access across the project area
- implementing vehicle hygiene procedures
- utilising existing and mobile vehicle wash down facilities

- regular mapping of weed infestations, and the sharing of this data across the broader project team
- training staff and contractors in weed identification and vehicle hygiene procedures
- managing known infestations that lie directly within, or adjacent to, the infrastructure sites.

Measures to prevent the introduction and/or spread of significant weed species across the project area and to the surrounding land are deployed by Westside. Westside utilises preventative measures for weed management in the first instance. Westside does rely on employees and contractors to follow the Vehicle and Mobile Plant Weed Hygiene Procedure, which aligns with the requirements under the *Biosecurity Act 2014*. Proactive weed treatment is also done in coordination with landowners' weed management programs.

4.12.3 Weed treatment

Priority weed infestations will be identified and will be the focus of treatment application works for the site to reduce the potential for these species to spread to new, unaffected areas across the Project area and to surrounding lands. Treatment applications will be selected on a species-by-species basis depending on the effectiveness of the application to control each species, the size and growth stage of each infestation and the timing of application. Surrounding land use and weather conditions will also be considered when choosing a treatment application.

Treatment applications may employ mechanical, chemical, biological and land management methods to reduce the size of infestations and minimise the potential to spread to new, unaffected areas.

4.13 Pest management

Pest animals have major economic, environmental and social impacts and can cause significant damage to crops and seriously affect Australia's livestock industries by preying on stock and competing for pasture as well as causing severe land degradation by promoting soil erosion, stream turbidity and the spread ofweeds. Under the *Biosecurity Act*, it is a legal requirement of all landowners or landowning state agencies to control declared pests.

Pest animal species that are likely to be present include:

- *Oryctolagus cuniculus* (European Rabbit)
- *Sus scrofa* (Feral Pig)
- *Canis familiaris* (Wild Dogs including Dingoes and Dingo hybrids)
- *Canis vulpes* (Red Fox)
- *Felis catus* (Feral Cat)
- *Mus musculus* (Mice)
- Macropods.

Control of these pests will be undertaken by landholders. However, Westside will support regional pest control activities.

4.14 Fire prevention measures

The risk of bushfire is a concern of all landholders and rehabilitation works as a bushfire can severely impact upon all land uses. The damage to crops, fodder, buildings and other farm infrastructure from fire can be devastating to landholder livelihoods. The Westside tenure development must maintain the safety of people and property by either avoiding areas of high or medium bushfire hazard or by mitigating any introduced risk. Bushfire risk within Westside operations will be managed by utilising a variety of measures as follows:

- Monitoring of a bushfire weather forecasting to be able to forewarning neighbours of the bush fire risks around Westside activities
- Observation of fire bans for high risk days/seasons where practical
- Implement fire prevention measures during construction
- Selected staff and contractor bushfire education and training
- Preparation and implementation of emergency response plans tailored to individual situations
- Implementation of fire prevention, fire watch, and fire response procedures during construction and operation, particularly within forested areas
- Provision of fire breaks around major facilities, plant and equipment
- Cooperate with the Rural Fire Service and adjoining landholders in respect to any controlled burning
- Consultation with the Rural Fire Service and landowners on matters of mutual interest (e.g. defining which Westside dams can be used for fire water, and clearly sign posting dams that are unsuitable for firefighting purposes)
- Installation of emergency shutdown systems.

4.14.1 Fuel reduction

Landowners may have existing fire management controls at a property scale including fuel reduction to protect Landowners assets.

Fuel reduction may include any or a combination of the following; stick raking, slashing and burning of fuels or combination of any of these methods. On a long term basis, burning of adjacent timbered areas on a regular rotation to reduce the fuel loads and the consequent intensity of a wildfire passing through the area may be undertaken.

These activities are undertaken by landowners and Westside will assist by protecting our petroleum infrastructure during the fuel reduction burns. This may include cleaning up fire breaks, monitoring the control burn with firefighting equipment available to protect the petroleum infrastructure.

4.14.2 Ecological fire requirements

Fire sensitive plant communities are those that can be killed or severely damaged by fire. These communities contain species that are not adapted to fire and are therefore fire intolerant. Fire is not required as an ecological process to promote regeneration of species in such communities. Examples of fire sensitive vegetation types include Brigalow woodlands and Semi Evergreen Vine Thicket (SEVT) communities. In addition to plant communities, individual flora and fauna species and their habitats, including Commonwealth

and State listed Endangered, Vulnerable; Near Threatened (EVNT) species maybe prone to fire. As such, fire may need to be excluded from populations and habitats for ecological reasons providing health and safety is not compromised by the action. Individual Listed Species Management Plans, both for Threatened Ecological Communities (TECs) and listed EVNT species should be referred to for specific ecological fire requirements.

4.15 Ongoing rehabilitation maintenance

Following rehabilitation works, limited access to infrastructure will be allowed to perform essential maintenance requirements. All other traffic is prohibited on topsoil areas and should remain off the rehabilitation areas to enable successful establishment of groundcover. Fencing of rehabilitation areas may be required to prevent grazing, with fences to be removed once sufficient vegetation cover has established.

Maintenance will take place to ensure the following objectives are met:

- Landforms remain stable
- Erosion control measures remain effective
- Stormwater runoff and seepage from rehabilitated areas does not negatively affect the environmental values of any waters
- Plants show healthy growth and recruitment is occurring
- Declared weed species are controlled on rehabilitated areas to a level consistent with the surrounding property and prevented from spreading to unaffected areas.

It will not be feasible to water all seeded areas, however creek banks and steep slopes may be selected for watering as identified by the Environmental Advisor as a high risk area. This will ensure groundcover is established and erosion is minimised. Wherever tubestock planting or transplanting is undertaken, follow-up watering may be necessary depending on climatic conditions with the focus to achieve sufficient groundcover. Watering is to be undertaken with water of a quality suitable for the purpose that meets EA standards and landscape requirements.

4.16 Rework

Upon decommissioning and final rehabilitation, sites not displaying stability or adequate vegetation cover through either regrowth or direct seeding may undergo re-seeding. Where further rehabilitation works are required the following will be undertaken dependant of the scale and type of rehabilitation undertaken as a minimum:

- Works will be conducted in consultation with the relevant landholder
- Re-contouring of erosion control measures, re-seeding, or reinforcement of scour protection on stream banks if damaged during flood activity
- Access will be restricted, with consideration of landholder access requirements, to facilitate rehabilitation has been successful
- If subsidence is observed, corrective actions will include backfilling of depressions and re-seeding as required
- Appropriate weed control will be undertaken as required.

5. Disturbance type

This section provides a summary of the types of infrastructure constructed or to be constructed, and where relevant specific details for the rehabilitation of this infrastructure. Depending of the length of operation, rehabilitation may include reinstatement after installation only, or rehabilitation after the removal of infrastructure. Specific techniques for infrastructure types are summarised in Table 18.

Prior to the commencement of disturbance (i.e. vegetation clearing), and the final site selection, environmental, cultural heritage, landholder and engineering constraints will be addressed as per the Permit to Disturb process.

The disturbance type also creates a land use constraint resulting from the type of disturbance that has occurred. The infrastructure that has been put in place may prevent the land from being used for its original purpose, until such time as the infrastructure is decommissioned. However where the infrastructure is temporary, these land use constraints will be temporary.

For all disturbed areas, the various Environmental Authorities applicable to the Westside tenures requires that rehabilitation of disturbed areas must take place progressively and maintained as works are staged and new areas are disturbed this is to be achieved within 12 months after a significantly disturbed area is no longer required for petroleum activities.

Table 18: Rehabilitation techniques for infrastructure (disturbance) types

Infrastructure type	Rehabilitation technique
Seismic survey	• Allow slashed and mulched seismic survey lines to regenerate naturally • Where necessary or where heavy machinery has been used to clear a path, utilise suitable equipment to provide compaction relief
Well pads (production wells, exploration/appraisal)	• Reinstatement following the completion of drilling to reduce well pad to the operating footprint. Re-profiling will not occur at this time and progressive rehabilitation undertaken (section 5.2) • Revegetation with native grasses and ground cover species or pasture grasses (cropping or grazing) similar to adjoining undisturbed land (section 4.9). • On the completion of operations, undertake decommissioning and final rehabilitation, including re-profiling of cut and fill batters • Seed final rehabilitation areas where pasture grasses (cropping or grazing) as determined by adjoining undisturbed land (section 4.9.1)

Infrastructure type	Rehabilitation technique
Tanks and stimulation dams (that require earthworks)	**Tank** • Test the contents of the tank to determine the waste management strategy for the contents • Remove the contents of the tank for re-use, recycling or disposal depending on the analysis of the contents • Remove tank • Break up concrete • Site profiling: depressions filled to return landforms to match • Surrounding topography (section 4.7.6) • Topsoil re-spreading (section 4.7.9) • Revegetation in accordance with (section 4.9) **Stimulation Dam** • Test the contents of the tank to determine the waste management strategy for the contents • Remove the contents of the tank for re-use, recycling or disposal depending on the analysis of the contents • Remove synthetic liners • Management of clay core materials: where clay has been used in embankments or as a liner, this will be re-spread, shaped and capped with topsoil for revegetation or stockpiled for reuse • Site profiling: the dam embankments would be pushed in and depressions filled to return landforms to match surrounding topography. Any retained subsoil would be used to infill dams (section 4.7.6) • Topsoil re-spreading: Topsoil will be placed to a minimum depth of 250mm (section 4.7.9) • Revegetation in accordance with (section 4.9)
Gas and water gathering lines	• Allow portion of RoWs and ancillary activities (laydowns and stockpile areas associated with the RoWs) not required to remain open to regenerate naturally (section 4.9) • Remediate unnecessary laydown and stockpile areas (section 4) • Seed areas required to remain open with native grasses and ground cover species or pasture grasses (cropping or grazing) (section 4.9) • Seed areas not required to remain open with pasture grasses (cropping or grazing) (section 4.9)
Ancillary disturbances for laydown and stockpiling	• Allow ancillary activities (laydowns and stockpile areas) not required to remain open to regenerate naturally (section 4.9) • Remediate unnecessary laydown and stockpile areas (section 5.5) • Seed areas required to remain open with native grasses and ground cover species (remnant vegetation) or pasture grasses (cropping or grazing) (section 4.9) • Seed areas not required to remain open with tree species determined from analogue site surveys (remnant vegetation) or pasture grasses (cropping or grazing) (section 4.9)

Infrastructure type	Rehabilitation technique
Central compressor station	• On the completion of operations, undertake decommissioning and final rehabilitation
Dam transition to landowner	• Landholder engagement for retention of constructed dams • Treatment/remediation of dam contents (section 5.7) • Infrastructure handover
Dams	• Treatment/remediation of dam contents (section 5.7) • Management of clay core materials: where clay has been used in embankments or as a liner, this would be re-spread, shaped and capped with topsoil for revegetation or stockpiled for reuse • Site profiling: the dam embankments will be pushed in and depressions filled to return landforms to match surrounding topography. Any retained subsoil would be used to infill dams • Topsoil Re-spreading, topsoil will be placed to a minimum depth of 250mm • Undertake re-seeding of topsoil with a seed mix appropriate for the final land use as agreed to by landholders or determined from adjoining undisturbed land (section 4.6)
Below ground power lines	• Backfill trenches with subsoil then topsoil (section 4.7) • Seed areas above power lines with native grasses and ground cover species (remnant vegetation) or pasture grasses (cropping or grazing) (section 4.9)
Access tracks	• Where tracks are to be retained, any wheel ruts will be graded and erosion-control measures such as the construction of diversion drains will installed before handing back to the landholder • Temporary access tracks not required for operations or to be retained by the landholder will be rehabilitated by ripping to remove compaction (section 4.4.6), re-spreading stockpiled topsoil (section 4.4.8) and revegetation following section 4.9
Camps	• Undertake reinstatement of areas not required to remain open during operations (section 5.10) • On the completion of operations, undertake decommissioning and final rehabilitation
Drilling camps	• Undertake reinstatement of areas not required to remain open during operations (section 4) • On the completion of operations, undertake decommissioning and final rehabilitation
Borrow pits	• Backfill with stockpiled subsoil, re-profile allowing for natural depression or change of land use (i.e. a dam), undertake ripping and spread topsoil (section 4) • Undertake re-seeding of topsoil with a seed mix appropriate for the final land use as agreed to by landholders in accordance with section 4.6

5.1 Seismic survey

5.1.1 Description of activity

Seismic surveys produce detailed images of the subsurface which are used to understand the geology of an area. Seismic surveys generate sound waves in the ground and record the sound energy that reflects from various rock layers within the earth. The sound energy is generated by a vibroseis truck, and the sound energy is received by geophones which are placed on the ground. The acquisition of sound energy response is designed to minimise disturbance by co-locating seismic survey lines with roads, tracks or other agricultural disturbances, however if required lines may be cleared to allow access for four wheel drive and vibroseis truck vehicles. Typically clearing would be slashing and mulching in areas with heavy vegetation with root stock left in situ. Occasionally some bulldozing may be required if terrain is difficult to access.

5.1.2 Rehabilitation process

Any areas cleared as an action of seismic surveying where slashing or mulching have been undertaken will be allowed to rehabilitate through regeneration via the remaining seed bank and root stock. Any locations that required clearing with heavy machinery such as a bulldozer will require restoration with suitable equipment for task to stabilise the soil surface and provide for natural regeneration. All wastes are to be removed. Any disturbed farm infrastructure will be repaired and left in an operational condition.

5.2 Well pads (Production wells, Exploration/Appraisal)

5.2.1 Description of activity

In regard to development areas, typically well pads are spaced at 1000 to 1200m and in regard to exploration and appraisal wells are positioned to assess field prosperity, though spacing for both varies according to a range of site physical and environmental constraints. The maximum disturbance associated with the establishment of a typical pad is 2ha. Well construction disturbance footprint is reduced at the completion of drilling/establishment to an operation area of 0.5ha and this is maintained for the operational life of the well, typically up to 30 years.

5.2.2 Rehabilitation process

In regard to proposed well infrastructure rehabilitation of well sites will consist of two primary processes, reinstatement and final rehabilitation after decommissioning. Reinstatement will commence on the completion of primary drilling but before the completion rig is mobilised. Works will include the removal of any drilling fluids and the mud within the sumps will be allowed to solidify. Sumps will then be mixed-buried-covered as per the Environmental Authority conditions.

Following the removal of the completion rig, further reinstatement will take place. The disturbance footprint will be reduced to an area of approximately 0.5ha including a hardstand. Ripping of compacted muds will be required before soil is replaced. Reinstatement will include site stabilisation and seeding with grasses as outlined in section 4.9.2. Re-profiling of cut and fill batters will not occur until final rehabilitation.

For well infrastructure final rehabilitation of well sites will include the following steps as required:

- Decommissioning/removal of infrastructure (to be addressed in a separate decommissioning plan)
- Cut and fill batters will be profiled to re-instate the land surface (section 4.7.6)
- Compacted hardstand areas will be ripped (section 4.7.7)
- Stockpiled topsoil will be respread (section 4.7.9)
- Topsoil will be seeded with pasture grasses, or native species where native vegetation is the required final land use (section 4.9)
- Fencing to exclude livestock during rehabilitation operations.

5.3 Tanks and stimulation dams

5.3.1 Description of activity

Proposed wells may require stimulation to enable successful gas production as part of the completion of the well. This will primarily be by hydraulic fracture stimulation.

Hydraulic fracture stimulation or hydraulic fracturing is an existing, proven and accepted well completion technology to increase the flow of fluids and gas from the target formation to the wellbore. Fraccing involves pumping fluid (usually water containing sand/silica grains) into coal cleats at a high rate and pressure to form and extend a fracture in the coal reservoir. This creates a high conductivity pathway to the well bore and increases the gas production capability from the well.

The stimulation dams, where practical, will be co-located on the well pad and will store water sourced from overland flow, underground water or treated CSG water infrastructure. Wherever feasible, it is recommended that dams may be replaced with tanks or bladders or a single dam that will service a network of wells.

Dams will be decommissioned once fraccing is completed and lease reinstatement is undertaken, or dams are replaced with alternative water sources.

After fraccing, the production fluids will be stored in either 4 mega litre tank located on a pad or central produced water dam before transport to a treatment facility for treatment. During the field development phase the containment facility are typically replaced with a water gathering system which gathers the produced fluid to pre-treatment dams prior to treatment through the Water Treatment Facility.

5.3.2 Rehabilitation process

Source water dams will be decommissioned once the hydraulic fracture simulation program has been completed. Produced water dams or tanks would be decommissioned once the pilot well meets its objective. If the development plan doesn't include the use of the dam or the landowner is not interested in the asset for agricultural use, decommissioning of the dam will take place within 6 months of a dam no longer being required and rehabilitation of the site will follow. The process of rehabilitation will be as follows:

- **Remove remaining water:** remaining water will be pumped out and transported to a water treatment plant for treatment

- **Remove synthetic liners:** options for recycling of the liner materials such as a feed stock for a *pyrolytic* process for the production of liquid fuels are being identified. Should appropriate recycling options not be identified liners will be disposed of in landfill
- **Management of clay core materials:** where clay has been used in embankments or as a liner, this would be respread, shaped and capped with topsoil for revegetation or stockpiled for reuse
- **Site profiling:** the dam embankments would be pushed in and depressions filled to return landforms to match surrounding topography. Any retained subsoil would be used to infill dams
- **Topsoil re-spreading:** topsoil will be placed to a minimum depth of 250mm in accordance section 4.7.9. The landform will be re-instated such that it will no longer function as a dam and will be stable
- **Revegetation:** revegetation will then take place in accordance with section 4.9.

Dams may also be decommissioned for a beneficial use provided it is agreed to by the landholder or the administering authority.

Produced water tanks would be decommissioned once the well meets its objective. The process for rehabilitating of tanks will involve the following:

- **Remove remaining water:** remaining water will be pumped out and transported to a water treatment plant for treatment
- **Removal of tank:** the tank structure will be removed and recycled
- **Break up of concrete:** the concrete foundations will be broken up and removed for recycling
- **Topsoil re-spreading:** stockpiled soil will be spread back over the area in accordance with section 4.7.9
- **Revegetation:** revegetation will then take place in accordance with section 4.9.

5.4 Gas and water gathering line

5.4.1 Description of activity

Flow from each well is separated into water and gas in a small vessel called a wellhead separator. After separation occurs at the wellhead, the low pressure CSG from each of the wellhead separators flows into a system of low pressure buried pipelines which will operate for the life of the Project.

Low pressure pipelines interconnect all wells operating in a specific area to form the gas gathering system. The entire gas gathering system up to the compressor facility will be constructed from high density polyethylenepipe (PE) buried at least 750mm below ground level.

The ROW for the gas and water gathering lines will be dependent on the number of parallel pipelines within the ROW and ground-truthed constraints.

Where possible, the gathering network will be installed in areas of previous disturbance. This includes adjacent to existing infrastructure, access tracks, property and fence boundaries where environmental impact is minimised.

5.4.2 Rehabilitation process

No additional disturbance outside of the existing operational footprint is expected.

Areas will be reinstated with back fill and topsoil being returned within three months after pipelaying and revegetation as outlined in section 4.9. Areas required to remain vegetation free during project operations (access tracks and areas above pipelines) will be revegetated with pasture grasses (where cropping is the final land use), or native grasses and ground cover species (where native vegetation is the final land use).

5.5 Ancillary disturbances for laydown and stockpiling

5.5.1 Description of activity

Laydown and stockpile locations are co-located with development areas and can relate to many disturbance types described in Table 18. These storage locations will accommodate the materials associated to the development project and store stockpiles of soils where required or where soil/vegetation overburden exists in the development. These storage areas are to operate in the short and long-term dependent upon their function; as such they will be available for rehabilitation at the end of useful or strategic function or at the completion of Project operations.

5.5.2 Rehabilitation process

Laydown facilities will be developed to effectively support the development activity. These laydown areas will be sized in accordance with disturbance limits.

Construction of laydown and stockpile areas will be undertaken as follows, once where necessary vegetation clearing, topsoil soil stripping and stockpiling has been completed:

- Where required cut and fill will be used to produce a flat pad and to minimise the requirements for cartage of additional fill material. Local material will be sourced for hardstand areas when required from borrow pits/quarries
- Contouring will be completed to ensure any existing runoff is diverted around the storage area using suitable erosion and sediment control devices.

5.6 Compressor station and booster stations

5.6.1 Description of activity

The Westside tenures have a number of compressor stations and multiple satellite booster stations. Gas enters a compressor station via the gas gathering system. The gas is compressed and dehydrated to remove any remaining water which may have been transferred with the gas through the gas gathering system. The compressed gas may then be sent to the high pressure gas pipeline system for transmission to the main gas transmission pipeline.

Compressors will not be decommissioned until Project completion; however, some small areas not required to remain open for Project operations will be progressively rehabilitated.

The compressor station equipment mainly consists of a raw gas inlet and separation system, a gas compression system, a gas dehydration system, and ancillary equipment.

5.6.2 Rehabilitation process

Disturbed areas not required for operations will be rehabilitated as outlined in section 4. Following decommissioning at the completion of the project the remaining areas associated with the compressor stations or booster stations will be rehabilitated to the surrounding land use in accordance with section 4.

Final rehabilitation of compressor stations and boosters will include the following steps as required:

- Decommissioning/removal of infrastructure (to be addressed in a separate decommissioning plan)
- Cut and fill batters will be profiled to re-instate the land surface (Section 4.7.6)
- Compacted hardstand areas will be ripped (Section 4.7.7)
- Stockpiled topsoil will be respread (Section 4.7.9)
- Topsoil will be seeded with pasture grasses, or native species where native vegetation is the required final land use (Section 4.9)
- Fencing to exclude livestock during rehabilitation operations.

5.7 Dams and tanks

5.7.1 Description of activity

Dams that operate for the storage of associated water include:

- Low hazard dams
- Produced water transfer dams
- Brine storage dams

Tanks that operate as associated water storage include:

- Break tanks for the gathering network and pumping station
- Feed tanks for the water treatment plant
- Brine storage tank

Dams and tanks have multiple purposes supporting CSG water management. During exploration, pilot ponds (low hazard dam) or tanks are used to evaporate produced water. During development dams and tanks can be used as transfer facilities, feed storage for water treatment, gathering breaks to assist in pumping to move water around the field prior to treatment. Brine ponds or brine tanks are used to store brine from the water treatment process and further evaporate the brine prior to the final salt disposal.

Depending on the contents to be stored in dams and the size of the dam determines the hazard assessment category, which is determined using the latest version of the *Queensland Government Manual for Assessing Hazard Categories and Hydraulic Performance of Dams*. The hazard assessment category influences the design of the dam, considerations to minimise the risk of loss of containment through seepage, overtopping or structural failure in accordance with the relevant hazard assessment category.

Tanks are not high hazard structures under the *Queensland Government Manual for Assessing Hazard Categories and Hydraulic Performance of Dams.* The tanks are designed for the storage of associated water with double liners and leak detection sumps.

5.7.2 Rehabilitation process

Dams will be maintained so as to prevent environmental harm until the dam is decommissioned. As per state policy and financial assurance arrangements, landholders upon whose land dams are built will be given the option to keep the dams for their own water storage purposes, if also agreed to by the administering authority. Prior to this occurring however any water entry point must be decommissioned to no longer accept in flow from petroleum activities, residue in the dam must be quantified and tested to demonstrate that it is safe and the contained water must be of a quality suitable for the intended ongoing use by the landholder or overlapping tenure holder.

Depending on the results of the testing of the residue, Westside will manage any waste with the appropriate controls for its transport, transfer and disposal.

Dams which are no longer required by any party will be decommissioned in a manner which avoids any ongoing environmental harm. Once the associated water or brine is removed, the dams will require rehabilitation to remove any source of potential contaminants and return the land to a useable form. The landform will be re-instated such that it will no longer function as a dam and will be stable. The process for decommissioning and rehabilitating the dams will involve the following major components:

- Remove and recycle synthetic liners, if present
- Complete an investigation of the bottom of the dam and the dam walls to identify any land contamination
- In the case were some leakage of the liner system has occurred a full contaminated land assessment will be undertaken as per the *National Environment Protection (Site Assessment) Measure 1999*
- Depending on the results of the investigation will determine the remediation solution for the dam. Options could include:
    - removal of soils to a waste facility
    - soils removed and treated in a remediation area adjacent to the dam
    - in situ treatment of contaminated soils where required through the site assessment
    - materials capped beneath the rooting zone and above any surface aquifers.
- Retain clay materials where clay has been used as part of the containment system. Clay will be stockpiled for reuse where appropriate or shaped and capped with topsoil for revegetation. Where clay cannot be reused, it will be ripped and covered with subsoil

Rehabilitate the site by pushing in dam embankments and filling in depressions to return landforms to match surrounding topography. Any retained subsoil would be used to infill dams and adequate topsoilor suitable amended growth medium for rehabilitation, guided by section 4.

Produced water tanks would be decommissioned once petroleum activities are completed. The process for rehabilitating produced water tanks will involve the following:

- **Remove remaining water:** remaining water will be pumped out and transported to a water treatment plant for treatment or disposed at a waste disposal facility that can accept the waste.
- **Removal of tank:** the tank structure will be removed and recycled
- **Break up of concrete:** the concrete foundations will be broken up and removed for recycling
- **Topsoil re-spreading:** stockpiled soil will be spread back over the area in accordance with section 4.7.9
- **Revegetation:** revegetation will then take place in accordance with section 4.9.

5.8 Water treatment plant

5.8.1 Description of activity

Westside tenures utilise water treatment facilities to treat produced water for beneficial uses like stock water, irrigation, dust suppression and construction activities.

The water treatment plant is connected to the field through a water gathering network and is buffered with above ground storage tanks strategically located to support the water gathering network.

The water treatment plant equipment is made up of feed tanks, pre-treatment facilities, reverse osmosis (RO) units in two 40ft containers, balance tanks, brine tanks, pumps, chemical tanks and chemical storage.

5.8.2 Rehabilitation process

Disturbed areas not required for operations will be rehabilitated as outlined in section 4. Following decommissioning at the completion of the project the remaining areas associated with the water treatment plant will be rehabilitated to the surrounding land use in accordance with section 4.7.6.

Final rehabilitation of compressor stations and boosters will include the following steps as required:

- Decommissioning/removal of infrastructure (to be addressed in a separate decommissioning plan)
- Cut and fill batters will be profiled to re-instate the land surface (section 4.7.6)
- Compacted hardstand areas will be ripped (section 4.7.7)
- Stockpiled topsoil will be respread (section 4.7.9)
- Topsoil will be seeded with pasture grasses, or native species where native vegetation is the required final land use (section 4.9)
- Fencing to exclude livestock during rehabilitation operations.

5.9 Access tracks

5.9.1 Description of activity

Access tracks provide temporary and permanent access to proposed facilities within the Westside tenures. These access tracks need to be constructed to form a slightly domed shape allowing water to shed through

appropriately placed erosion and sediment control devices and discharged into broad flat vegetated drains. In determining the location of access tracks, consideration is being given to the proximity of existing roads, the needs of the landowner and the local environment.

5.9.2 Rehabilitation process

Temporary access tracks not required for operations or to be retained by the landholder will be closed and reinstated to a condition compatible with the surrounding land use. This will involve ripping to remove compaction (section 4.7.7), re-spreading stockpiled topsoil (section 4.7.9), and re-vegetation following section 4.9.

Access tracks in existence prior to petroleum activities and where tracks are to be retained, any wheel ruts will be graded and erosion-control measures such as the construction of diversion drains will installed before handing back to the landholder.

5.10 Camps

5.10.1 Description of activity

Accommodation camps are co-located with laydown yards, compressor stations or well pads. Camps and support facilities and services will be provided during the construction phase including site offices, lunch rooms and ablution blocks. Accommodation facilities will include individual units, mess halls, recreational facilities, utilities, car parking, sewage treatment plants, administration facilities and waste management areas.

5.10.2 Rehabilitation process

Long-term camps will not be available for rehabilitation until after final project decommissioning. Disturbed areas not required for operations will be rehabilitated as outlined in section 4.

Following decommissioning at the completion of the project the remaining areas will be rehabilitated to the surrounding land use in accordance with section 4.

5.11 Drilling camps

5.11.1 Description of activity

Drilling camps (fly camps) are located central to the drilling campaign during the construction phase for a region or in regard to exploration and appraisal often a single location. These camps are co-located with laydowns or well pads. These camps include accommodation to house personnel, associated facilities such as site offices, lunch rooms, ablution blocks and parking. As these camps are to operate in the short-term they available for rehabilitation upon completion of the regional or site specific drilling activities.

5.11.2 Rehabilitation process

Temporary camps will be rehabilitated following the completion of use. The temporary camps are modular transportable buildings, they will be transported off-site and disturbed areas not required for operations will be rehabilitated to the surrounding land use in accordance with section 4.

5.12 Borrow pits

5.12.1 Description of activity

Borrow pits are an incidental activity under the *Petroleum and Gas (Production and Safety) Act 2004* (P&G Act) necessary for the construction of infrastructure.

Material to be extracted is likely to include gravel (for access tracks and drill pads) sand and clay (for lining dams). Borrow pits will be operational until the required material has been extracted. Borrow pits will be decommissioned and rehabilitated as soon as extraction is completed, when not needed for operational maintenance or as agreed by the landholder. Any ongoing landholder management of a borrow pit will be via development approval under the *Planning Act 2016*, where borrow pits are not exclusively used for petroleum activities.

5.12.2 Rehabilitation process

Backfilling of the site with subsoil is required to ensure the surface is in close alignment with the natural contours of the existing landscape while allowing for a lower surface due to material that has been extracted. Backfilling should be completed to ensure surface subsidence is avoided (section 4.7.5). Following the replacement of topsoil (section 4.7.9), direct seeding will be required (section 4.9).

6. Residual pollution risks and management and mitigation strategies

6.1 Notifiable activities

Activities that have been identified as likely to cause land contamination are listed in Schedule 3 of the *Environmental Protection Act 1994*. Under the Act, landowners or occupiers and local government must inform the Department of Environment and Science (DES) that land has been or is being used for a notifiable activity. Land that has been or is being used for a notifiable activity is recorded on the Environmental Management Register (EMR), which is maintained by DES.

Areas within the Westside tenures that include these notifiable activities will be registered on the EMR. Land may be removed from the EMR if the landowner or occupier has information that shows the listing was either incorrect, i.e. the land has not been used for a notifiable activity or that the land is not contaminated. Land is removed from the EMR if, after a site investigation report has been submitted to the administering authority, no contamination is found or work is done to satisfactorily remediate the land.

Section 6.3 provides an outline of the site investigation process to be employed in association with any land parcels where notifiable activities have taken place and or hazardous materials have been released.

6.2 Hazardous materials

The list of hazardous materials in use by development and operations within Westside tenure is centrally located in a register managed by the Stores team.

All chemicals will be stored and handled in accordance with the relevant legislative requirements and Australian Standards including the provisions of:

- AS 3780:2008 – the storage and handling of corrosive substances
- AS 3833:2007 – the storage and handling of mixed classes of dangerous goods
- AS 1940:2004 – the storage and handling of flammable and combustible liquids.

6.2.1 Notification of hazardous material release

Westside utilises a software database to manage incidents for all field activities conducted by the workforce including contractors.

The workforce is encouraged to report incidents and observations to support continual improvement. External environmental incident/spill reporting will be in accordance with current regulatory guidelines and the environmental authority. Westside will notify the DES Pollution Hotline (1300 130 372) or local office as soon as practicable after becoming aware of any release of contaminants not in accordance with the conditions of the environmental authority or any event where environmental harm has been caused or may be caused.

Westside has a Crisis and Emergency Management Plan to ensure incidents and emergencies are appropriately managed in accordance with the HSE policy.

6.3 Site investigation

Preliminary site investigations are conducted to determine the presence or absence of site contamination where notifiable activities have been conducted, where evidence of leakage or spillage of hazardous material is detected.

A preliminary site investigation will includes the following components:

- Development of a site history
- An inspection of the site
- A basic sampling program to determine if contamination is present
- Report preparation.

Investigations will be conducted by suitably qualified persons. The *Environmental Protection Act 1994* requires persons submitting contaminated site investigation reports to be members of a prescribed professional organisation listed in Schedule 8 of the *Environmental Protection Regulation 2008*. Persons conducting site investigations should hold appropriate qualifications and have experience relevant to the investigation.

A comprehensive site history of the investigation area will identify all past and present potentially contaminating activities. Information obtained from the site history research will be used to assess the potential for contamination on the site and determine the most appropriate locations for sampling. Sampling is required in areas where the site history research indicates that possible contaminating activities have been conducted. Site history information will be supported by all available copies of original site plans, local authority zoning records, flammable and combustible liquids licence details, sewage/trade waste and stormwater drainage plans, aerial photographs, environmental licences etc. All available evidence, including verbal interviews and analysis reports, will be included. Interviewees' relationship to site activities should be documented.

The possibility of contamination due to activities on adjacent land and the possibility of contamination extending beyond the site boundaries should also be examined.

Areas which have received imported fill should also be assessed.

Site investigations should be conducted in accordance with the *National Environment Protection (Assessment of Site Contamination) Measure 1999* and attending Schedules and the provisions of the *Environmental Protection Act 1994*.

6.4 Mitigation strategies

6.4.1 Dams

Dams are utilised for the storage regulated wasted including associated water, brine and other by-products. Therefore, dams have a risk, albeit low, to cause contamination if there was a failure in a liner.

6.4.2 Soils

Contaminated soils will be assessed following the *Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites*. Where remediation is required, contaminated soils will undertake further assessment and be remediated to site specific needs following the preferred order or options for site clean up and management:

- On-site treatment of the soil so that the contaminant is managed so the associated hazard is reduced to an acceptable level
- Off-site treatment of excavated soil so that the contaminant is managed so the associated hazard is reduced to an acceptable level, after which the soil is returned to the site.

Purpose built soil remediation areas may be established for the remediation of contaminated soil from various locations. Dependent upon the preferred order for site clean up contaminated soils may be transported to the purpose built soil remediation area for remediation. Following the removal of contaminated soils visual inspections and contamination testing will be undertaken to confirm that all contaminated soil has been removed.

Subject to assessment soil remediation strategies may include:

- Excavating contaminated soil and burying it at one location on-site (this reduces the number of areas containing contaminated soil)
- Installing horizontal, vertical or reactive barriers
- Constructing an engineered landfill cell on-site (for situations with shallow groundwater, permeable soils, leachable contaminants or very high results)
- Solidifying (locking contaminants in solidified matrix) or stabilising (converting contaminants to a less mobile and/or less toxic form, typically by chemical reaction) when contaminants are highly leachable, then incorporating with one of the above options
- Land farming volatile contaminants and reusing soil on-site (if no sensitive receptors are nearby)
- Land farming volatile contaminants at an off-site location then returning the soil to site
- On-site or off-site treatment, for example thermal desorption
- In situ biological (e.g. air stripping, sparging or venting) or chemical treatments. These can be considered for permeable soils but are usually slow processes.

7. Rehabilitation type

7.1 Rehabilitation hierarchy

The overall goal of rehabilitation is to reinstate land to the pre-disturbance land use unless otherwise agreed to by Westside, the landholder, and the administering authority. However, where this is not practical, final rehabilitation goals will be determined according to the following hierarchy, in order of preference.

1. Reinstatement of the previous land use (e.g. cropping and grazing).
2. Reinstatement of a self-sustaining progressive native ecosystem

7.2 Remnant native vegetation

7.2.1 Disturbance

Following decommissioning, all areas will be rehabilitated to a stable landform with self-sustaining vegetation, containing species similar to adjoining undisturbed areas.

7.2.2 Rehabilitation objective

The process of developing specific goals for individual sites for the species to be established, the required species diversity, the required abundance, the required ground cover and habitat variables, composition and the required cover percentage will involve the following:

1. Determine the correct Regional Ecosystem (RE) of the site to be disturbed as to the adjacent highest quality standing community
2. Assessment of adjacent land use to develop criteria for each RE for species diversity, composition, ground cover, habitat variables and foliage cover
3. Set criteria for each location were remnant revegetation recovery is undertaken
4. Monitor rehabilitation against set goals for the RE and that of the EA conditions

All infrastructure considers the ecological constraints, fauna corridors, pre-disturbance values and the surrounding landscape. This includes linking rehabilitated areas with undisturbed native vegetation to provide larger areas of wildlife corridors where feasible.

7.2.3 Rehabilitation technique

The aim of the rehabilitation following disturbance of all native vegetation is to restore a stable landform, with self-sustaining vegetation cover and species similar to adjoining undisturbed areas. There will be differences in the techniques for revegetation of the dominant species within each RE, based on these species natural regeneration processes in response to fire and other natural disturbances.

The general revegetation technique for native vegetation, upon decommissioning will be as required with preference to direct seeding as outlined in section 4.9.3. Planting of native vegetation will be a consideration post monitoring rounds and if required through observation may be undertaken to improve the species diversity, and cover percentage to achieve final acceptance criteria objectives.

The seed mix for areas of native vegetation will be determined by the vegetation composition of surrounding undisturbed areas. Consideration will be given to a seed mix including native grass species that will provide good protection from erosion in the short term but also allow shrubs and tree seedlingsto establish successfully. In areas where vegetation is removed, but the soil and roots are not extensively disturbed, natural regeneration only will be relied upon only for revegetation.

7.3 Flora species (and communities) of conservation significance

Eleven flora species and/or communities that are known to occur within the region and are listed as Endangered or Vulnerable under the EPBC Act and the *Nature Conservation Act 1992* (NC Act) and Near Threatened under the *NC Act*. A list of the known threatened ecological communities in the Brigalow Belt Northern Bioregion is provided in Table 19.

Table 19: Threatened flora and communities

Status[1]		Family	Scientific Name	Common Name	Source[2]	Records	Likelihood of Occurrence
NCA	EPBC						
E	E	*Acanthaceae*	*Xerothamnella herbacea*	–	PM/WO	23	High
NT	–	*Asteraceae*	*Rutidosis lanata*	–	WO	1	Low
V	–	*Cyperaceae*	*Cyperus clarus*	–	WO	1	Moderate
NT	–	*Euphorbiaceae*	*Bertya pedicellata*	–	WO	2	Low
V	E	*Poaceae*	*Dichanthium queenslandicum*	King Blue-grass	PM/WO	4	High
LC	V	*Poaceae*	*Dichanthium setosum*	Bluegrass	PM	0	Low
V	V	*Rhamnaceae*	*Polianthion minutiflorum*	–	WO	1	Low
E	E	*Solanaceae*	*Solanum dissectum*	–	PM/WO	28	High
E	E	*Solanaceae*	*Solanum johnsonianum*	–	PM/WO	48	High
E	–	*Solanaceae*	*Solanum elachophyllum*	–	WO	12	High
V	V	*Surianaceae*	*Cadellia pentastylis*	Ooline	PM/WO	2	Moderate

1. Status: LC = Least Concern, NT = Near Threatened, V = Vulnerable, E = Endangered, CE = Critically Endangered
2. Source: WO = Wildlife Online Database, PM = EPBC Protected Matters Report

7.3.1 Rehabilitation objective

The primary objective will be to avoid threatened ecological communities and populations of flora species of conservation significance. Where impacts are unavoidable, the rehabilitation objective in relation to significant flora is the successful rehabilitation of flora species, or successful translocation or establishment of offsets to ensure no net loss of individuals or populations (as determined as necessary from environmental surveys). The rehabilitation objective will be determined for specific sites where populations are detected on an individual species or ecosystem basis in regard to TECs on the advice of suitably qualified person with experience in rehabilitation and/or outlined in individual Species Management Plans.

7.3.2 Rehabilitation techniques

Natural regeneration will be used to rehabilitate areas containing flora species of conservation significance if the soil is not removed. Direct seeding or tree planting with native tree and shrub species representative of the RE and habitat will also be undertaken upon asset decommission. Translocation, propagation and replanting of tubestock of plant species will be undertaken where established to be effective for that particular species (refer to individual Species Management Plans and individual species recovery plans). Specific requirements for propagation by seed, cuttings or other techniques are outlined in Species Management Plans.

In addition to the general rehabilitation techniques listed above, the following specific control measures may need to be put in place during the rehabilitation process but are dependent upon site specific benefits:

- Install erosion and sediment control measures to protect the location/s of conservation significant flora from scouring and sedimentation without significantly altering surface waterconditions
- Avoid broad-scale spraying of herbicides for weed management in proximity to populations of flora species of conservation significance
- Undertake fencing of areas until plant populations have re-established, to prevent grazing or browsing damage
- Implement weed control measures where weeds are identified a threat to flora species of conservation significance as outlined in section 4.12Weed management
- Implement pest animal control measures as outlined in section 4.13
- Implement ecological fire management guidelines as outlined in section 4.14

7.4 Habitat of fauna species of conservation significance

Thirteen terrestrial fauna species of special conservation significance are known or considered possible occurrences within the Westside tenures. Threatened fauna known to be present and potentially present in the Project area are presented in Table 20.

Table 20: Threatened fauna

Scientific Name	Common Name	NC Act Status
Petauroides volans	Greater glider	Vulnerable
Phascolarctos cinereus	Koala	Vulnerable
Denisonia maculata	Ornamental snake	Vulnerable
Elseya albagula	Southern snapping turtle	Endangered
Rheodytes leukops	Fitzroy river turtle	Vulnerable
Falco hypoleucos	Grey falcon	Vulnerable
Geophaps scripta scripta	Squatter pigeon	Vulnerable
Grantiella picta	Painted honeyeater	Vulnerable
Hirundapus caudacutus	White-throated needletail	Special Least Concern
Rostratula australis	Australian painted snipe	Vulnerable

Scientific Name	Common Name	NC Act Status
Delma torquata	Collared delma	Vulnerable
Egernia rugosa	Yakka skink	Vulnerable
Furina dunmalli	Dunmall's snake	Vulnerable

7.4.1 Rehabilitation objective

For any new infrastructure proposed the primary objective is to avoid habitat of fauna species of conservation significance. Where impacts are unavoidable the rehabilitation objective in relation to fauna habitat is the successful rehabilitation of fauna species habitat through the return of habitat devices or fallen timber or via re-establishment of populations in translocation sites and/or establishment of offsets.

7.4.2 Rehabilitation techniques

Natural regeneration will be used to rehabilitate the habitat of fauna species of conservation significance where soil is not removed. Direct seeding or tree planting where required with native tree and shrub species representative of the adjoining undisturbed land and habitat will also be undertaken where required. It will be necessary to ensure rehabilitation includes food trees appropriate to the fauna species, the habitat, and land tenure type.

If habitat of species of conservation significance is located within riparian vegetation downstream of the clearing site or in adjacent wetland areas, the following measures will also be implemented but are dependent upon site specific benefits:

- Install erosion and sediment control measures to protect the habitat from scouring and sedimentation without significantly altering surface water conditions
- Minimise impacts of infrastructure on temporary shallow wetlands through alteration of drainage conditions or siltation
- Avoid the broad application of herbicides, insecticides and other chemicals near wetlands and other water bodies.

7.5 Pastoral land

7.5.1 Disturbance summary

Pastoral land occurs within the Westside tenures, including Class A crop land; Class B limited cropping land and Class C pastoral land as defined by the *State Planning Policy 1/92: Development and Conservation of Agricultural Land (GQAL Policy).*

7.5.2 Rehabilitation objective

The aim of rehabilitation is to restore the production potential of pastoral land. Westside will determine the required land use of individual properties in consultation with landholders. This will guide soil preparation, amelioration, fertilisation and determine the seed mix that is applied.

The process of identifying rehabilitation goals for individual pastoral properties is as follows:

1. Consult with landholders regarding final land use and seed mixes
2. Undertake grass check monitoring during monitoring activities and upon final rehabilitation
3. Undertake a final soil and land capability study after reinstatement.

7.5.3 Rehabilitation technique

Areas where grazing is the required final land use will be sown with appropriate pasture species, as agreed with landholders. Local native grasses may be used in some situations, such as where it is desirable to return an area to grazing on unimproved native pasture. Fencing off from stock, in negotiation with thelandholder, may be required to facilitate pasture establishment, until such time as sufficient vegetation cover has established to stabilise soils.

7.6 Cropping land

7.6.1 Disturbance summary

Class A GQAL (crop land) occurs in the Westside tenure and Strategic Cropping Land (SCL) also occurs in the area. The location of major infrastructure such as the plants, accommodation facilities and dams has been selected to minimise the impact to agricultural land's productive capacity.

Where possible, access tracks and associated pipelines have used existing tracks, fence lines and road reserves unless direct access through properties is required for health and safety reasons.

7.6.2 Rehabilitation objective

The aim of rehabilitation in regard to cropping land is to restore the production potential of cropping land. Westside will determine the required land use of individual properties in consultation with landholders. This, and the soils ground-truthing and mapping surveys will guide soil preparation. Although cropping is the desired final land use, areas may be sown with sterile grass species to stabilise soils.

The process of identifying rehabilitation goals for cropping land is as follows:

1. Consult with landholders regarding final land use and seed mixes
2. Undertake annual crop monitoring during monitoring activities and upon final rehabilitation.

7.6.3 Rehabilitation technique

Careful management of topsoil and subsoil will form an important component of the rehabilitation strategy and are discussed in section 4.7 to optimise the rehabilitation outcomes post disturbance. Access tracks will be constructed as prescribed in section 5.9. However, on cropping land, access tracks may not be gravelled and may be a wheel rut track only as determined via assessment of appropriate health, safety and environmental considerations. At the completion of construction, wastes will be removed, temporary access routes will be closed and soils will be replaced in the order in which excavation was carried out.

Before topsoil re-spreading on cropping land, where topsoil has been stockpiled, it may be re-analysed as required. If undertaken re-analysis will, as a minimum, require the analysis of pH, electrical conductivity, chloride, cations (calcium, magnesium and sodium), exchangeable sodium percentage and soil fertility (including nitrogen, phosphorous, potassium, sulphur and micronutrients). Additional nutrients (specifically

nitrogen and phosphorus-based fertilisers, depending on the type of revegetationplanned) or conditioners may be required to improve topsoils and return them to a productive state for cropping. Fertilisers and soil supplements will be used only as necessary and with the agreement of landholders where required from soil analysis or as a corrective action should rehabilitation prove unsuccessful.

Following topsoil re-spreading, areas will be sown with appropriate cover grass species or not, as agreed with landholders which may occur as reinstatement aligns to proposed cropping regime. Fencing off from stock, in negotiation with the landholder, may be required to facilitate grass establishment, until such time as sufficient vegetation cover has established to stabilise soils.

7.7 Riparian areas and watercourse crossings

Riparian areas and watercourses have the potential for higher biodiversity than the surrounding landscape. They provide water for many flora and fauna species adapted to specialist habitats characterised by permanent/semi-permanent surface water.

7.7.1 Rehabilitation objective

For any new infrastructure proposed the primary objective is to minimise impacts to riparian areas and watercourses. Where riparian areas cannot be avoided, mitigation measures will be adopted including minimising the area of disturbance and impacts on riparian vegetation and water quality. Mitigation measures are outlined in the Code for self-assessable development: *Temporary waterway barrier works and the Guideline – activities in a watercourse, lake or spring associated with mining operations.*

Where clearing of riparian vegetation is unavoidable the objective will be to rehabilitate the creek banks and riparian vegetation not required for operational use, as soon as practical, post-construction. This rehabilitation will be consistent with the surrounding environment and contours of the channel at the time of construction. A further objective is to minimise erosion and destabilisation of creek banks, and restore vegetation and fauna habitat.

7.7.2 Rehabilitation techniques

Rehabilitation of waterway crossings will involve re-contouring disturbed areas to match the surrounding land as soon as practicable after pipe laying and backfilling. Erosion controls will be constructed or installed, where necessary. The surface will usually be lightly scarified before spreading the topsoil, to promote vegetation re-growth and protect against the topsoil loss.

Rehabilitation will be undertaken in adherence to the *Code for self-assessable development: Temporary waterway barrier works* and the *Guideline – activities in a watercourse, lake or spring associated with mining operations,* ensuring that:

- Any water ingress into trenches will be handled with pumping from the trench utilising APIA Code methods for sediment and erosion control
- Temporary facilities such as waterway barriers will be removed and the areas rehabilitated
- Seed spreading will be carried out in areas at risk of erosion or in densely vegetated watercourses to enhance natural regeneration
- Pipelines will be backfilled and normal flow reinstated as soon as practicable.

7.8 Stock routes

For any new infrastructure as proposed the primary purpose of the stock route network is to provide for travelling stock, although other secondary uses may occur within a stock route. These other uses may include the short-term adjustment of parts of the route, the establishment of watering agreements with private landholders, and the construction and maintenanceof stock route facilities. A road that is a stock route may be used as a transport corridor for vehicles or for communication and utility infrastructure facilities, for example phone, power and gas lines. Impacts on stock routes will generally arise from the clearing of vegetation and ground disturbance associated with the laying of gas and water pipeline networks. No plant or water storage sites will be located within a stock route.

7.8.1 Rehabilitation objective

Parts of the stock route network disturbed or affected by works are to be rehabilitated upon completion of the project to a state that is safe for travelling stock and drovers, and the travelling public, and is consistent with the area's pre-disturbance state unless otherwise agreed by DES and the local government.

7.8.2 Rehabilitation techniques

Ground disturbance to stock routes will be rehabilitated as soon as practicable following the cessation of construction activities. Stock routes will be rehabilitated so as to return the disturbed areas to a status consistent with the surrounding area. Rehabilitation will be undertaken following the methods outlined in section 4.

8. Success criteria

8.1 By approval conditions

Rehabilitation success criteria are provided in the Westside Environmental Authorities listed in Table 21. Success criteria will be achieved through monitoring and compliance providing evidence of criteria met as prescribed in Table 21.

Table 21: Rehabilitation success criteria

Environmental Authority	Application	Success Criteria Rehabilitation 2 -4	Indicators	Measurable success criteria
EPPG00805913 (ATP 602) EPPG00704113 (ATP 688) EPPG00693213 (ATP 769) EPPG00622613 (ATP 2027) EPPG00783713 (PL94) EA0002230 (PL1048 & PL1049) EPPG00551013 (PPL26) EPPG00486113 (PPL61) EPSX01908114 (PPL182) Streamlined model conditions for future applications	All significantly disturbed areas no longer required for ongoing petroleum activities	Non-polluting	Land suitability Subsidence and erosion	No subsidence or gully erosion observed for at least five years
	All significantly disturbed areas no longer required for ongoing petroleum activities	The landform is stable	Subsidence and erosion	No subsidence or gully erosion observed for at least five years
	All significantly disturbed areas no longer required for ongoing petroleum activities	Land is re-profiled to consistent contours as to surrounding landform	Land suitability	Level of backfill and contours are consistent with surrounding landform or provides suitable stability
	All significantly disturbed areas no longer required for ongoing petroleum activities	Surface drainage lines have been re-established	Subsidence and erosion	No subsidence or gully erosion observed for at least five years within the originally disturbed location
	All significantly disturbed areas no longer required for ongoing petroleum activities	Topsoil is reinstated	Soil suitability	Topsoil layer is identifiable in the disturbance area that is reasonably equivalent to the undisturbed soil community
	All significantly disturbed areas no longer required for ongoing petroleum activities	Groundcover is growing	Foliage cover	A suitable vegetative layer has established to a similar condition of the undisturbed adjacent vegetation

Environmental Authority	Application	Success Criteria Rehabilitation 2 -4	Indicators	Measurable success criteria
	All significantly disturbed areas intended for landholder use or overlapping tenure holder	Greater than or equal 70% of native ground cover species richness	Vegetation richness	A suitable vegetative layer has established to a minimum 70% species richness of the undisturbed adjacent vegetation
	All significantly disturbed areas intended for landholder use or overlapping tenure holder	Greater than or equal to the total percent ground cover	Foliage cover	A suitable vegetative layer has established to a similar cover percentage of the undisturbed adjacent vegetation
	All significantly disturbed areas intended for landholder use or overlapping tenure holder	Less than or equal to the declared plant pest presence	Pest cover	Disturbed sites do not contain a greater density of declared pest plant species than present on the undisturbed adjacent vegetation
	All significantly disturbed areas intended for landholder use or overlapping tenure holder	Regional Ecosystem recovery	Regional Ecosystem	A Regional Ecosystem of the broad vegetation group to the adjacent vegetation is recovering through recruitment and displaying species present in stands of ecosystems of adjoining vegetation
	Significantly disturbed ESA/REs vegetation	Greater than or equal 70% of native ground cover species richness	Vegetation richness	A suitable vegetative layer has established to a minimum 70% species richness of the undisturbed adjacent vegetation
	Significantly disturbed ESA/REs vegetation	Greater than or equal to the total percent ground cover	Foliage cover	A suitable vegetative layer has established to a similar cover percentage of the undisturbed adjacent vegetation
	Significantly disturbed ESA/REs vegetation	Less than or equal to the declared plant pest presence	Pest cover	Disturbed sites do not contain a greater density of declared pest plant species than present on the undisturbed adjacent vegetation

Environmental Authority	Application	Success Criteria Rehabilitation 2 -4	Indicators	Measurable success criteria
	Significantly disturbed ESA/REs vegetation	A greater than or equal to 50% organic litter cover and density of coarse woody material is present	Fauna species diversity Habitat availability	Maintain a minimum 50% equal density of habitat structures such as coarse woody material and organic litter present in disturbance area in comparison to adjacent vegetation is present
	Significantly disturbed ESA/REs vegetation	Species belonging to the ecologically dominant layer (EDL) are present	Vegetation richness	All EDL species present in the best quality adjoin vegetation are showing recruitment or are present in the disturbance area

8.2 By disturbance type

Success criteria will apply to all areas irrespective of the type of infrastructure that was located on the site. However, there is certain infrastructure that will require specific criteria due to the nature of disturbance, such as evaporation dams. Success criteria specific to certain infrastructure are outlined in Table 22 below.

Table 22: Rehabilitation success criteria for specific disturbance type

Disturbance type	Rehabilitation objective	Indicators	Measurable success criteria
Borrow pits	Surface is in close alignment with the natural contours of the existing landscape while allowing for a lower surface due to material that has been extracted	Visual consistency Land surface	Level of backfilled borrow pits is consistent with surrounding soil, while allowing for a lower surface due to extraction
Pipeline ROWs (following backfilling and reinstatement)	A stable landform	Subsidence and erosion gullies	No subsidence or erosion gullies observed
	Exhibit no subsidence or erosion gullies for the life of the operational pipeline	Subsidence and erosion gullies	No subsidence or erosion gullies observed
	Be re-profiled to a level consistent with the surrounding soils	Land surface	Level of backfilled pipelines is consistent with surrounding soil
	Be re-profiled to original contours and established drainage lines	Land surface and drainage lines	Original contours and drainage lines re-established

Disturbance type	Rehabilitation objective	Indicators	Measurable success criteria
	Be visually consistent with surrounding land features	Visual consistency	Land features of pipeline ROWs are visually consistent with the surrounding area
	Be vegetated with groundcover as a minimum to ensure erosion is minimised	Vegetation cover	Landform is stable, with self- sustaining vegetation of similar composition to adjoining undisturbed land
Well sites	A stable landform	Subsidence and erosion gullies	No subsidence or erosion gullies observed
	Exhibit no subsidence or erosion gullies for operational life of the well/well pad	Subsidence and erosion gullies	No subsidence or erosion gullies observed
	Be re-profiled to a level consistent with the surrounding soils	Land surface	Level of well site/pad is consistent with surrounding soil
	Be re-profiled to original contours and established drainage lines	Land surface and drainage lines	Original contours and drainage lines re-established
	Be visually consistent with surrounding land features	Visual consistency	Land features of the well site/pad are visually consistent with the surrounding area
	Be vegetated with groundcover as a minimum to ensure erosion is minimised	Vegetation cover	Landform is stable, with self- sustaining vegetation of similar composition to adjoining undisturbed land

8.3 By rehabilitation type

Rehabilitation success criteria will also differ by the final land use (rehabilitation type) of the area to be rehabilitated, as outlined in Table 23.

Table 23: Rehabilitation success criteria based on rehabilitation type

Rehabilitation type	Rehabilitation objective	Indicators	Measurable success criteria
Watercourse crossings	Rehabilitation consistent with surrounding environment and contours of the channel at the time of construction	Erosion control measures in place Channel contours Water quality	• Erosion is minimised with appropriate sediment traps and erosion control measures installed as determined by a suitably qualified person • Creek rehabilitation will be consistent with surrounding environment and contours of the channel • No ongoing contamination of waterways
Native vegetation	Rehabilitation consistent with surrounding vegetation and environment	Vegetation presence Land holder satisfaction	• Rehabilitation will be similar to the species of surrounding vegetative environment • Landholder is satisfied that no greater management input than for other land in the area being used for a similar purpose is required.
Validated cropping land	Restore the production potential of cropping land	Land holder satisfaction Land suitability	• Landholder is satisfied that no greater management input than for other land in the area being used for a similar purpose is required for it be used for cropping. • All significantly disturbed land is reinstated to the pre- disturbed land use.
Grazing land	Restore the production potential of pastoral land	Pasture condition Land holder satisfaction	• Pasture condition is similar to the condition of adjacent pastures. • Landholder is satisfied that no greater management input than for other land in the area being used for a similar purpose is required for it be used for grazing

Rehabilitation type	Rehabilitation objective	Indicators	Measurable success criteria
Stock routes	Safe for travelling stock and drovers, and the travelling public	Subsidence and erosion	• No subsidence or major erosion gullies
	Consistency with the areas pre-disturbance state	Land surface and drainage lines	• Original contours and drainage lines re-established

9. Monitoring and compliance reporting

9.1 Monitoring type, method and frequency

9.1.1 Monitoring post-construction

9.1.1.1. Visual monitoring

A regular monitoring regime is undertaken to ensure management actions for the prevention of erosion and sedimentation during vegetation clearing, topsoil stripping, subsoil management, stockpiling activities, rehabilitation activities, weed control, water diversion, erosion and sediment control activities and watercourse protection activities are being implemented and are appropriate for the site conditions:

- Visual monitoring using a checklist (and photographic records, where they exist) to ensure all actions are being implemented in accordance with the requirements outlined in this plan
- Formal inspections using a checklist (and photographic records, where they exist) to ensure there are no incidences of soil subsidence or erosion resulting from construction activities and to identify any erosion repair works that might be required
- Following high rainfall events watercourse crossings of pipelines and tracks will be inspected to assess the stability of the channel and banks
- Record keeping of the above in a GIS database or Westside server.

A significant focus of monitoring is completed during the warranty period (usually 1 year) provided by the construction contractor. Any defects in rehabilitation like subsidence, soil inversion, poor germination is then the responsibility of the contractor.

For self-performing projects the focus is still to complete the monitoring during and at completion of construction to ensure the reinstatement has been completed correctly, there is a stable landform and sufficient cover.

Visual checks are completed on a daily basis by the contractors and Westside field staff during construction, with any anomalies being reported immediately for rectification. Formal inspections are undertaken on a monthly basis by the environmental advisor or land access advisor to ensure reinstatement and rehabilitation is competed and successful.

9.1.1.2. Vegetation monitoring

Once reinstatement activities have been successful and progressive rehabilitation of petroleum assets has begun an annual vegetation monitoring program is undertaken to ensure reinstatement and progressive rehabilitation is on track to meet the final rehabilitation criteria at the end of petroleum activities. Westside uses a checklist approach to document the rehabilitation over time to provide the required documentation for the final rehabilitation certification.

Westside works with landowners for pasture monitoring which includes recording the condition of pastures, timber and soil, and estimating sustainable production rates. Monitoring measures the cover of grass species including annual, perennial, native and introduced grasses. Westside utilises the monitoring to provide information to landowners to sign off on the rehabilitation work undertaken on their properties and to enable handing the site back to the landowner.

9.1.1.3. Weed monitoring

The distribution of weeds will be recorded through an active inventory of declared and environmental weeds, including the distribution of weeds within rehabilitated areas. All staff and contractors will be trained in the identification of weeds and required to report their occurrence to the Land access or Environment Advisor.

Monitoring of the extent and distribution of weed populations including new infestations and weeds within rehabilitated areas will include the following:

- Monitoring will include previously disturbed and rehabilitated areas, retained vegetation, and buffer areas
- Monitoring of known weed infestations will be taken before and a suitable time frame after treatment to determine treatment success
- Photos will be taken prior to and a suitable time frame after treatment applications to provide a visual assessment of the effectiveness of methods to reduce weed density
- Record keeping of the above in a geographic information system (GIS) database

9.1.2 Monitoring on the completion of the rehabilitation

Monitoring and reporting will be completed to meet the success criteria in Table 21 at the end of petroleum activities. Checklists will be completed at different stages of infrastructure development, predominately upon work site transfer and for site handover. High risk areas like erosive soils, creek crossings, cut and fills, flood prone areas will be identified by the environmental advisor or land access advisor for higher frequency monitoring. Sign-off of rehabilitation works is required on completion to ensure rehabilitation has been undertaken to the required standard.

9.2 Data and document management

Westside has a data management system that includes:

- a GIS with the GPS locations of monitoring points and GIS layers for certain variables that are monitored where practical
- procedures and check lists to ensure all rehabilitation steps are recorded
- a photographic record of all photo monitoring, where they exist, with the GPS locations and direction of orientation off all photo monitoring points.

9.3 Compliance reporting, contents and frequency

9.3.1 Environmental authority reporting

Westside reports to the administrating authority regarding the status of disturbance, progressive rehabilitation and final rehabilitation associated with project activities. Detailed schedule of disturbance is submitted to the administering authority as part of the annual return processes. Disturbance and rehabilitation spatial data is supplied as part of the Environmental Rehabilitation Cost and the Plan of Operation (for P&G 2004 tenures) and annual return process.

10. Responsibility

10.1 Westside

10.1.1 Inductions and training

Westside will develop inductions and training for all staff and contractors undertaking rehabilitation works, to ensure they are familiar with the procedures outlined in this Rehabilitation Plan and are able to locate and report weed infestations and other hazards.

10.1.2 Field Superintendent/Environment Advisor/Land Access

The Field Superintendent is accountable for the rehabilitation outcomes.

The Field Development Manager will be responsible for determining if site specific control measures (such as erosion and sediment control measures and weed control) are required.

The in Land Access/Environmental Advisor will be responsible for undertaking on-site checks to ensure the procedures in this Rehabilitation Plan are followed.

11. Definitions, Abbreviations and Documents

11.1 Definitions

In this document, the following definitions apply:

Table 24: Definitions

Term	Definition
Decommissioning	To withdraw something from active service. This typically involves the removal of project infrastructure on the completion of a project.
Progressive Rehabilitation	The process by which significantly disturbed areas are rehabilitated to their pre-disturbance land use with the same species and density of cover to that of surrounding undisturbed areas, as soon as practicable following the completion of any construction or operational works
Recovery	The process of protecting, conserving and managing a listed threatened species or a listed threatened ecological community
Regeneration	Vegetation that regenerates naturally (i.e. without the assistance of human intervention) from existing seed banks, suckering or coppice growth
Rehabilitation	Means the process of reshaping and revegetating land to restore it to a stable landform and in accordance with acceptance criteria set out in relevant environmental approvals and, where relevant, includes remediation of contaminated land
Reinstatement	The process of bringing the construction earthen landscape back to the original profile of the surrounding environment, including the stabilisation of the site. This can include seeding with grasses to stabilise the site.
Remediation	To take action to repair or mitigate damage that may or will be, or that has been, caused to a MNES or an EVNT listed species Remediation, in reference to contaminated land, means: a) rehabilitate the land; or b) restore the land; or c) take other action to prevent or minimise serious environmental harm being caused by the hazardous contaminant contaminating the land
Revegetation	The use of direct seeding or tubestock to support an area achieving the pre-clearance native vegetation or regional ecosystem

11.2 Abbreviations

In this document, the following abbreviations apply:

Table 25: Abbreviations

Term/Abbreviation	Meaning
APIA	Australian Pipeline Industry Association
ATP	Authority to Prospect
CCA	Conduct and compensation agreement
CSG	Coal seam gas
DES	Department of Environment and Science
EA	Environmental Authority
EDL	Ecologically dominate layer
EMP	Environmental Management Plan
EMR	Environment Management Register
EMS	Environment Management System
EP Act	Environmental Protection Act 1994 (Queensland)
EPBC Act	Environmental Protection and Biodiversity Conservation Act 1999 (Commonwealth)
ESA(s)	Category A, B and C Environmentally Sensitive Areas as mapped by DES and defined by DES
EVNT	A species listed as endangered, vulnerable or near threatened under the NC Act or threatened species under the EPBC Act.
GIS	Geographic Information System
GPS	Global Positioning System
GQAL	Good Quality Agricultural Land as defined by Planning Guidelines: the Identification of Good Quality Agricultural Land (Queensland)
HSE	Health, Safety and Environment
HSEMS	Health Safety Environment Management System
IECA	International Erosion Control Association
LNG	Liquefied Natural Gas
MNES	Matters of National Environmental Significance listed under the EPBC Act
NC Act	Nature Conservation Act 1992 (Queensland)
PE	Poly Ethylene Pipe
PL	Petroleum Lease
PLA	Petroleum Lease Application
PPL	Petroleum Pipeline Lease
RE	Regional Ecosystem

Term/Abbreviation	Meaning
RoW(s)	Right of Way(s)
SCL	Strategic Cropping Land
SEVT	Semi Evergreen Vine Thicket
TEC	Threatened Ecological Community listed under the EPBC Act

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13. Plan certification

I Rob Ully (Bachelor of Science & Watershed Management Dip.), am a suitably qualified person as defined as a person who has professional qualifications, training or skills or experience relevant to the nominated subject matters and can give authoritative assessment, advice and analysis about performance relevant to the subject matters using relevant protocols, standards, methods or literature.

I certify that this plan demonstrates the following:

- relevant material, including current published guidelines (where available) have been considered in the written document;
- the content of the written document is accurate and true; and
- the document meets the requirements of the relevant conditions of the Westside environmental authorities.

Signature: