Arrow CASS Tie-in

Regional Planning Interests Act 2014

Assessment Application Report

Lot 3 RP77715

RPI25/004

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Contents

1. Executive Summary

As part of the Surat Gas Project (SGP), Arrow Energy (Applicant) is mitigating its impact on the Condamine Alluvium through its Condamine Alluvium Substitution Scheme (CASS). The scheme is designed to mitigate the low level of interconnectivity between the Condamine Alluvium and the Walloon Coal Seams by returning treated water to landholders in the area of expected impact, for agricultural irrigation use.

Rather than use an agreed amount of their water allocation, participants in the scheme will use Arrow's treated water. The volume of water returned will be based on the total volume of water predicted to be extracted through coal seam gas production, with Arrow providing substitution year-round through a 'multiplier' calculation to ensure that participants are no worse off through scheme participation, meaning farmers will be delivered more water than their existing licences.

The additional water provided to participating landholders could result in production yield on these farms increasing and the impact on the Alluvium from water take, will be lessened given the reduction of the revoked allocations. The water to be provided will be treated to a standard to a higher specification than is required under the Australian and New Zealand Environment and Conservation Council (ANZECC) and Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ) (2000) water quality guidelines.

The treated water will be delivered to the southern part of Arrow's tenure via the proposed Beneficial Use Water pipeline via two Beneficial Use Networks (BUNs). The small buried, connection pipeline and pipeline valve that are the subject of this application are a key component of the southern BUN. This infrastructure will be located on a cropping property owned by Arrow Land Holdings Pty Ltd, Lot 3 RP77715. This lot size is 500 hectares and when operational, the water valve fenced out area will be 0.0016 hectares in size.

2. Purpose

The purpose of this application is to seek approval to undertake temporary petroleum activities within an Area of Regional Interest including Priority Agricultural Area (PAA) and Strategic Cropping Area (SCA) on Petroleum Lease 252 (PL252). This report provides the required supporting information for an application for a Regional Interest Development Approval (RIDA) under the *Regional Planning Interests Act 2014* (RPI Act).

2.1 Scope

The scope of this application is a project described as the Condamine Alluvium Substitution Scheme Tie-in (CASS Tie-in). Infrastructure to be installed is a pipeline valve and a single 12 m length of buried High-Density Polyethylene (HDPE) pipe (nominal outer diameter of 630 mm) tie in between key parts of the treated water pipeline distribution network.

The scale of impact is 0.3 hectares during the construction phase and 0.0016 hectares during operation, and the activities can be fully restored when the tenure expires and the broader coal seam gas (CSG) activities in the area cease.

All impacted land areas will be returned to their previous land use at the completion of the CSG activities.

The project is proposed to occur on land located on Lot 3 RP77715 owned by Arrow Land Holdings Pty Ltd ("the Land"). Lot 3 RP77715 is 500 hectares in size. The proposed works occur within PL252 which is covered by Environmental Authority (EA) EPPG00972513. PL252 is currently scheduled to expire in 2038.

2.2 Context

Section 29 of the RPI Act requires that a RIDA be accompanied by a report that:

- Assesses the resource activity or regulated activity's impact on the area of regional interest; and
- Identifies any constraints on the configuration or operation of the activity.

The *RPI Act Guideline 01/14 - How to make an assessment application for a regional interests development approval under the Regional Planning Interests Act 2014* and supplemental guidelines describe the matters to be addressed by an assessment application report. Table 2-1 lists these requirements and a reference to the sections of this report where they are addressed.

Table 2-1 - Assessment Report Information Requirements

Information Requirement	Where Addressed
The location, nature, extent (in hectares) and duration of the surface impacts of the proposed activity.	Sections 3.5 & 6
A description of the impact of the proposed activities on the feature, quality, characteristic or other attribute of the area.	Section 10.1
Include a table identifying the location and surface area of each of the proposed activities.	Table 3-2
The report must also include an explanation of how the proposed activity will meet the required outcome/s and address the prescribed solution/s contained in the assessment criteria for the area of regional interest.	Section 10.1

2.3 Applicant

The Applicant for this assessment application is the resource authority holder for PL252; Arrow Energy Pty Ltd ABN 73 078 521 936 and Arrow CSG (Australia) Pty Ltd ABN 54 054 260 650 (see Appendix A).

The owner of the Land that is subject to this application is Arrow Land Holdings Pty Ltd ACN 117 510 844 ("the Landowner") (see Appendix B).

3. Proposed Works

3.1 Description of Work Activities

Arrow Energy's Surat Gas Project (SGP) is supporting the move to a cleaner energy system by unlocking new natural gas supplies in southwest Queensland. The project is underpinned by a 27-year gas sales agreement with the Walloons Coal Seam Gas Company and allows Arrow to use existing QGC-operated infrastructure, thereby minimising our impact on landholders and the community.

Over the 27-year contract, the SGP aims to deliver approximately five trillion cubic feet of natural gas to the market, equivalent to 600 terajoules per day, enough energy to meet the needs of over four million homes.

The SGP involves the construction of up to 2500 new coal seam wells and supporting infrastructure across Arrow's Surat Basin tenure. Arrow is investing more than $70 million to improve local roads in the area as part of the project. This investment not only ensures a safer road network but also leaves a lasting positive legacy for the community and the local agricultural industry.

Arrow is undertaking the CASS project to develop the necessary treated water infrastructure to facilitate obligations under the *Environment Protection and Biodiversity Conservation Act 1999* to offset the impact to the Condamine Alluvium from Arrow's SGP CSG development. The scheme provides water to landholders who have agreed to take the water in lieu of using their irrigation allocations from the Condamine Alluvium. Guided by the community, the primary objective of Arrow's CASS is to offset the impact of Arrow's CSG-related activities on the Condamine Alluvium's groundwater resources in Arrow's largest predicted drawdown.

The physical distribution of this water – between various CSG water treatment facilities and end users' delivery points – will be through Arrow's Beneficial Use Network (Figure 3.1). The water is available for agricultural uses including irrigated cropping. The final extent of the entire infrastructure network will depend on the number and location of end users that sign up to the scheme.

The CASS tie-in (the subject of this application) facilitates a possible future expansion of the network to users to the north of the tie-in point.

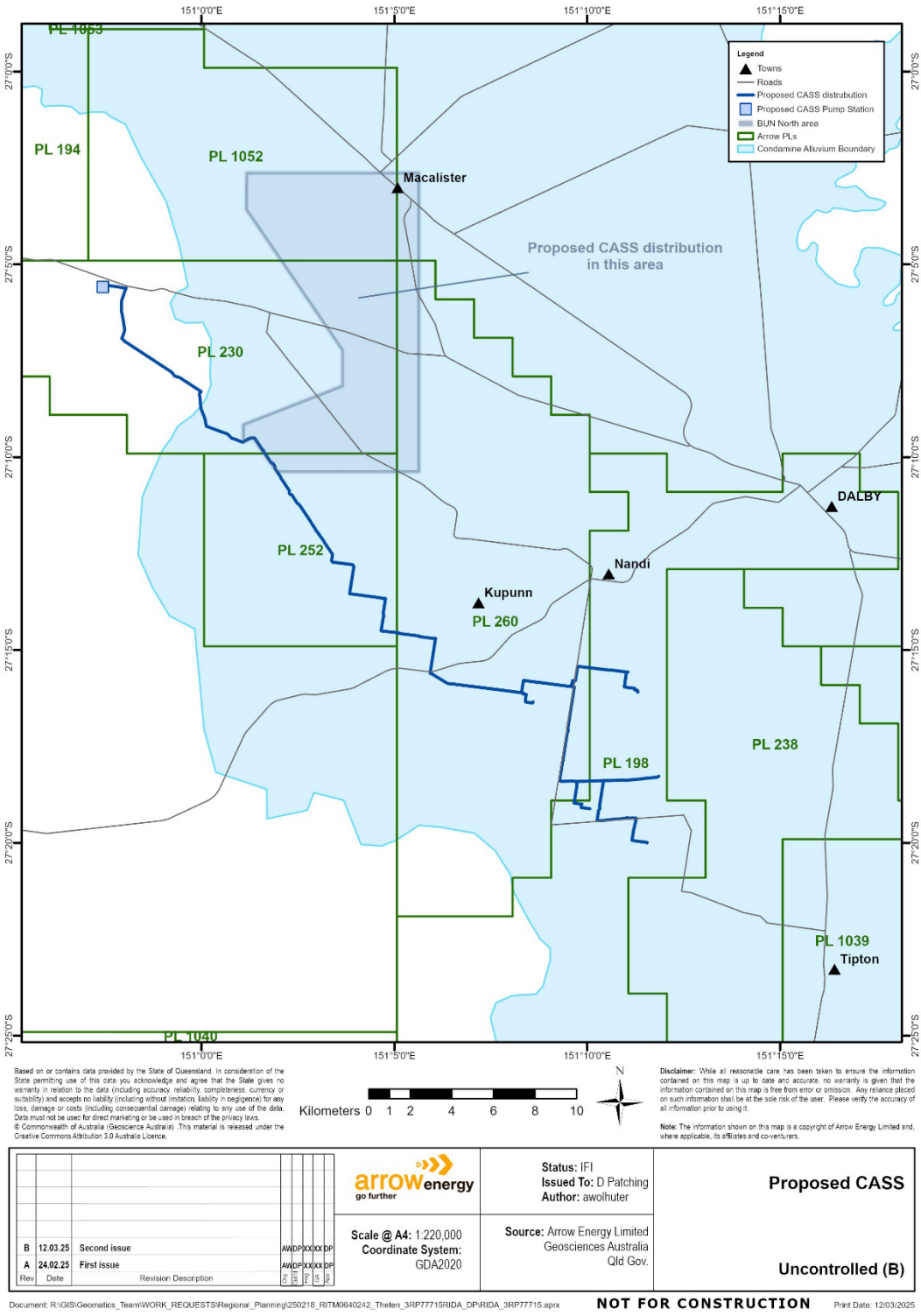

Figure 3.1 Proposed CASS network

Most of the CASS will be located on private properties and constructed under executed Conduct and Compensation Agreements (CCAs) with relevant landholders.

Above ground valves are required on connecting pipelines to allow sections of pipeline to be isolated, with an operational footprint of two-by-two metres. The valve, a single l12 m length of pipe (capped at this stage) and supporting pipeline form the entirety of the activity to be considered under this application. The valve will be located near existing access tracks and/or fence lines to minimise the impact on landholder activities.

Images of a valve during construction and then post rehabilitation are included in Plates 3-1 and 3-2 below. A standard drawing of the valve assembly is included as Appendix H.

Plate 3-1 – Image of valves during construction

Plate 3-2 – Image of a valve post reinstatement

3.2 Definition of Work Activities

The table below outlines the definition of the four phases of the activity, including work activities that are the subject of this application.

Table 3-1 – Activity Definitions

Activity	Definition
Construction of Tie-in and valve. A proposed direct disturbance of 0.3 hectares, expected duration two months.	1. Establish pre-activity soil conditions. 2. Conduct inspection/photographic records and collect soil samples. 3. Conduct site preparation using an existing access track and using previously disturbed areas wherever possible. 4. Digging trenches and bell holes within the identified disturbance area and stockpiling of spoil. Maintain separate soil stockpiles for different soil horizons. 5. Installation of HDPE pipe sections and a pipeline valve. 6. Backfill of the trench and bell holes using existing materials. 7. Installation of a two-by-two metre fenced-out area to facilitate valve operation. 8. Undertaking reinstatement and rehabilitation of the balance of the disturbance area, including: a. Conduct soil testing to confirm productivity potential or identify remediation requirements. b. Apply fertiliser and or ameliorants to assist with restoration of productive capacity.

Operations A proposed direct impact of 0.0016 hectares; shadow areas impact to 0.05 hectares, expected duration is life of tenure.	1. Operation and maintenance of the valve and associated pipeline/s. 2. Undertaking inspections and monitoring on a periodic basis. 3. Conduct regular inspections of the condition of the rehabilitated areas and fences and signage. 4. Conduct maintenance as required. Monitor rehabilitation activities as required.
Decommissioning A proposed maximum direct impact of 0.3 hectares during rehabilitation works, expected duration is two months.	1. Preparation of an Abandonment Plan and a Final Rehabilitation Plan. 2. Removal of above ground infrastructure. 3. Make safe any decommissioned pipelines.
Restoration A proposed final disturbance of 0 hectares.	1. Conduct initial rehabilitation activity. 2. Conduct soil testing to confirm productivity potential or identify remediation requirements. 3. Apply fertiliser and/or ameliorants to restore productive capacity. 4. Conduct final restoration inspection and sign-off.

3.3 The Land

The Land is described in Table 3-2:

Table 3.2 – The Land

Item	Description
Land	Lot 3 RP77715
Address	Daandine Nandi Road, Ranges Bridge
Area of Land	500 ha
Property Name	Theten
Land Owner	Arrow Land Holdings Pty Ltd ACN 117 510 844
Land Purchased	18 September 2009
Local Government	Western Downs Regional Council (formerly Wambo Shire Council)
Zoning	Rural

Regional Plan	Darling Downs Regional Plan
Area of Regional Interest	Priority Agricultural Area (PAA) and Strategic Cropping Area (SCA)
Land	Portion of Lot 3 RP77715
Expected Area of Impact on the Land (Includes shadow areas)	**Construction:** 1.38 ha or 0.27 per cent of the Land (includes shadow area that indirectly precludes PALU activity during construction period of 8 weeks) **Operations:** 0.82 ha or 0.16 per cent of land area (includes shadow area that indirectly precludes PALU activity and all CSG activity on Lot3 RP77715) **Decommissioning:** maximum of 0.3 ha or 0.06 per cent of the land. Necessary to ensure all above ground infrastructure can be removed and the area restored to previous PALU activity and productivity. **Restoration:** 0 ha.

Subject Land

The Subject Land (Lot 3 RP77715), along with four other farming lots, is owned and operated by Arrow Land Holdings Pty Ltd as a single cropping enterprise. The remainder of the original Theten is leased by a third party and used for cattle grazing.

Table 3-3: Property Lot on plan areas

LOTPLAN	Owner	LOT_AREA (Ha)	PALU land on Lot (Ha)
26DY771	ARROW LAND HOLDINGS PTY LTD	245.34	193.50
1RP196767	ARROW LAND HOLDINGS PTY LTD	179.78	166.21
2RP196767	ARROW LAND HOLDINGS PTY LTD	181.61	147.20
3RP77715	ARROW LAND HOLDINGS PTY LTD	508.98	503.00
3RP196767	ARROW LAND HOLDINGS PTY LTD	224.59	69.27
Totals		1340.29	1079.18

The five lots are owned by the same entity (Arrow Land Holdings Pty Ltd), are adjacent to each other and are operated as a single agricultural enterprise that meets the definition of a “property” in Schedule 1 of the RPI Act.

The Subject Land is 1340 hectares in size with PALU activity conducted over 1080 hectares. The Queensland Land Use Mapping Program (QLUMP) land use data identifies activities on the property as a mixture of PALU and non-PALU agriculture, including livestock grazing, dryland cropping and irrigated cropping, wetland and natural areas.

In addition to these activities, Arrow conducted an irrigation trial on the Subject Land on the southwestern side of Lot 3 RP77715 from October 2012 to January 2019. These trials (three centre pivots) are evident on the Crop Frequency analysis report, see Appendix G. These trials were successful and produced irrigated sorghum, chickpeas and mung beans, in addition to the dryland crops of corn, chickpea, wheat, sorghum, mung beans and barley.

The irrigation trials on Lot 3 RP77715 are now complete and the south-western end of this Lot will be returned to dryland cropping as there is no permanent source of water / access to underground water to enable irrigation.

See Appendix D for a map of current PALU areas on Lot 3 RP77715 and a map of the current PALU areas on the Subject Land.

Current Land Use

The current land use on the Subject Land is agricultural production including dryland cropping and irrigated cropping.

A PALU assessment consistent with requirements of *RPI Act Statutory Guideline 07/14 How to identify a Priority Agricultural Land Use (PALU)* has been conducted with the assistance of Arrow’s Farm Manager for the Subject Land (See Appendix D.)

The predominant land use is PALU, in particular dryland and irrigated cropping. Of note, the small footprint associated with this application does not significantly interfere, directly or indirectly, with the identified PALU activity on Lot 3 RP77715. Indirect impact and impacts to neighbouring properties (for example, impact to overland flow during the construction phase) will also be minimal and managed to ensure there is no impact to production on neighbouring properties.

The Subject Land also has a history of CSG activities that co-exist with the priority agricultural activities, including:

- production wells
- microwave communications tower
- water pipelines
- gas pipelines
- geo-tech survey points, and
- water bores.

Due to the temporary nature of the Project, the duration and limited extent of the expected area of impact of the proposed petroleum activities, there will not be significant impact on the use of the land for agricultural purposes.

Arrow policy manages the agricultural activity on the land as a separately owned property. In this way, activity is subject to the Land Access Code and a Land Liaison Officer manages all communication with the Farm Manager, who is consulted before any CSG activity is undertaken. This ensures that there is minimal disturbance to normal agricultural activity.

Surrounding Land Uses

The current agricultural land use of parcels surrounding this application is dryland and irrigated cropping of grain, legumes, cotton and oilseed crops, with some isolated patches of remnant vegetation and areas used for grazing of cattle. The area also hosts pre-existing CSG infrastructure (See Figure 3.4).

Figure 3.3 illustrates the land use mapping (from QLUMP).

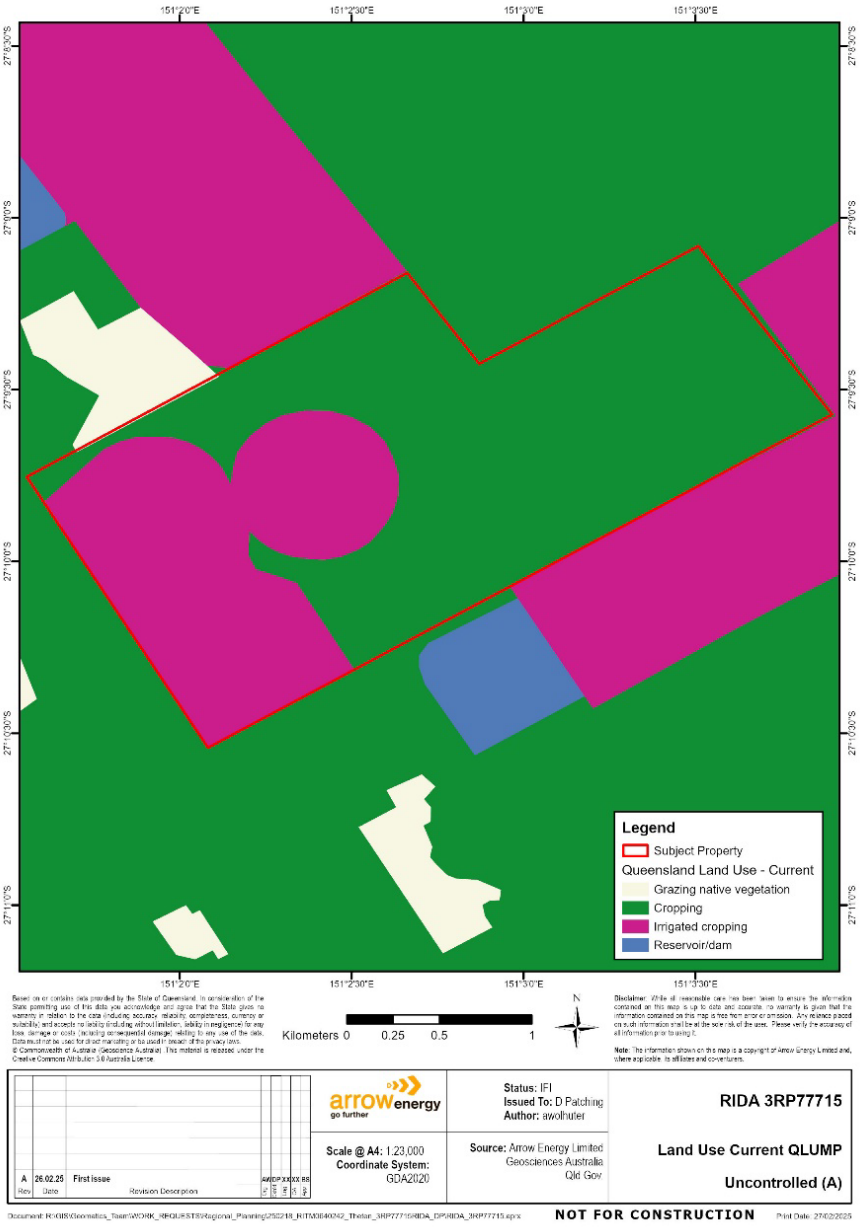

Figure 3.3 QLUMP land use

Some neighbouring properties to the south and east of the Subject Land have established the collection of overland flow water for use in irrigated cropping activities.

Overlapping Resource Tenures

The only overlapping resource authority over the Subject Land of this application is an Exploration Permit for Coal, EPC899, which partially overlaps Lot 3 RP77715. EPC899 is held by New Emerald Energy and is currently due to expire in April 2025. New Emerald Energy is currently in administration. Irrespective, Arrow is not required to have an overlapping tenure agreement with New Emerald Energy Pty Ltd as only one party (Arrow, the petroleum resource authority holder) holds a production tenure, i.e. PL252.

Easements

No easements have been identified on the Subject Land.

Road Reserves

There are no road reserves on the Subject Land.

3.4 Existing Authorities

The Land is subject to existing authorities described in Table 3.4 below:

Table 3-4: Existing authorities

Tenure	PL252
Tenure granted	20 September 2008
Tenure expiry	19 September 2038
Tenement Holder	Arrow Energy Pty Ltd Arrow CSG (Australia) Pty Ltd
Environmental Authority	Permit No: EPPG00972513 (Effective 28 November 2024)

3.5 Location of tie-in and valve for CASS

See the below Figures 3.4 and 3.5 for the planned location of the tie-in valve and consequent disturbance footprint.

The current proposed location takes advantage of the already existing Right of Way (ROW) which includes the Beneficial Use Water Pipeline (Petroleum Pipeline Licence application 2058). The location between the irrigation pivots and the southern boundary of the property was chosen as 1) it minimises the impact of the infrastructure on future farming; and 2) the productivity of this area is lower due to the lack of previous irrigation.

The existing ROW deviates from Lot 2 RP99604 and onto Lot 3 RP77715 in the vicinity of the Stratheden Wellpad 70, therefore limiting our impact on PALU by siting infrastructure as close as possible to the farm boundary. The location of this infrastructure provides Arrow with the opportunity to install the tie-in valve on Lot3 RP77715 without directly disturbing the neighbouring land parcel, Lot 2 RP99604.

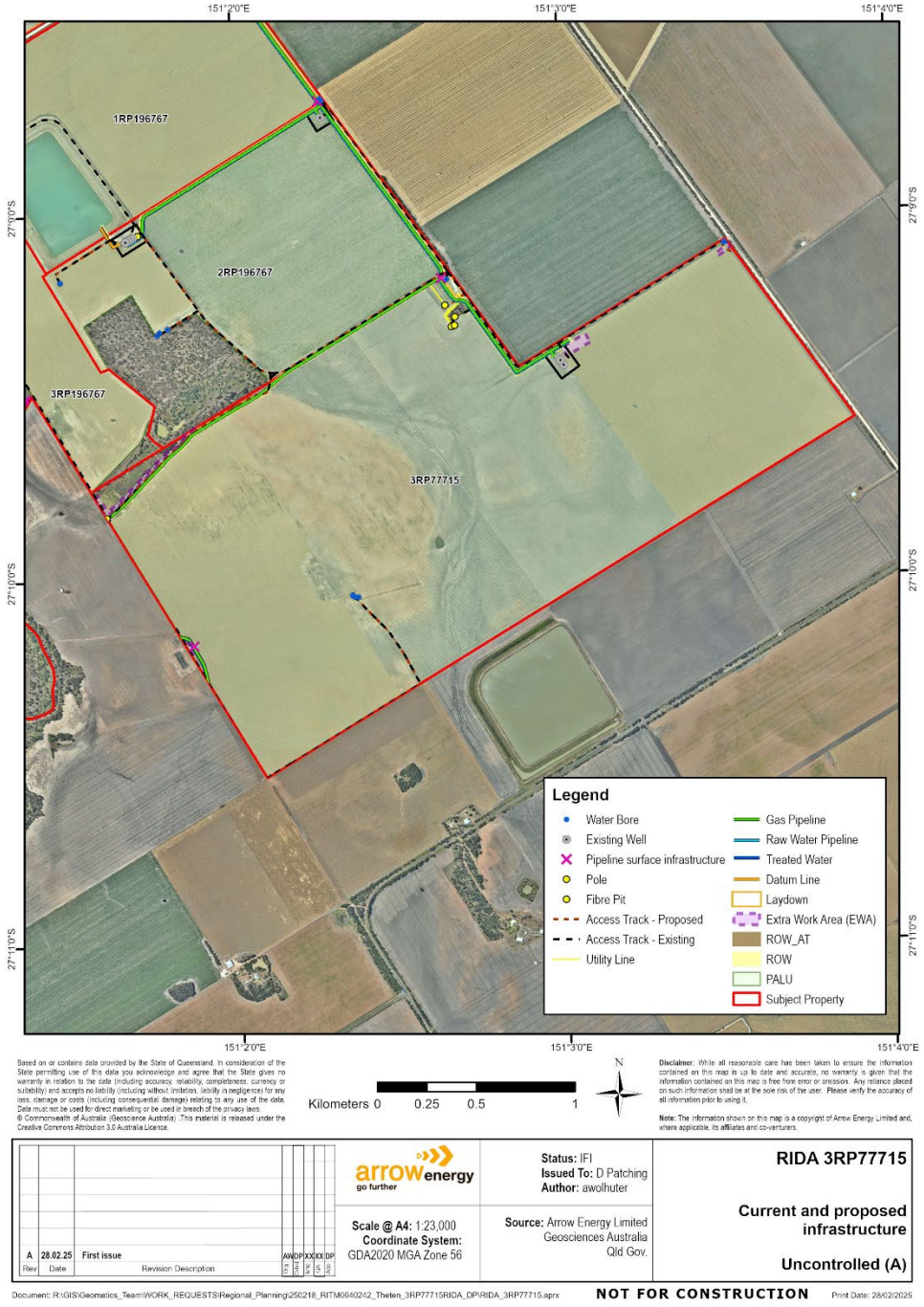

Figure 3.4 Subject property - CSG infrastructure

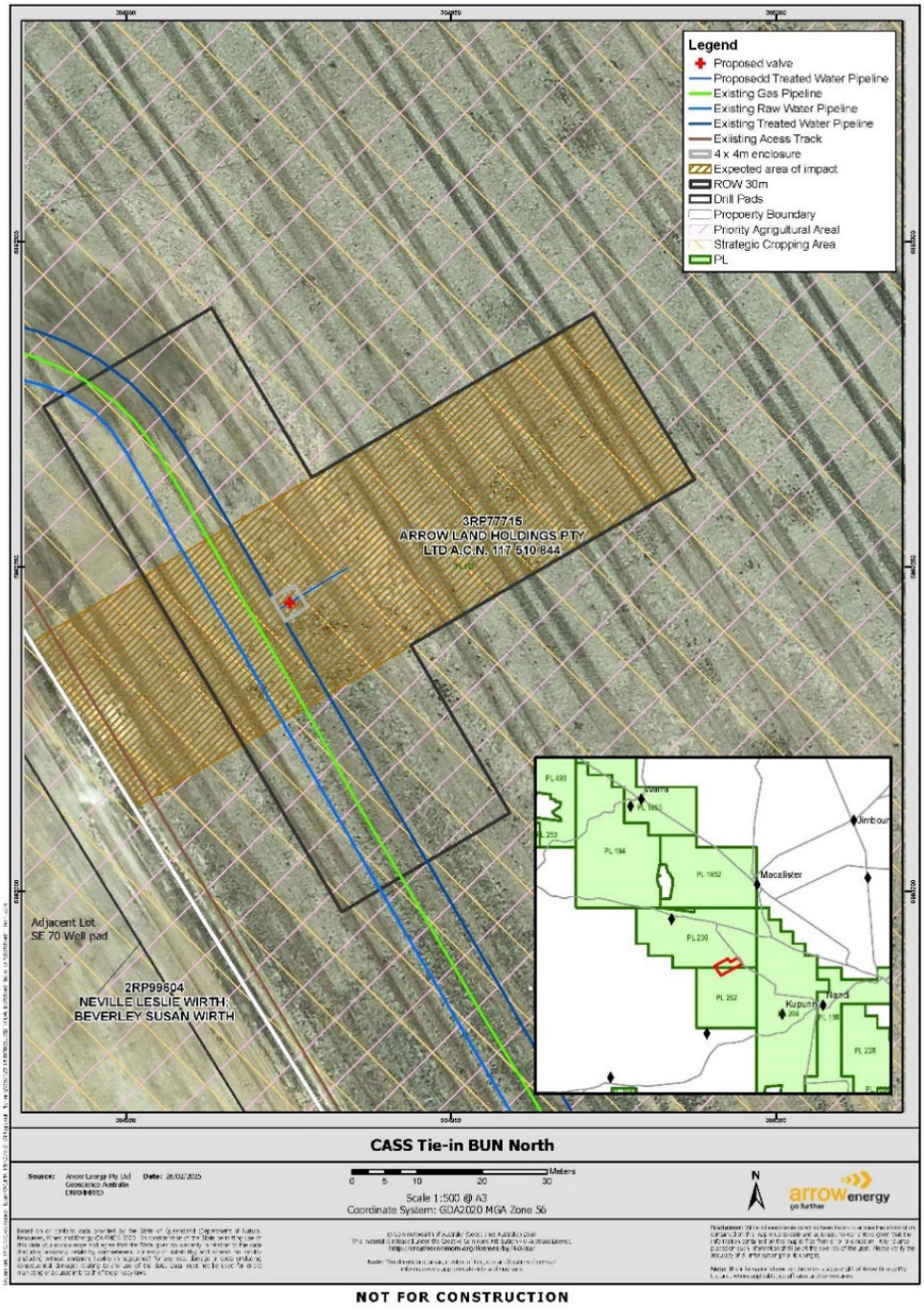

Figure 3.5 CASS tie-in valve location

4. Regional Planning context

The applicable Regional Plan is the *Darling Downs Regional Plan 2013*, which includes the following relevant policies:

> **Regional policy 1:** Protect Priority Agricultural Land Uses within Priority Agricultural Areas.

Regional policy 2: Maximise opportunities for co-existence of resource and agricultural land uses within Priority Agricultural Areas.

The Regional Plan supports these policies directly by:

- *defining PALUs*
- *mapping the region's Priority Agricultural Areas (PAA), and*
- *PAA co-existence criteria which protects PALUs within a PAA from the impacts of incompatible resource activities while maximising opportunities for the co-existence of resource and agricultural land uses.*
- *local planning instruments incorporating planning and development provisions that reflect Regional Policy 1: protecting PALUs within PAAs.*

The WDRC Planning scheme 2017 includes similar provisions that identifies both Agricultural Land Class (ALC) Class A and Class B agricultural land and the area's mineral and petroleum resources, both of which contribute significantly to the economic growth and development of the Western Downs.

In summary, the planning instruments seek to formally recognise areas of valuable agricultural land and the corresponding priority agricultural land uses and to facilitate coexistence with resources activities.

The *RPI Act Statutory Guideline 02/14- Carrying out resource activities in a Priority Agricultural Area* – states that coexistence may be achieved where the outcome:

- is mutually beneficial to both the agriculture and resource sectors
- will not cause agricultural activity to pause then restart to fit in with resource development schedules
- recognises and ensures the continual and ongoing agricultural production in areas affected by resource activities
- ensures that agricultural production is maintained, and its capacity and values are enhanced.
- ensures material impacts are compensated and mitigated
- provides positive flow-on effects for the agricultural supply chains in and out of the local or regional community.

The SGP brings significant benefits to the Western Downs community, providing mutual benefit to both the agriculture and resource sectors and positive flow on effects to the community. Refer to Appendix I for further details of these benefits which support the coexistence outcomes through:

- local procurement and employment.
- investment in infrastructure upgrades, including roads

- community investment helping both the local community and agricultural industries.
- direct compensation to impacted farms, providing an income that is not impacted by seasonal conditions.

Arrow has implemented 12 coexistence measures to ensure that agricultural production and values are supported in areas affected by the proposed activities through:

1. no permanent alienation
2. minimised operational footprint – less than two per cent of total intensively farmed land (IFL) area
3. flexibility on CSG well locations, but all wells located by edge of farm paddocks
4. pad drilling (up to eight wells from a single pad) used where coal depth and geology allows
5. spacing between wells maximised (average of between 800m and 1500m)
6. pitless drilling only
7. no major infrastructure facilities on IFL (dams, compression stations, gas gathering stations, water treatment)
8. treated CSG water used to substitute existing users' allocations on IFL*
9. no brine/salt treatment or disposal on IFL
10. flexibility on power supply option
11. fair compensation
12. continued proactive engagements with community and transparency on coexistence field activities.

This coexistence effort is further enhanced by the Land Access Code and Arrow's land access procedures, which require:

- Engaging with landholders on preferred placement of infrastructure.
- Construction scheduling to suit agricultural calendars and reduce impact to production cycles.
- Planning field layout to minimise disturbance footprint and impact through:
    - Minimising ROW for gathering lines

  - Use of multi-well pads to minimise number of well pads and overall well pad and gathering footprint for the project.
  - Use of existing access as far as possible to minimise new access tracks.
  - Moving well pads to the edge or corners of fields to minimise disruption to productive capacity.
  - Designing field layout to support existing overland flow paths.
- Development and implementation of sediment and erosion control measures.
- Stripping and segregation of topsoil and subsoils for preservation and reuse during reinstatement.
- Use of ameliorants and fertilisers as needed to reinstate soils to pre-existing condition
- Monitoring of both restoration and rehabilitation success.

5. Areas of Regional Interest

5.1 Priority Agricultural Area

PAAs are strategic areas, identified on a regional scale, which contain significant clusters of the regions' high value intensive agricultural land uses. The PAA surrounding the Land includes areas of high value intensive agricultural land uses, in particular areas of dryland and irrigated cropping.

Within the PAA, Priority Agricultural Land Use (PALU) is given priority by ensuring that the location of resource activities can coexist with these uses.

The entire area of Lot3 RP77715 is mapped as PAA.

Assessment of Priority Agricultural Land Use

The RPI Act Guideline 07/14: *How to identify a priority agricultural land use* (PALU) was consulted to determine if the Land within the Darling Downs Regional Plan is, or has been, used as PALU. This is summarised below. The full assessment is in the attached Appendix D.

Conclusions on PALU

The proposed petroleum activities will only temporarily impact on PALU, as defined under the RPI Act, in relation to a portion of Lot 3 RP77715 and then only minimally. This is because most of the proposed works within the area of the PALU will be rehabilitated and returned to its original use at the end of the eight-week construction phase and therefore will not prevent future priority agricultural use of the land. All areas on Lot 3 RP77715 impacted by CSG infrastructure will be restored to their prior PALU land use at the completion of the CSG activities.

5.2 Strategic Cropping Area

The SCA consists of the areas shown on the strategic cropping land (SCL) trigger map as SCL.

The entire Lot 3 on RP77715 is mapped as SCA.

The land subject to this application that is within SCA overlaps with land that is used for a PALU in a PAA. As per RPI Act Statutory Guideline 03/14 *Carrying out resource activities in the Strategic Cropping Area,* page 5, in areas of overlap *the assessor only needs be satisfied the activity meets the applicable PAA assessment criteria in deciding the application (relevant to the overlapping land).*

6. Extent and Duration of Disturbance

Generally, land within the Subject Land and particularly on Lot 3 RP77715 is used for productive agricultural purposes, including dryland and irrigated cropping as well as for existing petroleum activities. However, the proposed disturbance area that is the subject of this application has been located to the edge of cropping activity to minimise impact to PALU. The disturbance area is near the property boundary and is in an area previously disturbed for the installation of CSG infrastructure. The area includes a section of the gathering network established in 2022 and servicing well pads on adjacent land.

Therefore, the proposed activities will result in no new disturbance of cropping and grazing activity during construction and will not result in permanent impacts to the current agricultural uses of the Subject Land. During the operational phase, the Applicant will:

- ensure that routine and scheduled maintenance activities are conducted so that they cause minimum disruption to potential agricultural operations by managing vehicle movements
- minimise the probability of transport of weeds from property to property because of the proposed operational activities
- minimise the likelihood of any dislocation of existing farming practices and stock injury and loss in adjacent properties.

The extent and duration of the proposed petroleum activities is as follows:

Expected Area of Impact (includes shadow areas)

Priority Agricultural Area –

- Construction – 1.38 ha
- Operations **-** 0.82 ha
- Decommissioning and restoration - 0.3 ha
- Restoration - 0 ha.

Strategic Cropping Area –

- Construction – 1.38 ha
- Operations **-** 0.82 ha
- Decommissioning and restoration - 0.3 ha
- Restoration - 0 ha.

6.1 Expected Duration of Disturbance

The proposed petroleum activities will be constructed for the entire project (tie-in and valve and fence enclosure) within a period of approximately eight weeks. Given the short overall duration of construction, the works will be scheduled for a low rainfall period to minimise impact to overland flow during construction. These durations mean that the expected impacts from the gathering network will be short term and limited to specific areas, noting those areas have been strategically located to minimise the impacts.

The proposed work activities will be in operation for approximately 12 years, prior to being decommissioned and rehabilitated in accordance with the conditions of the Petroleum Lease, the Environmental Authority and relevant legislation.

Refer to Section 6 for further details on the management of mitigation measures.

At the completion of the construction phase of the project, the land impacted by gathering installation will be returned to its former productive state and the impact area reduced to the operational impact area (0.05 ha).

7. Management of Mitigation Measures

7.1 Assessment of Alternatives

As the new gathering is proposed to tie-in to the existing gathering network, there are no alternative locations for the gathering. The majority of new gathering has been routed adjacent to existing pipelines, along fence lines or in existing disturbed areas.

To the greatest extent possible, the construction and operation footprint of the proposed petroleum activities has been minimised.

The location of the valve enclosure on the Subject Land has been designed with a view to maintaining the productive agricultural capacity of the Land in the future, should it be pursued later. Wherever possible, locations have been located along fence lines, away from key farm infrastructure (such as the pivot irrigation system) and in locations that allow farming activities to continue unabated.

7.2 Construction Activities

Arrow will construct the proposed petroleum activities within the expected area of impact during construction (0.3 ha). The tie-in valve will be constructed in

accordance with the requirements APGA Code of Practice, Upstream Polyethylene Gathering Networks – CSG Industry, Version 4.

The construction of the tie-in is similar to that of other buried linear infrastructure. Pre-existing cropping activities will continue following the completion of construction, reinstatement and rehabilitation in all areas except the fenced-out valve pit.

The 30m wide ROW will provide access along the proposed pipe length and sufficient space for the installation of the tie-in valve. This includes delivery of the pipe and the valve and associated supplies, and for personnel to safely and efficiently carry out and complete construction.

The gathering trench on the Land that is the subject of this assessment application will be open for the minimum time practicable and will be backfilled and restored within approximately six weeks of the trench excavation.

Construction will temporarily cease during wet weather to minimise impacts to the land and soil runoff.

7.3 Reinstatement & Rehabilitation

Reinstatement and rehabilitation measures will be applied to all areas disturbed during construction as soon as practical following the completion of the construction of proposed petroleum activities.

All reinstatement and rehabilitation will be conducted in accordance with the Environmental Authority requirements. This will include:

- stockpiling of soil into differing horizons after clearing and prior to construction
- segregation of topsoil to ensure topsoil integrity when soil clearing is required as part of construction
- backfilling of pipeline trenches and bell holes once pipelines/valves are installed and constructed
- reinstatement of the land contours/land surface and drainage to maintain original overland flow conditions and agricultural production
- re-test of the soil to establish recommendations for fertiliser and/or ameliorants to re-establish the productivity of the soil
- application of ameliorants and fertilisers
- implementation of necessary stabilisation measures.

The land will be returned to its previous general state and use once construction is completed and rehabilitation is undertaken, and the land will be visually consistent with the surrounding land features. Periodic monitoring will be undertaken to ensure integrity of the rehabilitation.

Detailed erosion and sediment control measures will also be implemented and maintained consistent with the Environmental Authority during construction, and as required following construction.

Other reinstatement activities will include:

- removal of any foreign construction material and waste
- restoration of fencing as required
- reinstatement of existing access track.

7.4 Gathering Markers

Above ground markers will be designed and installed in accordance with APGA Code of Practice, Upstream Polyethylene Gathering Networks – CSG Industry, Version 4. They will indicate the location of the gathering and will be installed during ROW reinstatement.

The markers will be erected at intervals along the pipeline where they are visible and will be positioned at points which do not interfere, either directly or indirectly, with the Areas of Regional Interest (including PALU) in that they will not be installed on cultivation land or in a way that inhibits ongoing use of the land.

7.5 Commissioning

Commissioning of the new gathering will commence at the completion of construction. Commissioning will occur following the flow of gas and water to the pressures determined by the gathering specifications to allow operation.

7.6 Operational Activities

The gathering will be operated in accordance with APGA Code of Practice, Upstream Polyethylene Gathering Networks – CSG Industry, Version 4 and the APIA Code.

Operational maintenance activities will ensure that the integrity of the gathering infrastructure is maintained over the life of the project. Skilled staff will be deployed to undertake scheduled or unscheduled maintenance activities.

Other ongoing activities will be required to support its operation, including:

- monitoring and maintenance associated with the existing access track and ROW
- slashing and weed management.

Access to the site for operations and maintenance will be undertaken according to the Land Access Code (September 2016) and the requirements of the relevant legislation.

Works will temporarily cease during wet weather to minimise impacts to the land and soil erosion.

7.7 Decommissioning

Any decommissioning of inactive buried gathering will be undertaken in accordance with the requirements of the APGA Code of Practice, Upstream Polyethylene Gathering Networks – CSG Industry, Version 4 and Arrow's Land Rehabilitation Plan (See Appendix F – Restoration Plan).

8. Public Notification

The Subject Land is not mapped as Priority Living Area (PLA). Accordingly, this assessment application does not meet the definition of a notifiable application pursuant to section 34(2) of the RPI Act or section 13 of the *Regional Planning Interests Regulation 2014* and therefore public notification is not justified.

However, it is noted pursuant to s.34(4) of the RPI act the Chief Executive may require public notification to be made. In anticipation of this Arrow offers the following justification in support of a decision not to request public notification via a Requirement Notice.

1. The scope does not include any drilling of coal seam gas wells or water bores that may have direct impact to matters of a regional nature such as regional scale subsidence or impact to the Condamine Alluvium,

2. The overall scope of the resource activity is small. The activity is restricted to a direct disturbance of 0.3 hectares during construction and an impact area (including shadow areas) of 1.38 ha for the 8 weeks associated with construction.

3. Operational impact area is also small. The operational direct disturbance for the valve (the fenced-out area) is 0.0016 ha and an impact area (including shadow areas) of 0.05 ha for the operational period.

4. The small scope and limited construction duration involves very low risk of impact to neighbouring landholders, and

5. Arrow has undertaken consultation with the relevant nearby landholders as part of Arrow's area wide planning process, negotiations related to agreements with neighbouring landholders who are hosting CSG infrastructure and negotiations related to the implementation of the CASS.

6. All of the impact in this scope is temporary. All areas will be returned to pre-existing PALU land use at the conclusion of CSG activity.

9. Assessment Application Fees

This assessment application is accompanied by the fee prescribed under the RPI Regulation 2014.

Schedule 4 of the RPI Regulation provides a definition of the expected area of impact for an assessment application, which means the area in which:

- the activity is proposed to be conducted

- conducting the activity is likely to have an impact.

Given the proposed petroleum activities and the expected area of impact (1.38 ha), the following assessment application fees have been calculated:

Area of Regional Interest	Nature of assessment application	Fee Units
Priority Agricultural Area	Complies with the prescribed solution for required outcome 1	3,341
Strategic Cropping Area	Expected area of impact of less than 30 hectares	6,860

The current applicable value of a Fee Unit is $1.06. The applicable fee is therefore $10, 908.00.

10. Required Outcome Assessment

10.1 Priority Agricultural Area

The PAA Assessment Criteria provides a required outcome for activities in PAAs that deals with impacts on a property level. As the proposed petroleum activities are limited to the Land, impacts on a regional level (Required Outcome 2) are not applicable for the purposes of this assessment application.

Schedule 2, Part 2 of the RPI Regulation sets out the Required Outcome and prescribed solutions for activities carried out in a PAA. Please refer to Table 10-1 for evidence associated with the prescribed solution of Required Outcome 1.

Table 10-1 - PAA Assessment Criteria – Required Outcome 1

Required Outcome 1 - Managing impacts on use of property for priority agricultural land use in a priority agricultural area. The activity will be conducted on a property in a priority agricultural area and will not result in a material impact on the use of the property for a priority agricultural land use.	
Prescribed Solution	Evidence/Response

a) If the applicant is not the owner of the land and has not entered into a voluntary agreement with the owner: i. The applicant has taken all reasonable steps to consult and negotiate with the owner about the expected impact of carrying out the activity on each priority agricultural land use for which the land is used; and ii. Carrying out the activity on the property will not result in a loss of more than 2 per cent of both: A. The land on the property used for a priority agricultural land use; and B. The productive capacity of any priority agricultural land use on the property.	a) The applicant is not the owner of the land; however Arrow Land Holdings Pty Ltd is a wholly owned subsidiary business of Arrow Energy. The two parties maintain a voluntary agreement with respect to the CSG activities undertaken on the property. i. The Farm Manager of Theten is consulted prior to any new CSG activity taking place and the protocols used are identical to the requirements of The Land Access Code. The applicant has taken all reasonable steps to consult and negotiate with the Farm Manager about the expected impact of conducting the activity on each priority agricultural land use for which the land is used; and ii. Conducting the activity on the property will not result in a loss of more than 2 per cent of both: A. The land on the property used for a priority agricultural land use; and B. The productive capacity of any priority agricultural land use on the property. Arrow maintains a record of all CSG activity undertaken on the Subject Land and the cumulative total of the area and percent impact. See Appendix E. The Construction impact area on Lot 3 RP77715 (including shadow effects) is 1.38 hectares (0.27 per cent of PALU land). See Appendix E, Figure E1 for a map showing shadow effects during construction. The operational impact area (including shadow effects and cumulative across all CSG activity

1. Continued..	The productive capacity of the Subject Land will not be affected as: 1. the duration of the construction phase is short (eight weeks) and can be scheduled for a period with minimum impact to PALU activity. 2. The Operational impact area of all CSG activities on Lot 3 RP77715 has been minimised and amounts to 0.82 hectares (0.16 per cent of the PALU on Lot 3 RP77715). 3. All CSG activity will be removed at the end of the tenure and the PALU areas fully restored to former productivity levels.
2. The activity cannot be carried out on other land that is not used for a priority agricultural land use, including for example, land elsewhere on the property, on an adjacent property or at another nearby location.	Land on the southwest corner identified in Appendix D Figure D2 as non-PALU has high environmental values. Accordingly, the site selection process for this tie in has balanced environmental values, the feedback from neighbouring property owners and the Priority Agricultural Activities being undertaken on Lot 3 RP77715. The selection process settled on this location because it is: 1. adjacent to the treated water CASS pipeline 2. avoids impact to high value environmental areas 3. minimises impact to overland flow paths 4. minimises impact to PALU by minimising the valve pit fenced out area size 5. minimises impact to high value PALU by avoiding the pivot irrigation areas.

3. The construction and operational footprint of the activity on the part of the property used for a priority agricultural land use is minimised to the greatest extent possible.	The construction impact area on Lot 3 RP77715 (including shadow effects) is 1.38 hectares (0.27 per cent of PALU land). The operational impact area of all CSG activities on Lot 3 RP77715 has been minimised and amounts to 0.82 hectares (0.16 per cent of the PALU on Lot 3 RP77715). The operational impact area (including shadow effects and cumulative across all CSG activity on all five Lots) is 3.07 hectares (0.28 per cent of PALU land). The valve pit location is nominally 30m from the property boundary. The location is between the farm cropping swathes, providing the best opportunity to enable the farm equipment to negotiate the pit with minimum shadow effect. The shadow effects calculated for this application have assumed all the 30m swath between the pit and the boundary is inaccessible to the farming equipment. This assumption provides a level of conservatism concerning the impact calculations.
4. The activity will not constrain, restrict or prevent the ongoing conduct on the property of a priority agricultural land use, including, for example, everyday farm practices and an activity or infrastructure essential to the operation of a priority agricultural land use on the property	The following farm practices and their impacts have been considered: 1. weed spraying 2. fertiliser application 3. seeding 4. harvesting. While these practices will need to adjust to the presence of the valve pit, the impact has been minimised by:
4. Continued…	1. minimising the valve pit fenced out area size 2. locating the valve pit between swathes 3. minimising the height of the valve pit fence.

5. The activity is not likely to have a significant impact on the priority agricultural area.	The scale of impact is not significant at either the farm scale or the regional scale.

6. The activity is not likely to have an impact on land owned by a person other than the applicant or the land owner mentioned in paragraph (a).	The scale of impact is not significant at either the farm scale or the regional scale. The activity that is the subject of this application will have no ongoing (operational phase) impact to neighbouring farms. The construction phase involves trenching and soil stockpiling. These activities are recognised risks to overland flow paths, which must be maintained to avoid impact to neighbouring farms or to the ongoing productivity of the Subject Land. Construction phase controls implemented by Arrow on Intensively Farmed Land to avoid impact to overland flow paths are: 1. Selection of infrastructure sites away from recognised overland flow paths wherever possible. In this instance, the planned works are not in a significant overland flow path and will have no impact on the off-site quality, quantity or destination of overland flow water. There is a minor overland flow path in the vicinity of the valve pit, however it is sufficiently removed so that the operational phase impact is negligible. See Appendix J for the overland flow map for the site. 2. Design of tracks to ensure they do not influence overland flow paths. There are no new tracks proposed in this application. 3. Timing of construction activity to avoid overland flow events. In this instance, the small scope of works means the entire construction phase is scheduled for a maximum of eight weeks. This will be conducted during a characteristically dry period of the year.

6. Continued	4. Soil stockpiles and provision of flow breaks. Stockpiles of soil are required to have flow breaks so that they do not operate as a dam in case of un-forecasted rain events. 5. Regional scale subsidence – the planned works does not include drilling of wells and will have no direct impact on regional scale subsidence. 6. Condamine Alluvium – the planned works does not include drilling of wells or bores and will not directly impact the CA. The proposed infrastructure facilitates the CASS, the Arrow offset scheme to potential impacts to the CA.

10.2 Strategic Cropping Area

The SCA consists of the areas shown on the strategic cropping land (SCL) trigger map as SCL. The entire Lot 3 RP77715 is mapped as SCA.

The land subject to this application that is within SCA overlaps with land that is used for a PALU in a PAA. As per RPI Act Statutory Guideline 03/14 Carrying out resource activities in the Strategic Cropping Area, page 5, in areas of overlap the assessor only needs to be satisfied the activity meets the applicable PAA assessment criteria in deciding the application (relevant to the overlapping land).

11. Abbreviations and Acronyms

Definitions of terms used in this report:

Term	Definition
Applicant	Arrow Energy Pty Ltd and Arrow CSG (Australia) Pty Ltd
EP Act	*Environmental Protection Act 1994*
ha	Hectare
HDPE	High Density Polyethylene
Land	Lot 3 RP77715
PAA	Priority Agricultural Area
PALU	Priority Agricultural Land Use
PL	Petroleum Lease

Property	Theten – includes Lots 26DY771, 1RP196767, 2RP196767, 3RP77715 and 3RP196767
Proposed petroleum activities	Please see Section 3.
RIDA	Regional Interests Development Approval
ROW	Right of Way
RPI Act	*Regional Planning Interests Act 2014*
RPI Regulation	Regional Planning Interests Regulation 2014
SCA	Strategic Cropping Area
SCL	Strategic Cropping Land
Land	Lot 3 RP77715

Appendix A – Resource Authority Public Report

PL 252 Resource authority public report

PL 252 Resource authority public report

Queensland Government

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PL 252 Resource authority public report

Queensland Government

Permit details

Permit ID:	PL 252
Type:	Petroleum Lease
Status:	Granted
Lodged date:	19/02/2007
Grant date:	20/09/2008
Commencement date:	20/09/2008
Expiry date:	19/09/2038
Plan/program expiry date:	30/06/2025
Current term:	30 years
Work program type:	
Conditions:	
Locality:	Surat Basin; SOUTH-WEST OF DALBY WITHIN THE WALLOON COAL MEASURES
Remarks:	.
Act permit granted under:	Petroleum and Gas (Production and Safety) Act 2004
Act now administered under:	Petroleum and Gas (Production and Safety) Act 2004

PL 252 Resource authority public report

Queensland Government

Holders

Authorised holder representative (AHR)

FERGUSON, Suzanne
C/- Tenement Manager GPO Box 5262 Brisbane QLD 4001

Holders

	Holder name	Share %	Status	Held from	Held to	Authorised holder
*	ARROW ENERGY PTY LTD C/- Tenement Manager GPO Box 5262 Brisbane QLD 4001	70.0000000000000	Current	06/01/2011		Yes
*	ARROW CSG (AUSTRALIA) PTY LTD C/- Tenement Manager GPO Box 5262 Brisbane QLD 4001	30.0000000000000	Current	05/10/2010		No
	ARROW ENERGY LTD	70.0000000000000	Former	21/12/2009	06/01/2011	
	SHELL CSG (AUSTRALIA) PTY LTD	30.0000000000000	Former	21/12/2009	05/10/2010	
	ARROW ENERGY LTD	100.0000000000000	Former	08/07/2008	21/12/2009	
	ARROW ENERGY NL	100.0000000000000	Former	19/02/2007	08/07/2008	

Tenancy type: Tenancy in Common

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PL 252 Resource authority public report

Queensland Government

Area

Location:	View Map
Mining district:	Dalby
Local authority:	Western Downs Regional Council
Area:	25 Sub-blocks
Exclusions:	
Marked out date:	

Sub-blocks

BM	Block	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
Brisbane	2749	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z

Background land

No data available

Survey plans

Plan No.	Description	Date received	Locality	Volume	Folio
MP38492	PWL OF STRATHEDEN 10, STRATHEDEN 11, STRATHEDEN 12, STRATHEDEN 13 & STRATHEDEN 14	02/03/2009	DUCKLO		
MP38493	PWL OF STRATHEDEN 4, STRATHEDEN 16, STRATHEDEN 18, STRATHEDEN 19 & STRATHEDEN 28	02/03/2009	DUCKLO		
MP38744	PETROLEUM LEASE 252 PWL - "Stratheden #15"	09/03/2010	DUCKLO		
MP38734	PETROLEUM LEASE 252 PWL - "Stratheden #17, 20, 22 & 24, 25, 26, 27"	09/03/2010	DUCKLO		
MP38853	PETROLEUM LEASE 252 PWL - "Stratheden #5"	18/08/2010	DUCKLO		
MP39583	PETROLEUM LEASE 252 PWL - Stratheden #60 & 61	12/11/2012	RANGES BRIDGE		
MP39593	PETROLEUM LEASE 252 PWL - Stratheden #40, 41, 42, 43, 44, 45, 46	14/12/2012	RANGES BRIDGE		
MP43663	PETROLEUM LEASE 252 PWL - STRATHEDEN 62, 63, 64, 65, 66, 67, 68, 69	14/10/2013	DUCKLO		
MP45812	PETROLEUM LEASE 252 PWL OF STRATHEDEN 111, STRATHEDEN 112, STRATHEDEN 113, STRATHEDEN 114, STRATHEDEN 115 AND STRATHEDEN 116, PETROLEUM LEASE 230 PWL OF DAANDINE 116, DAANDINE 232, DAANDINE 234, DAANDINE 236, DAANDINE 238, DAANDINE 282, DAANDINE 284, DAANDINE 286, DAANDINE 288, DAANDINE 302 AND DAANDINE 308	23/08/2018	RANGES BRIDGE		

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Plan No.	Description	Date received	Locality	Volume	Folio
MP45872	PWL OF STRATHEDEN 231, STRATHEDEN 232, STRATHEDEN 233, STRATHEDEN 234, LONGSWAMP 351, LONGSWAMP 352, LONGSWAMP 353 & LONGSWAMP 354	07/10/2021			
MP45875	PWL OF STRATHEDEN 201, STRATHEDEN 202, STRATHEDEN 203, STRATHEDEN 204, STRATHEDEN 211, STRATHEDEN 212, STRATHEDEN 213 & STRATHEDEN 214	25/11/2021			
MP45884	PWL OF STRATHEDEN 167, STRATHEDEN 168 & LONGSWAMP 401	13/05/2022			
MP46622	PWL OF STRATHEDEN 141, STRATHEDEN 142, STRATHEDEN 143 & STRATHEDEN 144. \n\n**Awaiting for the completion report for STRATHEDEN 141, then this can be added into "Survey is of Site" Field. Email sent to Cottrell et all on 03.11.2023.**	26/10/2023			

Relinquishment details

No data available

Sub-blocks retained

No data available

Term history

Term	Date notice issued	Date lodged	Date approved	Date commenced	Date term ends	Term	Act granted under
2008 - 2038		19/02/2007	20/09/2008	20/09/2008	19/09/2038	30 years	Petroleum and Gas (Production and Safety) Act 2004

Native title

Outcome	Process
All land subject to Native Title (<10%) is excluded from the permit area	Predominantly Exclusive Land

Purpose and minerals

Prescribed Purpose
PETROLEUM

Prescribed minerals
Coal Seam Gas

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PL 252 Resource authority public report

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Related permits

Pre-requisite permits:	ATP 790
Applied from permits:	WMA 2014; WMA 2015; WMA 2016
Dependent permits:	WMA 2; WMA 3; WMA 4; WMA 5; WMA 2017; WMA 2023; WMA 2024; WMA 2025; WMA 2026

Financial

Rent details

Area units:	75
Rate/unit area:	$171.72

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PL 252 Resource authority public report

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Activities

Activity name	Activity / Dealing No	Status	Date received	Expected completion	Date completed	Remarks
Coordination arrangement	367017	Approved	08/12/2021		06/07/2022	Coordination arrangement between PLs 252 and 260 approved on 6 July 2022.
Coordination arrangement	347504	Approved	28/04/2021		30/07/2021	Coordination Arrangement between the holders of PLs 252 and 230 has been approved by the Minister's delegate on 27/07/21.
Add excluded land	213520	Approved	19/07/2017		23/08/2017	Approval given to add excluded land namely land that may be subject to native title.
Later Development Plan Due		Closed	24/06/2014	19/09/2018	23/10/2024	LDP DUE 19/09/2018. Approval to close old records
Later Development Plan		Closed	06/06/2013	30/06/2014	18/06/2014	LDP DUE 19-SEP-2013. LDP RECEIVED 06/06/13, WITHIN TIMEFRAME, FOR PERIOD OF 5 YRS FROM 20/09/2013 TO 19/09/2018. CHECKLIST COMPLETED. TAS REQUIRED. LDP FORWARDED TO DELEGATE FOR APPROVAL 20/05/14.LDP APPROVED BY REGIONAL DIRECTOR ON 18/06/14 FOR THE PERIOD TILL 19/09/2018.
Change of holder name	1020891	Closed	06/01/2011	06/01/2011	06/01/2011	Changed name from ARROW ENERGY LTD to ARROW ENERGY PTY LTD
Coordination arrangement	131810	Approved	11/10/2010		20/03/2019	Coordination Arrangement cancelled by Ministers Delegate on 27/07/2021. New Coordination Arrangement has been approved 27/07/2021 between the holders of PLs 230 and 252 refer to activity number 347504 for further details.
Change of holder name	1019681	Closed	05/10/2010	05/10/2010	05/10/2010	Changed name from SHELL CSG (AUSTRALIA) PTY LTD to ARROW CSG (AUSTRALIA) PTY LTD
Change of holder name	1012587	Closed	08/07/2008	08/07/2008	08/07/2008	Changed name from ARROW ENERGY NL to ARROW ENERGY LTD
Later Development Plan		Closed	22/02/2007	19/04/2007	20/09/2008	INITIAL DEVELOPMENT PLAN LODGED WITH APPLICATION FOR A TERM OF 5 YEARS TO COMMENCE 20 SEP 2008 TO EXPIRE 19 SEP 2013

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Appendix B – Title Search

Titles QUEENSLAND

Current Title Search

Queensland Titles Registry Pty Ltd
ABN 23 648 568 101

Title Reference:	**12773173**	**Search Date:**	13/03/2025 15:40
Date Title Created:	31/08/1953	**Request No:**	51205620
Previous Title:	12255095		

ESTATE AND LAND

Estate in Fee Simple

LOT 3 REGISTERED PLAN 77715
Local Government: WESTERN DOWNS

REGISTERED OWNER

Dealing No: 712740210 18/09/2009

ARROW LAND HOLDINGS PTY LTD A.C.N. 117 510 844

EASEMENTS, ENCUMBRANCES AND INTERESTS

1. Rights and interests reserved to the Crown by
Deed of Grant No. 10405086 (POR 3A)

ADMINISTRATIVE ADVICES

Dealing	Type	Lodgement Date	Status
719575701	CON COM AGMT MINERAL AND ENERGY RESOURCES (COMMON PROVISIONS) ACT 2014	20/08/2019 15:20	CURRENT
723615862	CON COM AGMT MINERAL AND ENERGY RESOURCES (COMMON PROVISIONS) ACT 2014	22/10/2024 08:00	CURRENT

UNREGISTERED DEALINGS

NIL

** End of Current Title Search **

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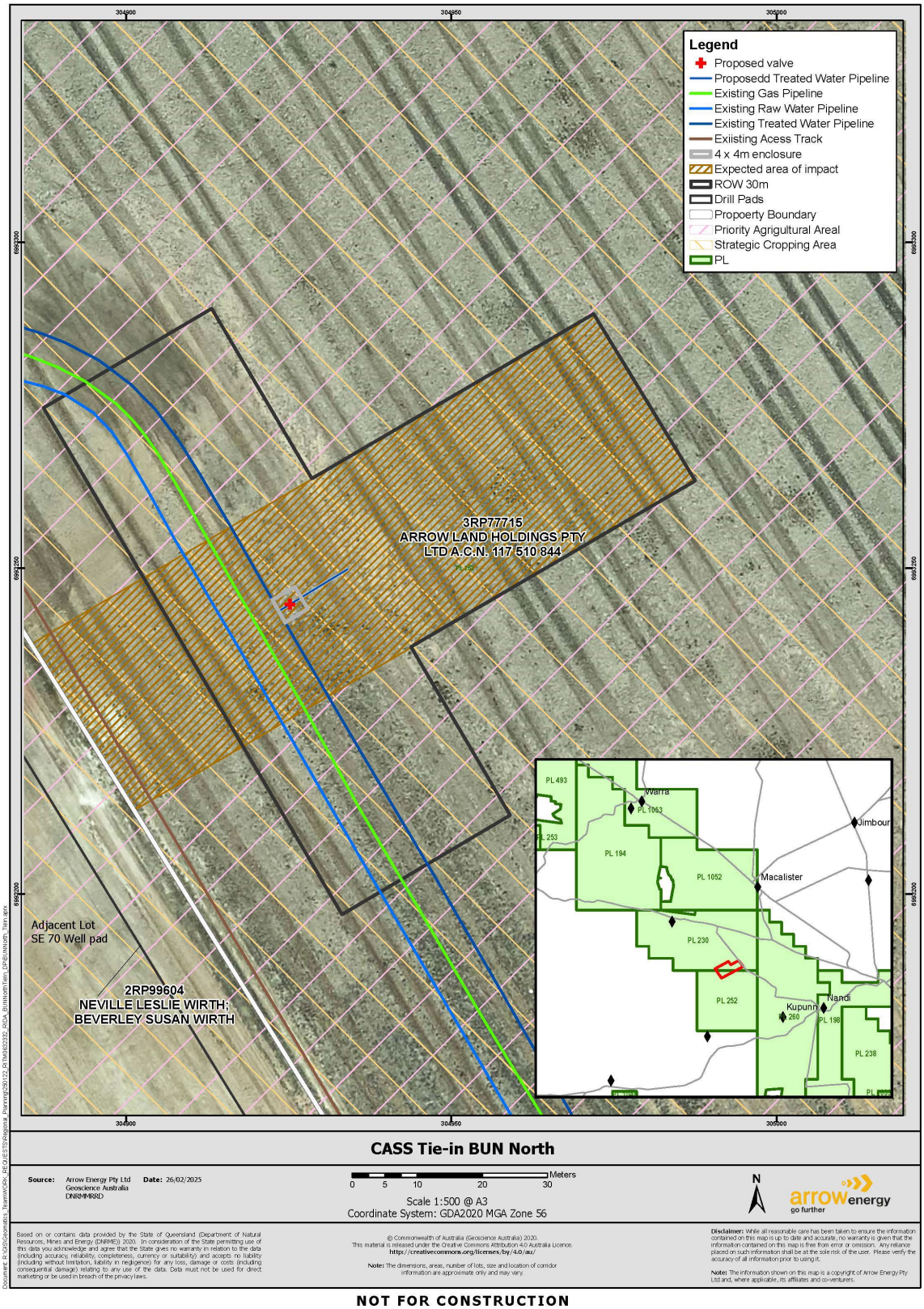
go further

Appendix C – Site Plan



Appendix D – Assessment of PALU on the Subject Land

The RPI Act Guideline 07/14: *How to identify a priority agricultural land use* (PALU) was consulted to determine if the Land proposed to be disturbed is, or has been, used as PALU.

The entire extent of both the Land (Lot3RP77715) and the Property (Subject Land) is mapped as Priority Agricultural Area (PAA).

The predominant agricultural land uses in the area are dryland cropping, irrigated cropping and cattle grazing. Dryland and irrigated cropping are defined as a PALU. The predominant cattle grazing in the area is on native grasses and is not defined as PALU.

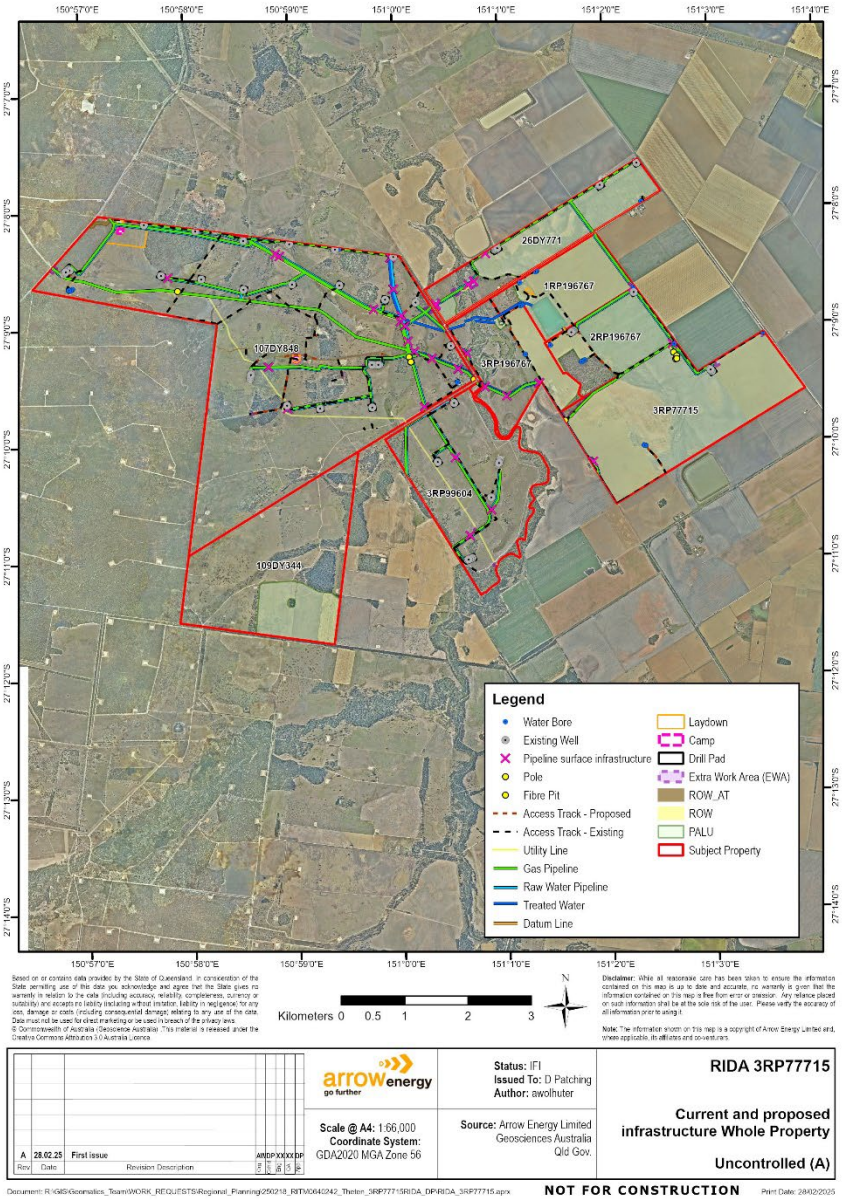


Figure D 1 – PALU areas of the Property

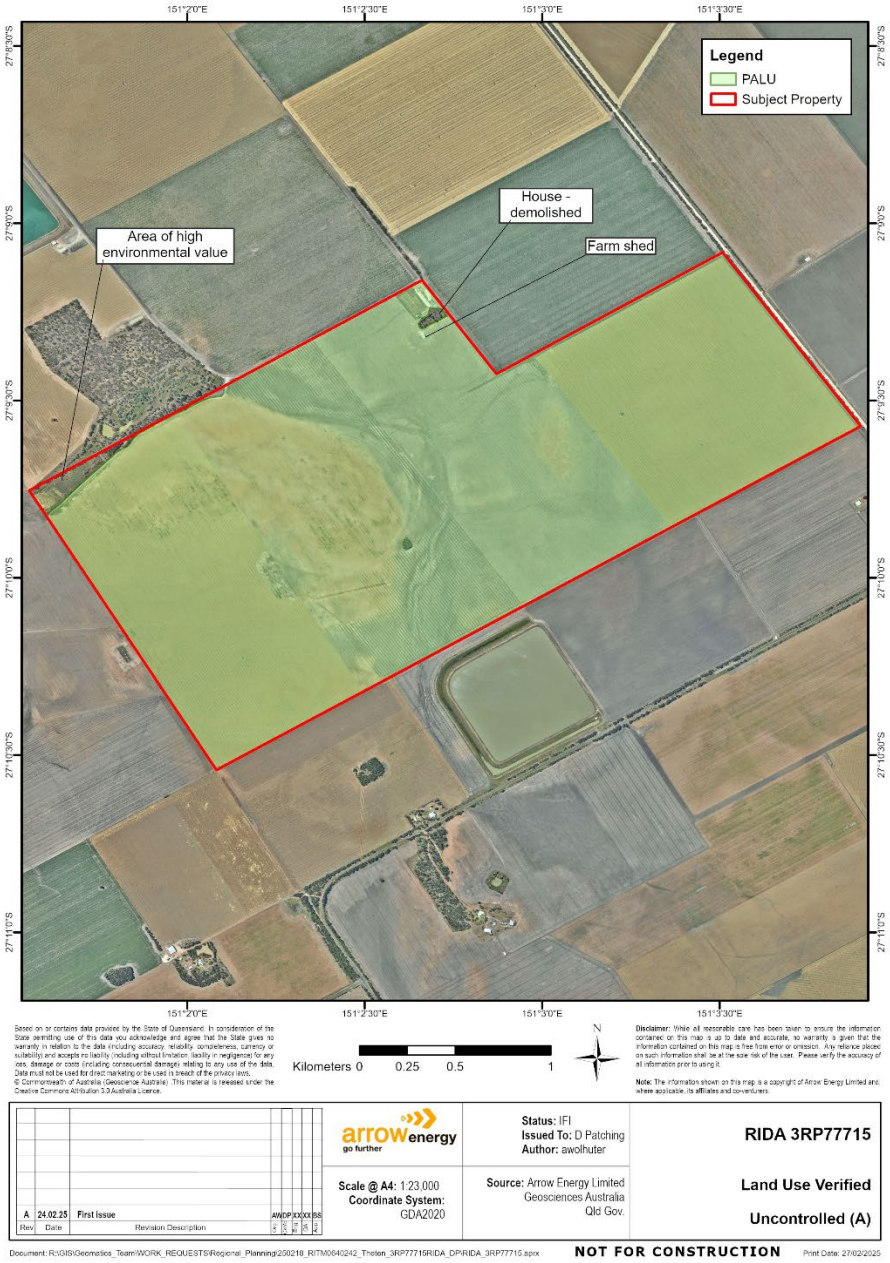


Figure D2 – Confirmed PALU extent – Lot 3 RP77715

Australian Land Use Management

A search at the secondary level of the Australian Land Use Management (ALUM) classification for the Land identifies the area within the cropping and irrigated cropping classes.

The Subject Land is located within the Darling Downs Regional Plan and the Western Downs Planning Scheme. The PALUs specific to the PAAs mapped in the Darling Downs regional plan are largely land uses and practices associated with Class 2 (Production from Relatively Natural Environments, to the west of Wilkie Creek) and Class 4 (Production from Irrigated Agriculture and Plantations, to the East of Wilkie Creek) in accordance with the Australian Land Use Management (ALUM) classification Version 8 (October 2016). Figure D2

illustrates the land use mapping (from Queensland Land Use Mapping Program (QLUMP).

Surrounding Land Uses

The current agricultural land use of parcels surrounding this application is dryland and irrigated cropping of grain, legumes, cotton and oilseed crops, with some isolated patches of remnant vegetation and areas used for grazing of cattle. The area also hosts pre-existing CSG infrastructure (refer to Figure 2-1).

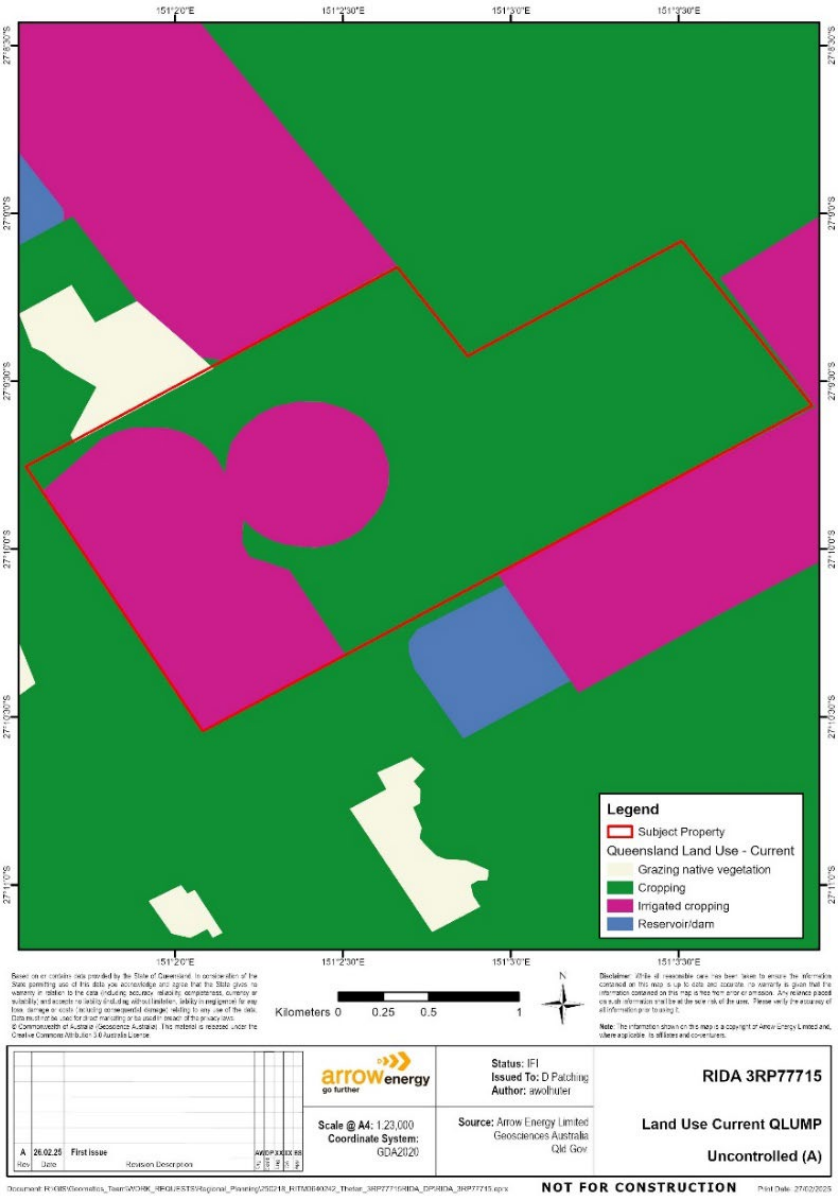


Figure D3 - Australian Land Use Management (ALUM) classification

Some neighbouring properties to the south and east of the Subject land have established collection of overland flow water for use in irrigated cropping activities.

Agricultural Activity on the Subject Land

Since 2014, the dryland cropping areas on the northern extent of Lot3 RP77715 have been used for crops of corn, chickpea, wheat, sorghum, mung beans and barley. The cropping activity focuses on two main crop cycles (summer and winter) with occasional additional crops sown according to water availability.

The southwestern part of Lot 3 RP77715, which includes the three centre pivot irrigation areas, is part of an irrigation trial using treated CSG production water and has produced irrigated sorghum, chickpeas and mung beans. The irrigation trial is complete, and the centre pivots are scheduled for removal. The water source used in the irrigation trials will be re-allocated under the Condamine Alluvium Substitution Scheme.

The area which includes the irrigation trials has also produced unirrigated dryland crops from time to time. In these instances, cropping is not restricted to the pivot areas. Accordingly, almost all the lot area is confirmed as PALU, with only small natural areas and an old house site the exception, see Figure D1.

Frequency of Agricultural Activity

Schedule 2 of the RPI Regulation states that:

> *For land or property in relation to PALU, means the land or property has been used for a PALU for at least 3 years during the 10 years immediately before an assessment application is made in relation to the land.*

To determine the frequency of agricultural activity, Forage Crop Frequency Report (Report) (see Appendix G) were obtained for the Land. The result of the Report concludes the following:

- Lot 3 RP77715: Six to nine crops were recorded between 2013 and 2024

The forage crop frequency report findings are supported by receipts for cropping activity for the broader portfolio of farmed areas. Receipts demonstrate that the dryland cropping areas have consistently produced greater than one crop cycle in each year for the entire period for which records are available. This meets the criteria for PALU.

The southern portion of the Lot contains three 480m centre-pivot irrigators. The pivots are part of an irrigation trial that is completed. The pivot irrigators will be removed and the area returned to dryland cropping.

The more northern extent of Lot 3 RP77715, while also containing existing gas wells, has been consistently used for dryland cropping over the previous decade. The CSG infrastructure has been located at the edges of the Lot boundary to ensure that the location minimally interferes with these PALU activities.

Despite the Lot in question being owned by an Arrow entity, the aggregation is run as a viable farm and the Farm Manager is consulted regularly to ensure Arrow's CSG activities do not adversely impact the priority agricultural activities. Arrow maintains a CCA (Voluntary Agreement) with the Farm Manager and this agreement is registered on title as required under the *Mineral and Energy Resources Common Provisions Act 2014.* (See copy of title at Appendix B)

Conclusion

The extent of PALU on Lot 3 RP77715 is mapped in Figure D2 above. The mapping extent has been confirmed by many years of survey activity on the site, required under the resource and environmental authorities applicable to PL252 for the pre-existing CSG activities. The extent of PALU activity was further confirmed in 2019 during a study into the Theten Farm Irrigation Demonstration and more recently by direct consultation with the Farm Manager.

Appendix E – Property Impact Area calculations

Existing CSG Infrastructure and and new disturbance proposed on Lot 3RP77715				1) Construction Footprint (Direct Impact)(1)		2) Construction Impact Area (2)		3) Operational Footprint (Direct Impact)(1)		4) Operational Impact Area (2)		5) Post Restoration Impact Area (3)	
LOTPLAN	Owner	AREA (ha)	PALU land on Lot (ha)	ha	%	ha	%	ha	%	ha	%	ha	%
26DY771	ALH PTY LTD(4)	245.34	193.50	0.00	0.00	0.00	0.00	0.55	0.28	0.95	0.49	0.00	0.00
1RP196767	ALH PTY LTD(4)	179.78	166.21	0.00	0.00	0.00	0.00	0.03	0.02	0.11	0.07	0.00	0.00
2RP196767	ALH PTY LTD(4)	181.61	147.20	0.00	0.00	0.00	0.00	0.41	0.28	1.19	0.81	0.00	0.00
3RP77715	ALH PTY LTD(4)	508.98	503.00	0.33	0.07	1.38	0.27	0.41	0.08	0.82	0.16	0.00	0.00
3RP196767	ALH PTY LTD(4)	224.59	69.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Totals		1340.29	1079.18	0.33	0.03	1.38	0.13	1.40	0.13	3.07	0.28	0.00	0.00
Notes	(1) Footprint is defined as the area of Direct Impact												
	(2) Impact Area is defined as the footprint + the Impact Shadow												
	(3) Restoration refers to the process of decommissioning and removing the CSG infrastructure.												
	(4) ALH is ARROW LAND HOLDINGS PTY LTD												

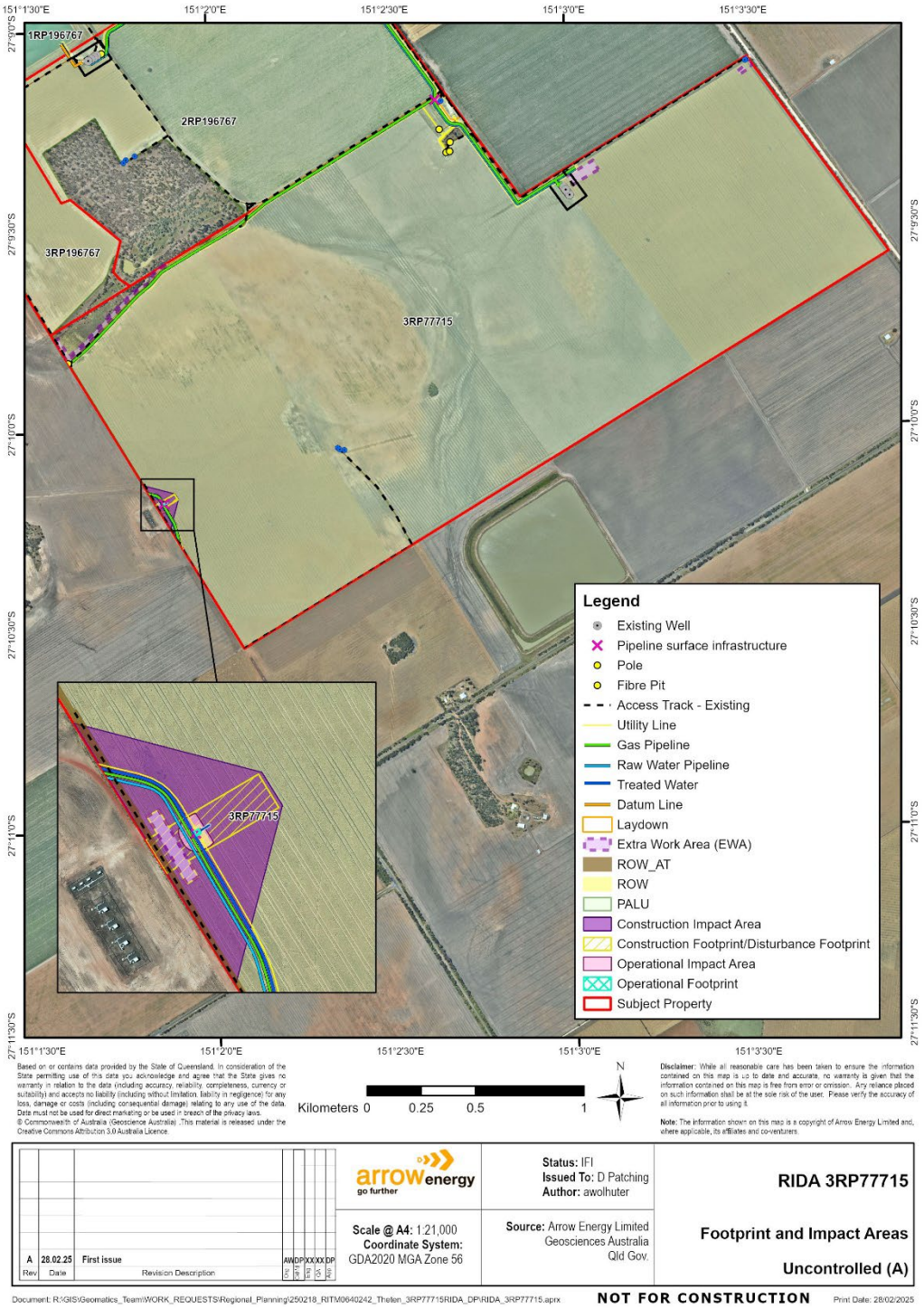


Figure E1 – Construction phase impact area

Appendix F – Restoration Plan

Plan
ORG-ARW-HSM-PLA-00064

Safe Work. Strong Business.

Arrow Energy - Land Rehabilitation Plan

Version	7.0
Released	05 March 2024
Document Owner	Manager Environment and Carbon
Document Author	Senior Environment Advisor
Review Date	05 March 2027
Document Status	Issued for Use
Security Classification	Unrestricted

Please see document administration section for more information

Land Rehabilitation Plan

Table of Contents

1 Background

Arrow Energy (Arrow) has an obligation to ensure disturbed land areas are appropriately managed to minimise risk of environmental harm and ensure an appropriate land use can be re–established at the end of life of the infrastructure/activity. Dependent on future activities, disturbed areas must be stabilised or rehabilitated to meet regulatory obligations and landholder expectations. Arrow has both a legal and social responsibility to stabilise and/or rehabilitate land disturbance due to its activities.

1.1 Purpose & Objectives

This Land Rehabilitation Plan has been prepared to inform how stabilisation and rehabilitation is executed. It provides an overview of Arrow's approach to meeting its rehabilitation obligations, including general principals and requirements to apply where land disturbance has occurred.

The plan is part of the Arrow Health, Safety and Environment Management System (HSEMS) as discussed in Section 2.2. Additionally, it meets Environmental Authority (EA) requirements for a *Rehabilitation Plan*.

The objectives of this plan are to:

- Facilitate compliance with relevant legislation, regulations, codes and approvals;
- Support compliance with rehabilitation aspects of the Arrow *Standard – Land Management;* and
- Provide guidance for:
  - Determining rehabilitation objectives for disturbed areas
  - Identifying appropriate rehabilitation activities for disturbed areas and procedures or plans guiding these including monitoring and maintenance
  - Prioritising rehabilitation monitoring.

1.2 Scope

This plan is applicable to All Arrow assets and activities within Arrow's gas field tenements (PL, ATP, PPL, WMA).

Specifically, this plan:

- Describes Arrow's approach to rehabilitation including prioritisation of activities;
- Describes the rehabilitation requirements for each project stage;
- Outlines general requirements to achieve rehabilitation/stabilisation objectives when rehabilitating a disturbed area;
- Identifies triggers for where more detailed assessments/site–specific rehabilitation management plans may be required; and

- Provides an overview of monitoring and maintenance actions to be conducted on areas undergoing rehabilitation.

The plan is to be implemented by all Arrow personnel responsible for rehabilitation works.

This plan does not include site specific information. This information may be found in Access and Approvals Packages (AAPs) and/or site specific rehabilitation plans specific to sites or activities which may be developed. These would complement this overarching plan.

Potential triggers for specific site or activity plans are discussed in Section 5. In the absence of a site/activity specific rehabilitation plan, this overarching plan constitutes the rehabilitation plan for the site/activity.

2 Approach to Rehabilitation

2.1 Guiding Principles

The following guiding principles for rehabilitation should be used to plan and implement works; and to develop additional plans and procedures for specific sites where required.

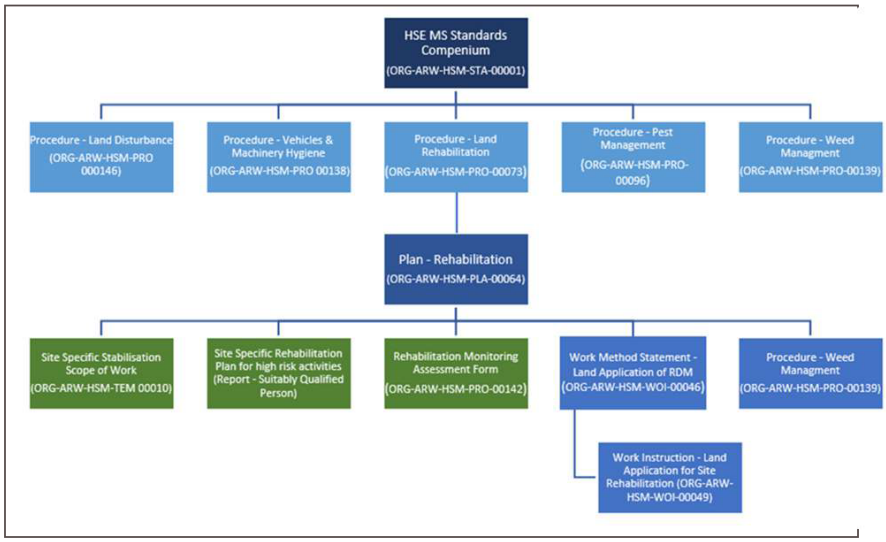
- Arrow's licence to operate is based on good land management practices on the properties which it operates. This is demonstrated by undertaking rehabilitation activities in accordance with relevant EA conditions.
- Effective and timely rehabilitation should reduce ongoing maintenance costs associated with erosion and weed management, and should also reduce ongoing financial assurance/estimated rehabilitation costs, which Arrow is required to maintain to cover rehabilitation liabilities.
- Stabilisation of disturbed areas must commence as soon as practicable following cessation of activities involving land disturbance.
- Final rehabilitation must commence as soon as practicable after infrastructure decommissioning, or within the timeframes required by the relevant EA.
- Rehabilitation/stabilisation objectives should be attained as soon as possible to minimise ongoing maintenance, monitoring and landholder compensation costs.
- Regular monitoring and timely maintenance of stabilisation/rehabilitation is essential to ensure rehabilitation integrity. This should also facilitate timely and smooth relinquishment of decommissioned infrastructure.

2.2 Health Safety and Environment Management System

Arrow's HSEMS provides a framework for health, safety and environmental (HSE) practices across its operations.

This plan is part of documentation which supports the *Procedure – Land Rehabilitation* and the Arrow *Standard – Land Management* as illustrated in Figure 1 below (HSEMS documents shown in yellow boxes). Supporting documents to the plan are also shown. Site Specific Rehabilitation Management Plans may be developed as required.

Figure 1: HSEMS Framework Supporting Standard – Land Management



2.3 Framework

Key rehabilitation related activities for projects/activities involving land disturbance and responsible parties for each are described in Table 1 in *Procedure – Land Rehabilitation*. The rehabilitation requirements for each project stage and how they are met under Arrow's framework are discussed further in Sections 2.3.1 –2.3.5.

2.3.1 Plan

This project stage involves project scoping and design including planning for infrastructure construction, operation and decommissioning where relevant. As this is where works are planned and budgets are determined, rehabilitation requirements need to be understood and included in project scopes, budgets and schedules. Where ongoing activities are associated with sites, stabilisation of disturbed areas will be required until activities cease and infrastructure is decommissioned, at which point works to achieve final rehabilitation outcomes will need to be undertaken.

In identifying stabilisation/rehabilitation requirements, consideration needs to be given to regulatory requirements (e.g. EA conditions), landholder requirements, the general nature of the site and surrounding areas, scale and nature of disturbance, lifecycle of any infrastructure installed and final rehabilitation outcomes required. For drilling activities, the method of management of residual drilling material (RDM) and fluids needs to follow requirements as outlined in the relevant RDM management documents in the HSE Key Documents Guide ORG-ARW-HSM-GUI-00183.

Rehabilitation planning for any site disturbance should include the following:

- Determining the rehabilitation objectives, e.g. stabilisation or final rehabilitation state, based on proposed short or long term land use and any regulatory or landholder requirements;
- Assessing current site conditions, e.g. vegetation, soil types, contours, landform, land contamination;
- Identifying erosion mitigation works that may be required;
- Identifying stabilisation and/or revegetation requirements, e.g. seeding, applying site stabiliser and/or supplementary planting of native or non–native species;
- Identifying mitigation and control measures to support achieving and maintaining rehabilitation objectives and reduce the likelihood for ongoing maintenance (e.g. applying soil ameliorants such as fertiliser and/or gypsum to improve soil fertility and structure);
- Identifying schedules for monitoring and maintenance, e.g. frequency and duration, to be determined through risk assessment for each site; and
- Identifying record keeping and/or reporting requirements.

This plan is intended to provide guidance on standard stabilisation/rehabilitation requirements for activities involving land disturbance in Arrow. **Any site specific requirements which differ from the standard requirements included in this plan should be included in Access and Approval Package (AAP) documentation and/or site specific rehabilitation plans (see Section 5).** This may include target outcomes, seed mixes and whether or not a site specific rehabilitation plan is required.

Other HSEMS procedures and supporting documents under the *Standard – Land Management* should also be referenced when planning works involving land disturbance.

2.3.2 Execute/Construct/Stabilise

This project stage involves construction of the infrastructure and generally includes site preparation (e.g. vegetation clearing, levelling of site and/or construction of trenches or pits on well pads to support drilling activities), construction of infrastructure (e.g. dams, wells, gathering lines) and then stabilisation of disturbed areas not required for ongoing operational activities. Where sites will be decommissioned on completion of works and not enter a further phase of activity, e.g. drill cores, rehabilitation to meet final acceptance criteria may be undertaken rather than stabilisation.

Stabilisation or rehabilitation activities for well sites may include on–site disposal of RDM via mix bury cover, land application or other certified method as well as other stabilisation activities. Departments undertaking land disturbance must undertake monitoring and maintenance to ensure sites meet agreed stabilisation or rehabilitation objectives prior to handover to the department responsible for ongoing operational and maintenance activities.

Information to be provided at handover includes:

- as–built drawings including disturbance footprints and stabilised/rehabilitated area footprints (including copy in electronic format meeting Arrow Standard – As–Built Geospatial Specification or other agreed standard);
- record of stabilisation/rehabilitation activities undertaken, e.g. seeding, soil amelioration/amendment, reinstatement of topsoil;
- volumes, methods and locations of any onsite waste disposal; and
- monitoring and maintenance records.

2.3.3 Operate

This is the operate and maintain period in the life of the infrastructure. From a rehabilitation perspective, ongoing monitoring and maintenance is required to ensure sites remain in a stable condition, i.e.

- weeds and pests are controlled;
- significant erosion/subsidence is not occurring; and
- groundcover has established and/or other soil stabilisation methods are maintained.

As operational activities may still cause land disturbance on previously disturbed areas, e.g. well workovers, track grading and maintenance works, stabilisation activities may also be required in this stage of the asset life. As the end of the operational life of an asset approaches, planning must commence for decommissioning of that asset and final rehabilitation of any remaining disturbed areas.

Monitoring and maintenance of stabilised areas is required during operations to ensure stabilisation objectives continue to be met.

2.3.4 Decommissioning

This is the stage when infrastructure is decommissioned and removed from the site and works are undertaken to achieve final rehabilitation objectives. For large infrastructure such as dams and CGPFs, a site specific decommissioning plan will be developed.

For pipelines and gathering networks that are to be decommissioned, a decommissioning plan will be developed to meet the requirements of the latest Australian Pipelines and Gas Association (APGA) Code of Practice Upstream Polyethylene Gathering Networks – CSG Industry, this plan will be supported by a Site Specific Rehabilitation Plan.

In addition to those matters identified in Section 2.3.1, planning for final rehabilitation should include:

- Identifying the final rehabilitation completion state required, e.g. agricultural cropping soils, exotic pastures, native pastures or native vegetation (see Section 0), to meet EA requirements;

- Confirming any regulatory and landholder requirements if an extended period of time has elapsed; and
- Scoping and budgeting for required works

Final decommissioning and rehabilitation objectives will be included in site specific rehabilitation plans.

This stage of work includes monitoring of rehabilitated areas to confirm they are progressing towards meeting final rehabilitation objectives. Maintenance works may be required if sites are not satisfactorily progressing towards meeting final rehabilitation objectives.

2.3.5 Post–Rehabilitation

A final rehabilitation report (FRR) or progressive rehabilitation report (PRR) is to be completed by a suitably qualified person when monitoring has confirmed final rehabilitation acceptance criteria have been met for a tenure (FRR) or particular area within a tenure (PRR).

Documentation including the FRR or PRR or Decommissioning and Rehabilitation Report may then be used to apply to Queensland Government to relinquish sites/tenure, obtain landholder signoff, close–out conduct and compensation agreements, apply for progressive certification and/or discharge financial assurance.

3 Rehabilitation Methods

General guidance on methods to achieve the stabilisation and rehabilitation objectives in *Procedure – Land Rehabilitation* are discussed below. Other matters relevant to land disturbance activities such as weed management, topsoil management, stockpile management, erosion and sediment control, subsoil salinity and sodicity management and dust control are covered in other supporting documents to the HSEMS Land Management Standard, e.g. *Procedure – Land Disturbance* and *Guideline – Land Disturbance* and *Procedure – Weed Management*.

Additional requirements specific to different asset types are discussed further in Section 0.

Table 1: Key Rehabilitation Activities

Rehabilitation Action	Description
Soil Assessment	The soil type/s for the site to be disturbed and risks of impacts based on proposed activities shall be determined as per *Procedure – Land Disturbance* and *Guideline – Land Disturbance*. This will inform appropriate management practices for the proposed works including any amelioration of topsoil to support revegetation of the site.
Topsoil management	Topsoil that is stripped and stored as part of construction activities is to be re–spread as part of stabilisation and rehabilitation activities. Correctly preserved topsoil resources can provide viable sources of seed–stock, biological life and nutrient conditions that assist with soil productivity and fertility, and thereby vegetation establishment. Topsoil management is to be undertaken in accordance with the requirements of *Procedure – Land Disturbance* and *Guideline – Land Disturbance*.
Sodic soil amelioration	Sodic soils when encountered should be blended with an appropriate soil ameliorant (i.e. gypsum, a calcium based ameliorant) during rehabilitation processes to reduce dispersiveness. A good layer of topsoil should be placed on top of sodic soils during rehabilitation works. Amelioration with gypsum and/or lime or additional of organic mulch can improve soil structure, infiltration and soil aeration can promote vegetation establishment. Soil amelioration is to be undertaken in accordance with the requirements of *Procedure – Land Disturbance* and *Guideline – Land Disturbance*.
Soil compaction	For long–term disturbances such as well leases, dams or CGPFs it is likely that that the soil will have become compacted over time. Where necessary, the soil should be treated (i.e. deep ripped) to alleviate the soil compaction. This should occur prior to reshaping the upper layers of the soil stratum.
Contaminated land	Where there is a risk of contaminated land occurring, such as brine ponds, CSG water dams and storage facilities, or other areas where significant hydrocarbons have been stored, a site specific contaminated land assessment and subsequent management plan may be required. Contaminated land investigations are required to be undertaken by a person with appropriate skills and experience. Consult the Environment Team if contamination investigations or remediation is required.

Land Rehabilitation Plan

Rehabilitation Action	Description
Landform management	Sites should be re–shaped to a safe and stable landform, with surface drainage lines and topsoil profile re–instated. Where practical, sites should be reshaped to a natural landform. However, it is not practical to reshape sites where cut and fill operations have occurred on slopes, or within highly dispersive soils. In these instances a stable landform should be reinstated by surface re–profiling, contouring or benching. Methods to reshape the landform will vary depending on the level of disturbance.
Revegetation	Natural Regeneration – natural regeneration is the preferred method for re–reinstating native vegetation where short–term disturbances are proposed (less than 18 months) and a viable seed bank is available. Natural regeneration is advantageous over assisted revegetation, as the seedlings are more likely to establish and grow rapidly with less mortality than planted individuals, as they are adapted to the local environment. Where natural regeneration is ineffective, assisted revegetation will be undertaken. Assisted Revegetation – In areas where long–term disturbances have occurred or where natural revegetation is deemed as ineffective, assisted revegetation may be required to ensure that disturbed areas are rehabilitated with species richness representative of the adjacent land use or natural area. Within areas of native vegetation, a combination of tubestock and seeding may be implemented. Tubestock should be used for canopy and shrub species, while a combination of tubestock and seeding is appropriate for herbs, forbs and grasses. Species should be selected based on assessments of the adjacent vegetation community composition and other appropriate benchmark guidelines. Appropriate buffer distances shall be maintained for planted species from above ground infrastructure and from pipelines. Refer to Section 4.2 for further guidance for buffer distances from pipelines. Refer to AAP and/or site specific rehabilitation plan for site–specific revegetation requirements and/or seek guidance from Ecology team.
Mulching and placement of vegetation	Vegetation cleared during construction phases may be retained on–site for use during stabilisation and/or rehabilitation activities in the form of: • Mulch; or • Felled timber and large logs (for habitat recreation) Mulch and vegetation may be respread over the site as required where practical. This will assist in site stabilisation, revegetation efforts and suppressive weed growth.

Land Rehabilitation Plan

Rehabilitation Action	Description
	Where mulch is applied on flat sites for rehabilitation purposes only, conditions supportive of re–establishment of vegetation generally include: • Mulch is at least 6 weeks old • Mulch has been prepared from a single tub grind of cleared standing vegetation, with maximum fines of 5% and particle size within 15 – 600mm • Mulch is applied consistently at a depth of 10 – 25 mm across the site For additional guidance, refer to Environment Team. Vegetation clearing and management is to be undertaken in accordance with *Procedure – Land Disturbance* and *Guideline – Land Disturbance* and in consultation with Land Liaison Officers and landholders.
Weed and pest monitoring and management	Weed and pest management may be required to enable the regeneration of pre–disturbance land uses and to minimise the risk of introduction of new weed or pest species or increase the localised population of existing species. Weed and pest management is to be in accordance with *Procedure – Weed Management*, *Procedure – Vehicle and Machinery Hygiene*, *Procedure – Pest Management*, any species–specific management plans in place and any site–specific requirements in AAPs.
Livestock and wildlife management	Where livestock, e.g. cattle, or wildlife are present within areas undergoing stabilisation or rehabilitation, temporary fencing may be required to ensure livestock or wildlife cannot damage rehabilitation works. Guidance on fencing is contained in *Procedure – Land Disturbance*. Proposed fencing should be discussed with Land Liaison Officers to ensure landholder considerations are accounted for.
Backfilling of excavations	When backfilling excavations, excavated material should be replaced in the order it was removed, e.g. deepest material excavated should be replaced first when backfilling. Backfilled material must be capped with topsoil per *Procedure – Land Disturbance* and *Guideline – Land Disturbance*.
Onsite disposal of residual drilling material	Onsite disposal of RDM must only be undertaken where permitted under EA conditions, landholder agreements and internal Arrow guidelines (e.g. for activities on intensively farmed land). AAPs will contain guidance on whether or not onsite disposal of RDM is permitted on specific sites. Guiding documents for onsite disposal of RDM include *Work Method Statement – Application of Residual Drilling Material*, *Work Instruction – Mix Bury Cover*, *Work Instruction – Land Application* and *Guide – Residual Drilling Material (RDM) Sampling and Work Method Statement – Application of RDM-Site Specific Stabilisation Scope of Works - Wellsite*
Waste management	Waste management is to be in accordance with *Procedure – Waste Management*, *Guideline – Waste Classification and Tracking* and relevant Site Waste Management Guides. Sampling of waste streams,

Land Rehabilitation Plan

Rehabilitation Action	Description
	e.g. RDM and residual drill fluid, may be required for a suitable disposal facility/location to be identified.
Erosion and sediment control	Erosion and sediment controls identified and implemented as part of the site preparation process shall remain in place where appropriate until stabilisation of the site has been achieved. Erosion and sediment controls and plans shall be reviewed prior to execution of rehabilitation works to determine any alternative or additional controls required.
Decommissioning/Abandonment of Pipeline and Gathering Networks	The pipeline and gathering network section will be decommissioned/abandoned in such a way to ensure that future ground subsidence and the risk of contamination of the soil or groundwater is minimised and any impacts to ongoing land uses are identified and mitigated. When assessments identify subsidence to be an unacceptable risk, suitable measures will be put into place, such measures as filling the network sections with concrete or other similar materials or continuation of ROW monitoring programs and implementation of remediation activities. Refer to Australian Pipelines and Gas Association (APGA) Code of Practice Upstream Polyethylene Gathering Networks – CSG Industry and APGA Code of Environmental Practice – Onshore Pipelines.
Final rehabilitation objectives	Within Arrow, the final rehabilitation objectives for a site will be as per EA requirements and will generally be one of the following four outcomes: • State 1: Agricultural cropping soils. • State 2: Exotic pastures. • State 3: Native pastures. • State 4: Native vegetation. These are described in more detail in Appendix A.

4 Asset–Specific Requirements

4.1 Well Leases

Following completion of a gas well, stabilisation of parts of the well lease not required for continuous operational use will occur. Areas outside the operational footprint of this may be used intermittently throughout the life of the well, e.g. for workovers or other maintenance activities, hence may be subject to re–disturbance and require re–stabilisation during this time.

Well–lease specific actions which may be required to meet stabilisation and/or final rehabilitation objectives include:

- Execute any permitted onsite disposal of wastes, e.g. land application or mix–bury–cover of RDM, in accordance with HSEMS, EA and AAP and Site Specific Scope of Works requirements.
- Backfill any excavations, e.g. pits/trenches/sumps, not required for ongoing operations.

Final rehabilitation of the whole site will not occur until all activities cease and infrastructure is decommissioned, however consideration should be given to the final rehabilitation objectives when undertaking stabilisation works so that sites will proceed towards this if no further re–disturbance is required.

If sites are to be decommissioned immediately on completion of the activity causing land disturbance, e.g. drill core holes, rehabilitation works should aim to meet final rehabilitation criteria in addition to stabilisation objectives.

4.2 Linear Infrastructure

Following completion of construction of linear infrastructure, e.g. gas or water pipelines, areas within the operational footprint are to be stabilised and areas not required for ongoing operations and/or maintenance are to be rehabilitated. The width of the operational footprint will depend on the nature of the linear infrastructure. Staged stabilisation and/or rehabilitation works is recommended for linear infrastructure as works progress to minimise the length of time disturbed areas are exposed.

For pipelines, no tree species should be planted or allowed to establish in operational footprints as these may damage the pipeline's integrity over time. Furthermore, tree canopies (and therefore root balls) should not overgrow the pipeline to minimise risk due to bushfires. If any species are planted, species should not exceed 15 metres in expected height, buffer distances for tree species should be maintained at 3 metres greater than the expected canopy reach. These control measures will reduce the risk of infrastructure damage in the event of a bushfire.

Other linear infrastructure such as power lines may require certain distances between the power line and trees of a particular height to avoid potential impacts on the asset, e.g. from tree branches or falling trees.

Once the pipeline and/or gathering networks is no longer required, a site-specific decommissioning plan and site specific rehabilitation plan must be prepared and implemented to meet final rehabilitation criteria.

4.3 Facilities/Laydowns

Areas within the operational footprint of facilities/laydowns are to be stabilised and maintained until decommissioning and final rehabilitation occurs. Areas disturbed by construction works which are not required for on–going operational or maintenance activities are to be rehabilitated to meet final rehabilitation objectives, as per the Rehabilitation Procedure.

4.4 Quarries and Borrow pits

For activities involving significant cut and fill operations e.g. borrow pits and quarries, rehabilitation to the pre–existing or adjacent land use may not be a practical or achievable outcome. Notwithstanding, stabilisation objectives are to be met to ensure the final landform is stable, non–polluting and safe to humans, livestock and wildlife. Outcomes which differ from EA requirements must be agreed with the regulator and landholder.

4.5 Dams

During and post construction of a dam, all areas within the footprint (e.g. batters, tracks) are to be stabilised and maintained until decommissioning and final rehabilitation occurs. Once the dam is no longer required a site-specific decommissioning plan and site specific rehabilitation plan must be prepared and implemented to meet final rehabilitation criteria.

5 Site or Activity Specific Rehabilitation Plans

A site or activity specific rehabilitation plan may be required where more complex site investigation, remediation and/or rehabilitation activities are necessary to meet rehabilitation objectives. This should be developed by a suitably qualified person.

Triggers for a site or activity specific management plan include:

- Complex ecosystems to be reinstated;
- Significant land contamination issues to be addressed (potential or actual);
- Sites with steep gradients;
- Sites with highly dispersive or otherwise unstable soils;
- Significant areas of disturbance (e.g. dams, central gas processing facilities (CGPFs)); and
- Approval received from regulator for alternative outcome to standard environmental authority conditions, e.g. to accommodate landholder requests.

Additional specialist studies or support may be required to scope and execute rehabilitation works for these sites. Advice is to be sought from an environmental or ecology representative about scope of work required.

6 Monitoring, Maintenance and Record Keeping

6.1 Monitoring

All stabilised or rehabilitated sites will require ongoing monitoring to ensure relevant rehabilitation objectives continue to be met during their operational life and decommissioning process.

Monitoring will be undertaken of stabilised or rehabilitated sites during operations and decommissioning stages to ensure that the relevant rehabilitation objectives continue to be met. Monitoring periods are to be determined on a case–by–case basis and will be dependent on the success of rehabilitation, season or natural disasters impeding rehabilitation efforts or access. Sites are to be monitored until such time that relevant rehabilitation criteria can be demonstrated as met. Arrows Rehabilitation Monitoring Assessment Form is used to record ecological data and achievement against the EA rehabilitation acceptance criteria conditions.

Records are to be kept to demonstrate site conditions at the time of the monitoring event. Criteria to be assessed and recorded and used to prioritise future monitoring events include:

- Presence of contamination;
- Land profile/land reinstatement;
- Drainage;
- Topsoil reinstatement;
- Groundcover;
- Land stability/erosion/subsidence;
- Weeds;
- Waste materials/disused equipment;
- Landholder matters, e.g. compensation payment dates, relinquishment/signoff on sites, complaints; and
- Tenure matters, e.g. relinquishment requirements.

Monitoring is to continue until final rehabilitation criteria have been met and sign–off on the site has been received from the landholder.

6.2 Maintenance Actions

Any remedial actions and maintenance requirements identified during the scheduled monitoring activities and incidental observations shall be carried out in a timely manner.

The timing of remedial actions or maintenance activities is to be based on the perceived risk of harm to people, the environment or infrastructure posed by the site and/or any regulatory (e.g. EA) or landholder conditions.

Maintenance actions which may be required including watering, replanting, seeding, weed removal, stabilisation and repair/reinstatement of fencing and erosion and sediment control measures.

6.3 Record Keeping

Information to be provided at handover of sites from departments undertaking land disturbance works to the department responsible for operation and maintenance of that asset is listed in Section 2.3.2. This information is to be saved in applicable compliance and assurance data management system/s, e.g. CMO.

Records of monitoring activities are to be saved in the relevant data management system under the asset to which they relate.

Copies of landholder signoffs, progressive certification applications, FRRs, PRRs, Final Dam Decommissioning Reports and any regulatory signoffs are to be saved in the relevant data management system under the asset to which they relate.

7 Evaluation and Review

The implementation and effectiveness of this management plan will be regularly assessed to ensure:

- Arrow is demonstrating compliance with legal and landholder obligations;
- The overall management strategy remains relevant and up to date;
- Monitoring and maintenance is being scheduled and executed in a cost–effective manner; and
- Staff are aware of their obligations under the plan.

Reviews and changes to the plan will be communicated to relevant Arrow personnel.

8 Definitions

Term	Definition
Access and Approvals Package (AAP)	Package issued under Access and Approvals Framework which hosts the access and approval conditions which must be met for activities undertaken on a particular site.
Certified rehabilitated area	The area the subject of progressive certification is a certified rehabilitated area for the relevant tenure.
Decommissioning	When a network is disconnected from all sources of hydrocarbons or water that may be present in other pipelines and other appurtenances. Gas lines are purged of hydrocarbons and vapour with non-flammable fluid. Water lines are purged using compressed air.
Rehabilitation	Rehabilitation is the process of returning the land to a condition that will ensure the ongoing physical integrity and the natural ecosystem values of the site
Final rehabilitation report (FRR)	A final rehabilitation report prepared under chapter 5, part 10, division 3 of the *Environmental Protection Act 1994*. It provides evidence that the land on which activities authorised under an EA have been carried out has been rehabilitated to the required standards, e.g. final rehabilitation acceptance criteria in EA.
Progressive certification	Certification from the regulator that a particular area within a relevant tenure has been successfully rehabilitated to meet final acceptance criteria in EA.
Progressive rehabilitation report (PRR)	A report prepared to support an application for progressive certification of a particular rehabilitated area within a relevant tenure. It contains the same information as a final rehabilitation report.
Stabilisation	Following land disturbance, the stabilisation of the land to minimise further risk of land degradation, this may include but is not limited to backfilling of excavations, reinstatement of topsoil and amelioration, waste disposal, remediation of contaminated land, re-profiled contours, establishment of groundcover or another soil stabilisation method.
Suitably qualified/ experienced person	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.

APPENDIX A – REHABILITATION STATES

State 1: Agricultural cropping soils (including SCL) Rehabilitation that allows the pre-work land use to be undertaken and where the site had an annual groundcover component i.e. cropping or annual pasture phase. Consideration should be given to reshaping of the land surface to preconstruction landform. Pre-disturbance soil productivity and structure should be maintained or recreated.	
State 2: Exotic pastures Rehabilitation that allows the pre-works land use to be undertaken, and where the site had a perennial groundcover component. May involve reshaping of the land surface to preconstruction landform and introducing exotic perennial groundcover.	
State 3: Native pastures Rehabilitation that allows the pre-works land use to be undertaken, and where the site involves a perennial native groundcover component. May involve reshaping of the land surface to preconstruction landform and re-establishing a native perennial groundcover. This may be actively sown or encouraged through passive regeneration. Regeneration of woody species through natural recruitment would be expected to occur in appropriate vegetation types.	
State 4: Native Vegetation Rehabilitation that allows the pre-works land use to be undertaken and where this involves essentially a native vegetation remnant. Rehabilitation aimed at reconstructing the landform, habitat components, native vegetation structure and species composition formerly found on the site. This would occur through a combination of natural recruitment, passive management and active interventions	

9 Document Administration

Revision history

Revision	Revision Date	Revision Summary	Author
5.0	12/11/2020	IFU - Alignment with APGA CoP for Upstream Polyethylene Gathering Networks	L Mack
6.0	3/11/2023	Review and minor updates	D Blunt
7.0	05/03/2024	Added buffer distances for planted specifies from pipeline infrastructure to reduce risk of polyethylene damage due to bushfire	K Bawden

Related documents

Document Number	Document title
ORG–ARW–HSM–STA–00001	Standard – Land Management
ORG–ARW–HSM–PRO–00146	Procedure – Land Disturbance
ORG–ARW–HSM–PRO–00073	Procedure – Land Rehabilitation
ORG–ARW–HSM–PRO–00138	Procedure – Vehicle & Machinery Hygiene
ORG–ARW–HSM–PRO–00139	Procedure – Weed Management
ORG–ARW–HSM–PRO–00096	Procedure – Pest Management
ORG-ARW-HSM-PRO-00066	Procedure – Waste Management
ORG-ARW-HSM-GUI-00052	Guide – Waste Classification and Tracking
ORG–ARW–HSM–FOR–00208	Work Method Statement – Land Application of RDM
ORG–ARW–HSM–WOI–00049	Work Instruction – Land Application Method for Site Rehabilitation
ORG–ARW–HSM–WOI–00048	Work Instruction – Mix Bury Cover Method for Site Rehabilitation
ORG–ARW–WLS–PRO–00001	Procedure – Access and Approvals Framework
ORG-ARW-HSM-FOR-00142	Rehabilitation Monitoring Assessment Form
ORG-ARW-HSM-FOR-00276	Site Specific Rehabilitation Plan
ORG-ARW-AOP-PLA-00016	Environmental Management Plan – Operations
ORG-ARW-ENV-PLA-00003	Environmental Management Plan – Projects Execution Stage Construction

Acceptance and release

Author

Position	Incumbent	Release Date
Senior Environment Advisor	Daniel Blunt	November 2023

Stakeholders and reviewers

Position	Incumbent	Review Date
Manager Environment and Carbon	Kelsey Bawden	05 March 2024

Approver(s)

Position	Incumbent	Approval Date
Manager Environment & Carbon	Kelsey Bawden	Kelsey Bawden

Appendix G – Crop Frequency Report

FORAGE REPORT: CROP FREQUENCY

Queensland Government

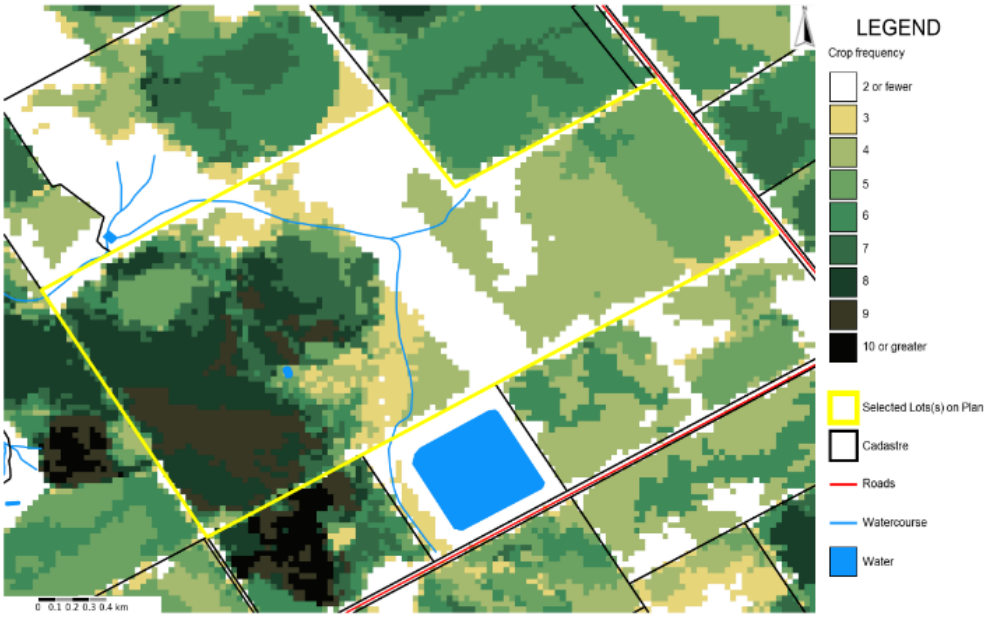
http://www.longpaddock.qld.gov.au/forage 22/01/2025 Lot on Plan: 3RP77715 Label: proposedrds

Introduction

This report presents maps of crop frequency for your chosen area, and chosen time period. Maps are based on time-series analysis of satellite imagery (30m spatial resolution), for both the summer (November of the previous year - May) and winter (June - October) growing seasons. Composite satellite images that display the maximum greenness within a summer or winter growing season for each year are also provided, as a visual reference. For further information refer to the FORAGE User Guide (https://data.longpaddock.qld.gov.au/static/forage_user_guide.pdf).

Location map

Estimated total crop frequency map (2014 - 2023)



How to interpret the information

Crop-frequency mapping: Coloured areas on the maps indicate locations where actively growing crops have been detected three or more times, for the time period specified.

The map on this first page shows the 'Total Crop Frequency'. For example, a total crop frequency of 5 indicates that there have been 5 crops for the entire time period specified, which can be made up of either summer-growing crops or winter-growing crops.

The maps on page 2 show the frequency of summer-growing and winter-growing crops (respectively).

Pages 3–5 show the frequency of the individual groups of crops: the summer-growing crops are grouped as 'banana', 'cotton', 'sugarcane', and 'other'; the winter-growing crops are grouped as 'cereal' and 'chickpea'. **Note:** while bananas and sugarcane can be grown all year around, they are best detected by satellites during summer. In addition, only sugarcane and banana crops are mapped in proximity to the coast (Queensland).

Blue polygons (if any) indicate the maximal area of known lakes and reservoirs, according to existing data. Where these areas have been covered by water for the majority of a growing season, they display as whitespace in the corresponding composite satellite image (i.e. they have been excluded from analysis).

Composite satellite images: Due to the limitations of the automated method used to detect active cropping, it is recommended to view the corresponding reflectance images (page 6 onward), composited to represent the maximum greenness (per pixel) observed within a particular growing season. Cropped areas will generally appear bright green in these images compared with the surrounding landscape. Even if the frequency mapping does not indicate cropping in an area, it is important to check each reflectance image to confirm that cropping has not been done. Sometimes it will not be possible to clearly identify cropped areas in the imagery, e.g in relative wet seasons the entire landscape might appear bright green. In such a case we recommend to investigate further with other sources of information.

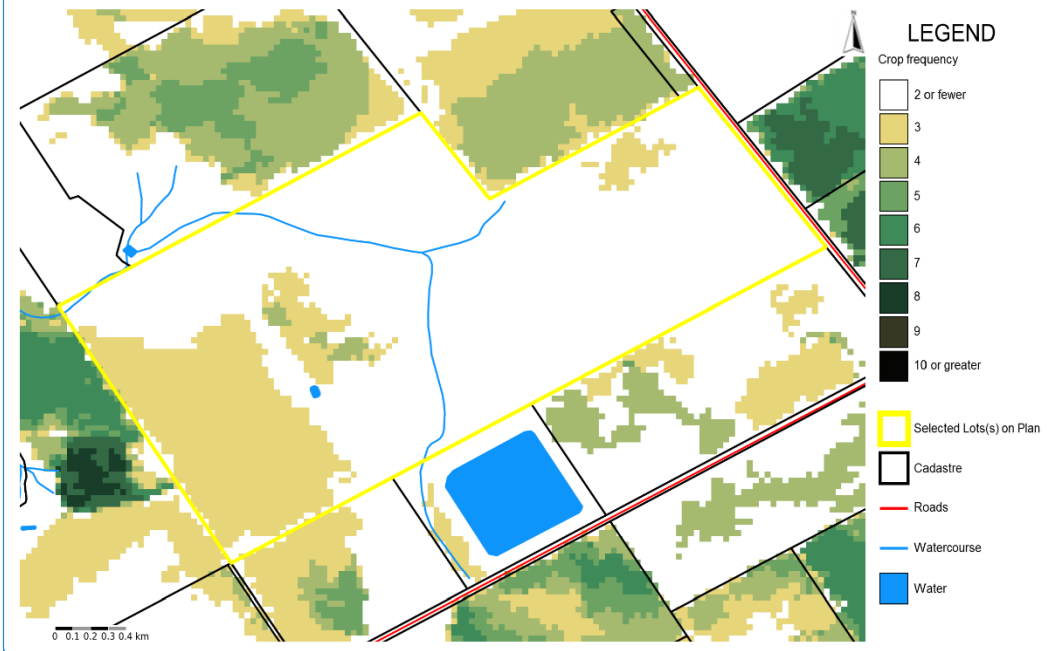
Time-series plot: On the final page of the report is a plot of the proportion of the selected area that was cropped in each growing season through time.

FORAGE REPORT: CROP FREQUENCY

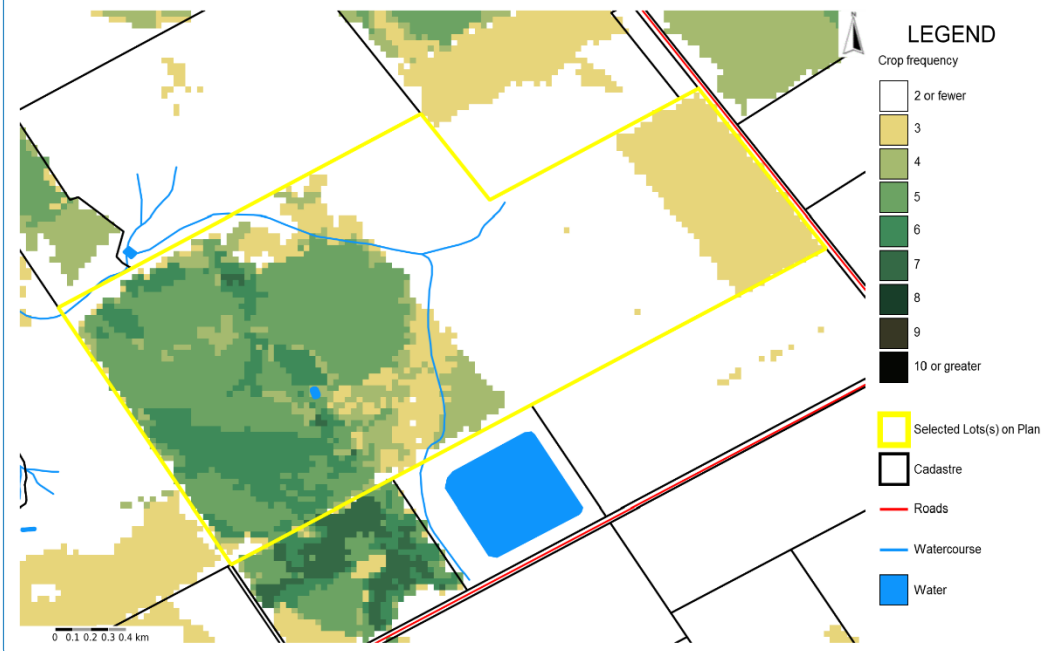
http://www.longpaddock.qld.gov.au/forage 22/01/2025 Lot on Plan: 3RP77715 Label: proposedrida

Queensland Government

Estimated frequency map for summer-growing crops (February, 2014 - 2023)



Estimated frequency map for winter-growing crops (September, 2014 - 2023)



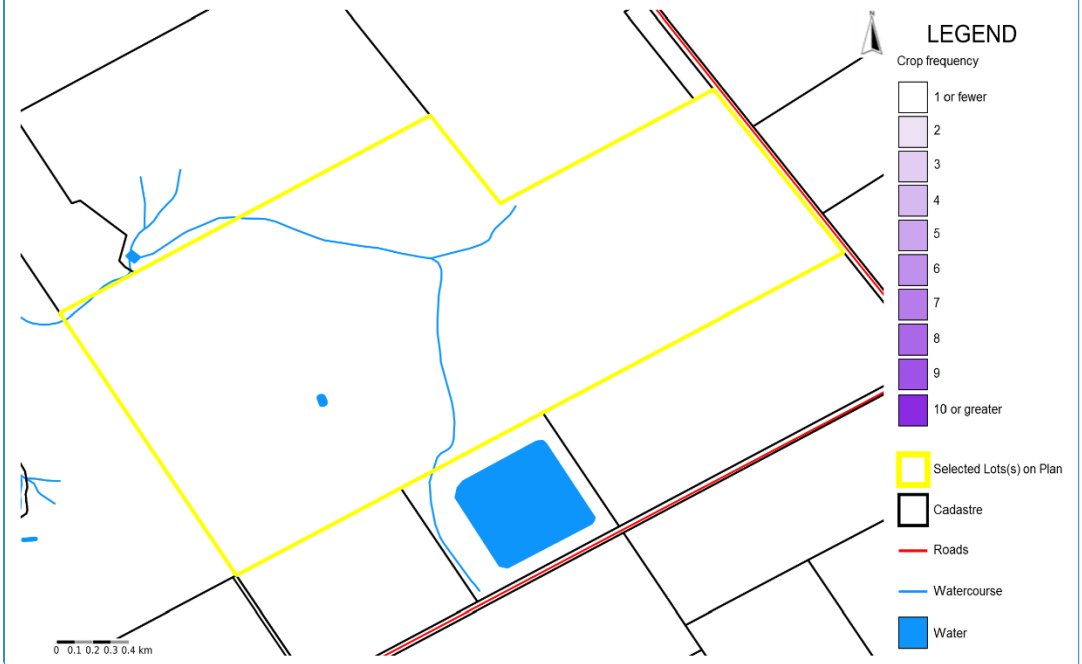
arrow energy go further

FORAGE REPORT: CROP FREQUENCY

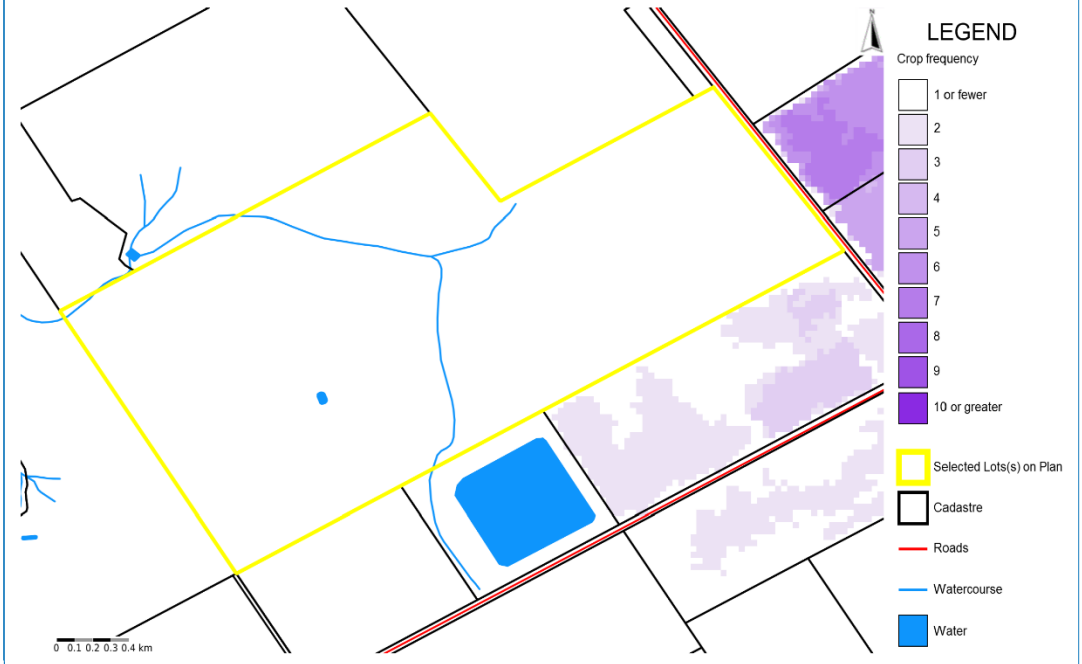
http://www.longpaddock.qld.gov.au/forage 22/01/2025 Lot on Plan: 3RP77715 Label: proposedrida

Queensland Government

Estimated frequency map for banana crops (February, 2014 - 2023)



Estimated frequency map for cotton crops (February, 2014 - 2023)



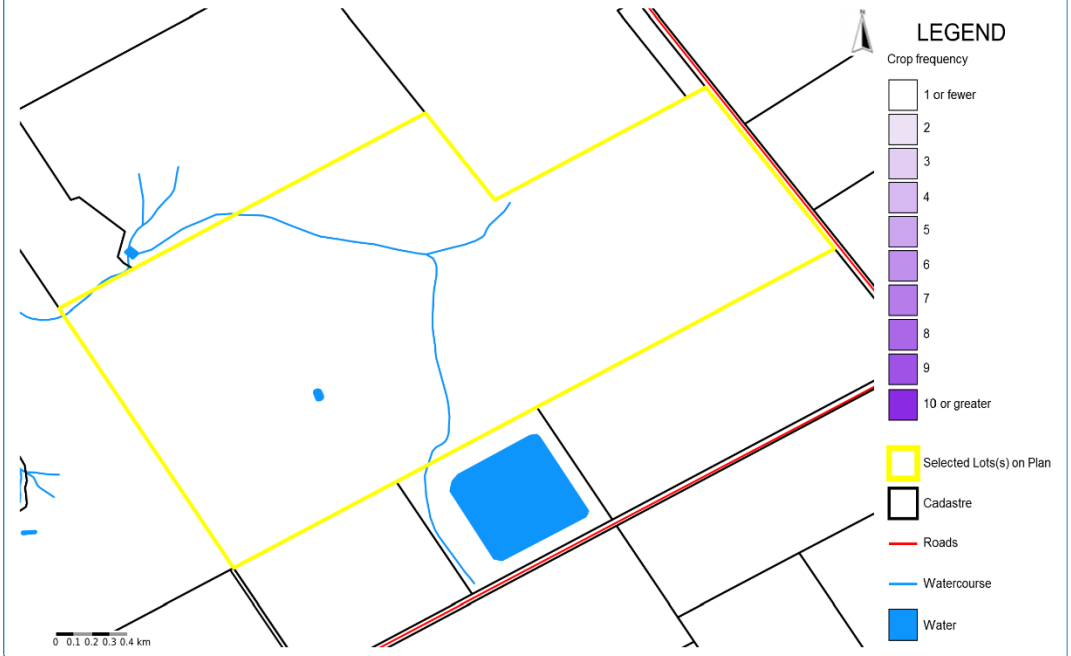
arrow energy go further

FORAGE REPORT: CROP FREQUENCY

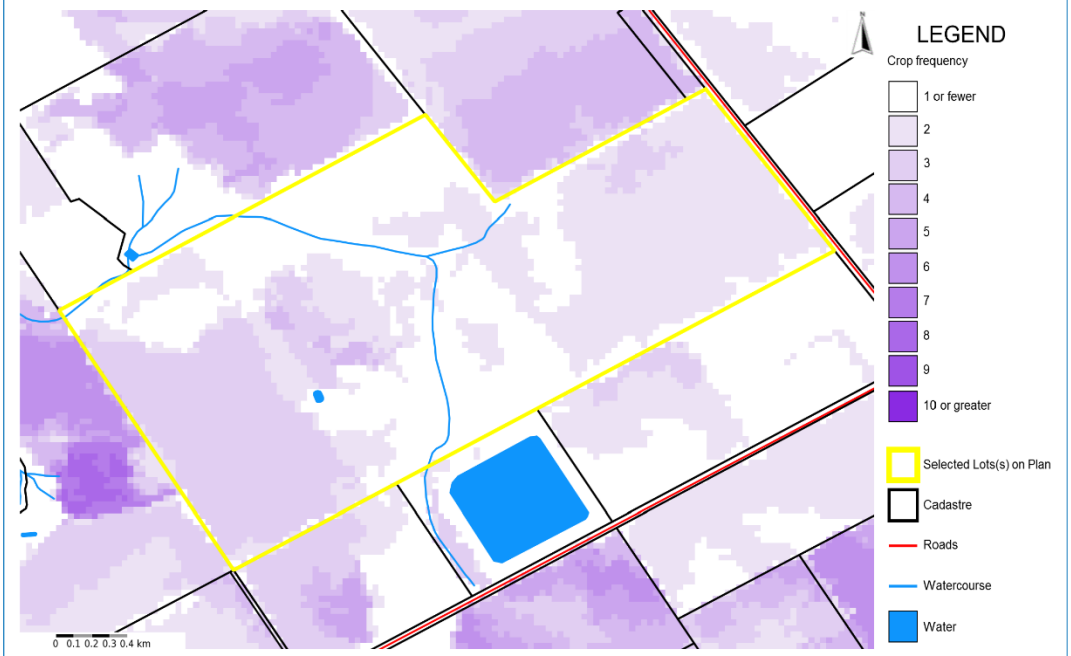
http://www.longpaddock.qld.gov.au/forage 22/01/2025 Lot on Plan: 3RP77715 Label: proposedrida

Queensland Government

Estimated frequency map for sugarcane crops (February, 2014 - 2023)



Estimated frequency map for other summer-growing crops (February, 2014 - 2023)



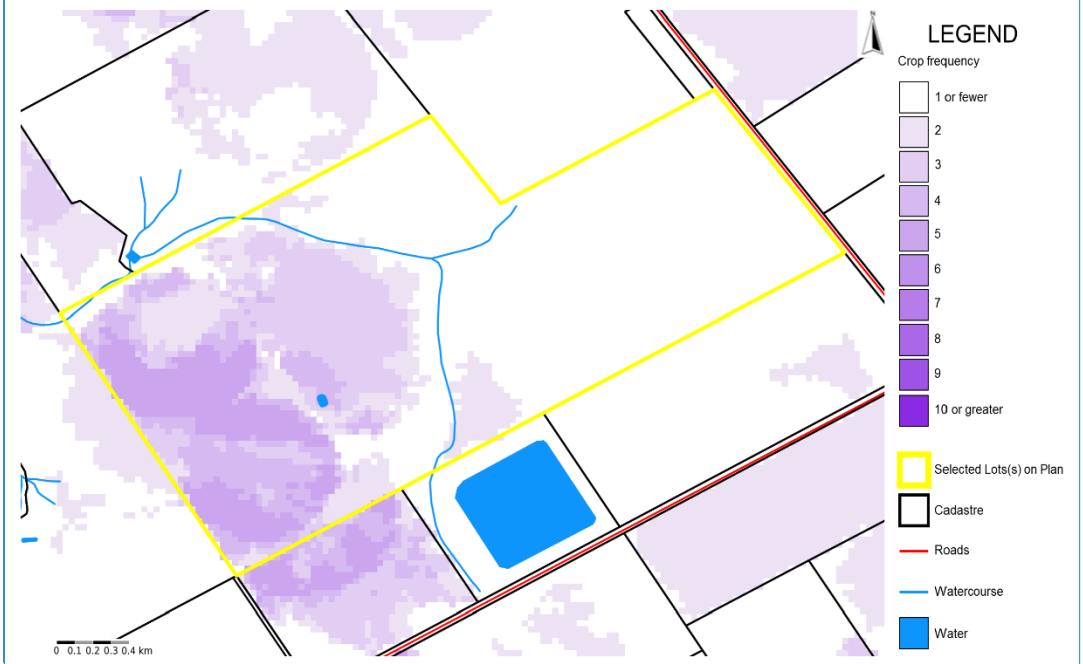
arrow energy go further

FORAGE REPORT: CROP FREQUENCY

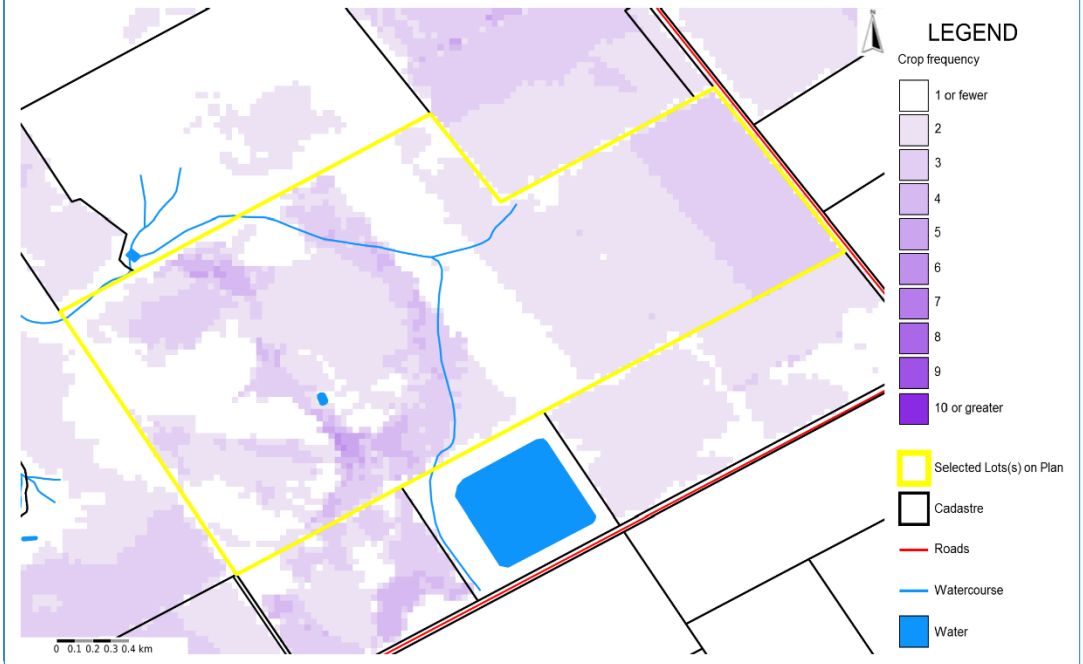
http://www.longpaddock.qld.gov.au/forage 22/01/2025 Lot on Plan: 3RP77715 Label: proposedrida

Queensland Government

Estimated frequency map for cereal crops (September, 2014 - 2023)



Estimated frequency map for chickpea crops (September, 2014 - 2023)



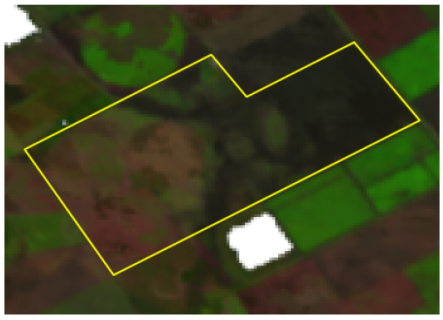
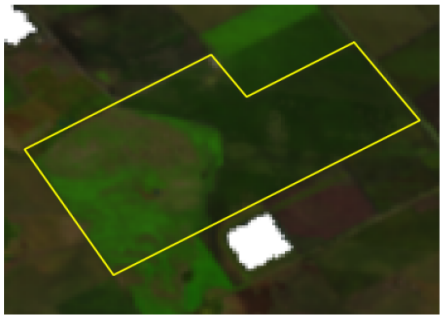
arrow energy go further

FORAGE REPORT: CROP FREQUENCY

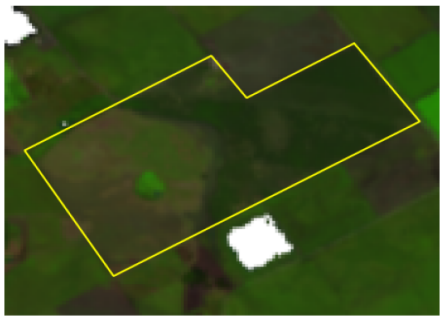
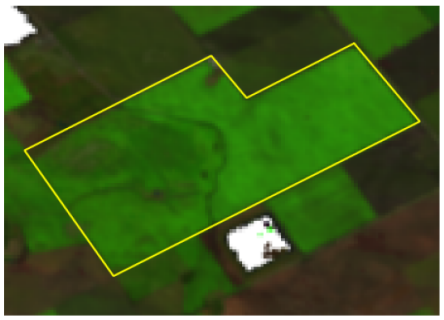
Queensland Government

http://www.longpaddock.qld.gov.au/forage 22/01/2025 Lot on Plan: 3RP77715 Label: proposedrida

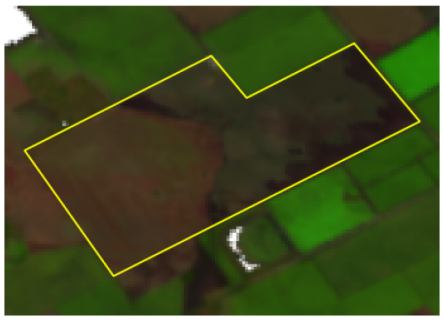
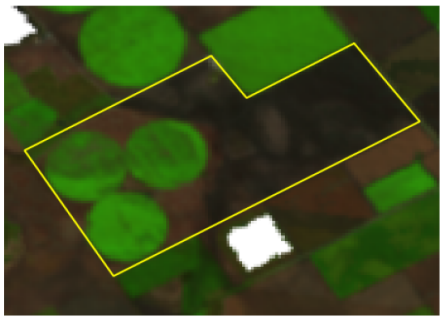
February (left) and September (right) images for 2014

February (left) and September (right) images for 2015

February (left) and September (right) images for 2016

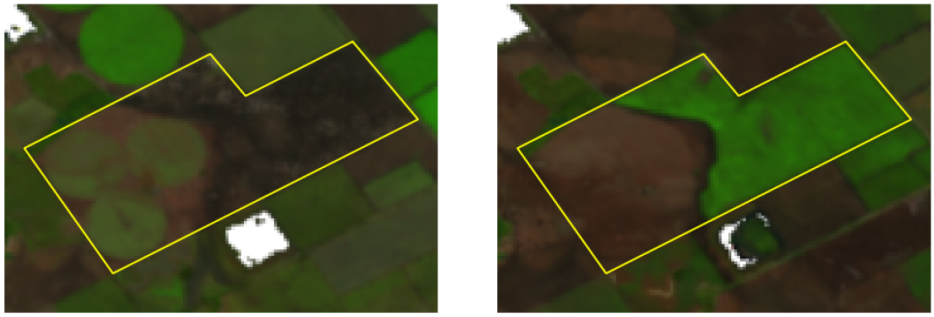
arrow energy go further

FORAGE REPORT: CROP FREQUENCY

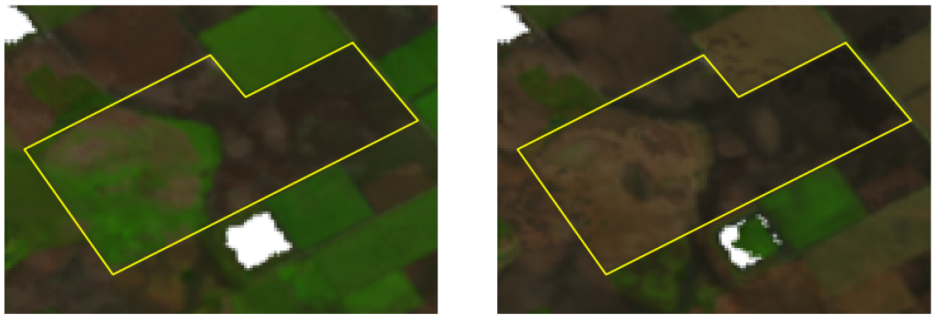
http://www.longpaddock.qld.gov.au/forage 22/01/2025 Lot on Plan: 3RP77715 Label: proposedrida

Queensland Government

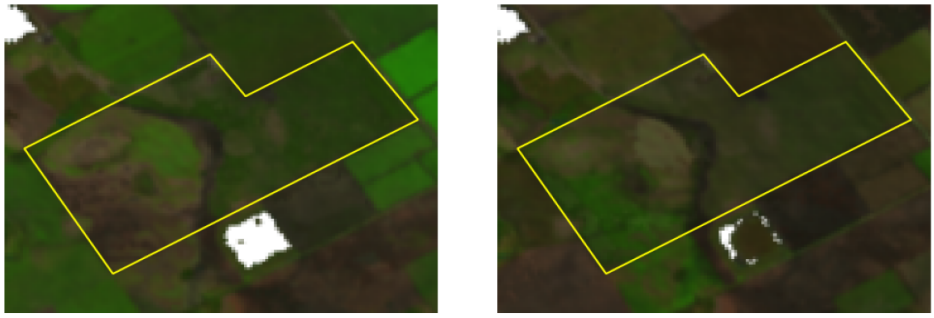
February (left) and September (right) images for 2017



February (left) and September (right) images for 2018



February (left) and September (right) images for 2019



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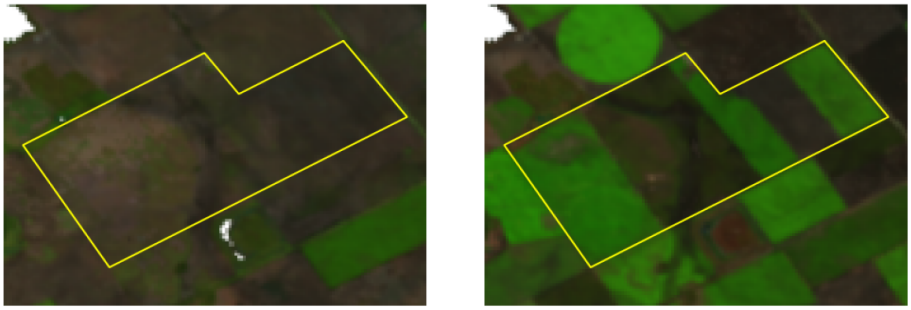
FORAGE REPORT: CROP FREQUENCY

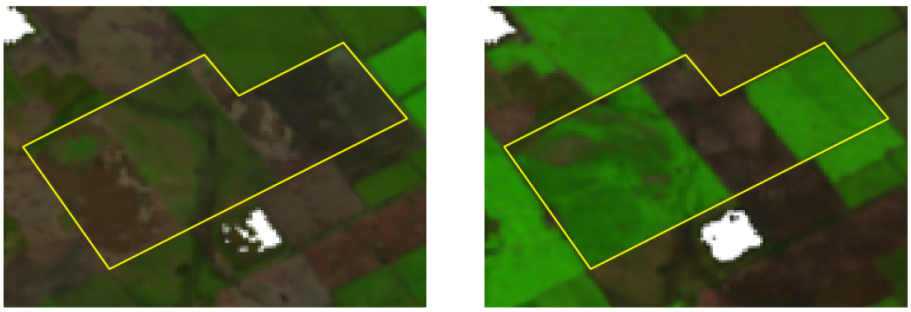
http://www.longpaddock.qld.gov.au/forage 22/01/2025 Lot on Plan: 3RP77715 Label: proposedrida

Queensland Government

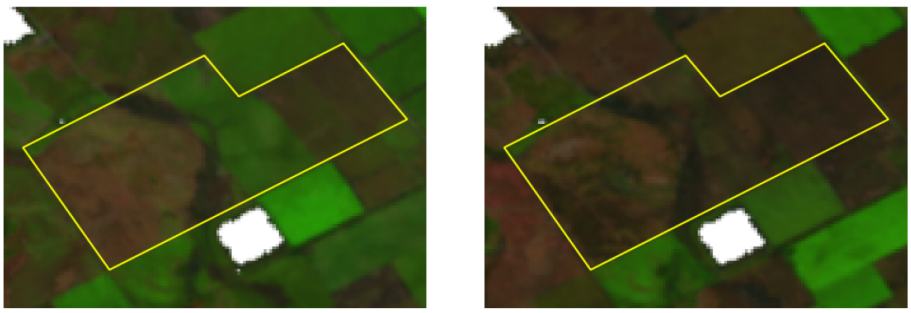
February (left) and September (right) images for 2020



February (left) and September (right) images for 2021



February (left) and September (right) images for 2022



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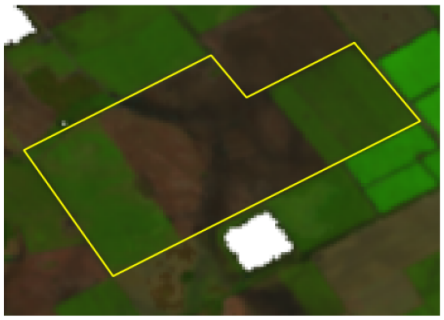
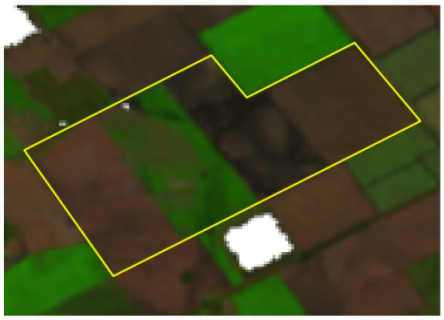
FORAGE REPORT: CROP FREQUENCY

http://www.longpaddock.qld.gov.au/forage 22/01/2025 Lot on Plan: 3RP77715 Label: proposedrida

Queensland Government

February (left) and September (right) images for 2023





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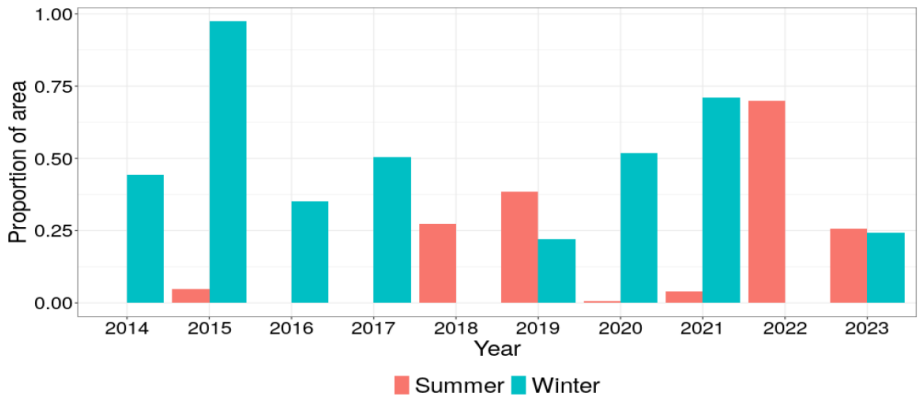
FORAGE REPORT: CROP FREQUENCY

http://www.longpaddock.qld.gov.au/forage 22/01/2025 Lot on Plan: 3RP77715 Label: proposedrida

Queensland Government

Proportion of area assessed as crop by season (summer/winter)



About the above graph

This graph shows the proportion of the Lot(s) on Plan or selected area that was cropped in summer (November of the previous year - May) and winter (June - October) through time.

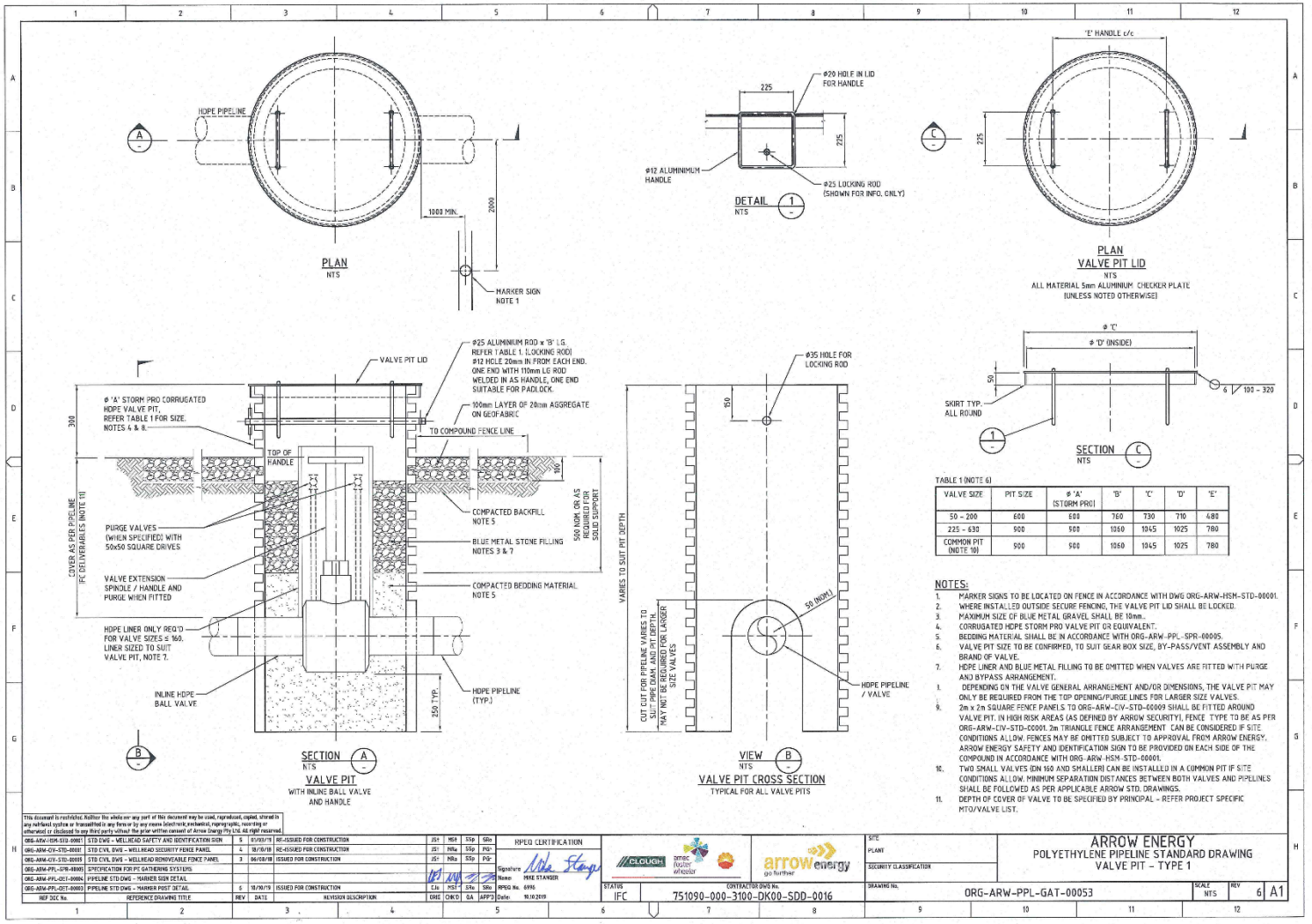
Reference

Pringle, M., Schmidt, M., and Tindall, D. (2018): Multi-decade, multi-sensor time-series modelling - based on geostatistical concepts - to predict broad groups of crops. Remote Sensing of Environment, 216, 183–200.

Pringle, M. (2021). Detecting the annual extent of sugarcane crops in Queensland, Australia. Remote Sensing Applications: Society and Environment, 22, 100496.

Disclaimer

Appendix H – Standard Drawing: Pipeline valve



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Appendix I – Coexistence

Surat Gas Project Overview

Arrow Energy's Surat Gas Project is supporting the move to a cleaner energy system by unlocking new natural gas supplies in southwest Queensland. Over its 27-year lifespan, the project aims to deliver approximately five trillion cubic feet of natural gas to the market, equivalent to 600 terajoules per day, enough energy to meet the needs of over four million homes.

The project involves the construction of up to 2500 new coal seam wells and supporting infrastructure across our Surat Basin tenure. Arrow is investing more than $70 million to improve local roads in the area as part of the project. This investment not only ensures a safer road network but also leaves a lasting positive legacy for the community and the local agricultural industry.

The project is fortified by a long-term gas sales agreement with the Shell-operated QCLNG joint venture, allowing us to use existing QGC-operated infrastructure, thereby minimising our impact on landholders and the community.

Progress to Date

Construction began in 2020, and considerable progress has been made toward completing the first phase, which includes the establishment of over 600 new wells at our Daandine and Tipton gas fields. Through 116 conduct and compensation agreements with landholders, we have made substantial progress on the project, with over 200 new wells drilled, more than half of which are now operational and producing gas. Additionally, over 341 kilometres of pipeline have been installed, along with 33 kilometres of local road upgrades.

Other phase one achievements include record-high daily gas production, successful construction of two processing facilities (David and Harry), and the initial delivery of gas and water under our agreements with QCLNG. Planning for future stages, and landholder engagement to support this activity, is underway.

For Queensland, the gas industry is a critical enabler for the economy by providing royalties, secure jobs, and energy to support the manufacturing sector and domestic uses. Gas plays an important role in the energy transition towards more renewables.

Community Benefits

The gas industry brings considerable spending to regional Queensland communities, contributing to:

- regional jobs
- local business spending
- community contributions
- local government payments.

In addition to supporting local employment and businesses, our proposed activities in the region will also help to address the State's demand for increased gas supplies.

Similarly, the Surat Gas Project brings a wealth of benefits to the Western Downs community. Arrow anticipates up to 1000 jobs will be generated throughout the project's duration, providing a major boost to the local economy.

Arrow also supports local landholders by compensating them for the use of their land. This dependable income provides resilience to agricultural businesses and can be used to enhance and diversify their farming operations, especially during difficult seasonal conditions.

Local Procurement and Employment

For over a decade, Arrow has been creating local jobs and procurement opportunities in the areas where we operate. We prioritise hiring staff from the local area and offer incentives for them to continue living locally. We also understand the importance of supporting regional businesses and suppliers. Through our Local Content Policy, we consistently demonstrate our commitment to the region by engaging with Australian businesses for contracting purposes.

To ensure compliance with our objectives, we require all businesses contracted for the provision of services and goods to submit a local content plan outlining how they will meet local procurement and employment commitments.

Investing in the Community

Investing locally is a cornerstone of our commitment. We understand our long-term success is intricately linked to the health and wellbeing of the communities where we operate. Our more than 20 years of operation have shown us that communities expect resource companies to add value – not just through a one-off contribution, but by continuing to be productive, contributing members of the community.

In addition to providing employment and contracting opportunities that stimulate and build local economies, Arrow has invested in education and skills development, shared our environmental research with local landholders, and collaborated closely with our communities to ensure they benefit from our presence.

Since 2011, we have invested more than $32 million, primarily in the Surat Basin, in partnerships and initiatives that deliver services, activities and events that uphold our corporate values (Respect, Lead, Own, Integrate and Solve), and bring significant, local benefits that will, where possible, last beyond our projects. This is beyond the investment we have provided for roads, jobs, procurement and landholder compensation.

Specific initiatives that benefit the local community and agricultural industry include:

- **LifeFlight Surat Gas Aeromedical Service (SGAS):** Arrow is one of the four coal seam gas company partners in the SGAS, whose helicopters provide around-the-clock coverage for more than 200,000 people across southwest Queensland. The service was created in 2011 to ensure our employees, their families, and community members in the region had access to prompt emergency medical services and to minimise the impact on local medical services.
- **Heart of Australia Mobile Medical Clinics:** Arrow is the foundation partner of Heart of Australia, Australia's first mobile medical specialist clinic. Launched in 2014, the service tours rural, regional and remote Queensland, bringing city level medical intervention to communities for whom this is otherwise a distant, costly and time-consuming luxury. Since 2014, the service has helped more than 12,000 patients and saved over 500 lives across 33 regional communities.
- **Indigenous Scholarships:** Since 2012, Arrow has partnered with five Queensland universities to deliver the Go Further Indigenous Tertiary Scholarship Program. Indigenous students are significantly under-represented in the higher education system, particularly in rural and regional communities. Arrow is addressing this situation through the scholarship program, which provides up to $10,000 to help Indigenous students undertake tertiary studies. By encouraging more Indigenous graduates, the program contributes to regional development and reduces Indigenous disadvantage.
- **Agricultural Scholarships:** We are supporting the agricultural sector's next generation through our partnership with Dalby State High School. Through the scholarship program, up to 10 students a year receive $5000 to meet tuition and boarding costs at the school's residential campus, helping to alleviate the pressure on rural families.
- **Brighter Futures:** Brighter Futures is our community investment program. It offers small-scale investments to not-for-profit groups through one-off projects and events. Since the program was launched in 2017, we've delivered more than $530,000 to more than 250 grassroots organisations.

We will continue these and other investments as we implement future phases of the Surat Gas Project.

Appendix J – Overland Flow