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Bowen Gas Project SREIS

AUSTRALIA

Supplementary Social Technical Report

March 2014
42627140/01/01

Prepared for:
Arrow Energy Pty Ltd

Prepared by URS Australia Pty Ltd

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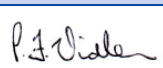
Prepared by	Pat Vidler		March 2014	Senior Associate
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ABBREVIATIONS

Abbreviation	Description
APPEA	Australian Petroleum Production and Exploration Association
BIBO	bus-in, bus-out
CGPF	central gas processing facility
COB	Central Operating Base
CSG	coal seam gas
EIS	Environmental Impact Statement
ERP	estimated resident population
FCF	field compression facility
FIFO	fly-in, fly-out
FTE	full-time equivalent
GFC	global financial crisis
ha	hectare
IRC	Isaac Regional Council
km	kilometre
km^2	square kilometres
LAIP	Local Area Infrastructure Program
MBL	multi branch lateral
ML/d	megalitres per day
mmscf	million standard cubic feet
NNM	Not Normally Manned
NRW	non-resident workers
OESR	Office of Economic and Statistical Research
Project (the)	Bowen Gas Project
QRC	Queensland Resources Council
SIA	Social Impact Assessment
SIMP	Social Impact Management Plan
SIS	Surface-In-Seam
SREIS	Supplementary Report to the Environmental Impact Statement
TWAF	temporary workforce accommodation facility
WTF	water treatment facility

1 INTRODUCTION

Project development work for the Bowen Gas Project (the Project) has been on-going since the publication for comment of the Environmental Impact Statement (EIS) in March 2013. The socio-economic environment of the potential Project impact area has changed in response to economic conditions in the coal mining sector, due substantially to a fall in commodity prices. The purpose of this supplementary report to the Social Impact Assessment (SIA) is to validate impacts identified in the EIS and identify any potential changes to impacts on local communities due to:

- Project description updates, including the reduced footprint and changed workforce profile; and
- The availability of more recent social baseline statistical information from the Office of Economic and Statistical Research (OESR), Councils and the private housing sector.

2 ASSESSMENT METHOD

The assessment method adopted for the review of impacts involved a four-step process as described below.

Step 1- Identification of relevant project description changes

The revised project description developed by Arrow was examined to identify changes that could have a potential effect on the impacts identified in the EIS Social Technical Report (Appendix U). Critical aspects of these changes included:

- Any changes to the Project component facilities and the Project footprint likely to alter the amount of land disturbed;
- Changes to the Project construction and operations workforce numbers and manning profile, including associated changes to camp accommodation arrangements and the estimated population influx to Project area towns;
- Changes to the phasing of development across the Project area; and
- Changes to the expected traffic levels and durations on local and State-controlled road networks in the Project area.

These changes are described in Section 3 of this report.

Step 2- Confirmation of the policy and regulatory environment changes and status

The Queensland coal seam gas (CSG) regulatory and statutory planning environments have undergone continual change over the last 18 months. These changes were examined to identify those with relevance to the Project development and for the management of social impact to communities within the Project area. These changes are described in Section 4.1 of this report.

Step 3- Update of the relevant baseline profile indicators

While the social profile of a community is invariably dynamic, communities within the Project area have a high level of exposure to the coal mining sector and have consequently been recently subjected to the effects of economic adjustment in the sector due to low commodity prices. Changes of particular relevance include housing affordability and the local labour market status, as well as the forecast levels for non-residential workers (NRW) expected in the local government areas affected by the Project. These changes are described in Section 4.2 of this report.

Step 4- Review and validation of impacts

The final step involves reviewing the effects of the changes on the impacts identified in the Social Technical Report (Appendix U) of the EIS. Where impacts are consistent with those already identified, the likelihood and consequences are assessed to determine whether there are changes to the assessed significance rating, as shown in Table 2-1 below. Any changes in the significance of impacts identified triggers a review of the proposed management measures in the Social Impact Management Plan (SIMP) to assess their suitability for management of the revised impact.

Table 2-1 Impact Significance Rating Matrix

Likelihood	Magnitude				
	Insignificant	Minor	Moderate	Major	Severe
Rare	Nil	Low	Medium	High	Very High
Unlikely	Low	Low	Medium	High	Very High
Possible	Low	Medium	Medium	High	Very High
Likely	Low	Medium	High	Very High	Very High
Almost Certain	Low	Medium	High	Very High	Extreme

3 PROJECT DESCRIPTION UPDATE

3.1 Footprint Changes

Key project description changes/components that will have an effect on the potential for social impact are shown in Table 3-1. While the Project development area remains at 8,000 km^2, planning is now based on 33 drainage areas of 6 km radius (approximately 373,200 ha) in comparison with the EIS base case of 17 development areas of 12 km radius (approximately 769,000 ha), as shown in Figure 3-1. Drainage area infrastructure will include wells, field compression facilities (FCFs), pipelines, water treatment facilities (WTFs), and power generation and distribution infrastructure.

Where possible, multiple wells may be grouped on a singular pad location to form a multi-well pad. Multi-well pads consolidate a group of wells at one surface location, whilst targeting multiple coal seams, which will typically allow:

- A reduction in the total number of well pad sites; and
- An increase in the distance between any two well sites.

As a consequence, the introduction of multi-well pad sites into the Project will reduce the total surface impact of the well pads. Arrow is also aiming to minimise pad footprint as much as possible, particularly during the operational phase.

Table 3-1 Project Components with an Effect on the Potential for Social Impact

Project Description – EIS case	Project Description – SREIS case
• 8,000 km^2 Project development area; • 14 development regions; and • 17 catchment areas (12 km radius).	• 8,000 km^2 Project development area; • 9 development regions; and • 33 Drainage areas (6 km radius).
Well count up to 6,625.	Well count approximately 4,000.
• Well types: Surface-In-Seam (SIS) Chevrons and multi-seam hydraulically fractured • No multi-well pads	• Well types: horizontal SIS, Multi Branch Lateral (MBL) and multi-seam hydraulically fractured; and • Maximum of 6 MBLs on a multi-well pad.
• 4 integrated processing facilities (IPFs); • 3 central gas processing facilities (CGPFs); and • 10 field compression facilities (FCFs).	• 2 CGPFs – with co-located WTFs; and • 33 FCFs. Note – there is potential for a third WTF to be constructed in the Blackwater region in Phase 2+ of the Project.
Primary Power Self generation	• Primary Power Grid; and • Temporary 2 year self-generation scenario.

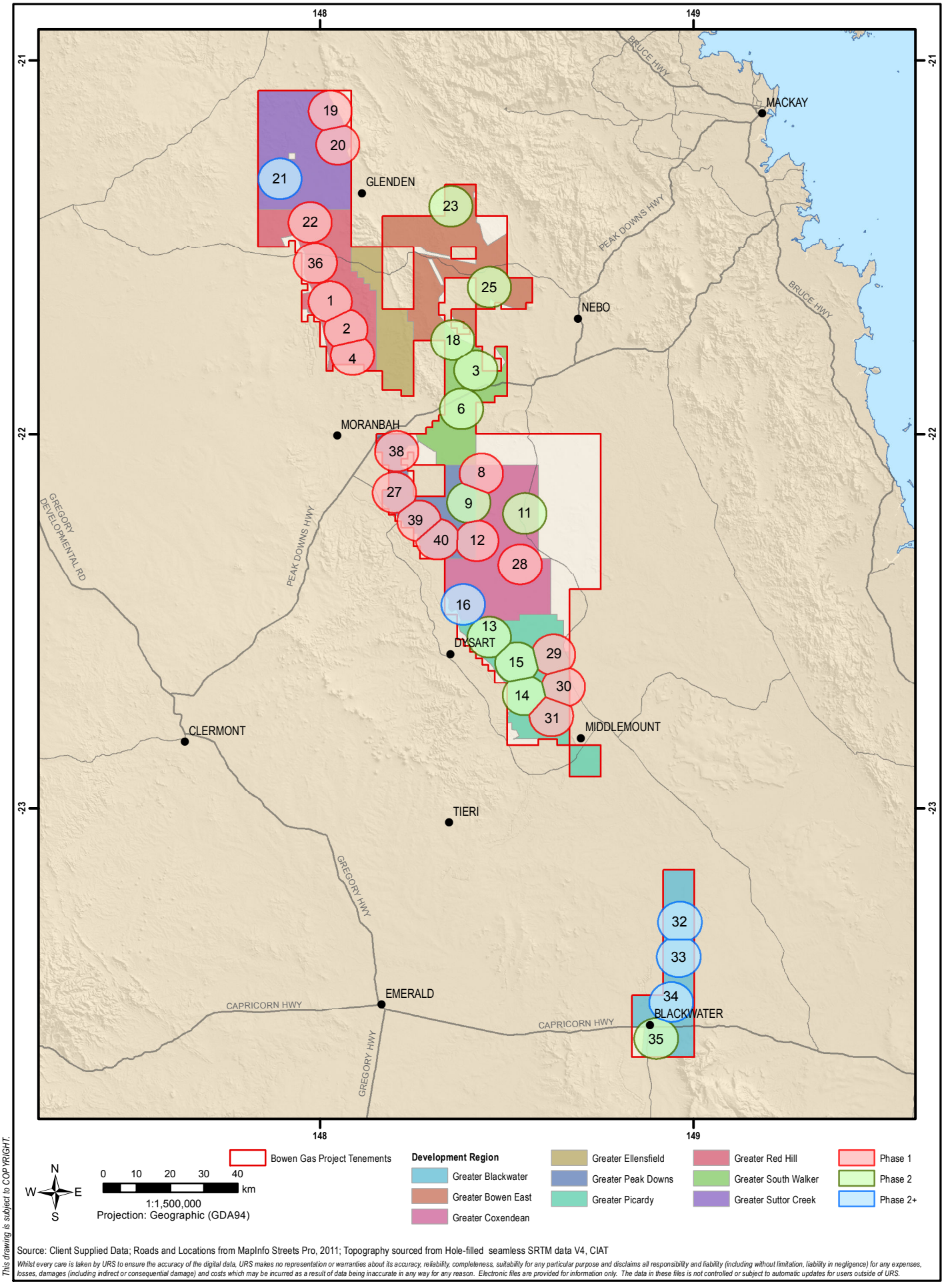
Due to travel distances and times between the CGPFs and Moranbah, it is proposed that a North Maintenance Base will be co-located with the North Central Operating Base (COB) to serve CGPF1, associated FCFs, wells and gathering system and the WTF1. Similarly a South Maintenance Base will be co-located with the South COB to serve CGPF2, associated FCFs, wells and gathering system and the WTF2.

Additionally, it is expected that there will be a centralised support facility (including main office, warehouse and workshop) in the Moranbah area to support the Bowen operations, with only limited store facilities (routine consumables stock only) and workshops located at the COBs.

The Moranbah support facility is expected to provide the following services:

- Management (including maintenance supervisors, planner and schedulers);
- Occupational health and safety;
- Environment;
- Main Project centralised warehouse;
- Main Project centralised maintenance workshop;
- Logistics;
- Land access liaison; and
- Training.

This location is also expected to accommodate the main equipment lay down area for the Bowen region during the operations phase.



Source: Client Supplied Data; Roads and Locations from MapInfo Streets Pro, 2011; Topography sourced from Hole-filled seamless SRTM data V4, CIAT

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BOWEN GAS PROJECT SREIS

DEVELOPMENT LAYOUT AND ASSET PHASING

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SOCIAL TECHNICAL REPORT

Figure: 3-1

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3.2 Construction and Operationsal Workforce

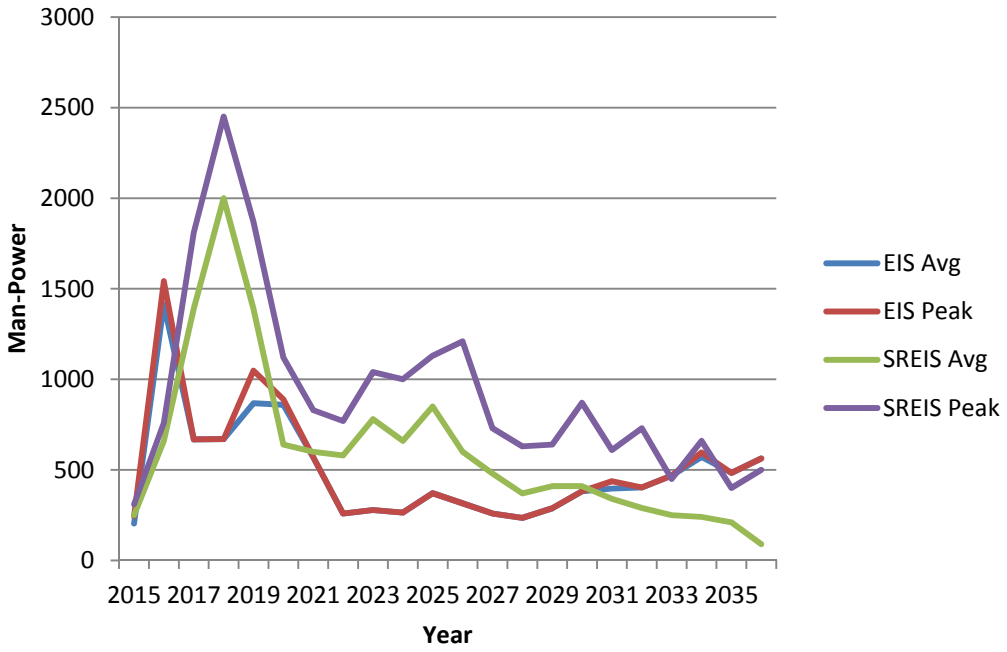
3.2.1 Construction

A comparison of the construction workforce for the Project EIS and Supplementary Report to the EIS (SREIS) reference project descriptions is shown in Table 3-2 and Figure 3-2.

Table 3-2 Workforce Time Profile Comparison between EIS and SREIS Reference Case

Year	EIS Reference Case		SREIS Reference Case	
	Average Daily Man-Power	Peak Daily Man-Power	Average Daily Man-Power	Peak Daily Man-Power
2015	204	245	250	310
2016	1,413	1,542	660	760
2017	668	668	1,390	1,810
2018	670	670	2,000	2,450
2019	868	1,048	1,390	1,870
2020	859	890	640	1,120
2021	569	569	600	830
2022	259	259	580	770
2023	278	278	780	1,040
2024	264	264	660	1,000
2025	371	371	850	1,130
2026	315	315	600	1,210
2027	259	259	480	730
2028	235	235	370	630
2029	288	288	410	640
2030	382	382	410	870
2031	397	437	340	610
2032	403	403	290	730
2033	468	468	250	450
2034	572	596	240	660
2035	483	483	210	400
2036	563	563	90	500
Total person-years	**10,788**		**13,490**	

Figure 3-2 Workforce Time Profile Comparison



The labour input has risen from 10,788 person-years for the EIS reference case to 13,490 person-years for the SREIS reference case (an increase of 25%). The assumption remains that all the construction workforce is fly-in / fly-out (FIFO), with 100% living in temporary workforce accommodation facilities (TWAFs). TWAFs will be sized based on this assumption.

3.2.2 Operations

During operations, control of the Bowen Region CSG production facilities will be managed centrally from the Brisbane Central Control Room on a 24 hour/7 day full-time basis. The surface facilities will have telemetry equipment for the transmission of signals to a central control room. To reduce health, safety, environment and transportation risks, as well as labour cost, the wells will be highly automated to reduce the frequency and duration of direct intervention by operators. Operational data such as water flow, gas flow and valve positions will be transmitted such that the well can be observed, controlled and optimised remotely. The Project facilities will therefore incorporate a high level of monitoring, automation and communications. Not Normally Manned (NNM) operations are defined as those operations where operations staff are not permanently allocated to a specific facility but allocated across a number of facilities and visit a facility on an as needed basis for a specific purpose. The NNM philosophy is the long term operations intention for the Project and will be implemented when commissioning has been completed and reliable steady state operations have been proven.

NNM facilities will require periodic visits (e.g. fortnightly for operators and quarterly for maintenance) to carry out inspections or other scheduled routine work activities. The introduction of the NNM concept is related to and associated with the “operations” of the CGPFs, FCFs, WTFs, wellheads, and gathering system.

Excluding workover crews, approximately 250 to 300 operations and maintenance personnel will be required for the Project operations, maintenance, support and administration teams

(this excludes Arrow Brisbane based staff and field maintenance contractors). This peak is expected to be reached by 2028 and remain at plateau for approximately 13 years before starting to decline as gas is depleted. The workover crews (which include the well completion crews given that the same rigs will be used) are expected to range between 10 and 100 people over the life of the Project (averaging at around 65 personnel onsite at any given time). These are all assumed to be FIFO roles sourced from outside the region.

Arrow's order of preference for operations and maintenance workforce sourcing has not changed from the EIS case and remains as follows:

- Local area (lives within the Project area);
- Regional (lives within southern or central Queensland);
- National (lives in Australia); and
- International (lives outside Australia).

Arrow's local area preference also includes candidates without the necessary industry-specific skills but who show a strong willingness to be trained.

While the EIS reference case assumed that 10% of operational workers could be recruited locally, the SREIS case increases that level to 20% on the following assumptions:

- The cost of housing is moderating;
- There will be a higher level of desire to move out of coal mining employment; and
- Local government programs to attract workers to reside in the region are moderately successful.

While up to 60 personnel may be recruited from within the Bowen Basin under those assumptions, for accommodation sizing it is assumed that they will all require camp accommodation due to the distance of facilities from towns and fatigue management constraints on daily travel from towns to facility sites. Hence each permanent camp will have the capacity to accommodate more than 150 personnel.

Arrow intends to establish FIFO for the majority of the operational personnel, however bus-in, bus-out (BIBO) is also being considered. A sponsored shuttle bus service, or similar arrangement is under consideration.

A summary of the operational workforce numbers and their residential status is given in Table 3-3 below.

Table 3-3 Operational Workforce Estimated Numbers and Residential Status

Project Case	2016	2020	2024	2028	2034	2041
EIS	203	326	418	492	597	600
EIS case local (10% from Bowen Basin)	20	33	42	49	60	60
EIS case FIFO	183	293	376	443	537	540
In-migrants (Assume from 2020, 5% of FIFO workers elect to reside in Moranbah)		15	19	22	27	27

Project Case	2016	2020	2024	2028	2034	2041
Population influx (assuming each worker has 1.6 dependents)		39	49	57	70	70
SREIS	100	200	250	300	300	300
SREIS case local (assuming 20% from Bowen Basin, all with existing housing)	20	40	50	60	60	60
SREIS Operations FIFO numbers	80	160	200	240	240	240
Employee influx (assuming from 2020, 5% of FIFO workers elect to reside in Moranbah)	-	8	10	12	12	12
Population influx (assuming each worker has 1.6 dependents)		21	26	31	31	31

3.3 Development Phasing

The anticipated development sequence for the Project is shown in Figure 3-1 and detailed in Table 3-4. In summary, development in Phase 1 (2017-2022) includes:

- Seven drainage areas in a 20 km by 90 km block aligned north-south commencing 20 km north of Moranbah;
- Seven drainage areas in a 50 km by 50 km block between Moranbah and Dysart; and
- Three drainage areas in a 20 km by 35 km block aligned north-south commencing at Middlemount.

Phase 2 (2023-2027) includes the development of:

- A new 25 km by 75 km block containing five drainage areas between Moranbah, Nebo and Glenden;
- A further two drainage areas in the Phase 1 block between Moranbah and Dysart;
- A further three drainage areas to the west and contiguous with the Phase 1 block north of Middlemount; and
- One drainage area immediately south of Blackwater.

Phase 2+ (2028 forward) development activities are focussed on ATP751 to the north of Blackwater where three drainage areas will be developed.

The major difference in phasing is that the development in the revised Project is continuous over the three phases, whereas the EIS reference case envisaged no construction activity occurring in the Phase 2 period from 2023-2027.

Table 3-4 Development Phasing and Project Description

Phase	Years	Project Description EIS Case		Project Description SREIS Case	
		Development activity	**Development zones (catchment areas)**	**Development activity**	**Development zones (drainage areas)**
1	0-5 2017-2022	• 7 catchment areas • 3 CGPFs • 3 IPFs • 1 FCF	Red Hill/Suttor Creek (2) Peak Downs/South Walker (2) Coxendean (2) Picardy (1)	• 17 drainage areas (FCFs) • 2 CGPFs and WTFs • 192,000 ha	Red Hill/Suttor Creek (7) Peak Downs/ Coxendean (7) Picardy (3)
2	6-10 2023-2027			• 11 drainage areas (FCFs) • 124,300 ha	South Walker/ Bowen East (5) Peak Downs/ Coxendean (2) Picardy (3) Blackwater (1)
2+	11+ 2028-	• 10 catchment areas • 9 FCFs • 1 IPF	Coxendean(1) Picardy (2) Blackwater (1) Bowen East(3) Red Hill (1)	• 5 drainage areas (FCFs) • 56,500 ha	Suttor Creek (1) Coxendean (1) Blackwater (3)

3.4 Camp Location and Size

Table 3-5 lists the NRW accommodation options for the EIS and SREIS reference cases. The workforce needed to establish the camps will initially be accommodated in existing commercial camp facilities until sufficient rooms are established to permit transfer to the camp construction site. In the Dysart/Middlemount area there are currently at least 2,800 commercial camp rooms available from other parties, while in the Moranbah area there are currently in excess of 1,500 commercial camp rooms available from other parties.

Table 3-5 Summary of Accommodation Camp Options

TWAF	Location	Max capacity (year expected)
EIS Reference Project case		
1	IPF area 4, Red Hill 40 km north of Moranbah	291 (2020)
2	IPF area 5, South Walker 50 km north-east of Moranbah	259 (2016)
3	IPF area 7, Coxendean 20 km north of Dysart	298 (2016)
4	IPF area 19, Blackwater 35 km north of Blackwater	386 (2034)
SREIS Reference Project Case		
1	CGPF2 North, Red Hill, 40 km north of Moranbah	1,225 (2018)
2	CGPF2 South, Peak Downs, 40 km south-east of Moranbah	1,225 (2018)

Table 3-6 outlines the parameters that will guide the establishment and operation of the camp facilities.

Table 3-6 Summary of Accommodation Camp Parameters

Accommodation Aspect	Strategy
Site selection	It is currently envisaged that purpose-built accommodation will be constructed as follows: • Two main villages located near CGPF1 and CGPF2, designed and built as permanent accommodation solutions to house the construction workforce and long term permanent staff. Villages are expected to cater for FIFO workers (including workover crews). • In an effort to minimise staff travelling time, several additional smaller TWAFs (currently estimated at four) are expected to be required when the facilities associated with the drainage areas furthest away from the CGPFs are under construction. The following factors will be considered during site selection : • Achieve a max commuting time of approximately 30 minutes to the work fronts; • Design; • Environmental constraints; • Social constraints; • Native title sensitivities; and • Avoid strategic cropping land.
Village size	The final size and number of accommodation villages will be influenced by: • The rate of Project development; • The distance between nearby gas processing facility sites; • Opportunities for efficient use (or reuse) of accommodation infrastructure and resources; and • The level of overlap between temporary construction workforce and permanent staff. Accommodation villages will be sized to accommodate: • 100% of the peak construction workforce including the wells and gathering line installation construction teams; and • 100% of permanent FIFO operations staff.
Village facilities	Accommodation villages are designed to be self-sufficient in terms of power, water and sewage services, and will include: • Individual sleeping quarters; • Catering services, commercial kitchen and dining area; • Recreation facilities; • Ensuite facilities; • Laundry facilities; • First aid; • Vehicle parking; and • Security fence. Onsite couple and family accommodation is not anticipated.

Accommodation Aspect	Strategy
Establishment	Accommodation villages will be modular in design to enable them to expand and contract in line with the requirements. The 'pioneer' workforce required to establish accommodation villages will be housed in existing accommodation camps in the area until sufficient units are constructed.
Short-term accommodation	In addition to the construction workforce, Arrow anticipates a constant stream (average of 20 persons, five days a week) of management personnel and specialist consultants who may visit the Project development area. Where possible, these personnel will be housed in accommodation villages. However, during peak activities, it is likely these personnel will seek motel or similar accommodation in nearby towns.

Small mobile camps to house drilling and completions staff may also be required in a location central to the drilling activities. These camps would contain a small canteen, vehicle parking areas, waste collection and storage areas.

3.5 Traffic Generation

The traffic impact assessment based on the revised project description indicates that for key roads the level of impact is comparable with the EIS reference case, while the impact is slightly less for roads of a lower order in the road hierarchy. The impacts are capable of being managed through the application of standard road use management and road safety measures as detailed in the existing SIMP.

4 SOCIAL BASELINE CHANGES

Following submission of the Project EIS there have been both a number of policy changes affecting the regulatory environment for gas projects and changes in the socio-economic environment of the Bowen Basin due to the prevailing conditions in the coal mining sector. Changes in both of these areas may influence the potential for social impact from the Project when considered in conjunction with the project description changes. The following sections provide an update on institutions and instruments relevant to the Project.

4.1 Policy and Regulatory Update

4.1.1 Gas Fields Commission

The *Gasfields Commission Bill 2012* was introduced in the Queensland Parliament on 27 November 2012 to establish the commission as an independent statutory body. On 17 April 2013, the Bill was debated and passed in the Queensland Parliament with support across the parliamentary spectrum, and the commission commenced operations on 1 July 2013. The purpose of the commission is `to manage and improve sustainable co-existence between landholders, regional communities and the onshore gas industry in Queensland', recognising the importance of both agriculture and the onshore gas industry to Queensland's economy. The Commission's role, powers and functions pursuant to the *Gasfields Commission Act 2013* include:

- Reviewing legislation and regulation;
- Obtaining and publishing factual information;
- Identifying and advising on coexistence issues;
- Facilitating better relationships and resolving issues;
- Promoting scientific research to address knowledge gaps; and
- Making recommendations to government and industry.

The commission has developed six priority portfolio areas to guide its efforts in managing and improving coexistence among stakeholders. These portfolios, aligned with the experience and expertise of the six commissioners, are:

- Community and Business;
- Gas Industry Development;
- Land Access;
- Local Government and Infrastructure;
- Science and Research; and
- Water and Salt Management.

A Portfolio Plan has been developed detailing commissioner responsibilities and key actions for 2013-2014 (GasFields Commission, 2013). Key actions include:

- Establish and support the operation of the Gas Fields Commission Community Leaders Councils (South and North) as a formal mechanism for regional engagement;

- Engage and invite input from major regional community and social groups introducing the Commission and inviting them to contact it about any relevant issues;
- Provide oversight and guidance to the government in its implementation of the six point action plan for land access improvement;
- Establish ongoing program of engagement with local government contacts to identify trends and broker contacts or escalate issues to help achieve solutions; and
- Facilitate the development and delivery of region specific information packages on CSG water management and underground water information.

4.1.2 Royalties for the Regions

The Queensland Government has established a Royalties for the Regions initiative to support priority development projects in communities subject to the impacts of resource development projects. Over a four year period that started in 2012, the program will invest $495 million in new and improved community infrastructure, roads and floodplain security projects in resource regions. In future years there will be an ongoing commitment of $200 million each year.

The Dysart Medical Centre, a medical centre with three consulting rooms and two treatment rooms on Queensland Health land, received approval for $750,000 funding under Round 1 of the initiative. The facility will house two general practitioners, two part-time practice nurses and visiting allied health specialists such as dentists, chiropractors and optometrists.

Applications for Round 2 of the initiative closed in August 2013 and focussed on supporting infrastructure projects that respond to critical community needs that have resulted from resource sector activity.

4.1.3 Regulatory Guidelines

In July 2013 the State Government, through the Department of State Development, Infrastructure and Planning, released a suite of regulatory guidelines in relation to the assessment and management of the impacts of major resource projects (DSDIP, 2013a). These included:

- *Managing the impacts of major projects in resource communities;*
- *Preparing an environmental impact statement: Guideline for proponents; and*
- *Social Impact Assessment (SIA) guideline.*

In addition and complementary to these guidelines, in March 2013 the Queensland Resources Council (QRC), with support from the Australian Petroleum Production and Exploration Association (APPEA) released the Queensland Resources and Energy Sector Code of Practice for Local Content (QRC, 2013).

The intent of these guidelines is to streamline the management of social impacts by clarifying the role of local government in the EIS process and to respond to economic and infrastructure impacts and opportunities through greater coordination of agencies and the implementation of Local Area Infrastructure Programs (LAIPs) and the Royalties for the Regions program that focuses on managing cumulative impacts. The role of LAIPs is to prioritise core community and transport infrastructure and to ‘create the basis for aligning funding commitments whether

from governments, industry or other sources'. They will also build on the engagement approach that underpins the Regional and Resource Towns Action Plans, with resource industry representatives invited to participate in their preparation.

The Royalties for the Regions program, while helping communities to better manage the cumulative impacts of resource sector projects, does not absolve proponents of the responsibility to address the direct impacts of projects, though it does allow resource proponents to make financial contributions directly to the program.

The EIS Guideline mandates that a project's predicted impacts be categorised as either 'critical' or 'routine', with routine impacts requiring less study effort than critical matters. The SIA Guideline advises that "proponents should commit to mitigation measures that address impacts that are directly related to their projects", and that these mitigation measures should "focus on outcomes to encourage innovative solutions to capitalise on social opportunities and mitigate detrimental impacts that may arise from the project". SIAs do not assess project impacts on hard infrastructure such as roads and transport facilities and utilities.

The *Queensland Resources and Energy Sector Code of Practice for Local Content* (the Code) is a voluntary self-regulatory regime to "provide full, fair and reasonable opportunity for capable local industry to compete for the supply of goods and services for significant projects". Effective from 1 March 2013, the State Government will seek commitments from project proponents as part of EIS approval that they will adhere to the Code. Those companies that commit in their EIS to adopt the Code for these projects will no longer be conditioned through the State Government EIS approval processes to submit a Local Industry Participation Plan to the State Government. The Code will be promoted and administered by the QRC who will consolidate individual company Code Industry Reports into an annual Code Effectiveness Report. The consolidated report will be provided to stakeholders, including State and Local Governments, by year end each year. The QRC has also committed to a formal review of the code by the end of 2015.

4.1.4 Regional and Local Planning Update

The draft *Central Queensland Regional Plan* (DSDIP, 2013b) was released for consultation at the end of June 2013, and forms part of the State Government's new statutory regional planning agenda. The plan "seeks to provide a policy response to resolve the competing state interests affecting the agricultural and resources sectors" and provide certainty for the future of towns in the region through the implementation of the following regional planning policies:

- Protect Priority Agricultural Land Uses within Priority Agricultural Areas;
- Maximise opportunities for co-existence of resources and agricultural land uses within Priority Agricultural Areas;
- Safeguard the areas required for the growth of towns through the establishment of Priority Living Areas; and
- Provide for resource activities to locate within a Priority Living Areas where it meets the communities' expectations as determined by the relevant local government.

A complementary *Central Queensland Economic and Infrastructure Framework* (DSDIP, 2013c) was also released to promote growth for the Central Queensland region by highlighting "the economic potential of each region and a range of economic development opportunities

aimed at encouraging private sector investment and participation in local business, industry and infrastructure projects".

In March 2013 the State Government released its *Regional and Resource Towns Action Plan* (DSDIP, 2013d) that "identifies short-term initiatives and 'on the ground' projects to address local issues, such as housing availability and affordability". Based on consultation with Local Governments and other stakeholders in areas impacted by resource development, the issue of housing affordability and land supply, both for residential and industrial purposes was highlighted. There are actions within the plan with relevance to the potential impacts of the Project, including the development of residential land within Moranbah, Dysart, Middlemount and Blackwater.

4.2 Social Profile Update

The social parameters of interest for communities in the Project area include population (residential workers and NRW); housing costs (purchase and rental); affordability trends; and labour market status, particularly the level of unemployment in the current economic climate. The review examined the most recent statistical data available from Government and private sources, to establish the current status of these parameters and assess the degree of change since the publication of the EIS for public comment.

4.2.1 Population

The population estimates for towns in the Project area were updated with the latest data available from the Queensland Government Statistician to estimate the full-time equivalent (FTE) population as at 30 June 2012. These figures, presented in Table 4-1 and Figure 4-1, indicate the modest changes in the Moranbah and Dysart estimates and the major downward revisions in NRW estimates for Glenden and Nebo.

Table 4-1 Population Estimates for Project Area Towns

	EIS-ERP	EIS-NRW on shift	EIS FTE estimate	NRW/ ERP %	ERP-June 2012	OESR June 2012 NRW est.	SREIS FTE estimate	NRW/ ERP %	Change in %
Moranbah	8,790	3,560	**12,350**	41	8,990	4,585	**13,575**	51	10
Dysart	3,450	2,080	**5,530**	60	3,280	2,365	**5,645**	72	12
Glenden	1,320	1,620	**2,940**	123	1,340	535	**1,875**	40	-83
Middlemount	2,220	2,280	**4,500**	103	1,960	2,110	**4,070**	108	5
Nebo	350	1,320	**1,670**	377	495	555	**1,050**	112	-265
Blackwater	5,550	2,000	**7,550**	36	5,235	1,885	**7,120**	36	-

Source: Government Statistician: Survey of Accommodation Providers, 2011 and 2012; Bowen Basin Population Report 2012. ERP: estimated resident population.

Figure 4-1 Estimated Resident Population and Non-resident Workers On-shift - Project Area Towns - 30 June 2012

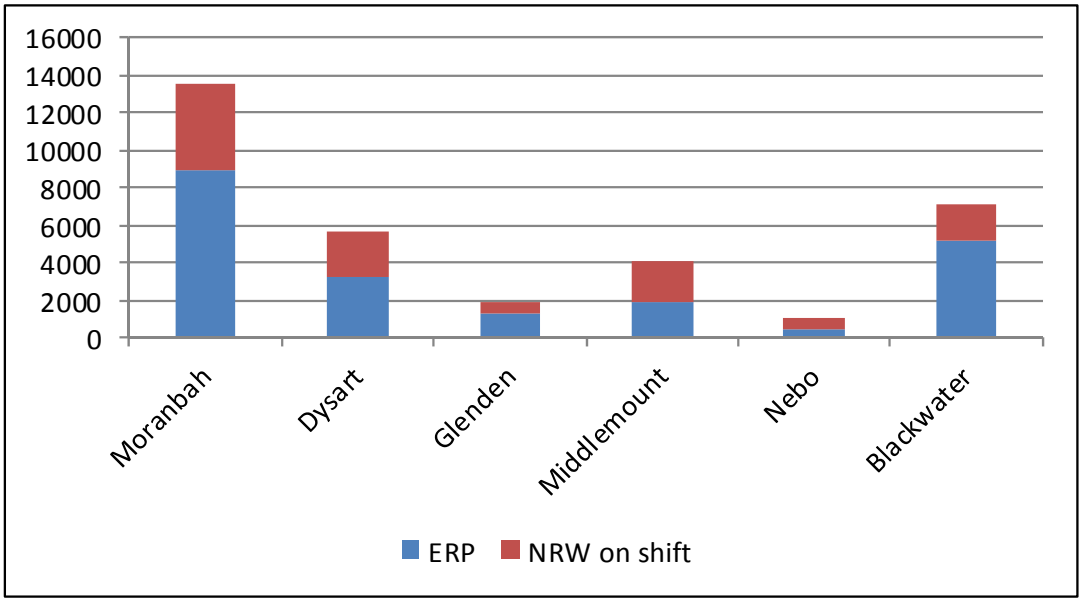
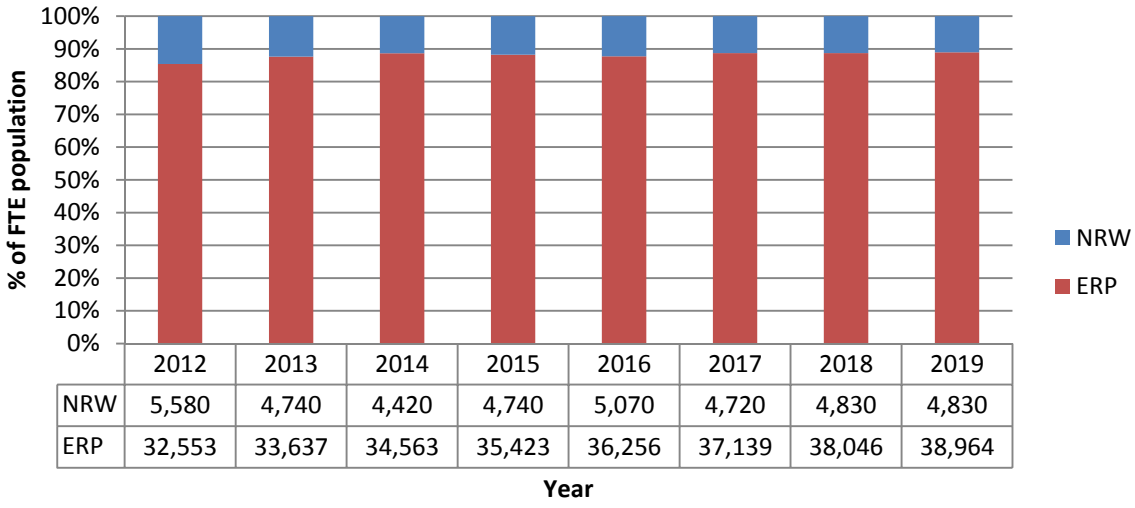


Figure 4-2 and Figure 4-3 present the Estimated Resident Population (ERP) and NRW population projections through to 2019 for both the Central Highlands Regional Council and Isaac Regional Council (IRC) areas, indicating a slight rise in the ERP as a proportion of the FTE population.

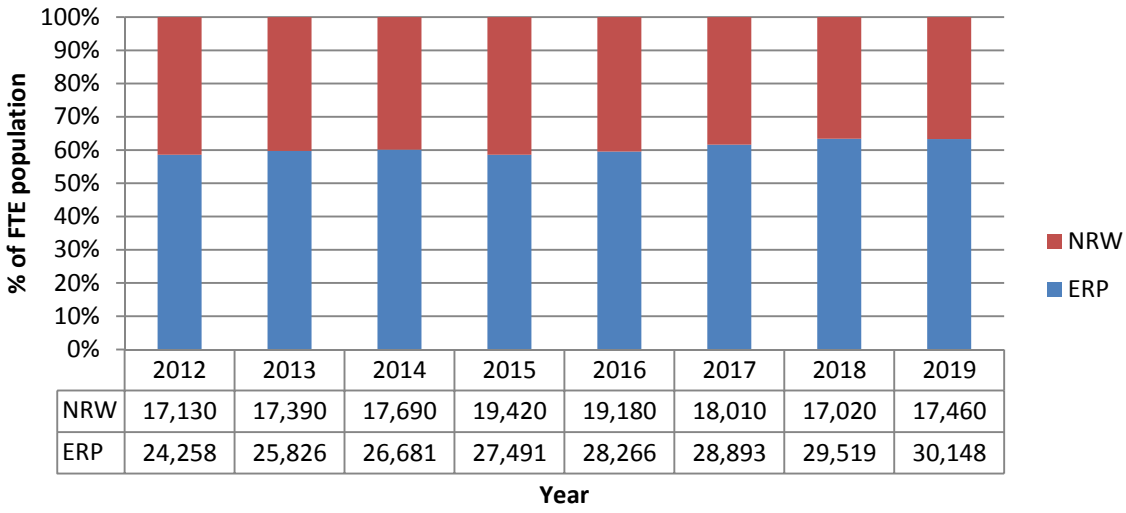
Figure 4-2 Central Highlands Regional Council Population Projections



	2012	2013	2014	2015	2016	2017	2018	2019
NRW	5,580	4,740	4,420	4,740	5,070	4,720	4,830	4,830
ERP	32,553	33,637	34,563	35,423	36,256	37,139	38,046	38,964

Source:
NRW-Government Statistician, Series C Non-resident population projections, 2012-13.
ERP- Queensland Government population projections, medium series, 2011 edition, Office of Economic and Statistical Research, Queensland Treasury and Trade.

Figure 4-3 Isaac Regional Council Population Projections



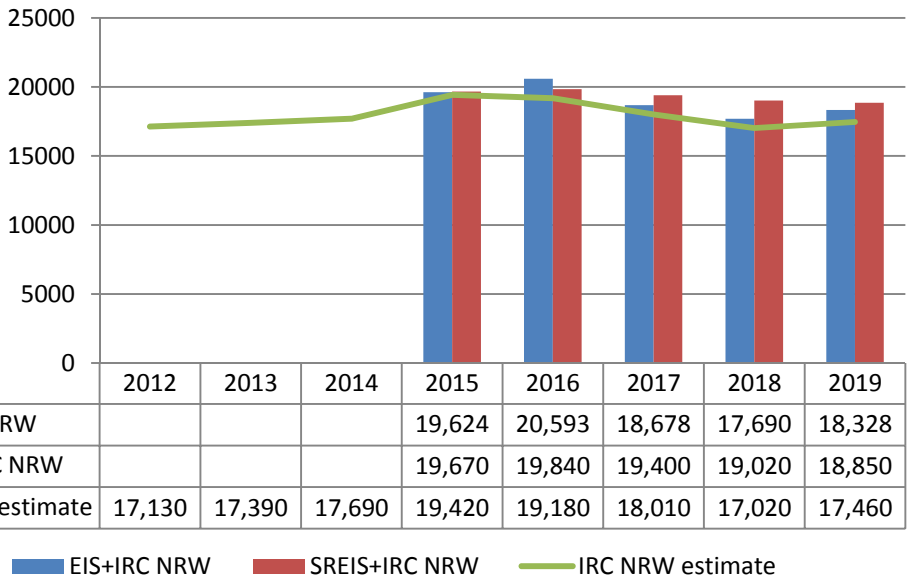
	2012	2013	2014	2015	2016	2017	2018	2019
NRW	17,130	17,390	17,690	19,420	19,180	18,010	17,020	17,460
ERP	24,258	25,826	26,681	27,491	28,266	28,893	29,519	30,148

Source:
NRW-Government Statistician, Series C Non-resident population projections, 2012-13.
ERP- Queensland Government population projections, medium series, 2011 edition, Office of Economic and Statistical Research, Queensland Treasury and Trade.

These projections from the Queensland Government Statistician include the Arrow Bowen Pipeline Project but not the Bowen Gas Project.

Figure 4-4 compares the incremental increase in NRW between the EIS and SREIS reference case NRW for the IRC area, which will host the two construction camps for the Project.

Figure 4-4 EIS and SREIS NRW Estimates Compared to NRW Projections



	2012	2013	2014	2015	2016	2017	2018	2019
EIS+IRC NRW				19,624	20,593	18,678	17,690	18,328
SREIS+IRC NRW				19,670	19,840	19,400	19,020	18,850
IRC NRW estimate	17,130	17,390	17,690	19,420	19,180	18,010	17,020	17,460

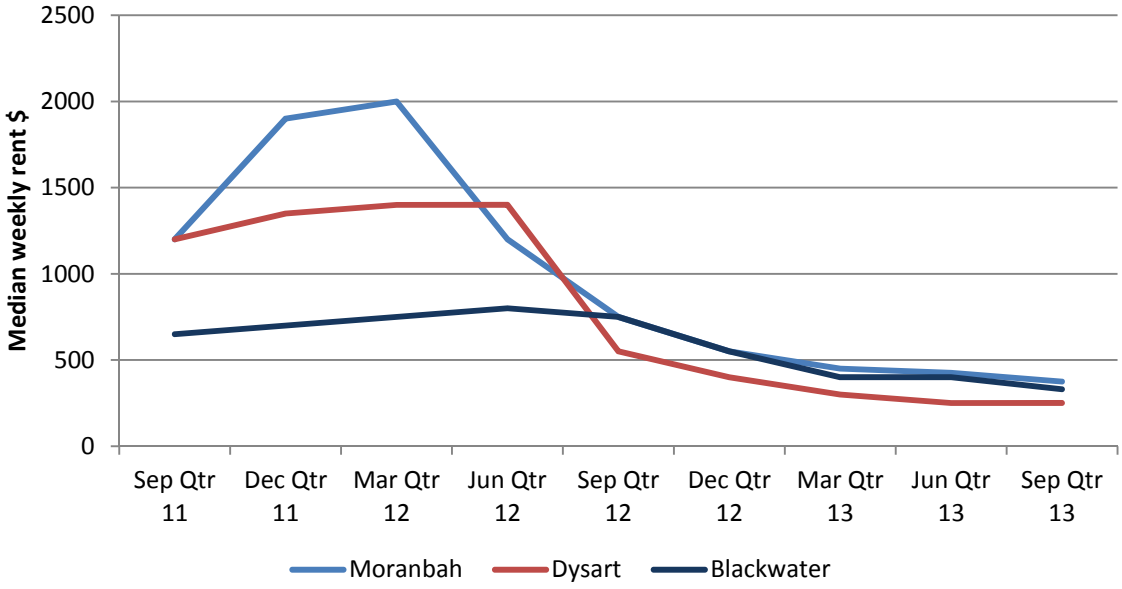
Source: NRW-Government Statistician, Series C Non-resident population projections, 2012-13; Arrow workforce estimates

4.2.2 *Housing Costs and Affordability*

Housing costs, and consequently the affordability of housing, have altered significantly following the decline in economic conditions in the coal mining sector. Figure 4-5 shows the dramatic decline in median weekly rents for a three bedroom house in the towns of Moranbah, Dysart and Blackwater – which sit within the Project area. Data is not available for Glenden or Middlemount.

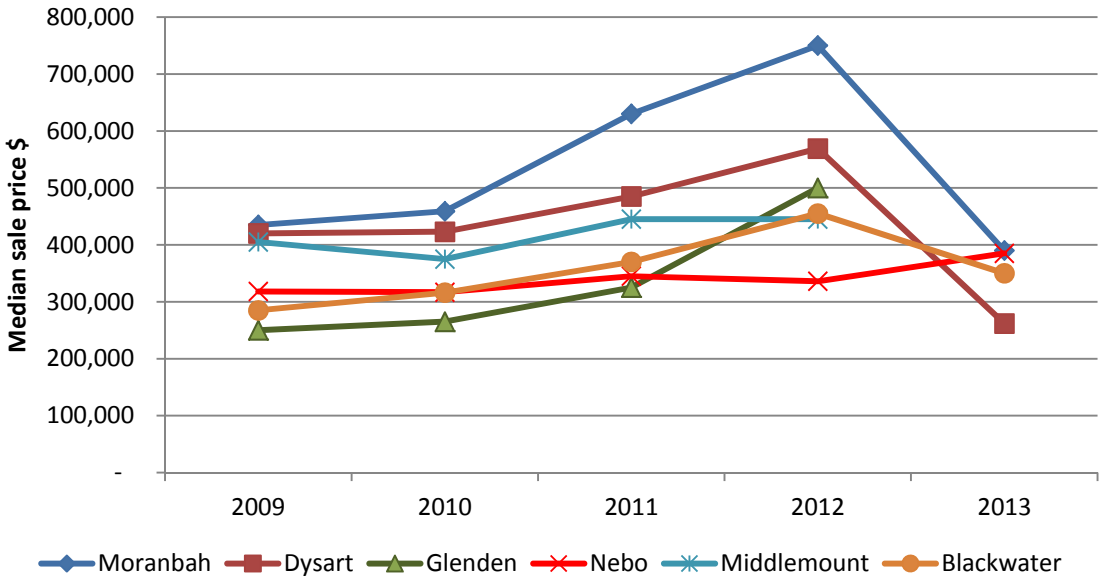
Figure 4-6 shows the median sale prices for houses in Project area townships for the past four years, with the steep decline in prices over the past twelve months being evident. The indicative influence on housing affordability in Moranbah and Blackwater are assessed in the following sections.

Figure 4-5 Median Weekly Rent in Project Area Townships



Source: Rental Tenancies Authority

Figure 4-6 Median House Sale Prices in Project Area Towns



Source: Price Finder, October 2013

4.2.2.1 *Moranbah Affordability Assessment*

Key indicative data on housing in Moranbah include:

- Sale and rental prices:
  - Over the past five years, the median sale price of vacant urban land in Moranbah increased by 80%. More recently, median sale prices have increased from $195,000 in 2010 to $270,000 in 2011, before dropping to $204,000 in 2012 and rising to $228,500 in 2013 (Price Finder, 2013).
  - The median cost of purchasing a house in Moranbah rose to unsustainable levels in 2012 (approximately $750,000) prior to dropping substantially (around 48%) in 2013 to approximately $400,000.
  - Median weekly rents for new bonds for a three bedroom house have decreased substantially over the past 18 months, falling from around $2,000 to $400.
- Rental and home purchase affordability (see Table 4-2 and Table 4-3):
  - The median house price is affordable for households earning a median income in Moranbah (by at least $100,000) whereas households in the bottom 22% of households by income would find the median house price unaffordable.
  - Home purchase affordability (using the median multiple measure) in 2012 was approximately 5.2, which was higher than the 'sustainable' median multiple (3.0)[1]. The median multiple has fallen to 2.7 in 2013 due to the decrease in median sale prices.
  - The median rental cost for new rentals in the region is unaffordable for households in the bottom 10% of the income distribution. The median rent of a three bedroom house at $400 per week in the region is only affordable for households earning more than $70,000 per year.

[1] The median gross household income for all households divided by median detached house sale price.

- Rental vacancy[2]:
  - The rental vacancy rate at the end of 2013 was in the order of six percent.

It is emphasised that this assessment is indicative, rather than definitive, serving to highlight a recent improvement in housing affordability. However, the housing market in Moranbah is quite volatile and subject to significant swings depending on the state of the coal mining industry. There are also significant market interventions in the Moranbah housing market through Economic Development Queensland and housing investment through conditions imposed on mining developments. The impact of these interventions on housing affordability in the longer term is uncertain and will need on-going monitoring.

Table 4-2 Moranbah Housing Affordability Assessment

Max. affordable rental per week	Income distribution Moranbah	Affordable house purchase price
More than $750 per week	$2,500+/w($130,000+/y) 59.6% of total households	$548,000+
$750 per week	$1,500-$2,499/w ($78,000-$130,000/y) 15.2% of total households	$548,000
$450/week	$1,000-$1,499/w ($52,000-$78,000/y) 5.7% of total households	$329,000
$300/week	$600-$999/w ($31,200-$52,000/y) 3.6% of total households	$220,000
$180/week	$0-599/wk ($0-31,200/y) 3.8% of total households	$131,500

Median household income = $145,000

Median House Price $450,000

Median Rental Cost $400/wk

Table 4-3 Moranbah Median Multiple Assessment

	2009	2010	2011	2012	2013
Moranbah	435,000	459,000	630,000	750,000	390,000
Median multiple	3.0	3.2	4.3	5.2	2.7

Moranbah median income = $145,000, ABS Census 2011

[2] Estimated from data at http://www.realestateinvestar.com.au/Property/moranbah; and http://www.sqmresearch.com.au/graph_vacancy.php?postcode=4744&t=1, accessed 20/12/2013.

4.2.2.2 *Blackwater Affordability Assessment*

Key indicative data on housing in Blackwater include:

- Sale and rental prices:
  - Over the past five years, the median sale price of vacant urban land in Blackwater increased by 60%. More recently, median sale prices have increased from $120,000 in 2010 to $212,000 in 2011, to $310,000 in 2012 before dropping to $151,000 in 2013 (Price Finder, 2013).
  - The median cost of purchasing a house in Blackwater rose significantly from 2009 to 2012 (up 60% to approximately $455,000) prior to dropping substantially (around 23%) from 2012 to approximately $350,000 in 2013.
  - Median weekly rents for new bonds for a three bedroom house have decreased substantially over the past 12 months, falling from around $750 to $350.
- Rental and home purchase affordability (see Table 4-4 and Table 4-5):
  - The median house price is affordable for households earning a median income in Blackwater (by at least $100,000). However, households in the bottom 20% of households by income would find the median house price unaffordable.
  - Home purchase affordability (using the median multiple measure) in 2012 was approximately 3.3, which in the order of the 'sustainable' median multiple (3.0).
  - The median rental cost for new rentals in the region is unaffordable for households in the bottom 15% of the income distribution. The median rent of a three bedroom house at $400 per week in the region is only affordable for households earning more than $70,000 per year.
- Rental vacancy[3]:
  - The rental vacancy rate at the end of 2013 was in the order of five percent.

As Project development in Blackwater is proposed from 2028 onwards (15 years hence), housing market impacts will have to be re-assessed closer to that period. The indications are that any housing market impacts would be limited due to the extent of gas field and facility development proposed, as well as the proposed land and housing development underway currently through Economic Development Queensland.

[3] Estimated from data at http://www.realestateinvestar.com.au/Property/moranbah; and http://www.sqmresearch.com.au/graph_vacancy.php?postcode=4744&t=1, accessed 20/12/2013.

Table 4-4 Blackwater Housing Affordability Assessment

Max. affordable rental per week	Income distribution Moranbah	Affordable house purchase price
More than $750 per week	$2,500+/w($130,000+/y) 54.2% of total households	$548,000+
$750 per week	$1,500-$2,499/w ($78,000-$130,000/y) 16.6% of total households	$548,000
$450/week	$1,000-$1,499/w ($52,000-$78,000/y) 6.4% of total households	$329,000
$300/week	$600-$999/w ($31,200-$52,000/y) 4.2% of total households	$220,000
$180/week	$0-599/w ($0-31,200/y) 6.4% of total households	$131,500

Median household income = $140,000

Median Rental Cost $400/wk

Median House Price $350,000

Table 4-5 Blackwater Median Multiple Assessment

	2009	2010	2011	2012	2013
Blackwater	285,000	316,000	370,000	455,000	350,000
Median multiple	2.0	2.3	2.6	3.3	2.5

Blackwater median income = $140,000, ABS Census 2011

4.2.3 Employment

Media reports and statements from coal industry peak bodies indicate that there have been significant job losses in the coal industry. Project area labour market data for the June Quarter 2013 is shown in Table 4-6, with the trend in unemployment shown in Figure 4-7. These figures demonstrate the sharp rise in unemployment between June 2012 and June 2013 to levels in excess of those following the global financial crisis (GFC). Although the rise in unemployment appears dramatic, the communities in the Project area have retained unemployment rates below that of the national and state average.

Figure 4-8 indicates that the labour force has continued to grow in the Project area following the GFC, particularly in the Belyando and Emerald areas, with only a slight hiatus in the immediate years following the GFC.

Table 4-6 Project Area Labour Market Data, June Quarter 2013

Statistical Local Area	Unemployed	Labour force	Unemployment rate
Belyando (S)	130	7,872	1.7
Broadsound (S)	70	4,643	1.5
Duaringa (S)	170	5,040	3.4
Emerald (S)	300	10,718	2.8
Nebo (S)	21	1,759	1.2
Peak Downs (S)	50	2,283	2.2

Source: Data tables - Small Area Labour Markets - June Quarter 2013, http://docs.employment.gov.au/node/33233

Figure 4-7 Project Area Unemployment Trend

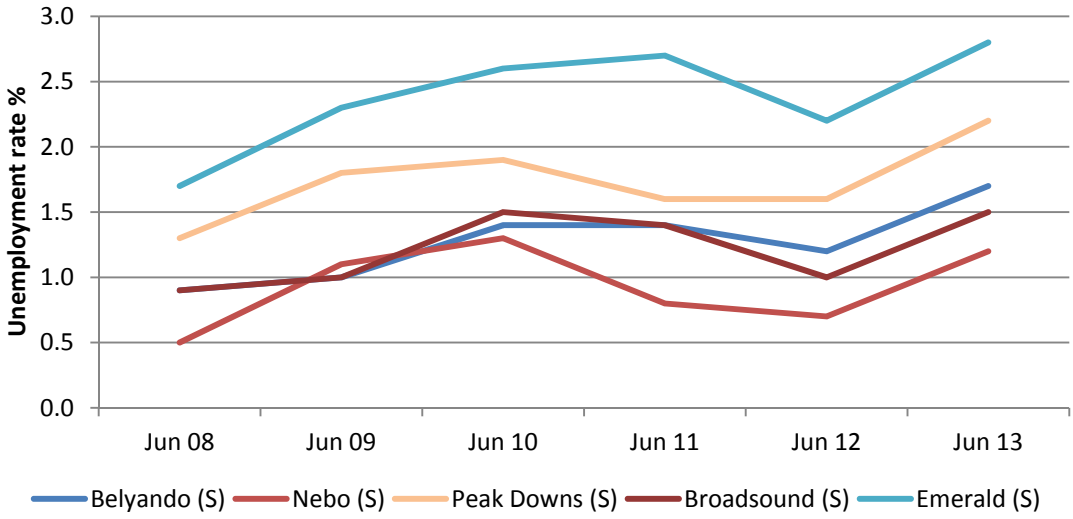
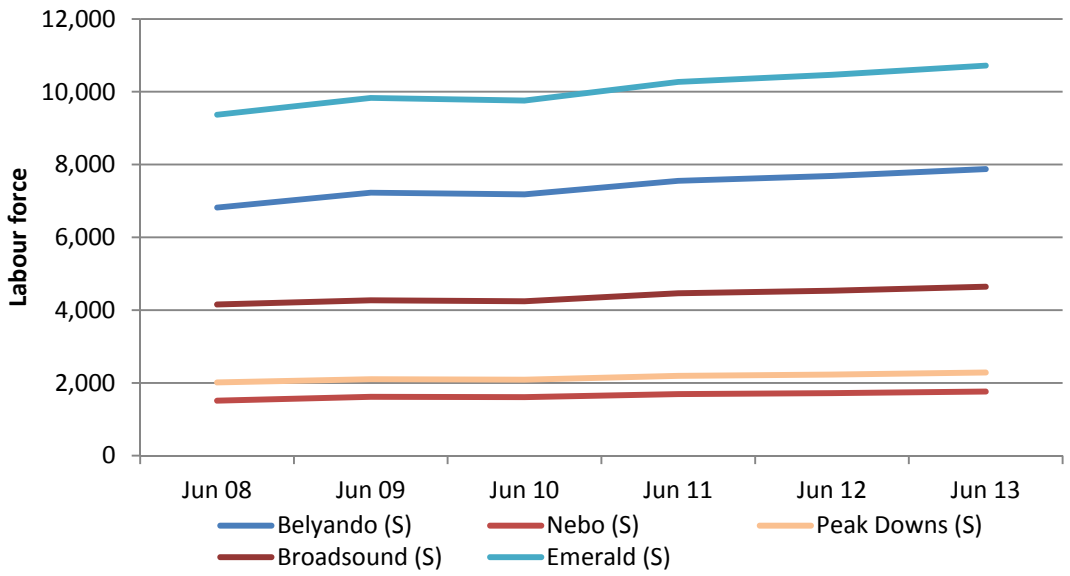


Figure 4-8 Project Area labour Force Growth



Summary

In summary, a review of recent information in key social baseline areas indicates:

- The Project will contribute to a slight increase in the number of NRW over the projected level in the Project area.
- In the last 12 months there has been an improvement in housing affordability within the Project area. However, the sustainability of this improvement will depend on economic conditions in the coal mining sector and their influence on new mine development or expansions in the area.
- The labour force is likely to continue to grow, possibly with some growth in unemployment levels. However, unemployment levels will be lower than those in the broader region or at State levels, indicating tight labour markets, particularly for skilled workers.

5 IMPACT REVIEW AND VALIDATION

This section outlines any changes to the impacts identified in the EIS based on the updated socio-economic baseline data and the project description changes (SREIS reference case).

5.1 Implications of Changes in the Social Baseline and Regulatory Environment

The changes in the regulatory environment are aimed at 'streamlining processes in order to provide greater certainty for proponents and reduce costs' and 'delivering better outcomes for resource communities through a more integrated and adaptive approach to managing impacts'. These changes ultimately aim to support the co-existence of gas development projects with existing land uses, as well as improving the preparedness of regional communities to manage potential pressures that may result from resource development projects in their locality.

Increased landholder engagement and information sharing facilitated by the Gasfields Commission - particularly around groundwater impacts and land access provisions - is aiding the creation of a more receptive and supportive environment for resource development. Further support to landholders from the AgForce CSG Project (AgForce, 2013) also contributes to an environment more open to negotiation. Concurrent with these developments, in 2013 the Queensland Government introduced a number of direct support programs such as the Royalties for the Regions program and the Resource Towns Action Plan. These programs are helping to build the preparedness of rural and resource towns to manage the potential impacts of resource development projects.

A review of the most recent demographic statistics indicates minor changes to the Estimated Resident Population used in the EIS. However, these changes do not affect the outcomes of the EIS impact assessment. There have been more significant changes to the estimates of NRW in the regional towns based on the latest survey by the Government Statistician. These numbers have the potential to change rapidly as companies in the coal mining sector reduce the use of contractors in response to market conditions for coal production. Towns where the numbers of NRW within their boundaries constitute a higher proportion of the FTE population, such as Dysart, Nebo and Middlemount, will be particularly susceptible to impacts that may result from these rapid changes, such as reduced demand for local businesses and difficulty in encouraging NRW to engage with local residents and to participate in local activities. On a regional scale, NRW comprise 40% of the FTE population for the IRC. Rapid changes in these numbers, combined with any employment loss for local residents due to industry conditions, may present challenges to Local Government.

Industry adjustment has also induced significant falls in the cost of housing, for both rental and sale prices, in the Project area. Housing purchase is now more affordable (with median multiples in Moranbah and Blackwater being less than three), though the volatility in prices may still mean that there is a high level of uncertainty in the market. The higher affordability may mean that there is potential for a higher population influx associated with the Project. However the likelihood of this would have to be assessed closer to the commencement of the Project. Industry adjustment has also led to rises in the level of unemployment throughout towns in the Project area. However it is noted that these levels are still substantially less than overall State levels. This may have an influence on the ability of the Project to recruit locally, as some coal mining employees may see the potential for employment in the long-term

operating environment of the Project to be more stable than employment in the coal mining sector.

5.2 Effects of Project Description Changes

This section assesses the effects of the revised Project scope on the unmitigated social impacts identified in the Social Technical Report (Appendix U) of the EIS, accounting for the updated assessment of the baseline environment outlined in the previous section. The appropriateness of SIMP management measures to mitigate these impacts is considered in Section 6.

Project Footprint Changes

Changes in the footprint of the Project result from two initiatives. The first is the consolidation of temporary accommodation camps from four smaller camps (sized to accommodate between 300 and 400 persons each) to two larger camps (sized to accommodate approximately 1,200 persons each). The second initiative is the reduction in well numbers (from approximately 7,000 to approximately 4,000) combined with the development of multi-well pad sites.

The consolidation to two larger camps will allow for a higher level of amenity to be provided in each camp due to the economy of scale. For example, swimming pools, playing field and other recreational facilities may be placed in each camp, and the higher resident numbers may increase the scope for employing a recreation officer and organise regular team events. This may also enable a higher level of integration with local community competitions, thereby assisting in socialising the workforce to the region. The larger camps may also create a more feasible opportunity for procuring services from local businesses. The provision of a higher level of health services to residents in a larger camp may also act to minimise demand on community services.

The reduction in the number of wells and development areas will mean that a smaller number of landholders will be subject to direct impacts within the Project development area. For those that are impacted, while there may still be some disruption to agricultural operations, there is likely to be less environmental disturbance.

Hence, the impacts to land use and property identified in the EIS are likely to be of lower significance due to the footprint changes proposed.

Construction and Operational Workforce Changes

Construction and operational workforce estimates for the EIS and the revised project description are detailed in Section 3.2.

The construction manning profiles shown in Figure 3-2 indicate that the most intensive construction phase occurs between 2016 and 2020 coinciding with construction of the two CGPFs when the average workforce in the field numbers around 2,000. From 2020 to 2026 the average number of construction workers is between 500 and 1,000, and from 2026 to 2036 the average number of construction workers declines slowly from around 500 to approximately 100. The peak phase for the revised Project occurs two years later than the peak for the EIS reference case, and extends over a four year period compared to a two year

period for the EIS reference case. This in combination with Arrow's intention that the 'pioneer' workforce required to establish accommodation villages will be housed in existing accommodation camps in the area until sufficient units are constructed, is not expected to have a material impact on nearby communities.

While Arrow's preference is to provide employment to people sourced locally, traditionally low unemployment in the Project area and the quantum of labour required indicates that labour will likely need to be sourced from further afield. Arrow's aim, in this regard, is to implement a hierarchy of preferred employment and contractor candidates based on the employees / contractors home or source location.

Regardless of source location, Arrow will make provision for all construction workers to be accommodated in purpose-built accommodation villages.

The required operational workforce has been revised down significantly from the EIS reference case. As indicated in the revised project description "to reduce HSE and transportation risks, as well as labour cost, the wells will be highly automated to reduce the frequency and duration of direct intervention by operators". Table 3-3 indicates that the total resident population influx to Moranbah is likely to decrease from 70 to 31 under prevailing assumptions. However, if more optimistic assumptions are adopted (20% of FIFO elect to become residential, each with 2.6 dependents) the population influx could rise to 125.

The following sections provide an overview of the potential impacts of the changes to the project description including the revised construction and operational workforce numbers.

5.2.1 Population and Demographic Profile

The Social Technical Report (Appendix U, Section 6.3) of the EIS assessed the impact of population change associated with the Project. To be conservative in estimating the need for accommodation camps the EIS assumed that for construction 100% of the workforce would be sourced from outside the region. Any local sourcing of construction inputs would be provided by businesses whose employees were locally-based and already living in town accommodation. For the operational phase, the Social Technical Report (Appendix U) of the EIS assumed that 10% of workers would be recruited locally, would not require accommodation, and that there was some potential for families of these workers to out-migrate should the workers be compelled to live in camp accommodation while on roster. It also assumed that there would be little to no in-migration of the operational workforce to the local area due to high costs of living.

The expected impacts from the population changes assessed in the Social Technical Report (Appendix U) of the EIS included an increase in cultural diversity, some decline in population for Moranbah and Dysart, an increase in the number of NRW in the region and an increase in the proportion of young males in the population.

The on-going validity of the Social Technical Report (Appendix U) of the EIS assumptions was reviewed in the light of changes to the social baseline profile and the revised project description. While Arrow planning will continue to size accommodation facilities to accommodate the full complement of operational workers, there is no intention to compel locally-engaged workers to reside in the camps while on-shift. The revised project description indicates that "A sponsored shuttle bus service, or similar arrangement is under consideration". Detailed logistical planning will be undertaken at a later stage; however it is

unlikely that the Project would lead to any decrease in the size of the local resident community. Recent falls in the cost of housing in the IRC area, if sustained, may also act to encourage a degree of relocation to the study area for operational workers.

As shown in Figure 4-4, the construction NRW associated with the revised project description increases the level of NRW over the projected number of NRW in the IRC area, from 2015 to 2019, by an average of 6.4%, compared to the estimated increase in the EIS reference case of 4.2%. This additional increase of 2.2% (or approximately 400 workers) is not expected to impose any incremental impact as they will all be accommodated in the TWAFs to be established.

As described in the previous section, the operational workforce assumptions indicate that the residential population of Moranbah may increase by up to 125 persons (or approximately 1.0% above the projected population level at 2020) should an optimistic scenario prevail. An increase of this level would be in line with the confidence limits of organic growth expected, and should not impose any significant change that normal community servicing could not accommodate.

5.2.2 Housing and Accommodation

Impacts upon housing and accommodation in the Project area are assessed in the Social Technical Report (Appendix U, Section 6.4) of the EIS. That assessment concluded that there was not likely to be any direct increase in demand for housing, and noted that while Arrow had a preference for operational staff to be resident in the region there was likely to be minimal demand from operational workers to relocate to the region. The Project characteristic of facilities and infrastructure (and hence construction workforce) being dispersed across a large area, compared to the more localised development of a mining project, supports this assessment. A possible increase in housing costs as a result of speculative activity was noted, but assessed as being unlikely and of overall low significance.

As shown in Section 4.2.2, there have been significant falls in weekly rent costs and in median house prices over the last 12 to 18 months. The median multiple levels in Moranbah and Blackwater have now fallen into the sustainable range for households earning median incomes and above. As a result, the decrease in the Project's operational workforce numbers, combined with the rise in housing affordability, confirms that there will be no change to the impacts assessed in the Social Technical Report (Appendix U) of the EIS. It is noted though, that the housing market in resource towns, particularly where there is a high level of dependence on one commodity, is significantly volatile and future movement in housing costs are subject to considerable uncertainty. This warrants on-going close monitoring of the market to ensure that the assumptions made with respect to housing impacts remain valid.

5.2.3 Employment, Skills and Business

Impacts on employment, skills and business were assessed in the Social Technical Report (Appendix U, Section 6.5) of the EIS. It noted that the Project may bring about an increase in the number and type of apprenticeships available, effect improvements in regional training facilities, improve the retention of students to Year 12, and diversify the skills base of the regional population. These were all considered positive impacts with a medium level of significance. The Social Technical Report (Appendix U) of the EIS also identifies an increase in opportunities for smaller local businesses, but notes the possibility of supply chain issues

associated with differences in terms of trade extended by the suppliers to the local businesses, and the terms of trade that local businesses received from major developers. The significance of this potential impact was rated as high.

Changes to the project description indicate that for the construction phase there will be an increase in the peak workforce which may lead to increased opportunity for local employment. As discussed in Section 4.2.3, the level of unemployment is rising due to the subdued market for coal, however as overall levels of unemployment are still low any significant increase in local employment will continue to be constrained by the lack of locally available labour.

The project description also indicates that the operational workforce will be significantly reduced, primarily due to the effects of automation on well-field and facilities operation.

5.2.4 Land Use and Property

Land use and property impacts were assessed in the Social Technical Report (Appendix U, Section 6.6) of the EIS. The principal impact identified was a potential for disruption to agricultural production due to the direct impacts of construction activity, in particular the use of private roads on properties to access construction sites. Deterioration of Local Government roads was also expected to affect agricultural enterprises. While rated as unlikely, disruption to agricultural production was expected to be of moderate consequence with a resulting medium level of significance.

As indicated in Section 3.1, the revised project description results in major changes to the Project footprint. The overall Project development area (800,000 ha) does not change however the EIS reference case was based on development occurring in 17 areas of generally 12 km radius, totalling 769,000 ha, while the revised project description envisages the development of 33 drainage areas of generally 6 km radius, totalling 373,200 ha. This results in a reduction of the Project footprint in the order of approximately 50%. This reduction in disturbed area, combined with the use of multi-well pad sites, is expected to reduce the impact consequences for construction from moderate to minor, with a resulting significance of low.

As described in Section 3.2.2, during operations, Project gas facilities are planned to be highly automated, with control of the CSG production facilities managed centrally from the Brisbane Central Control Room on a 24/7 full-time basis. Arrow also intends to implement the NNM philosophy for the Project gas facilities when commissioning has been completed and reliable steady state operations have been proven. NNM operations are defined as those operations where operations staff are not permanently allocated to a specific facility, but allocated across a number of facilities and visit a facility on an as needed basis for a specific purpose. This will further reduce the frequency of access (and hence potential disruption) to landholders in the region.

5.2.5 Community Values and Lifestyle

The Social Technical Report (Appendix U, Section 6.7) of the EIS assessed impacts of the Project on community values and lifestyle. The report identified a potential detriment to the social fabric of the impacted communities, with residents viewing the presence of NRW as inimical to the sense of place desired by residents, especially those raising children in the community. While this is dependent to a large extent on the location of the accommodation camps, there was also a concern that media reporting of the impacts of FIFO workforces has

contributed to a general negative perception of the region by those outside of the region. The Social Technical Report (Appendix U) of the EIS also identified potentially conflicting opinions among residents within the region, where some view NRW utilising community facilities as an impost on the community, while others view the same effect as a contribution to the viability of community facilities. A further impact of the region hosting large numbers of NRW is the development of a perception that personal safety is at risk due to anti-social behaviour associated with NRW resident in camps. These impacts were all rated as possible with minor to moderate consequences, resulting in a medium level of significance.

The revised project description, while incorporating a higher peak construction workforce, will maintain the separation between the community and the NRW by locating accommodation camps remote from the main communities. This is with the exception that they will be larger and possibly incorporate a higher level of amenity than the originally proposed four smaller camps. The workforce and camp residents will continue to be subject to a strict Code of Conduct, which has been shown to generally be effective in managing the behaviour of camp-based employees associated with resource Project development and operations in the Bowen and Surat basin areas to date. Any construction and operations workers who relocate into the area are more likely to be accompanied by families which encourages community integration and lessens the chances of anti-social behaviour.

5.2.6 Community Infrastructure and Services

Potential effects of the Project on community infrastructure and services are discussed in the Social Technical Report (Appendix U, Section 6.8) of the EIS. Impacts on community facilities (such as libraries) and services (such as childcare and other support services) were assessed as being limited in scope, with the more likely impacts being experienced in recreational facilities such as clubs and hotels and in outlets in the retail sector. The cumulative impact of other projects was also a significant factor in determining whether or not the impacts actually materialised.

The impacts on health services were noted as a particular concern for the community of Moranbah, notwithstanding that the town was serviced by six general practitioners and a range of visiting specialist services and allied health providers. Consultation for the EIS indicated the existence of some tension between the public and private models for the provision of health services in the region making it difficult to be definitive about the impacts of additional population in the area. As indicated in Section 5.2.1, the revised project description will increase the level of NRW over the projected number of NRW in the IRC area for the years 2015 to 2019 by an average of 6.4%, compared to the estimated increase due to the EIS reference case of 4.2%. This additional increase of 2.2% (or approximately 400 workers) is not expected to impose any incremental impact on health service provision to residents of the area as they will all be accommodated in the temporary camp facilities which will have on-site medical facilities that will most likely include a general practitioner. The operational workforce assumptions indicate that the residential population of Moranbah may increase by up to 125 persons (or approximately 1.0% above the projected population level at 2020) should an optimistic scenario prevail. An increase of this level would be in line with the confidence limits of organic growth expected, and is broadly in line with Queensland Health planning parameters for the delivery of public health services to the area.

In August 2013 the MAC Group, a commercial camp accommodation provider, announced that it was reserving four accommodation rooms in its Moranbah camps on an on-going basis

for the use of visiting medical personnel (http://www.abc.net.au/news/2013-08-16/mine-camp-rooms/4891916). A token charge of $50 per night is to be charged and donated to the Moranbah Community Partnership Group for use in community support programs. The purpose of the accommodation initiative is to facilitate the provision of medical services and to attract medical professionals to move to and settle in the community.

Hence the increased population estimates associated with the revised project description are not expected to alter the impact significance identified in the Social Technical Report (Appendix U) of the EIS (assessed as medium level) and are capable of effective mitigation through the plans outlined in the EIS SIMP (Appendix V).

5.2.7 Health, Safety and Environment

Impacts related to community health, safety and the environment were assessed in the Social Technical Report (Appendix U, Section 6.9) of the EIS. The principal concern of note was potential for community anxiety over perceived negative impact on groundwater, and safety issues surrounding the production and transport of gas. The Social Technical Report (Appendix U) of the EIS assessed the significance of this impact as being medium, based on a likelihood of occurrence rated as 'unlikely', with consequences rated as moderate. Mitigation was based on the provision of information through the implementation of community engagement and health, safety and environment plans, reducing the consequences to minor. The changes to the project description are not likely to alter the perceptions of stakeholders in the local community in the near-term, though the reduction in area disturbed through the use of multiple-well pads will reassure the community that Arrow has a serious intent to avoid environmental impact through the adoption of best practice technical approaches. As such, the significance of the impact is not expected to change to any observable extent.

5.2.8 Summary of Impact Changes

Table 5-1 provides a summary of the impacts assessed as having a revised significance ranking based on updates to the project description and updated socio-economic data.

Table 5-1 Summary of Changes to Impacts

Potential Impact	Status	Phase	Pos/ Neg	Likelihood	Consequence	Signifi-cance
Impacts on population and demographic profile The project description changes are not likely to alter the level of significance for this category of impact.						
Impacts on housing and accommodation The project description changes are not likely to alter the level of significance for this category of impact.						
Impacts on land use and property						
Deterioration of roads and detrimental effect on agricultural activity	Decreased consequence	C,O	Neg	Unlikely	Minor	Low
Impacts on community values and lifestyles: The project description changes are not likely to alter the level of significance for this category of impact.						
Impacts on community infrastructure and services: The project description changes are not likely to alter the level of significance for this category of impact.						
Impacts on health, safety and environment: The project description changes are not likely to alter the level of significance for this category of impact.						

6 IMPACT MANAGEMENT REVIEW

6.1 SIMP Update

The Project draft SIMP was reviewed in consideration of:

- Changes to the project description;
- Alignment with the impact management approaches developed in the Arrow LNG Plant SIMP and the Arrow Surat Gas Project SIMP; and
- Current Arrow supported social development initiatives in the Bowen Basin.

Action plans in the SIMP were revised and consolidated into five plans covering:

- Housing and accommodation;
- Health and community wellbeing;
- Workforce management;
- Local content; and
- Cumulative impacts.

Key initiatives within the action plans include:

Focus	Initiatives
Housing and accommodation	• Development of an early works accommodation strategy • Participation in regional planning forums concerning population growth and housing
Health and community wellbeing	• Provision of Project-driven population growth forecasts to relevant agencies and local governments • Extension of the brighter Futures Program to the Project region • Implementation of a community engagement plan that includes a Regional Community Consultation committee • Support for NRW involvement in community activities.
Workforce management	• Equipping TWAFs with adequate recreational and entertainment activities • Provision of a comprehensive on-site health service for project employees • Education and training programs to maximise local employment and training opportunities
Local content	• Commitment to the Queensland Resources and Energy Sector Code of Practice for Local Content • Finalisation of an Australian Industry Participation Plan and the development and dissemination of a Local Content Policy and strategy • Continuation of the Whanu Binal program for Indigenous businesses.
Cumulative impacts	• Participation in regional development planning and issues coordination forums together with government and other project proponents • Participation in the Industry Leadership Group for CSG Resource Projects.

The following social investment programs are currently being implemented in the Moranbah area.

Brighter Futures

Arrow acknowledges it has a shared responsibility with government, and society more broadly, to help facilitate the development of strong and sustainable communities. It is committed to managing the residual social impacts of its activities that cannot be avoided or sufficiently minimised and to contributing to the social and economic wealth of the communities in which it operates through its social investment program. This program is comprised of the Brighter Futures community funding, sponsorships and partnerships and has been running in Brisbane, Gladstone, Surat and Bowen Basins and its exploration tenements since 2011.

MStep

Arrow is partnering with Moranbah State High School and Simply Sunshine Childcare to deliver the Bright Kids after school care program. This innovative program provides a reliable long-term solution to the towns after school care shortage by integrating the delivery of the service with the school's M-STEP Education Support and M-STEP Business programs. Senior students from Moranbah State High School assisted in the development, promotion and delivery of the facility and will continue to build on their learning by providing the staffing required to operate Bright Kids daily. As a result of this partnership Moranbah will now have a reliable long-term after school care solution while students will have access to enhanced learning and a pathway to employment in the region.

University Education

Arrow is partnering with six of Queensland's universities (University of Southern Queensland, University of Queensland, Griffith University, Queensland University of Technology, James Cook University and Central Queensland University) to provide a range of scholarships and financial support to students across the state. This includes young people from our regions of operation, including the Bowen Basin.

Community Wellbeing and Safety

Arrow participates in bi-monthly meetings between the Queensland Police and other local proponents. The purpose of these meetings is to discuss safety concerns and challenges within the community. An Arrow representative also attends the Moranbah Community Health Partnership Group meetings which include all the key health and community workers in the region focussed on community services and wellbeing.

7 REFERENCES

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