19 KEY FINDINGS AND CONCLUSION

19.1 INTRODUCTION

Chapter 19 identifies the key findings and conclusions from the environmental impact assessment for the Gas Field Component of the Queensland Curtis LNG (QCLNG) Project as described in *Volume 3*.

19.2 CLIMATE AND CLIMATE CHANGE

Gas Field Component infrastructure design, construction and operation will consider the climate of the region, which can experience wide seasonal variations and extreme weather events. Mitigation measures are proposed for the potential impacts of climate variation on the construction and operation of the Gas Field Component that may result in impacts to the environment or to the health and safety of QCLNG Project personnel and the community.

It is not predicted that climate change will significantly impact the Gas Field region in the next 20 to 25 years. Nevertheless, Gas Field infrastructure design, construction and operation will incorporate predictions about climate changes that may affect temperature and rainfall patterns.

19.3 TOPOGRAPHY AND GEOMORPHOLOGY

The development of the Gas Field will require minimal landform modification. Almost 75 per cent of the study area has no topographical constraint and an additional 24 per cent has only a minor constraint to any development activities.

Approximately 1 per cent of the Gas Field area has a significant topographical restriction in terms of field development. To the greatest extent possible, these areas will be restricted for development of the Gas Field.

19.4 GEOLOGY AND SOILS

The Gas Field is located in the Surat Basin on the western slopes of the Great Dividing Range and contains a large range of soils types and properties. Themost significant potential soil issue associated with the Gas Field development is erosion and the management of topsoil to ensure successful rehabilitation outcomes are achieved. Mitigation measures have been devised to minimise adverse impacts to soil from the Project.

The Gas Field also contains approximately 184,000 ha of good quality agricultural land (GQAL). Most of the GQAL is in the centre of the study area roughly bounded by Miles, Brigalow, Kogan and Condamine. Construction and ongoing production activities listed in association with the development of the Gas Field have the capacity to affect these areas. Mitigation measures have been developed to avoid significantly diminishing productivity of high value cropping land associated with the Gas Field.

19.5 LAND USE AND INFRASTRUCTURE

The total extent of the Gas Field is approximately 468,800 ha. Approximately 95 per cent of the Gas Field is zoned rural and 5 per cent rural/residential. Approximately 71 per cent is held as freehold, 13 per cent leasehold, 11 per cent state forest with the remaining 5 per cent crown reserves, stock routes and infrastructure reserves. Land use comprises approximately 72 per cent pastoral activities, 12 per cent cropping, 11 per cent state forest and 5 per cent rural residential.

Approximately 5 per cent of the Gas Field is covered by mining leases, predominantly for coal. There are no major industrial developments, other than power stations, in the Gas Field. The Gas Field is intersected by a number of infrastructure corridors for power lines, gas and water pipelines, and telecommunication lines. QGC has proposed mitigation measures to engage with mining lease holders where tenements overlap and to avoid infrastructure routes.

There are a number of native title claims over land in the Gas Field. Consultation will be conducted with all relevant claimants to ensure any potential impacts are mitigated.

Due to the dispersed nature and multiple locations of Gas Field infrastructure and operations, there is potential for moderate impacts on land use and infrastructure. This may be particularly relevant for agricultural cropping lands and state forests, where multiple well locations may reduce the ability of the landholder to access all areas of productive land. Mitigation measures have been proposed to reduce impacts, including landholder consultation and engineering solutions.

Findings and conclusions about impacts on environmentally sensitive areas, and mitigation measures for those impacts are discussed below.

19.6 LAND CONTAMINATION

A risk-based approach to land contamination has been adopted that considers the most likely contaminants and their likely locations. At this stage no potentially contaminated areas have been located. Management plans have been proposed for identifying potentially contaminated sites and for the

accidental discovery of contaminated sites.

There is potential for Project activities to cause land contamination through release of chemicals, waste, fuel and Associated Water. Risk management strategies will be implemented to reduce the probability of land contamination.

19.7 AQUATIC (FRESHWATER) ECOLOGY

Drained primarily by the Condamine and Balonne Rivers, the Gas Field contains a number of areas mapped as freshwater wetlands (Regional Ecosystem (RE) 11.3.27) and is in the broad vicinity of two important wetlands, Gums Lagoon and Lake Broadwater Conservation Park.

According to Queensland Herbarium records, the three endangered, vulnerable and rare (EVR) flora species *Aponogeton queenslandicus*, *Eleocharis blakeana* and *Fimbristylis vagans* could occur within the broad vicinity of the Gas Field. In addition, a search of Queensland Museum records indicated the potential presence of the endangered Murray Cod (*Maccullochella peelii peelii)* and the Fitzroy River Turtle (*Rheodytes leukops*).

QGC will exclude all non-linear infrastructure from all areas mapped by the Herbarium as RE 11.3.27 and within buffer areas (as set out in the current environmental authority [EA] requirement) of watercourses. In a small number of instances linear infrastructure will be unable to avoid transecting watercourses. Provided such unavoidable impacts are minimised and compensated for by offset initiatives there is a low potential for Gas Field activities to significantly affect aquatic biological features and values within or downstream of the Gas Field.

19.8 TERRESTRIAL ECOLOGY

According to existing RE mapping, approximately 297,475 ha of the total 468,800 ha (approximately) Gas Field is cleared. The area of remnant vegetation within the Gas Field equates to 171,225 ha and includes two Endangered EPBC-listed (*Environment Protection and Biodiversity Conservation Act 1999*) threatened ecological communities, seven REs listed as Endangered under the *Vegetation Management Act 1999* (Qld) *(VMA)* and six Of Concern REs. Based on field survey results, these Endangered and Of Concern remnants generally occur as long narrow fragments degraded by edge effects (e.g. weed invasion), past and present land uses (e.g. cropping and grazing), and regular fires.

Desktop studies identified 48 EVR flora species known to occur or have ranges that overlap with the Gas Field. Field surveys recorded eight of these species and a further 25 with potential habitat in the Gas Field. In addition to the EVR flora species, four Priority Species listed under the Department of Environment and Resource Management (DERM) Biodiversity Assessment

and Mapping Methodology (BAMM) for the Brigalow Belt South Bioregion were also recorded in the study area.

Fauna habitats on most rural lands and roadside verges in the Gas Field are fragmented and substantially degraded. Nevertheless, some areas, particularly riparian zones, have significant fauna habitat values with a relatively high percentage of hollow-bearing trees and moderate-to-high levels of under-storey vegetation and leaf litter.

According to desktop searches, 33 EVR fauna species could occur in the Gas Field. Eight of these were recorded during the field assessment within the Gas Field (three bird, three bat, one reptile and one butterfly species). A further 11 Priority Species listed under the BAMM for the Brigalow Belt South Bioregion were also identified during the detailed field surveys.

Through the use of desktop studies, field survey results and the BAMM it was possible to develop a zoning scheme that prescribes different levels of environmental constraints based on the conservation value of the area. Areas that fall into the category of very high constraints zone include Gurulmundi State Forest, areas north-west of Gurulmundi State Forest, *EPBC*-listed ecological communities, DERM defined Category B Environmentally Sensitive Areas (e.g. *VMA* Endangered REs), areas mapped as wetlands (RE 11.3.27) and areas within buffer zones of watercourses (as set out in the EA conditions for the existing QGC operations).

Linear infrastructure associated with the Gas Field activities will avoid very high ecological constraints zones wherever possible. It is recognised that in a small number of instances it will not be possible for linear infrastructure to avoid linear vegetation remnants and watercourses of significant ecological value (i.e. very high constraints zones). Provided such unavoidable impacts are minimised and compensated for by offset initiatives and provided that the recommended mitigation and rehabilitation measures are adopted, there is a low potential for the Gas Field activities to significantly affect the terrestrial ecology within and in the vicinity of the Gas Fields.

19.9 SURFACE WATER RESOURCES

The Gas Field is located largely within the Condamine and Balonne river catchment, which forms part of the upper catchments of the Murray-Darling Basin. The proposed activities are also located within the Fitzroy catchment, which contains a number of smaller streams including Horse Creek, Wandoan Creek and Woleebee Creek. No significant wetlands are located within the Project area. Two nationally significant wetlands within the vicinity of the Gas Field area are Lake Broadwater, located within Lake Broadwater Conservation Park southwest of Dalby and directly east of tenement PLA 279, and The Gums Lagoon west of Tara.

Field studies indicated that surface waters flowing through the Gas Field area have been detrimentally affected by anthropogenic activities such as land clearing, grazing, cropping and irrigation. Hydrochemical analysis of river samples identified elevated total suspended solids, total nitrogen and total phosphorus compared to Australian and New Zealand Environment and Conservation Council water quality guidelines.

Two main factors can pose risks to the surface water environment from the development of the Gas Field:

1. the volume and the quality of the Associated Water that has to be handled once brought to the surface
2. the development of infrastructure can affect surface water flow and water quality.

The Gas Field is unlikely to have a significant impact on surface water resources. With the implementation of appropriate mitigation measures, the potential impacts to surface water resources can be managed to ensure minimal impact.

19.10 GROUNDWATER RESOURCES

The Gas Field lies in the Surat Basin within the eastern-most portions of the Great Artesian Basin (GAB), one of the largest artesian groundwater basins in the world (Department of Natural Resources and Water, 2006). It is also located primarily within the Condamine Balonne Water Management Area (surface water) and in or adjacent to the Groundwater Management Areas of Surat East, Eastern Downs, Surat North and Surat.

A detailed groundwater study has been undertaken for the Gas Field area. This study included a desktop review of groundwater resources in the region and modeling of the potential affects on groundwater resources of the extraction of Associated Water as part of the CSG process.

The main aquifers of the Project area are (from the base of the sequence upward) the:

- Precipice sandstone
- Hutton sandstone
- Springbok sandstone
- Gubberamunda sandstone
- Mooga sandstone.

Specific units and sedimentary rock types were grouped together to create six hydrogeological units for modelling the potential effects of the Project on groundwater resources. This approach was adopted to enable a meaningful model to be created at a time when the full field layout has not been determined.

The conceptual groundwater model shows that, overall, the development and operation of the Gas Field poses low to moderate risk to neighbouring bore users and low risk to the ecosystem.

Based on the model, trigger levels have been proposed in relation to water quantity and quality. However, the data available to the Project indicates that drawdown effects could be expected to exceed the nominated trigger levels of various formations within the Gas Field and, for the Springbok sandstones, potentially outside of the Gas Field. Changes have been proposed to the current monitoring program to provide better data to enable more accurate modelling and the implementation of appropriate mitigation measures if required.

The risk of inter-aquifer flows arising from bore design or poor bore construction techniques is very low.

There would be a minor potential for impacts on water levels in the local unconfined aquifers and underlying intermediate aquifers and water quality changes are not considered likely.

Owing to the negligible to insignificant impacts expected on the water table aquifers in the study area, any significant impact on the baseflow to local river systems, particularly the Condamine River, is unlikely.

19.11 *ASSOCIATED WATER*

QGC will produce large volumes of saline Associated Water. Associated Water disposal presents both opportunities and potential impacts for environmental and social values.

There are a number of potential options for beneficial use of Associated Water. Selection of the optimal combination of beneficial uses will depend on environmental, social, economic, technical, commercial and regulatory aspects. Based on the options analysis presented in *Volume 3, Chapter 11*, the preferred short-term option is evaporation ponds and for the long term, irrigation of tree crops. Both short and long term options will be supplemented by supply to industry and QGC petroleum activities. Other options have not been discounted. The preferred options for Associated Water management may change over the life of the Project.

Each beneficial use option will require different levels of water quality, creating the need for alternative technologies for water treatment. Water treatment results in the creation of brine waste, which will be managed to minimise impacts on land. The preferred treatment option is desalination complemented by brine concentration and brine evaporation. Concentrated brine waste will be disposed of in specially constructed landfills.

QGC will be required to undertake further detailed investigations of Associated Water management options which will focus on determining the likely impact on environmental and social values.

19.12 AIR

Modelling of all airborne emissions, including nitrogen dioxide, carbon monoxide, hydrocarbons, ozone and particulates, indicates that emissions will be below air quality limits. The Gas Field is predicted to produce these emissions:

- nitrogen dioxide for normal operations will be between 6 per cent and 14 per cent of air quality objectives
- nitrogen dioxide for non-normal operations will be between 4 per cent and 17 per cent of air quality objectives
- carbon monoxide for normal operations will be about 1.3 per cent of air quality objectives
- carbon monoxide for non-normal operations will be about 0.02 per cent of air quality objectives.

Fifty-four hydrocarbons were modelled. Modelled results of certain hydrocarbon emissions were verified through stack testing of existing compressors. Based on modelling and stack testing, no hydrocarbon emissions are predicted to exceed the relevant air quality objectives.

Modelling indicates that the predicted range of maximum ozone concentrations is below air quality limits.

Cumulative impacts on nitrogen dioxide levels from other existing and proposed projects in the region are not expected to result in exceedences of air quality limits. Gas Field emissions of nitrogen dioxide, including background levels, will be between 6 per cent and 31 per cent of air quality objectives.

Further air quality testing, monitoring and modelling will be undertaken to predict cumulative impacts of other existing and proposed projects on carbon monoxide, hydrocarbons, ozone and particulate levels. However, given the rural nature of the region, limits are not expected to be exceeded and therefore a significant impact on the environment or on public heath and safety is not expected.

19.13 NOISE AND VIBRATION

The primary source of noise from the Gas Field is the operation of compressors. Night-time noise limits of 28 dB(A) will be exceeded at a distance of approximately 4 km to 5 km from a group of compressor stations.

At worst, and without mitigation measures, approximately 350 sensitive receptors may experience noise levels above night-time noise limits. With mitigation measures, noise levels at sensitive receptors may decrease by between 10 and 40 dB(A), with a substantial decrease, to less than five, in the number of noise-affected sensitive receptors.

Other noise sources are not expected to affect sensitive receptors due to the limited duration or low noise levels of the noise source. Where other noise sources are found to exceed noise limits at sensitive receptors, mitigation measures will be introduced. These will include choice of location, design of infrastructure, consultation with potentially affected receptors and construction of noise abatement structures.

No sources of vibration are predicted to exceed the relevant limits.

19.14 TRANSPORT

At this early stage of the Project transport logistics have not been completed. All materials and equipment for the Gas Field have been assumed to be sourced within Australia and delivered through south-east Queensland. Thepreliminary transport impact assessment assumes all transport will be by road, as this would give the worst-case impacts. Rail may be an option and this will be considered in a logistics study.

The assessment has shown that if all materials for the Gas Field were transported by road, moderate to major impacts may be created on the road pavement of the Leichhardt, Warrego and Moonie highways and the Surat Developmental, Dalby-Kogan, Kogan-Condamine, Jackson-Wandoan and Dalby-Jandowae roads. The transport impacts are not expected to reduce the level of service on any of these roads. Pavement impacts are also expected on regional council roads, the majority of which are unsealed.

QGC is seeking confirmation of its assessment approach and will work with the relevant road authorities to develop mitigation and management measures that ensure:

- no long-term adverse impacts on road pavement
- safe management of transport during construction.

19.15 VISUAL AMENITY

A visual impact assessment of the Gas Field has shown that this element of the Project is expected to have a generally low-to-negligible visual impact on its surrounds given appropriate positioning of infrastructure. The area has been assessed as having a suitable landscape for the proposed works primarily due to the extensively modified landscape in which the works are proposed. Mitigation measures to minimise impacts have been proposed, including the use of screening vegetation to reduce or remove visual impacts.

19.16 WASTE MANAGEMENT

The main sources of waste, by volume, are Associated Water and wastewater. Key findings and conclusions about Associated Water management are in *Section 19.11*. Wastewater will be treated on site in a waste treatment facility. Treated wastewater will be used for irrigation and remaining waste sludge disposed of at a licensed facility.

A comprehensive waste management plan, including waste minimisation, re-use and recycling, will be implemented for all other waste sources.

19.17 HAZARD AND RISK

A quantitative risk assessment was undertaken for the unplanned release of gas from Gas Field infrastructure. All other hazards were identified and assessed using a qualitative risk assessment process.

For hazards assessed qualitatively, those with the greatest residual risk related to transport incidents. Further control measures were proposed to minimise these risks.

A number of scenarios were considered for the unplanned release of gas, relating to the type of equipment and the size of the hole from which gas was released. For each scenario there are potentially five consequences: toxic effects, potential vapour-cloud flash fire, blast overpressure, thermal radiation from gas ignition, and downwind toxic effects of a fire.

All fatality risks from the above scenarios are considered negligible. Moderate injury risk criteria are highly unlikely to be exceeded at distances greater than 16 m.

Establishment and maintenance of adequate safety zones for each infrastructure type will ensure that the risk to human health is as low as reasonably practical.

It is probable that both fatality and injury risk will be less than the model predicts. Infrastructure will be constructed to Australian Standards, which data show results in a lower likelihood of release of gas than the likelihood used in the model.

Comprehensive emergency management plans will be developed to further mitigate potential hazards and manage any hazards, should they occur.

19.18 CUMULATIVE IMPACT

The cumulative contribution of other projects in the region was assessed at a high level, based on best available information.

The other projects with the greatest potential for cumulative impacts are those that:

- overlap or are adjacent to the Gas Field
- are geographically separated but have potentially significant impacts on certain environmental values within the Project boundary
- are geographically separated but will have impacts beyond the boundaries of the Project.

The environmental values with the greatest potential for cumulative impacts are associated with:

- terrestrial ecology
- groundwater resources
- air
- noise
- road transport.

QGC has proposed mitigation measures to minimise the Project's impact on the above environmental values.

19.19 CONCLUSION

A range of negligible to moderate-major environmental impacts have been identified relating to construction or operation of the Gas Field Component of the Queensland Curtis LNG (QCLNG) Project, on the basis of various technical study findings and impact assessment for the Gas Field contained in *Volume 3* of this EIS.

Mitigation measures and Environmental Management Plans for the construction and operation phases have been prepared to ensure impacts are as low as reasonably practicable.

Following the technical studies and impact assessment on the Gas Field, a diverse set of QGC commitments related to the Gas Field is proposed to be implemented during the detailed design, construction and operation phases. These commitments are documented in *Appendix 1.5*.

Table 3.19.1 provides a high-level risk assessment of impacts from the Gas Field. No impacts on environmental factors were identified as critical or major. Once mitigation strategies are implemented, all potential impacts are negligible, minor or moderate for construction, operation and decommissioning of the Gas Field.

Table 3.19.1 QCLNG Project EIS Summary - Gas Field Component and Associated Ancillary Activities and Infrastructure

Gas Field Component	Preferred Mitigation										Residual	Emergency Conditions					Ancillary Infrastructure and Act		
ENVIRONMENTAL FACTORS	Well Establishment and Operation	Gas Gathering [2]	Gas Compression [3]	Accommodation camps [4]	Avoid at Source	Abate at Source	Attenuate	Abate at the Receptor	Remedy	Compensate / Offset	Residual Impact Significance	Unplanned gas Release with Explosion or Fire	Infrastructure Failure, Inappropriate Use or Access	Pollutant Release	Natural Disaster (Impacts from Effects on Project)	Vehicle Accident	Associated Water Storage Ponds	Preferred Option for Associated Water Treatment and Waste Management [6]	Beneficial Uses of Associated Wate
Climate and Climate Change (Design implications)	N (-)	N (-)	N (-)	N (-)	√	√					N (-)	n/a	n/a	n/a	n/a	n/a	Mi (-)	N (-)	FI
Topography & Geomorphology (Changes in landform)	N (-)	N (-)	N (-)	N (-)	√				√		N (-)	n/a	n/a	n/a	n/a	n/a	Mi (-)	N (-)	FI
Geology and Soils (Erosion & GQAL)	Mi (-)	Mo (-)	Mi (-)	N (-)	√	√	√	√	√		Mi (-)	n/a	N (-)	Mi (-)	Mi (-)	n/a	Mo (-)	N (-)	FI
Land Use	Mo (-)	Mo (-)	N (-)	Mi (-)	√	√		√	√		Mi (-)	Mi (-)	n/a	n/a	n/a	n/a	Mi (-)	N (-)	FI
Infrastructure (Power, water, wastewater, waste)	Mi (-)	Mi (-)	N (-)	N (-)	√	√					N (-)	Mi (-)	n/a	n/a	n/a	n/a	N (-)	N (-)	FI
Land Contamination (Existing)	N (-)	Mi (-)	N (-)	N (-)	√				√		N (-)	n/a	n/a	n/a	n/a	n/a	N (-)	N (-)	FI
Land Contamination (Caused By Project))	Mi (-)	N (-)	N (-)	N (-)	√	√			√		N (-)	n/a	N (-)	Mi (-)	Mi (-)	n/a	Mo (-)	Mo (-)	FI
Terrestrial Ecology	Mo (-)	Mo (-)	N (-)	N (-)	√				√	√	Mi (-)	n/a	n/a	N (-)	N (-)	n/a	Mi (-)	N (-)	FI
Aquatic (Freshwater) Ecology	N (-)	N (-)	N (-)	N (-)	√				√		N (-)	n/a	n/a	N (-)	N (-)	n/a	Mi (-)	N (-)	FI
Surface Water Resources	Mi (-)	Mi (-)	N (-)	N (-)	√	√			√		Mi (-)	n/a	N (-)	N (-)	N (-)	n/a	Mo (-)	Mi (-)	FI
Groundwater Resources	Ma (-)	N (-)	N (-)	N (-)					√	√	Mi (-)	n/a	n/a	N (-)	N (-)	n/a	Mi (-)	N (-)	Ma (+)
Air (Air Quality)	N (-)	N (-)	Mi (-)	N (-)	√	√					N (-)	n/a	n/a	n/a	n/a	n/a	N (-)	N (-)	FI
Air (GHG emissions)	N (-)	N (-)	Mo (-)	N (-)	√	√					Mi (-)	N (-)	n/a	n/a	N (-)	n/a	N (-)	N (-)	FI
Noise	Mi (-)	N (-)	Ma (-)	Mi (-)	√	√	√	√			Mi (-)	N (-)	n/a	n/a	n/a	n/a	N (-)	Mi (-)	FI
Vibration	N (-)	N (-)	N (-)	N (-)	√	√	√	√			N (-)	n/a	n/a	n/a	n/a	n/a	N (-)	N (-)	FI
Road, Rail, Air and Public Transport	Mi (-)	Mo (-)	Mi (-)	Mo (-)	√				√	√	Mo (-)	N (-)	n/a	N (-)	n/a	Mo (-)	N (-)	N (-)	FI
Visual Amenity	N (-)	N (-)	N (-)	Mi (-)			√	√			N (-)	n/a	n/a	n/a	n/a	n/a	Mi (-)	N (-)	FI
Waste Management	Mi (-)	N (-)	N (-)	Mi (-)	√	√			√		N (-)	n/a	N (-)	Mi (-)	Mi (-)	n/a	N (-)	Mo (-)	FI

Potential impact significance ratings	
N	**Negligible:** Magnitude of change comparable to natural variation. Not significant to the decision to be made on the project.
Mi	**Minor:** Detectable but not significant. Impact warrants being brought to the attention of the decision-maker but does not require special conditions to be attached to the approval. Negative impacts can be controlled through the adoption of normal good practice. Monitoring is required to ensure mitigation for negative impacts is working properly, that benefits are realised and that the impact is not worse than predicted.
Mo	**Moderate:** Significant. Positive and negative impacts warrant being brought to the attention of the decision-maker and deserves careful attention in the decision. Negative impacts are amenable to mitigation. Monitoring is required to ensure mitigation for negative impacts is working properly, that benefits are realised and that the impact is not worse than predicted.
Ma	**Major:** Significant. Impact mitigation measures must be found to reduce negative impacts. Positive and negative impacts warrant being given considerable weight in the decision. Residual impacts must be compensated for if possible. Monitoring is required to ensure mitigation for negative impacts is working properly, that benefits are realised and that the impact is not worse than predicted.
C	**Critical.** Applies to negative impacts only. Intolerable and not amenable to mitigation. Alternatives must be found.
n/a	Not applicable (no impact)
+	Positive impact
-	Negative impact
FI	Impacts not assessed. Detailed investigations and impact assessment are required once options are refined.

Mitigation types
Avoid at source: Remove the source of the impact by designing the project so that a feature causing an impact is designed out or altered.
Abate at source: Reduce the source of the impact by adding something to the basic design to abate the impact (e.g. pollution control).
Attenuate: Reduce the impact between the source and the receptor.
Abate at the receptor: Reduce the impact at the receptor.
Remedy: Repair the damage after it has occurred.
Compensate / Offset: Replace in kind or with a different resource of equal value.

Other definitions
Residual impacts: Significance of impacts if feasible mitigation measures are integrated into design, construction and operation of the project.
Emergency conditions: Conditions that occur infrequently as a result of an accident or unplanned/extreme event. They represent non-normal operating conditions.

Notes
Note 1: Well establishment and operation refers to exploration for gas, well drilling, establishment of wells and extraction of gas from wells.
Note 2: Gas gathering refers to installation and operation of pipelines to transfer gas to compressors.
Note 3: Gas compression refers to the compression of gas at the FCSs and CPPs and transfer of gas to the Collection Header and Export Pipelines.
Note 4: Accommodation camps refers to the temporary camps required for construction and the permanent camps required for operations.
Note 5: Associated water storage ponds refers to the ponds required for balancing water flows before and after treatment of associated water.
Note 6: Preferred option for associated water treatment and waste management refers to RO water treatment supplemented by brine concentration and blending of untreated and treated water.
Note 7: Beneficial use of associated water refers to the options described in Volume 3, Chapter 11, for beneficial use of associated water.