CONTENTS

22. CONCLUSIONS AND RECOMMENDATIONS

22.1. REHABILITATION AND DECOMMISSIONING

Section 5—Rehabilitation and Decommissioning details the options, strategies and methods for the progressive, standard and specific rehabilitation and decommissioning processes of areas disturbed by the SGCP. Rehabilitation will consist of detailed planning and design of post-mine landforms, inclusive of erosion control and long-term geotechnical stability. Rehabilitation processes aim to establish a stable landform with a self-sustaining vegetation cover. Rehabilitation maintenance should also align with the agreed post-mining land use of native bush land and cattle grazing. Decommissioning will involve the removal of designated mine infrastructure and services, as well as the remediation of impacted areas.

The rehabilitation strategy for the SGCP is required to meet the obligations contained in the Department of Environment and Heritage Protection (DEHP) – Guideline 18 under the provisions of the *Environmental Protection Act 1994 (EP Act)* and other relevant requirements outlined by the former Environmental Protection Agency (EPA), the Department of Minerals and Energy (DME), the Department of Resources; and the Department of Resources, Energy and Tourism (DRET).

Approximately 585 hectares (ha) of remnant vegetation is expected to be cleared. Some endangered regional ecosystems (RE) are located within the cleared areas. Following clearing, topsoil removal and construction activities (i.e. blasting, overburden removal to waste rock emplacements and transportation of product coal for export etc.) specific to the mining operations, rehabilitation will proceed.

The SGCP will be progressively rehabilitated where practicable and in accordance with the Rehabilitation Management Plan. However there are some areas of disturbed land that will not undergo immediate rehabilitation. Areas will be rehabilitated within one year of being made available and will be considered successfully rehabilitated when nominated targets for land suitability, land use (i.e. vegetation cover and composition), landform stability and land contamination are met.

Decommissioning will commence upon the completion of all mining activities and preceding official mine closure. Prior to decommissioning and mine closure, a Mine Closure Plan (MCP) will be developed. Remediation of contaminated land will be guided by the Final Rehabilitation Report that will contain a contaminated site assessment.

In consultation with stakeholder/landowner expectations, the intended post-mine land-use will be native bush land and cattle grazing. Rehabilitation processes will be considered a success when all nominated targets are met and when all disturbed areas are stable and self-sustaining. In summary, rehabilitation and decommissioning processes should not constrain the SGCP operations.

22.2. CLIMATE, NATURAL HAZARDS AND CLIMATE CHANGE

Section 6—Climate, Natural Hazards and Climate Change describes the magnitude and frequency of local and regional climatic conditions (i.e. temperature, rainfall, wind speed and direction, relative humidity and evaporation) and extreme climate events (i.e. flooding, cyclones, bushfires, landslides and earthquakes) that have the potential to impact upon the SGCP. This Section was developed during a desktop review of the State Planning Policy (SPP), the Geoscience Australia database and Australian Bureau of Meteorology (BOM) data collected from five weather stations located within close vicinity to the SGCP.

There is a potential for the SGCP to experience heavy rainfall between December and March that could trigger flooding events. Flooding can threaten the on-site storage of contaminants and sediments. Potential impacts from flooding and heavy rainfall events have been assessed for the SGCP area and are detailed in **Section 9—Water Resources**.

The Galilee region experiences its peak fire season during spring. Although unlikely, there is a potential for the SGCP to be impacted by grassfires and bushfires. The Jericho Shire Planning Scheme bushfire hazard mapping classifies the SGCP as being situated in a low risk bushfire area, with a small number of fragments categorised as medium fire risk areas.

Landslides and slippages are unlikely events within the South Galilee region. Similarly, no earthquakes have been recorded within the region between 1955 to November 2011 and the area is considered tectonically inactive.

The *SPP 1/03 – Mitigating the adverse impacts of flood, bushfire and landslide* (SPP1/03) outlines the State's interest with regards to potential natural hazards and climatic conditions. In the unlikely event of a cyclone and subsequent flooding, bushfire, landslides/slippages and earthquakes, the SGCP will manage the emergence in accordance with SPP1/03 recommendations, the site Emergency Response Plan and will confer with the Queensland Government State Disaster Management Group.

Mitigation measures do not have any bearing on the likelihood of occurrence of extreme climatic events and climate change is not expected to have a great impact over the life of the mine. As the mine life is approximately 35 years, the SGCP is unlikely to experience extreme changes to climatic conditions.

22.3. LAND

Section 7—Land Resources provides a description of the existing land environment (including geology, geochemistry, topography, soils, tenure, land use and visual amenity) at the SGCP and surrounds. The Section identifies the potential impacts on land resources and discusses the land management measures required to appropriately mitigate the potential impacts identified.

This Section considers the Queensland Government's *SPP 1/92: Development and the Conservation of Agricultural Land* (SPP 1/92), which is implemented under the *Sustainable Planning Act 2009 (SPA)* in order to protect good quality agricultural land (GQAL). Due to the absence of Queensland or Australian guidelines for the visual impact assessment, the United Kingdom's Landscape Institute - Institute of Environmental Management and Assessment Guidelines were used for this assessment.

Existing mapping was reviewed to obtain an understanding of the anticipated land resources. Following this review, a detailed soil survey of the proposed disturbance area was undertaken in July 2011. The soil survey was conducted at a 1:100 000 scale across the Project area, except in areas of expected high disturbance, where a mapping scale of 1:50 000 was used. Eleven soil management units were identified with the SGCP area with mapping units being determined on the basis of similarity in morphological and topographic attributes. The majority of soils have a predominantly medium acid to moderately alkaline pH in the surface layer.

A geochemical testwork program was undertaken to characterise the overburden, interburden and coal and provide a basis for assessing potential environmental issues associated with the handling of these materials. Geochemical sampling results indicate that there is a low to negligible risk of acid rock drainage occurring. A material sampling program will be conducted to confirm ongoing acid generation potential, and selective placement of potentially acid forming material will occur to minimise the potential acid generation.

Viewpoints were identified from an initial desktop study involving an analysis of topographic maps and aerial imagery for the SGCP and immediate surrounding areas. These viewpoints were then visited in the field and assessed for sensitivity to the SGCP.

The natural topography of the SGCP is dominated by gently undulating plains and rises of low relief. Land is primarily used for low intensity beef cattle grazing and the majority of the area has been cleared for improved pasture. The site has been affected by land clearing and grazing that has caused varying disturbance levels. Cropping and/or horticulture are not undertaken within the SGCP site. The landscape within the vicinity of the SGCP is considered to have a moderate sensitivity to landscape changes arising from the SGCP, given that it currently primarily supports rural activities. The majority of sensitive views towards the waste rock emplacements are screened by topography and vegetation and therefore the impact of the waste rock emplacements is reduced. The SGCP will not impact on the visual amenity of ridgelines and escarpments or significantly impact on the amenity of the Rural Zone through lighting impacts.

The Queensland Government's Strategic Cropping Land (SCL) framework identifies five nominated cropping zones in Queensland. As the SGCP is located outside of all five zones, the SCL framework does not apply and the SGCP does not need to be assessed under the SCL policy. Overall, the SGCP is expected to have a minor impact on GQAL as only 5 ha of GQAL are likely to be subject to direct disturbance.

Searches of the Queensland Environmental Management Register (EMR) and the Contaminated Land Register (CLR) were conducted for all lots covered by Mining Lease Application (MLA) 70453 and the infrastructure corridor. No sites on the properties relating to the SGCP are included on either register. A Waste Management Plan (WMP) will be implemented to minimise the risk of land contamination at the site.

Open-cut mining will result in the alteration of the existing topography and surface drainage. Coal resources are also proposed to be mined by underground mining methods which are likely to result in surface expressions of subsidence. The proposed mine will have an impact to land tenure and land use. The main impacts include:

- reduction in potentially productive areas
- impeding optimal paddock layout and stock management practices for efficient production
- modifying overland flow patterns, potentially increasing erosion and sedimentation of the local waterways
- introducing weed species, or increasing their distribution.

A number of management and mitigation measures for land resources will be implemented over the life of the mine. These include:

- rehabilitation of disturbed areas with self-sustaining vegetation cover where practicable
- maintain average slope profiles and gradients
- when stockpiling maintain irregular dump shapes
- minimise waste rock emplacement heights
- ripping and backfilling of areas with soil cracking to prevent subsidence and where short-term elevations changes occur, earthworks will be used to minimise potential elevation changes.

Mine rehabilitation will be undertaken progressively through the mine life and wherever possible, typical land uses such as cattle grazing will be re-established.

Due to the mitigation and management measures proposed for the SGCP, there is not expected to be a significant increase in impacts relating to final land use, land contamination or scenic amenity.

22.4. NATURE CONSERVATION

Section 8—Nature Conservation details the existing terrestrial, aquatic and subterranean values that could be impacted on by the SGCP. Potential impacts have been identified for flora, fauna and aquatic ecology and, where practicable, management and mitigation measures have been developed. Biodiversity offsets are proposed for residual impacts.

The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)* identifies and manages threatened flora and fauna species, ecological communities and matters of national environmental significant (MNES). Queensland legislation applicable to this Section includes the:

- Biodiversity Offset Policy 2011

- *EP Act 1994*
- *Fisheries Act 1994*
- *Land Protection (Pest and Stock Route Management) Act 2002*
- *Nature Conservation Act (NC Act)1992*
- *Vegetation Management (VM Act) Act 1999*
- *Water Act 2000.*

22.4.1. Terrestrial Flora and Fauna

Desktop review of databases (*EPBC Act* protected matters search tool, Queensland Museum records, Wildlife Online database, Queensland Herbarium flora records and DEHP regional ecosystem mapping) and previous flora and fauna surveys of the SGCP surrounds were used to give insight to species existing within the South Galilee region, as well as their value and conservation status.

Terrestrial flora assessment involved detailed ground-truthing of vegetation mapping, and targeted surveys for threatened species. Flora surveys were conducted within the mine area in April and October 2009, and within the infrastructure corridor in May-June and September 2011.

Terrestrial fauna assessment involved trapping, anabat detectors, spotlighting and targeted searches within the mine area. Surveys were conducted in October 2009 and April to May, 2010. The infrastructure corridor was surveyed in May and June, 2011 and incidental fauna sightings were recorded during additional flora surveys.

Two regional ecosystems with an endangered biodiversity status were found within the site. These correspond to a single threatened ecological community under the *EPBC Act*.

Four fauna species of conservation concern were identified within the SGCP area during field surveys. Three flora species of conservation concern were identified.

Potential impacts from the construction and operational stages of the SGCP include vegetation clearing, edge effects and fragmentation, dust, subsidence and hydrological impacts, weeds, altered fire regime, release of contaminants and cumulative impacts. These impacts were identified as having possible negative effects on terrestrial fauna and flora, with habitat loss through vegetation clearing being the principal threat.

The Proponent is committed to mitigating or avoiding terrestrial flora and fauna impacts by implementing a number of measures. The proposed mine footprint has avoided remnant vegetation where practicable. A staged approach will be utilised during site clearance whereby the clearing of areas will be undertaken in divisions to allow time for fauna to relocate with the assistance of a spotter/catcher.

A Threatened Species Management Plan will be developed and implemented for the life of the mine. Rehabilitation of disturbed areas, establishment of buffer zones, potential translocation and offsetting of cleared significant flora species, and offsetting loss of habitat for fauna of conservation significance will be undertaken by the Proponent.

A Weed and Pest Animal Management Plan will be applied over the Project's life. Management plans will detail auditable monitoring requirements and outcomes. The habitat quality of all remaining vegetation will be enhanced through appropriate fire management and the exclusion of cattle.

22.4.2. Aquatic and Subterranean Ecology

A desktop literature review and subsequent field surveys were undertaken to establish and assess surface aquatic values present within the Project's footprint and to highlight information gaps. Field surveys gave detailed and site-specific data to determine ecological values potentially affected by the Project.

The subterranean ecology assessment and in particular, sampling for stygofauna and troglofauna was conducted in accordance with the Western Australian EPA Guidance Statement No. 54 and 54a. Stygofauna and troglofauna sampling involved the assessment of groundwater bores in June 2011.

Potential impacts of the SGCP are aquatic habitat loss, removal and modification of riparian vegetation, alterations to instream habitat and hydrology, restrictions to fish passages, runoff and chemical spills, direct mortality and coal dust emissions.

A wide range of mitigation measures have been designed to avoid extensive damage to existing surface aquatic ecological values. These mitigation measures require regular monitoring processes and the cooperation of the Proponent and all on-site employees.

Further hyporheic sampling will be conducted throughout 2012. In the event that either hyporheic or troglofauna are discovered to exist on-site, mitigation measures will seek to maintain the abundance, diversity, geographic distribution and productivity of populations through the management of threatening actions.

Certain impacts to aquatic, terrestrial and subterranean ecology will be unavoidable and mitigated where practicable. All impacts to flora and fauna will likely not have any significant influence on the Project's construction and operations if mitigation measures are implemented and meet all legislative requirements. Residual impacts will be offset under the relevant legislation and guidelines.

22.5. WATER RESOURCES

Section 9—Water Resources provides a description of the existing surface water and groundwater environments at the SGCP and surrounds. The Section identifies the potential impacts on water resources and discusses the water management measures required to appropriately mitigate the potential impacts identified.

A number of legislated Acts, regulatory guidelines and other water management documents are required to be addressed. This includes the following:

- *Water Act 2000*
- *Water Regulation 2002*
- *EP Act 1994*
- *Environmental Protection (Water) Policy 2009*
- *Water Supply (Safety and Reliability) Act 2008*
- *Water Resource (Burdekin Basin) Plan 2007*
- *Burdekin Basin Resource Operations Plan 2009*
- *Water Resources (Great Artesian Basin) Plan 2006*
- *SPA 2009*
- *Fisheries Act 1994*
- *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZECC & ARMCANZ, 2000)
- National Water Quality Management Strategy
- Queensland Water Quality Guidelines 2009, version 3 (DERM, 2009)
- Guideline: Establishing draft environmental values and water quality objectives (DERM, 2011)
- Australian Drinking Water Guidelines (NHMRC, 2004)
- Groundwater Flow Modelling Guidelines (MDBC, 2001; Barnett et al, 2012).

This surface water assessment covers:

- relevant legislation for surface water management
- the baseline (existing) surface water environment and associated environmental values
- the existing water users and uses
- the hydrology of the SGCP site including upstream and downstream conditions
- the known historical and modelled flooding characteristics of the site
- identification of potential impacts and impact assessment
- proposed site water management and mitigation measures.

The groundwater assessment involved:

- a review of geological data, including exploration reports and mapping
- a review of hydrogeological data held on the DNRM database for existing water bores and previous studies in the region
- inspections of the site to confirm bore locations, groundwater usage and quality
- field work, including siting and construction of groundwater monitoring bores, installation of data loggers (water level monitoring and a weather station) and a bore and facilities survey
- an assessment and analysis of all available hydrogeological data through the use of analytical and numerical modelling tools.

22.5.1. Surface Water Impacts

The potential impacts on surface water during the life of the SGCP are summarised below:

- potential change in runoff quality from disturbed catchments
- open-cut pit water (including surface runoff and groundwater inflow) to be managed within the Mine Water Management System (MWMS)
- runoff from areas disturbed by mining (including waste rock emplacement areas and rehabilitated areas) to be managed within the MWMS
- potential reduction in streamflows due to the need to contain mine-affected water
- subsidence and impacts on natural catchments
- potential changes to Tallarenha Creek flooding due to construction of clean water diversion around the disturbed areas
- diversion of Sapling Creek south into Dead Horse Creek to separate clean runoff from the undisturbed area from the mine workings (an increase of flows into Dead Horse Creek of approximately 30 %).

Levees are proposed to prevent flow down the Tallarenha Creek tributaries into the mining area, and a north-south channel collects flow and diverts it north around the pit back to Tallarenha Creek. During operations, the levees will be designed to protect the pit from flooding in the 3000 year ARI flood event. Before mine closure, the levees will be upgraded to protect the pit from flooding up to the Probable Maximum Flood.

Long-term expected water levels in the SGCP final void appear to stabilise at around 325 m AHD which is a depth of approximately 40 m compared to the total void depth of approximately 90 m.

22.5.2. Groundwater Impacts

The potential impacts on groundwater during the life of the SGCP are summarised below:

- the predicted SGCP mine dewatering rates under a cumulative impacts simulation range from less than 10 ML/day in the earlier and later years of operations, and up to 20 ML/day during peak years
- the cumulative volume extracted for mine dewatering is predicted to be 147 GL over 33 years, which is understood to be broadly consistent with the other mining projects in the area
- maximum drawdowns of around 70 m are predicted at the SGCP mine site, reducing to the order of 5 to 10 m regionally, and developing at a fairly slow rate over the life of mine of 33 years
- the predicted drawdowns will have a substantial impact on any bores within SGCP mining lease area, and these bores may need to be deepened or replaced
- the predicted drawdown at the bores with the Alpha township is predicted to be minimal, typically in the order of 1 to 2 m, and this is considered to be within the natural drawdown variability
- recharge to the groundwater system remains unchanged throughout the modelling, confirming that the GAB recharge through the Clematis Sandstone is unaffected by mining.

A post mining simulation of aquifer recovery was performed and shows that long term groundwater levels recover to around 10 to 20 m below the pre-mining levels, with about 80 % of that recovery occurring within about 30 years of cessation of mining, and water levels effectively re-equilibrated (to within a few metres of the long term level) within 50 years post-mining.

Cumulative impacts on drawdown due to the Alpha Coal Project, Kevin's Corner Coal Project and Galilee Coal Project (i.e. without the SGCP in operation) are predicted to extend southwards towards SGCP, and join with the cone of drawdown from the SGCP. These cumulative impacts on groundwater resources have been assessed in the modelling.

22.5.3. Surface Water Management

A conceptual MWMS and water balance was developed to control surface water flow at the site and to characterise the expected performance of the system. The water balance shows a deficit and that an external water supply is required.

The MWMS has been developed to manage the three identified categories of mine water (clean water, saline/waste rock water and raw water). The MWMS for the SGCP seeks to:

- minimise the amount of surface runoff impacted by mining operations by diverting clean water flows around the mining operations
- minimise the amount of raw water to be imported to site by maximising the recycling of stored water resources within the SGCP
- minimise or prevent the need for mine water to be released from site. If controlled releases are required to maintain freeboard in dams during high rainfall events, water quality would need to meet Environmental Authority conditions and release criteria
- minimise impacts to water quality and quantity on existing downstream water users
- provide adequate protection of internal water management infrastructure and external surface water values during flood events.

The 4.4 km long Sapling Creek diversion will be constructed to establish a hydraulic behaviour that is similar to that of the existing creek system, to ensure that the diverted channel is stable and supportive of revegetation, and to protect the upstream and downstream reaches from any detrimental changes in creek hydraulics.

A baseline monitoring program and an on-going water quality monitoring program are proposed to assess the impact of the SGCP operations on the receiving environment.

22.5.4. Groundwater Management

Where detrimental impacts on landholder groundwater supplies may be detected, and be shown to be related to the SGCP operations, the Proponent will seek to reach mutually agreeable arrangements with affected neighbouring groundwater users for the provision of alternate supplies throughout the mine life, and after mine completion while the aquifer recovers.

Monitoring of groundwater will be undertaken to:

- assess whether discernible changes in groundwater quality down gradient of the site are occurring as a result of controlled releases or groundwater seepage from the site
- assess the extent of groundwater level drawdown attributable to the operation of the SGCP.

22.6. AIR QUALITY

Section 10—Air Quality describes the potential impacts on air quality from the SGCP through the identification of existing air quality values, a review of potential air quality impacts, as well as mitigation measures to minimise the impacts.

The *Environmental Protection (Air) Policy 2008* utilises the principles of ecological sustainable development to define the air quality values to be enhanced or protected. The environmental values from the *EPP (Air)* relating to air quality environment have been assessed, namely: the health and biodiversity of ecosystems, human health and well-being, the aesthetics of the environment, including the appearance of buildings, structures and other property, and agricultural use.

The *National Environmental Protection Measure (Air) 2003* was developed by the National Environment Protection Council. The measure aims to provide ambient air quality that allows for the adequate protection of human health and well-being. This goal is the same as that contained in the *EPP (Air).*

Dust deposition monitoring is an accepted method in determining dust levels and can be used as an indicator to complete more comprehensive air quality investigations (in accordance with *Australian Standard (AS) 3580.10.1*).

An analysis of the existing air quality conditions was undertaken to establish a baseline for comparison. This involved sampling at three locations east, west and north of the SGCP in order to account for upwind and downwind influences. The existing atmospheric dust levels are typical of a rural, grazing area with potential sources of emissions resulting from the existing surrounding environment including farming and grazing, residential activities and commercial activities.

In addition to sampling, three stages of modeling were utilised and include the preparation of meteorological data, the development of an emissions database and the modeling of likely downwind ground level concentrations using The Air Pollution Model (TAPM). Modelled air quality concentrations at the most exposed existing off-site receptors have been compared with the relevant national ambient air quality standards. The predicted average ground level concentrations at nearby sensitive receptors have been modeled to include both normal and expected maximum emissions conditions and the worst case meteorological conditions.

Potential sources of particulate emissions from the Project's surrounding environment comprise farming and grazing activities, existing mining operation, traffic on unsealed roads, smoke generated by grass and bushfires and naturally occurring wind-blown dust.

The primary sources of particulate emissions generated by the SGCP are likely to include:

- clearing of vegetation and removal of topsoil
- drilling and blasting activities
- extraction and handling of coal and waste rock
- coal crushing, stockpiling and rail load-out
- gas emissions from mobile plant exhaust
- wind erosion of stockpiles and areas of bare soil
- vehicle movement on unsealed roads.

Results from the air dispersion modelling indicates that for most sensitive receptors, the dust exposure is low and well below goals. However, modelling indicates that some sensitive receptors adjacent to the mine (i.e. accommodation village) are likely to exceed the goals between one and three occasions a year due to adverse meteorological conditions. It is predicted that Total Suspended Particles (TSP) and dust deposition will not exceed guidelines beyond the boundaries of the mine.

Measures have been devised to mitigate the SGCP's potential and likely impacts on air quality. Such measures incorporate the minimisation of surface disturbance, progressive rehabilitation processes, the immediate removal and dumping of waste rock following blasting, the use of water sprays and trucks for dust suppression, the reduction of dump truck haul routes and so forth.

A long-term monitoring program will proceed prior to the construction stage. The program will consider the issues of potential PM_{10} (24 hour maximum) exceedances at the proposed accommodation village and the northerly located Villafield Station Homestead, future dust exposures for the Project and the effect of the tree zone on dust deposition. Dust deposition monitoring will be undertaken via a network of dust deposition gauges at the SGCP.

The development and implementation of a Dust Management Plan is recommended and dust minimisation strategies will be followed, particularly during predominant winds.

The overall impact of the SGCP on air quality is expected to be low and risks pertaining to human health are unlikely and within acceptable levels. Where practicable, the Proponent is committed to preventing and mitigating pollutants, suspended and deposited dust particles that are known to affect air quality and human health.

22.7. GREENHOUSE GAS EMISSIONS

Climate change is described as the variations to the statistical properties of the earth's climate system that occur over long time periods. The United Nations (UN) Intergovernmental Panel on Climate Change (IPCC) was founded in 1988 and undertakes comprehensive assessments of present human induced climate change data.

Section 11—Greenhouse Gas Emissions has been informed by the IPCC and an assessment conducted by Noise Mapping Australia (NMA). This Section estimates Scope 1 and 2 emissions, undertakes a review of potential scenarios to identify and assess the implications of climate change and devises mitigation measures to reduce greenhouse gas (GHG) emissions.

Australia has committed to a reduction in GHG emissions under the UN Kyoto Protocol. To support this initiative, other authorities have been developed by the Commonwealth Government, including the:

- *Climate Change Policy*
- *Clean Energy Bill 2011 (Carbon Tax)*
- *National Greenhouse and Energy Reporting (NGER) Act 2007*
- *Energy Efficiency Opportunities (EEO) Act 2006.*

It is estimated that the SGCP will emit 12,505,000 tonnes (t) of CO_2-e of:

- Scope 1 emissions – emissions generated within the mining lease boundary as a direct result of mining activity
- Scope 2 emissions – indirect emissions from the production of electricity, heat or steam that the facility will consume but are physically produced by another facility.

The principle source of Scope 1 emissions are methane emissions from mined coal and diesel consumed during mine operation. The principle causes of Scope 2 GHG emissions will be electricity for draglines, the Coal Handling and Preparation Plant (CHPP) and lighting.

An analysis of the potential risks that climate change imposes on the SGCP was assessed using a Likelihood Rating and Consequence Rating Table. The potential risks of climate change on the SGCP operation were assessed. Four scenarios were assessed as a moderate residual risk, including:

- increased dust generation due to increased winds and decreased soil and tailings cap moisture
- health impacts of increased temperature and more days > 35 °C
- increased soil erosion due to a decrease in soil moisture and increased rain intensity
- increased slope failure due to increased erosion, drop in soil moisture and increased flood events.

Measures to abate GHG emissions produced by the SGCP include electrical efficiency through strategic dragline processes, fuel efficiency through the utilisation of diesel vehicles/machinery and a shortened coal haul route.

Direct measures to reduce GHG emissions include the reduction of cleared areas and the utilisation of the pre-existing Central Line Railway for the transportation of construction materials and equipment. Indirect measures to reduce GHG emissions encompass carbon sequestration at nearby remote locations, progressive rehabilitation of disturbed areas, carbon trading through recognised markets and so forth.

As the life of the mine is estimated at 35 years, GHG induced climate variability will be gradual and minor.

The Proponent is committed to decreasing GHG emissions produced during operational activities. This will be achieved through the uptake of sustainable development principles and compliance with the NGER obligations.

22.8. NOISE AND VIBRATION

Section 12—Noise and Vibration evaluates the potential noise and vibration impacts of the SGCP. Measures have been devised to mitigate potential impacts to current noise and vibration values, where practicable.

Acoustic environmental values within Queensland are managed by the *EP Act* and are specifically recognised by the Queensland *Environmental Protection (Noise) Policy 2008 (EPP Noise).* The Policy's objective is to protect the amenity of an acoustic environment by addressing both indoor and outdoor noise levels, including critical habitat acoustics. Noise level limits for road/rail traffic and acceptable industrial/commercial noises are governed by the Queensland Rail (QR) *Code of Practice – Planning for Noise Control and the DEHP Ecoaccess Guideline – Railway Noise Management*, respectively.

Background monitoring was undertaken to establish the existing noise and vibration conditions of MLA 70453, prior to mine construction. Two noise models were developed to reflect varying stages of the SGCP (year three and year 26 of operation) to act as a measure of comparison for existing conditions. A Digital Terrain Model (DTM) was developed for the mine site and its surrounds in order to gain a conservative depiction of features (i.e. topography, tree cover, tree zones, mounds, barriers and weather) that can influence sensitive receptor readings.

Acoustic quality objectives at all receptor locations are predicted to be within the limits of the *EPP (Noise)* and other relevant guidelines, excluding the accommodation village. Residents of the accommodation village will be impacted in terms of having to close windows to reduce noise. The modelling of a worst case scenario depicts noise levels and night time background creep at the Creek Farm and Chesalon Station homesteads to exceed the Ecoassess Guideline threshold of 28 dB(A), approximately 15 % of the time. The main drivers of these exceedences are the use of trucks and shovels in exposed areas.

A noise management plan that outlines the long-term noise monitoring requirements of the Project, incorporating the resolution of noise complaints will be implemented. The accommodation village will be air conditioned to allow windows to be closed at all times in order to comply with indoor acoustic quality objectives outlined by the *EPP (Noise)*. To reduce background creep impacts at the two affected homesteads, mitigation measures that reduce the operation of trucks and shovels in exposed areas will be employed.

The SGCP seeks to maintain the existing environmental noise values, such that noise levels at nearby receptors are conducive to human health and well-being. The key impacts of noise and vibration will be experienced at the accommodation village and Creek Farm and Chesalon Station homesteads and will be mitigated where possible.

22.9. WASTE

This Section undertakes a review of the potential waste streams and volumes generated by the construction and operational stages of the SGCP, as well as their potential impact on humans and the natural environment. Appropriate actions to collect, treat, store and dispose of wastes have been addressed in **Section 13—Waste**.

Waste management requirements are legislated by a number of State acts and regulations, including the:

- *EP Act*
- *Queensland Environmental Protection Regulation 2008 (EP Regulation)*
- *Queensland Environmental Protection (Waste Management) Regulation 2000 (EP (WM) Regulation)*
- *Waste Reduction and Recycling Act 2011*
- *Waste Reduction and Recycling Regulation 2011*
- *Queensland's Waste Reduction and Recycling Strategy 2010-2020 (QLD Waste Strategy)*
- *Queensland Guidelines for Landfill Siting, Design, Operation and Rehabilitation (ERA 60 – Waste Disposal) 2010.*

Construction wastes are primarily associated with vegetation clearing and the development of infrastructure. The accommodation village will produce domestic wastes and waste water throughout the construction stage and may impact on salinity and acidity. Mine wastes include waste rock (i.e. overburden and interburden material) and reject material from the CHPP process.

The potential impacts of wastes will vary during the construction and operational stages of the SGCP and have the potential to affect existing environmental conditions such as water and air quality. During operation, regulated wastes (mainly waste oil) could impact the land and water courses if not managed. Waste oil will be bunded according to *AS 1940*.

A Waste Management Strategy (WMS) will be applied throughout all stages of the SGCP and encompass a number of sustainability principles. These principles include natural resource efficiency, cleaner production, pollution prevention and waste minimisation. All waste streams and volumes will be recorded in detail. Due to the Project's remoteness, an on-site landfill facility will be constructed, succeeding MLA 70453 approval.

The potential waste management impacts for the SGCP will predominately impact the local environment. Appropriate mitigation measures will ensure that these impacts are effectively controlled or mitigated. It is not foreseen that the production of wastes at the SGCP will impact upon waste management at a regional and state level.

22.10. TRANSPORT

Section 14—Transport provides a description of the existing traffic and transport environment at the SGCP and surrounds. This Section of the Environmental Impact Statement (EIS) discusses the potential impacts the SGCP imposes on the existing transport network (roadways, railways, air and shipping ports) and associated mitigation measures. The Section has been informed by a detailed transport assessment.

Relevant legislative provisions and guidelines of the State have been acknowledged by **Section 14—Transport**. These include the:

- *Transport Infrastructure Act 1994*
- *Transport Operation (Road Use Management) Act 1995*
- *Transport Planning and Coordination Act 1994*
- *Department of Transport and Main Road's (DTMP) Guidelines for Assessment of Road Impacts of Development (GARID)*.

The Capricorn Highway is a State Controlled Road (SCR) and is the major road infrastructure located close to the SGCP, connecting Rockhampton and Barcaldine. The highway is approximately 560 km long and is fully sealed, with sealed shoulders, with overtaking lanes and a speed limit of up to 100 km/hr. The roads in the vicinity of the SGCP are mainly used for agricultural purposes, and long distance transport. The Average Annual Daily Traffic (AADT) and the percentage of heavy vehicles were determined for the Capricorn Highway as well as other existing SCRs within the Project's vicinity. These include the Peak Downs, Gregory, Dawson, Carnarvon and Bruce Highways and Clermont-Alpha Road.

Existing rail infrastructure encompasses the Spirit of the Outback passenger train and a commercial rail connection at Alpha. The Alpha Aerodrome is located west of Alpha's main township on the Alpha Aerodrome Access Road.

A Transport Impact Assessment (TIA) for the construction and operation of the SGCP was completed in accordance with the GARID. GARID considers a development's road impacts to be insignificant if the development does not attribute to a > 5 % increase to existing traffic levels on SCRs.

An assessment of road and traffic foresees a > 5 % increase to sections of the Capricorn Highway and Clermont-Alpha Road from Pioneer Cyldevale Road to Hobartville as part of the construction and operations phases of the SGCP. Other roads assessed are predicted to experience insignificant impacts by GARID standards. No intersection upgrades are required and road maintenance will be negotiated between the Proponent and the relevant DTMR district, on a case by case basis.

Approximately nine additional train movements of the QR central line will be generated per week during the construction stage in 2013, whereas 14 extra movements of the common coal haulage railway line are predicted per day throughout mine operation. An increase to flight schedules is estimated throughout the Project's life with a further 17 and 14 flights implemented in 2014 and 2019, respectively. Accordingly, the Alpha Aerodrome will undergo an upgrade involving a runway extension. The Abbot Point Coal Terminal is also increasing capacity through the expansion of the X50 Project.

The SGCP will not impact on any other transportation network such as pedestrian, cycle, public transport routes or stock routes.

Based on the Road Impact Assessment of the SGCP, the following road impact mitigation techniques have been recommended:

- the development and implementation of a Transport Management Plan prior to the commencement of the construction stage of the SGCP
- the construction of Auxiliary Right Turn and Left Turn treatments at the intersection of the Carpentaria Highway and the SGCP Mine Access Road
- a case-by-case assessment of pavement impacts and subsequent maintenance and rehabilitation costs.

There is potential for the existing transport network to be impacted upon by the Project and other mining operations within the South Galilee region. These combined operations may result in a significant increase to additional road, rail and ship movements at all times of the year.

22.11. CULTURAL HERITAGE

22.11.1. Indigenous Cultural Heritage

Section 15—Indigenous Cultural Heritage highlights the significant Indigenous cultural values that may be impacted by the SGCP and discusses corresponding mitigation measures. The SGCP is located within the registered Native Title claim area of the Wangan and Jagalingou People.

Assessment of the International Council on Monuments and Sites (ICOMOS), Commonwealth and State legislation was conducted to gain insight into identification and protection measures concerning Indigenous cultural heritage sites within MLA 70453.

This Section has integrated legislation and previous cultural heritage assessments. Additionally, engagement with identified Indigenous parties, a search of the National Native Title Tribunal Register and Heritage Register Search was undertaken prior to a field survey and the development of the Cultural Heritage Management Plan (CHMP).

Desktop Register searches and initial on-site cultural heritage inspections did not identify items or places of Indigenous cultural heritage significance. However, sites may exist within the SGCP area that have not been identified.

Ultimately, the SGCP is anticipated to have no direct impact to registered features, yet areas designated to open-cut mining, waste rock, emplacement and infrastructure are likely to impact any unidentified or concealed values. Subsidence can generate indirect impacts to unidentified Indigenous cultural heritage features that are difficult to anticipate.

The SGCP implemented a staged management approach towards Indigenous cultural heritage features in consideration of the CHMP and is committed to avoiding impacts to registered features, if found and where practicable. Consultation with the DEHP and Wangan and Jagalingou People will be undertaken during the development of specific mitigation measures and a demarcated site approach will be adopted where identified features are situated adjacent to planned disturbance. This is in an attempt to decrease the occurrence of inadvertent damage.

The following general mitigation and management measures will be implemented at the SGCP to minimise impacts on Indigenous cultural heritage:

- comprehensive field survey will be conducted prior to surface disturbance
- where identified Indigenous cultural heritage features are located proximal to proposed surface disturbance, these sites will be demarcated where practicable to minimise the risk of accidental damage
- where direct disturbance is unavoidable, consideration will be given to collecting and relocating significant Indigenous cultural heritage features
- all SGCP employees and contractors will be made aware of their responsibilities and obligations in relation to cultural heritage (including procedures to be followed in the event of an accidental discovery of Indigenous cultural heritage material or skeletal remains) as part of the induction and training process

- in the event that significant Indigenous cultural heritage features are identified, a monitoring program will be developed in consultation with the Wangan and Jagalingou People prior to the commencement of construction. This is in order to monitor the potential impact of the SGCP activities against baseline values.

The Proponent will continue to engage with Traditional Owners to protect the Indigenous cultural heritage values located within the SGCP area.

22.11.2. Non-Indigenous Cultural Heritage

A review of non-indigenous cultural heritage features located within MLA 70453 was undertaken to determine if identified features are protected under Commonwealth, State and local heritage legislation and whether the SGCP imposes potential impacts upon such features. This involved a comprehensive evaluation of the relevant legislation and non-indigenous cultural heritage assessments, prepared as complementary EIS studies of preceding Galilee Basin mining proposals. A search of the Heritage Register, consultation with stakeholders (i.e. community members, landholders, the Alpha Historical Society and the Jericho Historical Society) and a field survey was also conducted as part of this review.

No sites listed on the Commonwealth Heritage List or State Register are located on or within close proximity to the SGCP and subsequently no cultural heritage values require approval from the Commonwealth Department of Sustainability, Environment, Water, Population and Communities (SEWPaC). Only two sites were confirmed during the field survey to have met the local heritage significance threshold.

Mitigation measures have been proposed to ensure potential impacts to artefacts during the construction and operation stages of the SGCP will be minimised or avoided. In order to comply with the Queensland *Heritage Act (QH Act),* the Proponent must uphold Part 9 of SPP1/03 that mandates the DEHP must be notified upon the discovery of an archaeological artefact.

As previously stated, no sites were assessed as meeting the threshold for Commonwealth or State heritage significance. Only two sites met the local heritage significance threshold developed by the Queensland Heritage Council 2006. Therefore, the proposed SGCP will have a minimal impact on places or features of non-indigenous cultural heritage significance.

22.12. SOCIAL

Section 17—Social of the SGCP EIS assesses the Project's social impacts (both negative and positive) in a local and regional context, comparative to an existing social environment assessment. Where practicable, measures to mitigate and manage potential negative impacts and endorse the positive impacts have been recommended.

The Queensland *State Development and Public Works Organisation Act 1971 (SDPWO Act)*, governs the Environmental Impact Assessment (EIA) process by requiring the development of a Social Impact Assessment (SIA). The SIA has been developed in consideration of the SGCP EIS Final Terms of Reference (Final ToR), the SIA Factsheet of the Department of Infrastructure and Planning (DIP) and the *SIA: Guidelines to Preparing a Social Impact Management Plan (SIMP)*.

The baseline (existing) social environment was identified in order to ascertain the Project's potential impacts. Two study areas were delineated, being the Local Study Area (LSA) and the Regional Study Area (RSA). The LSA was established to assess potential direct and indirect local impacts of the SGCP, as well as the cumulative impacts of nearby mining proposals. The objective of the RSA was to gauge the potential social impacts that operate at a regional scale. These impacts are commonly connected with the workforce, service provision and transport. The SGCP community engagement process and the development of the Community Engagement Plan (CEP) was another key component of **Section 17—Social.**

The Project is predicted to generate both positive and negative impacts upon social values within the South Galilee region. Social conditions that are likely to be impacted include demographics, education and training, economics, employment and income, infrastructure and services, housing and accommodation and community health, safety and culture.

Significant direct demographic impacts are considered unlikely, with the principal impact being an increase to Alpha's resident population which may alleviate ageing and declining populations. Cumulative growth from other projects may significantly impact on the LSA.

Population growth may increase pressure on Alpha's and potentially Barcaldine's local childcare and educational institutions, with cumulative impacts having significant bearing on institutional capacity. Mining expansion within the South Galilee region is likely to increase demands for mining-related vocational training (i.e. first aid training), beneficial to the local community.

The key potential economic benefits of the SGCP are an increase in personal income levels due to direct employment at the SGCP, flow-on economic impacts and diversification of the local economy. Potential negative impacts include income disparity, increased living costs, loss of skilled local labour from other industries and a heavy economic reliance on the mining industry.

Population growth may impact on infrastructure including road transport disruptions and the accelerated degradation of roads i.e. increased traffic accident potential. Positive impacts include the upgrade of the Alpha Aerodrome.

The SGCP will increase housing demands at a local level, in response to population growth. However, impacts are minor as 99.5 % of the workforce will reside at the on-site accommodation village, but the cumulative demand for housing will be highly significant. This demand will drive a reduction in housing availability, suitability and affordability for both purchased and leased properties. In contrast, there should not be major changes to the price, availability and suitability of housing, when considered in the context of wider housing trends.

To reduce potential negative impacts and maximise those with positive bearing, mitigation and management measures have been devised. The proposed measures for the SGCP are described in detail in the draft SIMP and include the development and implementation of a:

- CEP
- a number of action plans addressing key impact areas
- collaboration with other mining proponents and development of a cooperative agreement to facilitate this process
- a number of working groups to inform the development of action plans and the proposed Community Partnership Program
- Grievance and Dispute Resolution Process.

As a component of the SIMP monitoring process, SIMP reports will be prepared annually during construction and three-yearly during operation stages and will contain:

- a summary of stakeholder engagement undertaken during the preceding period and its effectiveness and all grievances/disputes reported during the preceding period
- an assessment of progress in implementing proposed management and mitigation strategies and achieving key performance indicators (KPIs)
- a description of any proposed updates/ revisions of the SIMP document.

The implementation of the SIMP will be a key component of the long-term management of any social impacts. In summary, social impacts likely to be generated by the SGCP are diverse in terms of their bearing (negative or positive), severity (minor or significant) and temporal scale (short or long-term). A copy of the SIMP reports will be provided to the SIAU and made available to key stakeholders upon request. Overall, the SGCP is anticipated to impose a slight to moderate impact on culture and community values within the South Galilee region.

22.13. ECONOMIC ENVIRONMENT

Section 18—Economic Environment assesses the potential economic impact associated with the SGCP. A discussion on the existing economic environment is outlined including information on:

- the study area
- Gross Regional Product
- population demographics
- key regional markets
- key regional industries
- current input costs (average weekly earnings).

The Input-Output (I-O) method was used to model the direct and indirect economic impacts of the SGCP on the regional, State and National economies.

Significant development and purchase expenditure will have a positive impact on a number of industries at a local, regional and State level. This impact will be in terms of increased industry output and increased Gross State Product.

The SGCP is expected to create a considerable number of employment positions both directly and indirectly.

The SGCP will employ a predominately Fly-in/Fly-out (FIFO) workforce, limiting the direct impact on housing prices in the local communities, although house prices in Alpha have already appreciated through property market speculation. Corresponding with this may be a rise in rental rates that may impact upon affordability.

There is expected to be some impact to the value of rural properties adjacent to the SGCP as well as impacts to the management of some rural properties, particularly those dissected by the SGCP infrastructure corridor.

Development of associated infrastructure, such as rail, water and power supply, will be beneficial to the development of the Galilee Basin energy reserves, particularly in terms of increased accessibility and the ability to transport coal from the Galilee Basin.

Other benefits to the State and National Economy as a result of the SGCP include:

- increased local government revenue
- increased State Government revenue through royalties, taxes and port charges
- increased Australian Government revenue through company income tax.

The economic impact of expenditure from the SGCP, the generation of employment opportunities, development of associated infrastructure, increased accessibility to the Galilee Basin and increased government revenues are positive impacts for the local, State and National economies.

Housing demand and supply is dependent on a number of factors beyond the control of the Proponent. SGCP will provide accurate and timely planning updates to local and State government authorities engaged in accommodation planning. A Housing and Accommodation Plan has been prepared as part of the SIMP (refer to **Appendix R—Social Impact Management Plan**).

The Proponent aims to work with the local community and government agencies to maintain the livability of the local community. Considering the cumulative impact of the SGCP and other projects, housing stock within the Barcaldine Regional Council area may require expansion.

The Proponent will employ procurement strategies to maximise opportunities for local businesses to provide goods and services to the SGCP. The Proponent and the Office of Advanced Manufacturing have agreed on a framework for the development of a Local Industry Participation Plan, (refer to **Appendix R—Social Impact Management Plan**).

A detailed Human Resources Strategy will be developed during the Definitive Feasibility Stage that details the more specific recruitment strategies to be employed during the construction and operational phases. Details of the Human Resources Strategy are provided in the Workforce Management Plan that will be developed as part of the SIMP (refer to **Appendix R—Social Impact Management Plan**).

Where a significant part of the surface of any rural property is required for the mining operations, the SGCP will acquire the property by negotiation at the appropriate market valuation. The Proponent will proactively engage with landholders to mitigate any management/operational impacts and negotiate appropriate compensation.

The overall economic impact of the SGCP is expected to be largely beneficial to the local, State and National economies. The economic impacts of the SGCP are expected to be sufficiently mitigated through the measures outlined above and in more detail in **Section 18—Economic Environment**.

22.14. HAZARD AND RISK

Hazards and risks associated with the implementation of the SGCP have the potential to impact people, property and the environment during all stages of the SGCP. The proposed risk management measures outlined in **Section 19—Hazard and Risk**, aim to reduce the likelihood and consequence of hazards and risks, whilst eliminating any potential extreme or high risks. The assessment of the SGCP's hazards and risks has been undertaken in accordance with the *Australia/New Zealand AS/NZS ISO 31000:2009 Risk Management Principles and Guidelines*.

Other legislative frameworks and standards applicable to the management and mitigation of hazards and risks associated with the SGCP include the:

- *Coal Mining and Safety Health Act 1999*
- *Explosives Act 1999*
- *ISO 3100 Risk Management – Principles and Guidelines*
- *AS 1940:2004 The Storage and Handling of Flammable and combustible Liquids*
- *AS 2187.1/1-2000 Explosives – Storage, Transport and Use – Storage*
- *AS 2187.2:2006 Explosives – Storage and Use – Use of Explosives*.

The risk management framework provides the foundation and arrangements to manage SGCP risks, with the risk assessment process requiring a number of actions. These actions encompass consultation and the contextualisation of processes and risks. Succeeding the establishment of risk criterion, an analysis and evaluation of potential risks was conducted.

The Preliminary Risk Assessment (PRA) was undertaken during a workshop in January 2011. Resultant of the PRA, key hazards pertaining to both underground and open-cut mining operations were assessed. The extreme or high risks related to potential hazards include strata failure, fire and explosion and interaction with mobile equipment.

To provide guidance towards appropriate emergency management (i.e. fire, flood, landslides, dam collapse, fuel spill and explosion of radiation) an Emergency Management and Response Plan has been developed for the SGCP.

A Risk Management Plan (RMP) was produced to integrate elements of risk management and practices to ensure the safety of SGCP employees, contractors and visitors. Mitigation measures include the implementation of risk management systems and ongoing assessment, employee training, safety signage and so forth.

The community and workforce health and safety values were assessed as part of the EIS process and were considered during the development of measures to minimise potential risks.

Values of the homestead and proposed accommodation village comprise the undertaking of everyday activities (sleep, rest and work) without increased disturbance from dust, noise, vibration and light, disease vectors, waste, water supply contaminants and traffic hazards. In contrast, workforce values encompass a health and safety conscious work environment whereby Personal Protective Equipment (PPE) and safety management systems are utilised where appropriate.

The Project's health and safety requirements are legislated by a number of State Acts and include the:

- *Workplace Health and Safety Act 1995*
- *Coal Mining Safety and Health Act 1999*
- *Explosives Act 1999*
- *Building Fire Safety Regulation 2008*
- *Electricity Safety Act 2002*
- *Radiation safety Act 1999*
- *Transport Operations (Road Use Management) Act 1995*
- *Health Act 1937*
- *Worker's Compensation and Rehabilitation Act 2003*
- *Food Act 2006*
- *Petroleum and Gas (Production and Safety) Act 2004.*

The *Acts'* corresponding regulations have also been considered for the SGCP.

Health and safety management systems and procedures are to be developed and implemented on-site and pertain to fitness for work assessments, noise and dust exposure, manual handling, monitoring and PPE.

Potential health hazards to the community and SGCP employees have been identified as particulates and gases, vapours, heat, noise and vibration, chemicals, process water use, pest management and disease vectors, waste, ground and surface water quality and traffic accidents.

A long-term dust monitoring program has been developed and further emissions monitoring will be undertaken in response to complaints. A noise management plan will detail ongoing noise monitoring requirements. Monitoring programs for dust and noise have been developed in accordance with the RMP.

The cumulative impacts of the SGCP on health and safety of the community are expected to be well within acceptable limits as a result of the management and mitigation measures proposed.

22.15. MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

The objective of **Section 20—Matters of National Environmental Significance** is to undertake a review of all potential impacts the SGCP may have on Matters of National Environmental Significance (MNES). Impacts on MNES are controlled actions requiring approval from the Commonwealth Minister for SEWPaC under Part 9 of the *EPBC Act*. MNES pertaining to the SGCP are:

- listed threatened species and ecological communities
- migratory species.

A review of listed threatened species (flora and fauna), threatened ecological communities (TECs) and listed migratory species within the SGCP area was undertaken by searching government databases and current literature. Verification was undertaken through targeted field surveys.

MNES within the SGCP area are an EPBC listed vulnerable reptile, an endangered TEC and migratory bird species.

None of the six potentially present threatened flora species listed under the *EPBC Act* was recorded in the SGCP area. These species are not considered likely to occur on-site, based on their habitat requirements and/or absence of local records.

Less than 3 % of the TEC recorded on-site (Brigalow) will be impacted by the proposed activities. Approximately 14 ha is proposed to be cleared (approximately 8.6 ha in the infrastructure corridor and 5 ha in the mine survey area). This clearing is unavoidable and is considered to have a minor impact on these communities in a bioregional context.

Two of the 13 potentially present *EPBC Act* listed threatened fauna species was recorded in the SGCP area (i.e. Brigalow Scaly-foot and Koala). The entire SGCP area is potential habitat for Brigalow Scaly-foots and Koalas. The SGCP area constitutes important habitat for Brigalow Scaly-foots due to it being the north-western boundary of the species' distribution.

The two migratory species confirmed to occur within the SGCP area are the Rainbow Bee-eater and Eastern Great Egret. Both species are regionally common and potential impacts on both species from the SGCP are expected to be negligible. Eight other migratory species possibly occur within the SGCP area but were not detected during ecological surveys. All migratory species in the region of the Project are widespread and, should they occur on-site, negligible impacts are expected for these species.

The primary potential impacts to MNES due to the SGCP are on the Brigalow Scaly-foot, Koala and Brigalow TEC. These include land clearing and subsidence, edge effects and fragmentation, altered fire regime, the introduction of weeds and pest fauna, and cumulative impacts. Land clearing is considered the principal impact on both the Brigalow Scaly-foot and Brigalow TEC.

Mitigation measures have been devised to alleviate impacts of the SGCP on MNES. Where residual impacts exist, biodiversity offsets are proposed. The overall impact from the Project on MNES is expected to be minimal.