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EXECUTIVE SUMMARY

INTRODUCTION

The South Galilee Coal Project (SGCP) is a proposed open-cut and underground coal mining operation in the Galilee Basin in Central Queensland.

PROJECT PROPONENTS

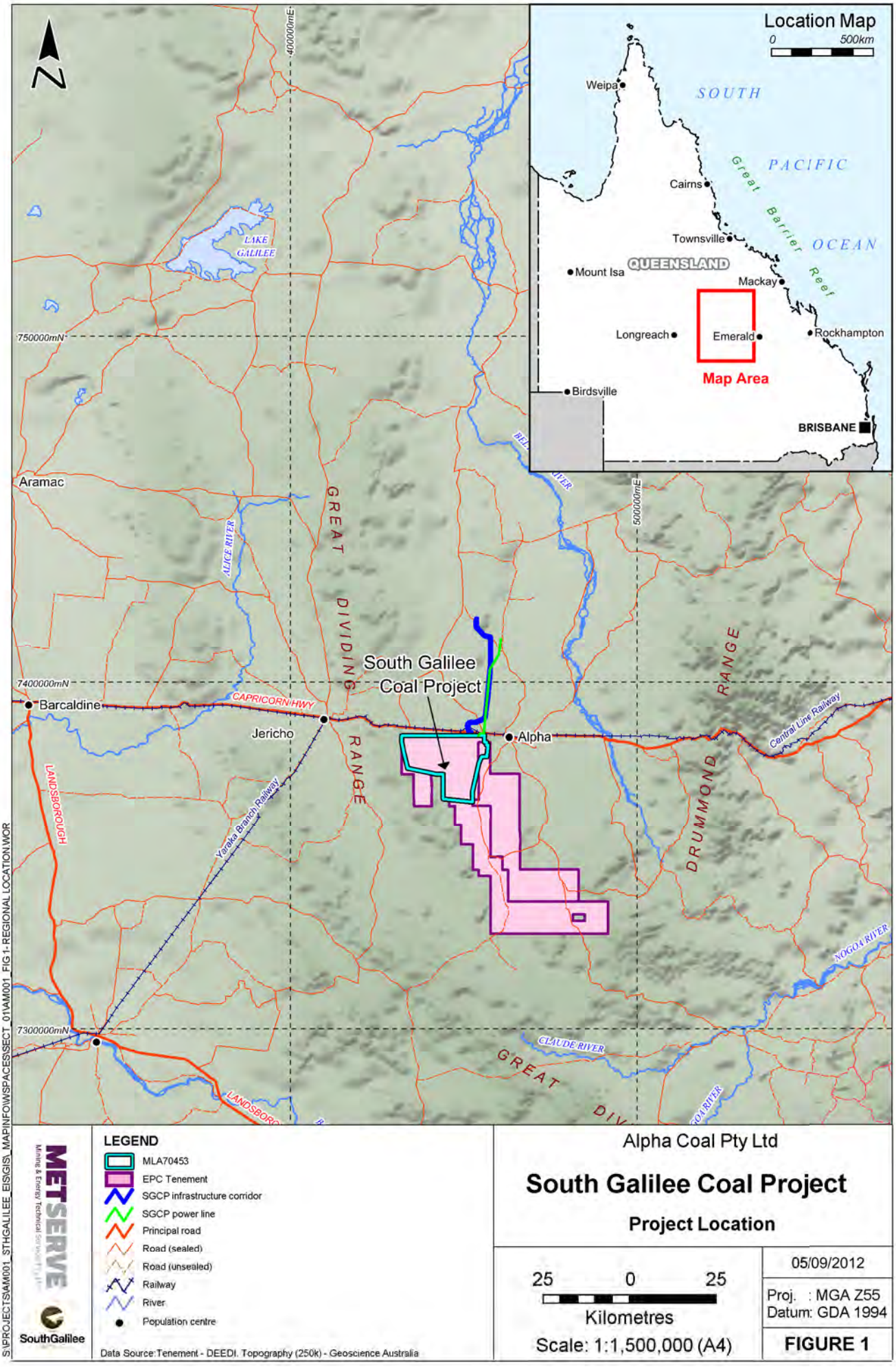
The SGCP proponents (the Proponent) are joint venture participants AMCI (Alpha) Pty Ltd and Alpha Coal Pty Ltd (Alpha Coal), a subsidiary of Bandanna Energy. AMCI is the manager of the joint venture and is responsible for the preparation of this Environmental Impact Statement (EIS).

The AMCI Group was founded in 1986 and is a private global mining, investment and trading business. The AMCI Group currently holds significant strategic investments in private and public mining in Australia, the United States, South Africa, Europe and South America. AMCI is experienced in coal exploration and mine development, and was instrumental in the development of several mines in Queensland and New South Wales, including Coppabella, Moorvale, Carborough Downs and Glennies Creek.

Environmental, community and safety obligations are given priority by the Proponent. The Proponent has not been subject to any proceedings under Commonwealth, State or Territory law in relation to environmental protection or conservation issues. The SGCP will be undertaken in accordance with the Proponent's Corporate Environment Policy.

LOCATION

The SGCP is located approximately 12 kilometres (km) south-west of the township of Alpha. Alpha is situated approximately 170 km west of Emerald and 450 km west of Rockhampton in Central Queensland. **Figure 1** provides an overview of the Project's location.


Location Map
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Weipa
SOUTH PACIFIC OCEAN
Great Barrier Reef
Cairns
Townsville
QUEENSLAND
Mount Isa
Mackay
Longreach
Emerald
Rockhampton
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Birdsville
BRISBANE
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LAKE GALILEE
Aramac
GREAT DIVIDING RANGE
ALICE RIVER
South Galilee Coal Project
Barcaldine
CAPRICORN HWY
Jericho
Alpha
DRUMMOND RANGE
Central Line Railway
LANDSBOROUGH
Varsha Branch Railway
NOGOA RIVER
CLAUDE RIVER
GREAT DIV
LANDSBORO
LEGEND
MLA70453
EPC Tenement
SGCP infrastructure corridor
SGCP power line
Principal road
Road (sealed)
Road (unsealed)
Railway
River
Population centre
Data Source:Tenement - DEEDI. Topography (250k) - Geoscience Australia
METSERVE
Mining & Energy Technical Services Pty Ltd
SouthGalilee
S:\PROJECTS\AM001_STHGALILEE_EIS\GIS_MAP\INFO\WSPACES\SECT_01\AM001_FIG 1-REGIONAL LOCATION.WOR
Alpha Coal Pty Ltd
South Galilee Coal Project
Project Location
25 0 25
Kilometres
Scale: 1:1,500,000 (A4)
05/09/2012
Proj. : MGA Z55
Datum: GDA 1994
FIGURE 1

PROJECT DESCRIPTION

The SGCP is a proposed open-cut and underground coal mining operation with an estimated mine life of approximately 35 years (2 years for construction, 33 years for operations). Over the life of the mine, the SGCP aims to produce approximately 447 Million tonnes of product coal for the export market. Further exploration may extend the life of the mine.

The key elements of the SGCP will include:

- coal mining operations, including:
    - open-cut and underground mining within Mining Lease Application (MLA) 70453, producing up to 19 Million tonnes per annum (Mtpa) of run of mine coal and 17 Mtpa of product coal for the export market
    - placement of waste rock and rejects in out-of-pit waste rock emplacements
    - progressive backfilling of the open pits with waste rock and rejects as mining develops.
- development of a mine water management system including clean water drainage channels, saline and waste rock water runoff collection, sediment dams, pit water management, on-site water reuse procedures and a permanent diversion of Sapling Creek
- underground services area
- Mine Industrial Area (containing administration, bath house, storage, vehicle parking, workshops, washdown, refuelling, controls and communication infrastructure)
- Coal Handling and Preparation Plant (CHPP)
- coal handling infrastructure (including conveyor systems, raw coal and product coal stockpiles)
- development of a Mine Access Road, on-site haul roads and light vehicle roads
- construction of an on-site rail component (including loading loop, breakdown and fuel sidings)
- construction of a SGCP rail spur component to connect to the common user rail component
- on-site accommodation village
- fuel, oil and explosives storage facilities
- soil stockpiles, laydown areas and a gravel borrow pit

- raw water supply infrastructure (e.g. pipeline, groundwater bores and Raw Water Dam)
- sewage and waste water treatment infrastructure
- on-site landfill facility
- electrical and telecommunications infrastructure
- ongoing rehabilitation
- ongoing exploration activities within existing exploration tenements
- other associated minor infrastructure, plant, equipment and activities.

ENVIRONMENTAL IMPACT STATEMENT

The objective of the Environmental Impact Assessment (EIA) process is to identify and assess the potential impacts associated with a particular development and develop measures to avoid or mitigate impacts identified.

This EIS document reports on the findings of the EIA process by providing information to interested bodies and persons, affected groups or persons, government agencies and referral bodies. The objectives of this EIS are to:

- provide a rationale for the SGCP and describe the alternatives considered
- describe the SGCP and how it will be implemented
- identify and assess the potential environmental, social and economic impacts of the SGCP
- demonstrate how potential impacts can be avoided, mitigated or managed, and present offsets for any residual impacts.

The Queensland Coordinator-General has declared the SGCP to be a 'significant project' for which an EIS is required. The Commonwealth Government has declared the SGCP to be a 'controlled action' requiring an EIS.

This EIS has been carried out under the *State Development and Public Works Organisation Act 1971 (SDPWO Act)*, administered by the Department of State Development, Infrastructure and Planning (DSDIP).

Following lodgement to DSDIP, this EIS will be made publicly available and submissions will be sought from agencies and the general public.

In addition to the EIA process, further compliance with relevant legislation, policies and approvals is required. Commonwealth, State and Local legislation has been considered as part of the EIS. The primary pieces of legislation that have governed the scope of this EIS include:

- the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (*EPBC Act*) administered by the Department of Sustainability, Environment, Water, Population and Communities (SEWPaC)
- the Queensland *SDPWO Act* administered by DSDIP
- the Queensland State Development and Public Works Organisation Regulation 2010 administered by DSDIP.

Full lists of relevant Commonwealth, State and local legislation and key advisory bodies are provided in the EIS.

PROJECT RATIONALE

SGCP Benefits and Opportunities

Coal is a significant resource commodity for both Queensland and Australia. Queensland has a large resource of high-quality coal, with almost 33 billion tonnes of *in-situ* raw coal identified by exploration (Department of Mines and Energy, 2007). The Galilee Basin, located in central Queensland, contains large resources of thermal coal.

Although the remote location and lack of supporting infrastructure have historically precluded large-scale coal mining in the Galilee Basin, a number of mining proponents and QR National have recently proposed to construct rail infrastructure to the Abbot Point Coal Terminal (APCT) near Bowen. On June 6, 2012, the GVK-Hancock Coal rail alignment was approved by state government to allow third party access for the transportation of coal from the Galilee basin to the APCT. Several utility providers have also proposed large scale power and water supply projects to the Galilee Basin. The provision of this infrastructure makes the SGCP viable.

The capital expenditure for the SGCP is expected to be $4.2 billion over the life of the Project. Operational expenditure is expected to be approximately $21.7 billion over the 33 year operational mine life. This expenditure will represent a significant boost to the regional and state economy and is expected to contribute millions of dollars per annum to the Queensland Government in royalties and taxes, as well as freight and port charges. This contribution coupled with direct and indirect employment opportunities and associated spending, highlights the important social and economic benefits of the SGCP to the region, Queensland and Australia.

The SGCP will result in a number of social, economic and environmental benefits.

Relationship to Other Projects

There are a number of proposed coal mines in the vicinity of the SGCP. These include:

- Galilee Coal Project, proposed by Waratah Coal Pty Ltd
- Alpha Coal Mine, proposed by GVK
- Kevin's Corner, proposed by GVK
- Carmichael Coal Mine and Rail Project, proposed by Adani Mining Pty Ltd.

The development and implementation of the SGCP is dependent on a range of additional key facilities and services. These additional facilities and services include the following projects that are currently the subject of separate environmental approvals. Although they do not form part of this EIS, their relationship to the SGCP is important and is described below:

- Abbot Point Coal Terminal - coal from the SGCP is proposed to be exported from this coal export facility
- Galilee Basin Transmission Project proposed by Powerlink Queensland - electricity for the SGCP will be supplied by this infrastructure project to a substation north of the SGCP (proposed Surbiton Hill Substation)
- A 132 kilovolt (kV) feed line from the proposed Waratah/SGCP Substation to the northern boundary of MLA 70453 - a Power Allocation (Power Enquiry) has been made to Powerlink by both Waratah Coal and the Proponent seeking confirmation of an unregulated supply to both mines
- Standard gauge rail infrastructure linking the Galilee Basin to APCT (separate proposals by QR National Ltd, Waratah Coal Pty Ltd, the GVK Group and Adani Mining Pty Ltd). On June 6, 2012, the GVK-Hancock Coal rail alignment was approved by state government to allow third party access for the transportation of coal from the Galilee basin to the APCT. The Proponent proposes to construct a rail spur component to connect to one of the common user rail lines via a third party access agreement.

PROJECT ALTERNATIVES

A pre-feasibility study (PFS) assessed a range of strategic options for developing the Project, including a "no development" scenario. The selection of the proposed development options for each SGCP component was made in consideration of leading industry practices, energy efficiency opportunities and regulatory, environmental, social and economic assessment criteria.

Mine Location

The location of the SGCP is dictated by the extent, quality and area of coal reserves identified within MLA 70453. The location of the SGCP is therefore determined by the coal resource, and alternatives to the site do not warrant further assessment.

Coal Export and Infrastructure Location

Although the Galilee Basin has historically experienced limited mining development due to its remote location and distance from a coal export terminal, a number of Galilee Basin proponents have proposed to construct a railway corridor to the APCT, with access available to third party users. On June 6, 2012, the GVK-Hancock Coal rail alignment was approved by state government to allow third party access for the transportation of coal from the Galilee basin to the APCT. Due to the likelihood of an effective supply chain from the Galilee Basin being developed (with third party rail access) the APCT was determined to be the preferred coal export location.

The location of infrastructure proposed by other mining proponents and/or utility providers is outside of the Proponent's control. The Proponent's infrastructure design is, to a large degree, influenced or dictated by the location or design of external infrastructure.

Accommodation

Due to the geographic isolation of the Galilee Basin and the region's limited capacity to supply a workforce, the SGCP workforce will be almost exclusively Fly-In/Fly-Out (FIFO). The option of basing the construction and operational workforce in Alpha was investigated. As the township of Alpha does not have adequate infrastructure or land available for housing required to support the proposed workforce, and to minimise potential social impacts, the SGCP workforce is proposed to be housed at an on-site accommodation village.

Conceptual and Technological Alternatives

The PFS has indicated that a range of thermal coal product options can be produced from the SGCP depending on market conditions. The preferred coal product was selected on the basis of a cost-revenue matrix.

A number of mining methods were identified as being potentially feasible for the SGCP and extensive modelling was undertaken to select preferred methods and develop mine plans. Mine plans have been developed to limit land disturbance, reduce the final void size and maximise resource recovery.

It was determined that the target coal seams can be most economically extracted using a combination of open-cut and underground longwall mining methods.

The proposed mining schedule has been based on geological modelling and has been developed to best accommodate the known timing of external infrastructure construction. Conventional coal handling and washing methods have been selected resulting from coal product characteristics and to maximise operating plant yield and reliability.

Due to the remote location of the SGCP, waste treatment and disposal options are limited. Waste will be either treated on-site or disposed of in an on-site landfill designed and managed to the appropriate legislative standards. A number of water management options have been considered and the most appropriate methods have been chosen as per topographic constraints.

Co-location Opportunities

A series of co-location opportunities with other mining and/or infrastructure projects have been examined for the SGCP to minimise the environmental, social and property impacts where practicable. Shared infrastructure use or co-location proposed as part of the SGCP includes:

- product coal from the SGCP is proposed to be exported from the APCT
- the SGCP would not support a dedicated rail line connecting to the APCT, and instead the Proponent proposes third-party access to a common user rail component from the Galilee Basin to the APCT
- electricity for the SGCP will be sourced from Powerlink Queensland's Galilee Basin Transmission Project
- the majority of raw water for the SGCP will be provided from an external water supply
- the SGCP workforce will fly in to and out from the existing Alpha Aerodrome
- the Proponent proposes to utilise the existing Central Line Railway to transport the majority of the SGCP construction material and equipment and operational consumables, where practicable.

Consequences of Not Proceeding

The consequences of the SGCP not proceeding would be that a major coal resource would remain undeveloped, and the positive socio-economic benefits associated with the SGCP would not be realised.

In addition, the transport of SGCP product coal on the common user rail component from the Galilee Basin to the APCT will provide strategic and financial support to other mining proponents. Should the SGCP not go ahead, this benefit would not be realised, potentially reducing the viability of service supply to the Galilee Basin, potentially limiting other projects.

ENVIRONMENTAL VALUES, POTENTIAL IMPACTS AND MITIGATION MEASURES

Climate

The SGCP area has a subtropical climate with mean maximum temperatures ranging from 22.9 – 35.7 degrees Celsius (°C), and mean minimum temperatures from 7.9 – 23.1°C. Rainfall data indicates that although the region experiences rainfall all year round, it is highly seasonal, with distinct wet and dry seasons. The majority of rainfall occurs between December and March and the least rainfall between July and September. The relative humidity is generally higher in late summer, autumn and winter and lower during the spring months.

The region tends to have winds of low to moderate velocity (e.g. up to 15 kilometres per hour (km/hr)) with the prevailing wind directions being from the north-east, south-east and east. The Pasquil stability class frequency indicates that the atmosphere around the SGCP is stable to slightly unstable for approximately 82 % of the time; therefore climatic conditions such as temperature inversions are possible.

Land

Tenure and Land Use

The SGCP is situated within MLA 70453. Land within the SGCP area is primarily used for low intensity beef cattle grazing and the majority of the area has been cleared for improved pasture. Land clearing, grazing and track construction have affected the vegetation communities and the levels of disturbance vary across the area. Cropping and/or horticulture are not undertaken within MLA 70453.

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.

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.

Overall, the SGCP is expected to have a minor impact on Good Quality Agricultural Land (GQAL) as only 5 hectares (ha) of GQAL are likely to be subject to direct disturbance.

The current land use in the SGCP area of low intensity cattle grazing will not be possible during mining operations and for the duration of the Project. The potential impacts of the SGCP on directly affected and adjacent landholders will be mitigated and managed by the implementation of a Landholder Management Plan.

Mine rehabilitation will be undertaken progressively through the mine life and where suitable, cattle grazing will be re-established.

Topography

The natural topography of the SGCP is dominated by very gently undulating plains and rises of low relief. The plains in the east and north-east generally decline from more elevated low hills located along the western portion of MLA 70453. The topography of the region ranges from 350 to 600 metres (m) Australian Height Datum (AHD) on the eastern flanks of Great Dividing Range. The major topographical features in the broader landscape are the Drummond Range located approximately 60 km to the east of the SGCP and the Great Dividing Range, located approximately 10 km to the west of the SGCP.

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. 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
- maintenance of average slope profiles and gradients
- maintenance of irregular dump shapes when stockpiling
- minimisation of waste rock emplacement heights
- ripping and backfilling of subsided areas and where short-term elevation changes occur, earthworks will be used to minimise potential elevation changes.

Scenic Amenity and Lighting

A baseline assessment of scenic values was undertaken and potential changes to the current land use were evaluated. The SGCP is located within the boundary of the Barcaldine Regional Council LGA: therefore the applicable former Jericho Shire Planning Scheme was referenced. Under that scheme, the SGCP area is classified as rural land. The landscape character within and surrounding the SGCP has been altered over many years by agricultural activates and cattle grazing.

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. As there are no other major developments within the immediate vicinity of the SGCP, the key existing visual elements of the area are predominantly grazing lands and natural vegetation.

Considering all views of notable sensitivity are a considerable distance from the SGCP, the primary features likely to impact on scenic amenity of the SGCP area are the proposed waste rock emplacements. 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. Mitigation measures to reduce impact on the scenic amenity and lighting from the SGCP will be implemented.

The post-mining rehabilitation objective is to rehabilitate above ground disturbance areas to a native bushland or grazing, where practicable. The only predicted residual disturbance will be the final void, which is unlikely to be visible from ground level outside MLA 70453.

Geology and Geochemistry

The Galilee Basin is a sequence of Late Carboniferous to Middle Triassic sedimentary rocks overlying Late Devonian to Early Carboniferous sedimentary and volcanic rocks of the Drummond Basin and has an area of approximately 247,000 square kilometres (km^2). The rocks of the Galilee Basin can be divided into northern and southern regions with a boundary in the vicinity of the Barcaldine Ridge extension of the Maneroo Platform.

The northern Galilee Basin is divided into two depositional environments. The Koburra Trough is located on the eastern side of the northern region of the Galilee Basin, and overlies the Drummond Basin. The Koburra Trough is also the Galilee Basin's thickest recorded sequence, with up to 2,818 m of strata recorded. On the western side of the northern Galilee Basin is the Lovelle Depression.

The southern Galilee Basin is divided by the Pleasant Creek Arch into two depositional centres; the Powell Depression to the west and the Springsure Shelf to the east. The primary target seams for the SGCP, the D1 and D2 seams, are interpreted to occur in the Late Permian Bandanna Formation. Current estimates of the resource indicate that approximately 498 million run-of-mine (ROM) tonnes of thermal coal will be extracted from the SGCP open-cut and underground mining areas.

Geochemical sampling results indicate that there is a low to negligible risk of acid rock drainage occurring. Despite these results, 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 potential acid generation.

Soils

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 and data indicates that there is no potential within the top 1.8 m of all soil profiles for acid generation by disturbance of potentially acid forming (PAF) material. Salinity at or near the surface is not a significant constraint within the SGCP area as approximately 87 % of the area has no salinity hazard.

The wind erosion hazard in the SGCP area is negligible due to rainfall levels and groundcover. Approximately 41 % of the SGCP has a minor water erosion hazard and 46 % has a moderate water erosion hazard. Only 9.5 % of the SGCP area has a severe or extreme water erosion hazard.

All soils have a low to very low level of at least one of the major nutrients, and approximately 96 % of the SGCP area has a moderate or greater soil fertility constraint, typically a combination of low organic matter and low available phosphorous. Topsoils will be stripped prior to any excavation works for later use in the rehabilitation and revegetation of the SGCP. Approximately 80 % of the SGCP area has layer(s) suitable for topsoil and therefore has no topsoil depth constraint.

The main impact on soil resulting from construction and operation activities at the SGCP is for erosion due to dispersion. Some soils identified in the areas of the open-cut mine area have a high erosion potential. If disturbance of soils occurs at creek crossings and where sediment runoff is allowed to enter waterways, the impact of increased sediment loads may impact the health of waterways.

Mitigation and management measures for soils include:

- topsoil resources impacted by mining will be stripped and stockpiled ahead of mining for reuse
- topsoil stockpiling areas will be suitably prepared to minimise topsoil losses
- duration of topsoil stockpiling will be minimised to reduce soil deterioration and weed colonisation
- prior to stripping, vegetation of areas to be disturbed will be cleared and windrowed
- adhering to recommended topsoil stripping depth requirements
- an erosion and sediment control plan will be developed and implemented prior to the commencement of construction and operations.

Subsidence

Surface subsidence is considered the principal surface impact of underground coal mining. Subsidence can vary depending on the soil type, local geology, faulting, jointing, depth of mining, thickness of coal, and width of chain pillars.

The potential environmental impacts from subsidence include:

- impacts to catchment boundaries, potentially resulting in self-contained catchment areas where water that would have runoff to the creek channels prior to subsidence would now pool within the subsided area and be lost to groundwater due to percolation
- loss of surface water flow through limited surface cracking
- change to stream bed profiles between longwall panels, resulting in erosion between adjacent longwall panels and sedimentation over the tops of the longwall panels
- localised mortality of riparian vegetation
- potentially reduced flood capacity in channels, resulting in more frequent inundation of floodplain areas
- reduced stability of the proposed Sapling Creek diversion channel due to subsidence over multiple panels.

Due to underground mining at the SGCP, land situated directly over longwall panels will subside by a maximum vertical subsidence of 4.2 m. For the D1 seam, the maximum vertical subsidence is 2.55 m, and 1.5 m for the D2 seam.

The establishment of a monitoring plan over the subsidence impacted areas of Tallarenha Creek will allow the identification of any changes to drainage that may have downstream impacts, and their mitigation through further channel engineering works.

Land Contamination

Searches of the Queensland Environmental Management Register (EMR) and the Contaminated Land Register (CLR) were conducted for all lots covered by MLA 70453 and the infrastructure corridor. No sites on the properties relating to the SGCP are included on either register.

The potential land contamination risks associated with the SGCP include:

- storage and use of fuel and chemicals
- landfill
- waste rock and reject handling and storage.

A Waste Management Plan (WMP) will be implemented to minimise the risk of land contamination at the site.

Cumulative Impacts

Within the regional area of the SGCP, cattle grazing is the predominant land use. Cumulative mine development in the region will in the medium term prevent the existing land uses from continuing. However, if properly managed and rehabilitated, the long-term cumulative impacts on land use are predicted to be low.

Cumulative landscape and visual impacts may result from changes to the landscape or visual amenity caused by the SGCP in conjunction with similar proposed mining developments.

Due to the mitigation and management measures proposed for the SGCP and by other mining proponents in the region, there is not expected to be a significant increase in cumulative impacts in relation to final land use, land contamination or scenic amenity.

Nature Conservation

Terrestrial Flora

A review of existing information and field assessment was used to identify, describe and assess key flora values of the area. Field verified Regional Ecosystem (RE) mapping identified that non-remnant vegetation accounted for approximately 70 % of the SGCP area, comprising an area of 32,000 ha.

Two of the 33 REs identified in the SGCP area are listed as 'endangered' under the *VM Act* and correspond to a threatened ecological community listed as 'endangered' under the *EPBC Act*. These listed REs account for 0.096 % of the total remnant vegetation within the SGCP survey area, with approximately 14 ha impacted by the SGCP. The SGCP area contains high floristic diversity with 312 plant species from 60 plant families recorded during field surveys.

The *EPBC Act* Protected Matters Search Tool identified four Threatened Ecological Communities (TEC) as potentially present within the SGCP area. Only one of the four TEC's (Brigalow – *Acacia harpophylla* dominant and co-dominant) was confirmed in the SGCP area. Three species of threatened or near threatened flora were recoded within the SGCP area – the Large-podded Trefoil (*Desmodium macrocarpum*), *Eleocharis blakeana* and Round-leaved Heath Myrtle (*Micromyrtus rotundifolia*). Twenty-eight weed species were recorded in the Project area.

The potential direct and indirect impacts associated with the SGCP on terrestrial flora include:

- the direct loss of individual plants through clearing activities
- a reduction in the long-term viability of local populations
- loss of mapped essential habitat
- fire
- introduction and spread of exotic weed species
- potential to affect the health and viability of plants outside the footprint area through edge effects, dust release and the accidental release of pollutants.

A number of mitigation measures have been considered to minimise impacts on terrestrial flora from the SGCP. These include:

- progressive rehabilitation of disturbance areas using native species to re-establish vegetation cover and self-sustaining ecosystems
- development and implementation of a Threated Species Management Plan (TSMP)
- a Fire Management Plan
- active revegetation of the edges surrounding habitat fragments
- a Weed and Pest Management Plan (WPMP), including a monitoring program with auditable performance measures.

The Proponent will create and implement a Mine Rehabilitation and Closure Plan to direct land rehabilitation during and after the operation life of the mine.

Terrestrial Fauna

Field surveys identified 233 terrestrial fauna species with the SGCP area. Nineteen Bio-regionally significant species have been listed for the SGCP bioregions.

The Brigalow Scaly-foot, Little Pied Bat, Square-tailed Kite and Koala are listed as threatened or near threatened under the *Nature Conservation* (NC) and/or *EPBC Act* and were found in the SGCP area. Two migratory species listed under the *EPBC Act* have been identified within the SGCP area: the Rainbow Bee-eater and the Eastern Great Egret.

Six introduced species have been identified in the SGCP area. These include four species listed as Class 2 declared animals under the *Land Protection (Pest and Stock Route Management) Act 2002* (*LP Act*).

The potential direct and indirect impacts associated with the SGCP on terrestrial fauna include:

- reductions in habitat values and health through potential loss of vegetation, habitat and resources
- edge effects and habitat fragmentation
- disruptions to wildlife due to light, noise, vibration and dust
- potential release of contaminants
- subsidence and hydrological impacts
- fire
- wildlife mortality through potential collisions with vehicles
- the introduction and spread of pest species.

A number of mitigation measures have been considered to minimise impacts on terrestrial fauna from the SGCP. These include:

- a WPMP, including a monitoring program with auditable performance measures
- all clearing is to be carried out in a phased approach to allow animals to move away
- all clearing is to be carried out in the presence of a qualified spotter-catcher
- all vegetation felled will be placed in remaining habitat to increase shelter for native fauna.
- fire management will focus on preserving and improving habitat and shelter for native fauna
- vertebrate pest control activities will be undertaken in conjunction with local authorities and landholders, particularly for pests such as pigs, wild dogs and feral cats
- putrescible waste will be kept in designated animal proof areas and waste will be regularly removed or buried
- a TSMP to minimise negative impacts on fauna in the SGCP area
- SGCP employees and contractors will be made aware of environmental obligations and compliance requirements were practicable
- areas posing a risk to fauna will be fenced to restrict fauna access where practicable
- livestock will be excluded from all vegetation outside the mine footprint to improve habitat quality for native fauna
- revegetation and rehabilitation of non-remnant vegetation will expand the amount of habitat for native fauna and link important wildlife corridors.

Aquatic Ecology

Aquatic ecology assessments were undertaken to describe the environmental aspects of on-site surface waterways in terms of surface water quality, aquatic flora and fauna and the relevant habitats across the SGCP area. A desktop assessment, including a literature and database review, was conducted prior to the commencement of field surveys. Information regarding site habitat conditions was evaluated and recorded as per the Queensland AUSRIVAS Monitoring and Sampling Manual, Environmental Water Protection (DERM, 2009).

The SGCP is located within the Belyando Catchment, which is a sub-catchment of the Burdekin River. The SGCP is located in the northern section of the catchment system and contains a variety of waterway types. Although there are examples of existing disturbances from cattle access to creeks, road and creek crossing construction, small scale riparian vegetation clearing and agricultural runoff, the majority of sites surveyed were remote and close to natural conditions in terms physical habitat.

Water quality in the SGCP area was often poor with respect to electrical conductivity, dissolved oxygen, pH and turbidity, which are common features of ephemeral stream habitats.

No species of high conservation value were identified within the SGCP area, as the majority of the fish species and macroinvertebrates present are generalists. However, a number of pollution sensitive taxa that might be vulnerable to mine runoff impacts were identified.

The potential direct and indirect impacts associated with the SGCP on aquatic ecology include:

- loss of aquatic habitat
- riparian vegetation clearing and modification
- modification to in stream habitat
- runoff or chemical spillage
- fauna mortality
- alteration of stream and floodplain hydrology
- release of mine water
- increased runoff, sedimentation and dust
- subsidence
- noise and vibration disturbances
- proliferation of exotic and pest fauna.

Mitigation and management measures have been proposed to minimise impacts to aquatic ecology, including:

- the creation of stream diversions that mimic the natural materials and geometry of removed stream reaches
- minimising the number of creek crossing or temporary levees where practicable
- implementation of a Weed and Pest Management Plan to manage and monitor the success of control strategies for pest plant and animal species within the SGCP site
- rehabilitation of disturbed sites are to be undertaken as quickly as practicable, preferably with excavated topsoil from the same area to maximise success of native plant seed stock recolonisation

- avoidance of construction works near stream systems where practicable
- where the avoidance of construction works, in, near or adjacent to streams is not practicable, works to be undertaken during the dry season or appropriate barriers to reduce sediment transport may be installed prior to significant rainfall events
- stockpiles storing excavated earth materials are to be placed away from waterways and/or bunded where practicable
- current best practice for the management of fuels, oils and chemicals on-site are to be adhered to at all times
- fauna mortality can be reduced by fencing construction areas where practicable and/or reducing speed limits near waterways
- a Receiving Environment Monitoring Program will allow baseline data to be collected for comparison of physio-chemical water quality parameters with construction and operational phases of the SGCP
- an Erosion and Sediment Management Plan will be produced.

Subterranean Fauna

Sampling for the presence and abundance of stygofauna within the proposed SGCP area was undertaken with a total of 22 groundwater bores sampled. In addition, specialised troglofauna traps were placed in 28 groundwater bores.

No stygofauna were identified in the SGCP area, and therefore mining in the area is unlikely to significantly threaten stygofauna. Troglofauna are unlikely to occur in the SGCP area and the Permian geology of the SGCP area contains no voids or sufficient fractures suitable for troglofauna.

The lack of stygofauna and troglofauna and the unfavourable habitat conditions present suggest that significant subterranean communities do not exist within the SGCP area and is therefore not considered to be a relevant environmental factor.

Matters of National Environmental Significance (MNES)

The SGCP has been deemed a 'controlled action' in accordance with Section 75 of the *EPBC Act*. The relevant controlling provisions are:

- Sections 18 and 18A (listed threatened species and ecological communities)
- Section 20 and 20A (listed migratory species).

MNES within the SGCP area include an EPBC-listed vulnerable reptile and marsupial, a threatened ecological community and migratory bird species. The Brigalow Scaly-foot (*Paradelma orientalis*) was recorded during fauna surveys within the mining lease area. The entire SGCP area is potential habitat for Brigalow Scaly-foot.

The SGCP area constitutes important habitat for Brigalow Scaly-foot due to it being the north-western boundary of the species distribution. Threatened ecological community, Brigalow – *Acacia harpophylla* dominant and co-dominant occurs over 575 ha of the Project area. This community is not proposed to be cleared for the Project. Biodiversity offsets are proposed for residual impacts on both Brigalow Scaly-foot and the Brigalow threatened ecological community.

Migratory species confirmed to occur within the SGCP area are Rainbow Bee-eaters (*Merops ornatus*) and Eastern Great Egret (*Ardea alba modesta*). 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 are but were not identified during ecological surveys. All migratory species in the region of the Project are widespread and, should they occur on site, are not expected to be impacted by the Project.

Cumulative Impacts

The impacts on flora and fauna from the SGCP may be negligible, however when coupled with the impacts of other projects, the accumulative changes to the environment over time can lead to more substantive outcomes. Cumulatively, these proposed developments will cover a relatively large percentage of the upper tributaries of the Belyando River and Catchment area.

Cumulative impacts from multiple mining projects in the Galilee Basin are difficult to quantify and vary depending on the nature of development, the biota impacted on and the landscape in which the development occurs.

The cumulative impact of land clearing and transport infrastructure is likely to result in increased fragmentation, increased edge effects, reduced extent of biodiversity corridors and the removal of large tracts of habitat. These impacts may reduce the likelihood of recolonisation of species into an area, disturb the seasonal movements of species and reduce dispersal between areas of remnant suitable habitat.

Potential impacts on aquatic ecology resulting from multiple mining developments in the region may include:

- altered catchment hydrology, with associated ecological and fluvial geomorphological implications
- reductions in water quality in the downstream environment, with associated ecological and social implications.

Water Resources

Surface Water

The SGCP is located in the upper catchment of the Burdekin River Basin. The SGCP MLA crosses the upper tributaries of Sandy Creek and Native Companion Creek, which are both tributaries of the Belyando River. The SGCP crosses the catchments of Tallarenha Creek in the north, and Sapling Creek and Dead Horse Creek in the south.

The watercourses within the SGCP site are ephemeral in nature and provide seasonal habitat for aquatic fauna and flora. The watercourses are slightly to moderately disturbed from current grazing activities.

There is no major water infrastructure in the Belyando/Suttor subcatchment; however, it contains a number of private weirs, pumps and off-stream storages licensed for water harvesting, irrigation and stock water. Licensed irrigators tend to be concentrated in areas with suitable alluvial plains adjacent to the Suttor and Belyando Rivers and their tributaries. Water licence holders were identified downstream of the SGCP site.

Water balance modelling indicates that the mine will generally operate with a water deficit and will have to import water to make-up the balance. The allocation sought is 3,000 megalitres (ML) per annum will be on a 'take or pay' basis. Process water demand varies inversely with the ash in the product coal, which will depend on international market conditions. Hence, the water demand throughout the SGCP life will vary and the water allocation provides flexibility in terms of the site water balance.

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 the construction of a clean water diversion around the disturbed areas
- diversion of Sapling Creek south into Dead Horse Creek to separate clean runoff from the mine workings (resulting in an increase of flows into Dead Horse Creek of approximately 30 %).

A 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 maximise the stability of the diverted channel, and to protect the upstream and downstream reaches from any detrimental changes in creek hydraulics.

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 annual recurrence interval (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 equates to a depth of approximately 40 m above the void floor, compared to the total void depth approximately of 90 m.

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.

Depending on the arrangement of the downstream projects, there will be some potential for cumulative impacts on downstream streamflow. However, given the contribution to streamflow from large downstream and adjacent catchments not affected by proposed mining projects, the percentage cumulative reduction in flows is likely to be less than the impact in the immediate vicinity of the SGCP.

Groundwater

Hydrogeological assessments undertaken characterised the existing groundwater environment and provided an estimate of impacts resulting proposed mining and dewatering activities at SGCP. Impact assessment also considered post-mining groundwater recovery and cumulative impacts due to other mining projects in the region.

Based on a review of the Department of Natural Resources and Mines (DNRM) groundwater database and available publications, groundwater in the SGCP area has been encountered in all geological formations, although it is the Quaternary/Tertiary and the Great Artesian Basin (GAB) sediments that provide almost all groundwater sources in region. The Quaternary/Tertiary and Permian sediments on the regional scale are generally regarded as not a significant groundwater resource. However, on the local scale, Tertiary and Quaternary alluvial sediments appear to contain groundwater resource sufficient to provide water supply to local farms and small townships (e.g. Alpha). The most significant groundwater resources in the area are attributed to the Great Artesian Basin (GAB), and the eastern margin of the nearest part of the GAB to the SGCP project is thus represented in the groundwater model.

At the SGCP, there are no springs or permanent water bodies connected to the various aquifers, around which groundwater dependent ecosystems may develop. Groundwater is not typically used as a source of drinking water or for recreational and aesthetic uses in the SGCP area due to its high salinity, however Alpha township utilises groundwater bores in alluvial and Tertiary sediments for town water supply. The primary use of groundwater in the SGCP area is stock watering.

Groundwater salinity is typically greater than 1,000 mg/L and in some places greater than 2,000 mg/L (i.e. not within drinking water guidelines, but nominally suitable for irrigation and stock). There are small areas of fresh groundwater (< 1,000 mg/L) in places along the major creeks, presumably recharged by leakage from streams. Field pH values indicate that the groundwater ranges from slightly acidic to neutral.

Groundwater recharge occurs mainly through rainfall infiltration, at less than 5 % of annual rainfall, with the highest recharge rates in areas of higher topography, notably the Clematis Sandstone outcrop aligned with the Great Dividing Range. Groundwater flows away from the main recharge area formed by the Clematis Sandstone along the Great Dividing Range, to the east and north into the Galillee Basin and Burdekin drainage basin, and to the west out into the GAB.

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. This indicates that, while there is significant drawdown at the mine site, substantial saturated aquifer resources would remain regionally, and locally within the deeper Bandanna Formation at SGCP.

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. However, the drawdown at the Alpha township area 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.

The model results show that the major change to the groundwater balance is the discharge for dewatering purposes, which is drawn from aquifer storage and then subsequently replenished during post-mining recovery. Additionally, the 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.

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.

Air Quality

Air quality impacts for the SGCP have been assessed against Queensland's *Environment Protection Policy (Air) 2008 (EPP (Air))* ground-level dust concentration guidelines for:

- total suspended particulates (TSP)
- particulate matter with an aerodynamic diameter less than 10 microns (PM_{10})
- particulate matter with an aerodynamic diameter less than 2.5 microns ($PM_{2.5}$).

Baseline air quality was established by sampling undertaken at three locations surrounding the SGCP. 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.

Air dispersion modelling has been used to predict ground-level concentrations of pollutants and rates of dust deposition. Modelling has been based on CSIRO's The Air Pollution Model (TAPM), an emissions database using the United States Environmental Protection Agency (US-EPA) AP-42 (2003) 5th Update 2003 and the Australian National Pollution Inventory (NPI). To assess the worst case conditions, emissions were estimated for year 26 of the mine's life as this represents peak emissions or the worst case scenario.

The major sources of dust emissions from the SGCP include:

- draglines
- trucks and shovels
- conveying and dumping of ROM coal
- dumping and spreading of overburden
- unpaved roads
- loading of trucks and trains.

Other emissions including sulphur dioxide, nitrogen dioxide and trace quantities of volatile organic compounds from the combustion of diesel fuel, are not expected to be of significant quantities to impact on air quality surrounding the SGCP.

Results from the air dispersion modelling indicate 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 are likely to exceed the goals between one and three occasions a year due to adverse meteorological conditions. It is predicted that TSP and dust deposition will not exceed guidelines beyond the boundaries of the mine.

The Proponent will introduce and implement ongoing dust management and mitigation measures on-site to maximise compliance with air quality standards and goals. Mitigation measures include:

- implementation of dust suppression measures (i.e. watering roads and stockpiles)
- wet processing for coal handling to minimise dust emissions
- a dust monitoring program to quantify impacts and to be used as a dust management tool
- a progressive rehabilitation program to reduce exposed mine and stockpiled surfaces and overall disturbed areas.

Mitigation measures undertaken across both construction and operational phases of the Project will minimise degradation of ambient air quality surrounding the SGCP.

The activity of mining, particularly open-cut mining will likely add particulates to the regional air shed. The cumulative impacts from the proposed mines in the Galilee Basin have not been modelled as part of this EIS due to the lack of available information, but are expected to be minimal.

Greenhouse Gas Emissions

The Proponent is committed to sustainable development and complies with its obligations under the National Greenhouse Energy Reporting and specifically annual reporting of GHG emissions.

The EIS provides an inventory of projected annual emissions for each relevant Greenhouse Gas (GHG), with total emissions expressed in CO^2 equivalent terms for the following categories:

- scope 1 emissions, meaning direct emissions of GHG from sources within the boundary of the facility and as a result of the facility's activities
- scope 2 emissions, meaning indirect emissions of GHG from the production of electricity, heat or steam that the facility will consume, but that are physically produced by another facility
- loss of carbon sink capacity.

Desktop studies have identified the likely GHG emissions sources from the SGCP. The principal sources of Scope 1 GHG emissions resulting from the SGCP include:

- carbon dioxide, methane and nitrous oxide emitted by diesel consuming vehicles
- methane (CH_4) released from the mining and stockpiling of coal
- carbon dioxide released by the burning of vegetation
- loss of carbon sink capacity from the initial removal of approximately 500 ha of vegetation.

The principal sources of Scope 2 GHG emissions resulting from the SGCP will be purchased electricity for draglines, CHPP and lighting.

A number of direct management measures are proposed to minimise GHG emissions from the SGCP. These include:

- maximised electrical efficiency though technology and efficient operating procedures
- maximising diesel efficiency though fuel efficient technology and mine design
- minimising the release of fugitive emissions
- minimising vegetation clearing where practicable
- utilising the existing Central Line Railway, where practicable, to transport construction material/equipment
- utilising the Galilee Basin common user rail line to transport supplies/equipment during the operations phase, where practicable

- maximising the use of renewable energy sources, where practicable.

Indirect means of reducing GHG emissions include measures such as:

- carbon sequestration at nearby or remote locations
- progressive rehabilitation of disturbed areas
- planting trees or other vegetation to achieve greater biomass than that cleared for the SGCP
- carbon trading through recognised markets.

The Environmental Management Plan (EM Plan) for the SGCP addresses greenhouse gas abatement.

Similar sources and emissions of GHG's can be expected from the other coal mining projects proposed for the Galilee Basin. Due to a lack of available data from other projects, cumulative impacts have not been quantified in this EIS, but are expected to be minimal.

Noise and Vibration

The noise and vibration assessment for the SGCP has considered potential impacts associated with the construction and operation of the mine as well as impacts from associated infrastructure. Noise impacts for the SGCP have been assessed against Queensland's *Environment Protection Policy (Noise) 2008 (EPP (Noise))*.

Baseline ambient noise levels were sampled at five locations around the proposed mine site. The Rating Background Level (RBL) is typical of a rural, grazing area with potential sources of noise and vibration resulting from the existing surrounding environment including farming and grazing activities, residential activities, existing commercial activities, environmental noise and road-based traffic.

Noise and vibration modelling was undertaken for the mine area and supporting road and rail infrastructure. Noise and vibration impacts from the SGCP will be primarily generated from:

- the operation of mining equipment
- on-site CHPP
- blasting activities
- traffic.

The modelled noise levels for the SGCP readily comply with acoustic quality objectives during the day, evening and night at all noise sensitive receptors. Modelling for background creep indicates that noise levels at some sensitive receptors close to the SGCP may exceed the goals to avoid background creep during the evening and night.

To manage the noise and vibration impact associated with the SGCP, the Proponent will develop and implement Noise and Vibration Management Plans. These may include:

- optimisation of mine layout to shield noise generation
- limiting construction hours to reduce construction noise impacts
- limiting the size and use of explosives to daylight hours.

Ongoing monitoring will occur throughout the life of the mine to maximise compliance with noise and vibration standards.

Noise levels generated by the proposed SGCP construction and operation phases are predicted to be within the established noise limits at all sensitive receptors. Similarly, the Project is predicted to comply with traffic noise guidelines. However due to an increase in traffic resulting from the cumulative development of projects adjacent to the SGCP, increased noise levels are predicted in the regional context.

Waste Management

Cleaner production, pollution prevention and waste minimisation will all be important components of the overall waste management strategy. Waste management and mitigation at the SGCP will be aimed at minimising the impacts of waste on the environment by promoting sustainable waste management practices in accordance with the *Waste Reduction and Recycling Act 2011*.

The primary sources of wastes generated by the SGCP over the life of the Project (construction, operation and decommissioning phases) will include:

- mine waste, including the overburden and interburden material above and between the coal seams
- coal processing waste, including coarse and fine rejects
- regulated waste, defined as a waste product that contains a significant quantity and concentration of a hazardous contaminant that has the potential to cause environmental harm if improperly transported, treated, stored, disposed or otherwise managed
- general construction and operational waste.

Potential impacts associated with waste management include:

- degradation of water quality through contact with waste products in operational areas
- gross waste accumulation
- loss of aesthetic value
- risk of vector-borne diseases from waste disposal sites
- degradation of air quality through gaseous emissions

- land contamination through inappropriate storage and handling of wastes.

A WMP will be developed prior to the commencement of the SGCP and will be based on the following principles:

- effective implementation of the waste management hierarchy by focusing on waste avoidance and reduction, waste reuse, waste recycling, energy recovery and waste disposal
- continual development and improvement of waste management practices involving water conservation, treatment and reuse, waste reduction and resource recovery
- ongoing monitoring and auditing to quantify the types, volumes and locations of waste produced on-site and transported off-site
- compliance with National and State waste management policies, the *EP Act* and associated regulatory instruments.

Other proposed mining projects in the Galilee Basin are expected to produce similar waste streams and volumes as the SGCP. The development of coal mining in the region is anticipated to increase the demand for waste collection, transport, treatment, reuse, recycling and/or disposal. This demand will likely have the effect of stimulating growth in waste services. 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. Overall, the impacts can be classified as minor on a local level and negligible to non-detectable on a regional, state or national level.

Transport

A Transport Impact Assessment for the construction and operational phases of the SGCP was undertaken in accordance with the *Guidelines for Assessment of Road Impacts of Development (GARID)* to predict the impacts of the SGCP on the existing transport network.

The transport of equipment and personnel working at the SGCP will be predominantly via the Capricorn Highway. The SGCP will connect directly to the Capricorn Highway by a sealed mine access road with the connection consisting of a priority controlled, three-way T intersection 8.8 km west of Alpha. Road intersection and pavement assessments have indicated that impacts generated by the SGCP during construction and operation will be well below guideline triggers and considered to be insignificant.

The SGCP is expected to generate a maximum of 9 train movements a week on the QR Central Line during the construction and a maximum of 14 rail movements per week during the mine's operation, through a common coal haulage railway line. No significant impacts are predicted from rail transport at the SGCP.

The Project will utilise the existing Alpha Aerodrome which is located approximately 5 km west of Alpha. Additional flights per week as a result of the SGCP are estimated at 17 in 2014, 8 in 2016,14 in 2019, and 14 in 2029. An upgrade to the Alpha Aerodrome will be required as a result of the SGCP and other significant projects in the Alpha area. The upgrade will include a runway extension and it is anticipated that commercial air service providers will meet the associated costs.

The Proponent is currently in negotiation for the allocation of port capacity at the APCT. No construction works on sea transport infrastructure are proposed to be directly undertaken by the Proponent. Some onshore coal stockpiles will be required and will be subject to a separate approvals process.

Based on the Transport Impact Assessment of the SGCP, it is suggested that the Project will not compromise capacity or safety on local and regional roadways due to low volumes and therefore no mitigation measures have been proposed.

Other proposed mining operations in the SGCP region have the potential to impact on the transport network. These combined operations may see significant increases in additional road, rail and ship movements on an annual basis. Therefore potential impacts on air quality, the acoustic environment, flora and fauna, the marine environment and surface water resources may occur.

Cultural Heritage

Indigenous Cultural Heritage

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

A search of the National Native Title Tribunal Register for the current Native Title status of the SGCP area has ascertained that the Wangan and Jagalingou people are the registered native title claimants. A search of other heritage registers was undertaken for items and places of significance within the SGCP area. No items or places were identified within the SGCP in any of these registers. However, sites may exist within the SGCP area that have not yet been recorded.

The SGCP is not expected to impact directly on any currently listed Indigenous cultural heritage values. The Proponent has established an approved Cultural Heritage Management Plan (CHMP) with the Wangan and Jagalingou people in accordance with the requirements of the *Aboriginal Cultural Heritage Act 2003*. The CHMP will facilitate the satisfaction of Indigenous cultural heritage management obligations.

SGCP employees, contractors, and sub-contractors will undergo an induction informing them of their responsibilities and legislative requirements in the event of an Indigenous cultural heritage find. In the event that a previously unrecorded Indigenous cultural heritage feature is identified, all work at the location will cease immediately and will not resume until the DEHP has been notified and a Cultural Heritage Advisor has confirmed the significance of the find. The Proponent will nominate an independent Cultural Heritage Advisor for the SGCP to provide expert advice, where required.

It is expected that the other regional mining proponents will undertake similar assessments and introduce mitigation and management measures to minimise any potential cumulative impacts on Indigenous cultural heritage values in the area.

Non-Indigenous Cultural Heritage

Non-Indigenous cultural heritage recognises the importance of sites and cultural landscapes to local communities and to science and provides measures for their identification and protection. No known sites or places of non-Indigenous cultural heritage within the SGCP area are listed on statutory or non-statutory registers; however a field survey identified five non-Indigenous cultural heritage features of low significance value within MLA 70453. Under the proposed mine plans, these features may be subject to indirect disturbances (e.g. subsidence, air quality, vibration impacts etc.).

A Non-Indigenous CHMP will be developed prior to the commencement of construction and will be a key tool in the management of non-Indigenous cultural heritage at the SGCP. Non-Indigenous cultural heritage mitigation measures are expected to be similar to those proposed for Indigenous cultural heritage in the event of an unexpected find.

It is expected that the other regional mining proponents will undertake similar assessments and introduce mitigation and management measures to minimise any potential cumulative impacts on non-Indigenous cultural heritage values in the area.

Social Environment

The SGCP will result in substantive development opportunities in Central Queensland and may result in a number of potential social impacts. Social impacts are identified as changes to the way people live, work, relate to each other, organise to meet their needs and cope with challenges. Impacts may be positive or negative, minor or significant and short or long-term.

Local and regional social impacts from the SGCP may include:

- population growth
- increased employment and training opportunities
- increases in personal income levels
- diversification of the local economy
- increases in the cost of living
- increased demand on local emergency services
- increased demand on public infrastructure and services
- increased demand on housing and accommodation
- impacts on local health services
- effects on road transport and road safety.

The Social Impact Assessment identified no key impacts that would delay, postpone or require restructuring of the SGCP.

The impacts from mining and specifically the SGCP can be managed through the implementation of an effective Social Impact Management Plan (SIMP). A draft SIMP has been developed for the SGCP and includes processes and strategies for managing and mitigating impacts that are predicted to arise through the development of the SGCP and other mining projects being developed in the region. These measures have been developed in consultation with stakeholders and include the development and implementation of a number of working groups and action plans that address and mitigate potential impacts.

The Proponent will continue to implement the measures outlined in the SIMP throughout the life of the SGCP and will undertake regular assessments of the effectiveness of engagement activities.

Although individually, the SGCP is unlikely to result in significant social impacts, significant cumulative effects may result from a number of proposed mining developments in region. Potential cumulative impacts may include:

- growth in the residential population of Alpha
- pressure on educational and training facilities
- increased cost of living and income disparity
- loss of local labour from other industries
- increased pressure on local infrastructure and services
- increased demand on local housing and accommodation
- impacts on community health and safety.

The Proponent has actively advocated for collaborative approaches between regional mining proponents and is a signatory to the Co-operation and Regional Development Agreement for the Galilee Basin.

Economics

The SGCP will have a positive economic impact to the local, regional, State and National economies. At both the local and regional level, there will be a direct increase in demand for employees, services and supplies.

The economic assessment of the SGCP was undertaken using the Input-Output method which examines the direct and indirect impacts on the Queensland economy in terms of output, household income, employment and value added. Direct economic impacts are related to the coal mining industry and indirect economic impacts are those resulting from the flow-on affects from the industries supporting coal mining. The impacts associated with the SGCP, both positive and negative are anticipated to occur primarily in the context of the local and regional economies.

Key positive impacts of the SGCP in the local, regional and State context include:

- increases in export revenue
- increase in industry outputs in Queensland
- support and development for local businesses and industries
- capacity building and skills development
- a decrease in unemployment rates as a result of jobs created by the SGCP.

Potential negative impacts from the SGCP in the local and regional context include:

- upward pressure on labour prices due to demand for skilled and unskilled labour
- increases in residential property values resulting from the additional demand created by contractors and flow-on employees migrating to the region.

The Proponent has committed to mitigation and monitoring strategies, including engagement with all levels of government to maintain and enhance regional economic values.

The cumulative increased economic activity due to the SGCP and other developments in the Galilee Basin will provide businesses across many industries with opportunities to expand. Associated infrastructure will be beneficial to the development of the Galilee Basin energy reserves. Rail Infrastructure associated with the SGCP and other mining projects in the region will increase accessibility and the ability to transport coal from the Galilee Basin. Increased rail access will be beneficial to the development of new mining projects in the future.

Hazard and Risk

The assessment of hazards and risks associated with the SGCP focuses on potential harm to property and people including on-site personnel, contractors and visitors as well as people who live and work in close proximity to the SGCP.

This process identified a number of potential high risk areas including:

- on-site and off-site interaction with vehicles, machinery and equipment
- excessive fugitive dust from road and earthworks and blasting
- excessive noise and vibration impacts from blasting and/or mine equipment
- release of oil, fuel or chemicals via leaks, ruptures, overflows, spillage or pooling
- physical injuries from manual handling and working at heights

- contact with high voltage electricity
- spontaneous combustion
- fire and other natural disasters.

Once mitigation measures and other controls including emergency and risk management plans are applied to the assessed hazards, the residual risks are either ranked as being low or moderate. The Proponent will implement its Corporate Environment Policy in order to reduce the hazard and risks associated with the SGCP.

The majority of health and safety risks for the SGCP are contained on the SGCP area with negligible impact to surrounding land users. However, the SGCP will present certain hazards to the environment and community at all phases of the mine's development. These hazards, in conjunction with existing hazards, and hazards presented by other regional mining proponents may increase the overall risk of community or environmental incidents or accidents.

Management Plans

An EM Plan and draft SIMP have been prepared as part of the Proponent's management strategies and commitments for the SGCP.

Environmental Management Plan

The Proponent has prepared an EM Plan in accordance with Section 203 of the *Environmental Protection Act 1994* which proposes best management environmental practice throughout the life of the SGCP. The content of the EM Plan addresses legislative guidelines and develops commitments that are measurable and auditable and strategies to achieve them.

Social Impact Management Plan

The draft SIMP is intended to support and address the changing nature of social impacts over the life of the SGCP.

The draft SIMP has been developed to meet the requirements of the final ToR for the SGCP EIS, in consultation with the DSDIP's Social Impact Assessment Unit.

The draft SIMP establishes the roles and responsibilities of the Proponent, government agencies and other stakeholders in mitigating and managing social impacts throughout the life of the SGCP.

The draft SIMP will adopt a phased approach, involving establishment of and consultation with action plan working groups, development of action plans, finalisation of the SIMP and implementation and review.