McCollum Environmental
MANAGEMENT SERVICES

Codrilla Project

INITIAL ADVICE STATEMENT

Bowen Basin Coal Joint Venture

26 June 2009
Client No. 2-1030

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Codrilla Project
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1. INTRODUCTION

1.1 General

The Codrilla Project (the Project) is proposed as an open cut coal mining and processing operation. The Project is located in the northern Bowen Basin region and will target the Leichhardt Lower 2 and Vermont Upper coal seams. Mining operations are expected to produce an average of 3.8 Million tonnes per annum (Mtpa) Run of Mine (ROM) coal which following processing will provide approximately 2.7Mtpa of Pulverised Coal Injection (PCI) and thermal coal product to export markets with. Based on current coal resources, mine life is expected to be in the order of 16 years, however ongoing exploration is expected to add to the resource base and consequently extend mine life.

This Initial Advice Statement (IAS) has been prepared in support of the voluntary Environmental Impact Statement (EIS) application submitted for the Project, in accordance with Section 71 of the *Environmental Protection Act 1994* (EP Act). Additionally, a Draft Terms of Reference (ToR) has been submitted with the voluntary EIS Application.

In accordance with the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act), the project was assessed and determined as having the potential for significant impacts on matters of National Environmental Significance (NES). Consequently, the Project has been referred to the Australian Government Department of the Environment, Water, Heritage and the Arts (DEWHA) and declared a Controlled Action, for which assessment was required.. Further to the Controlled Action determination, the Project is proposed to be assessed using an accredited environmental assessment process under the EP Act in accordance with the bilateral agreement between the Australian and and Queensland governments.

The Project is in an advanced stage of resource modelling and mine planning. This document presents the plans completed to date which will be further refined during assessment and detailed design stages of the project.

1.2 Proponent

The Project is owned by the Bowen Basin Coal Joint Venture (BB Coal JV), which is a joint venture (JV) arrangement between BB Interests Pty Ltd (85%) and CITIC Bowen Basin Pty Ltd (15%). BB Interests Pty Ltd is a 100% owned subsidiary of Macarthur Coal Limited and CITIC Bowen Basin Pty Ltd is a 100% owned subsidiary of CITIC Australia Pty Ltd.

Therefore, the proponents are the JV Partners as below:

BB Interests Pty Ltd
Level 5, 100 Melbourne Street
South Brisbane Qld 4001
Tel: 07-3221 7210
Fax: 07-3229 1776

CITIC Bowen Basin Pty Ltd
Level 7, CITIC House
99 King Street
Melbourne VIC 3000
Tel: 03-9614 8000
Fax: 03-9614 8800

The JV partners have a long standing relationship and through subsidiaries of their parent companies they are jointly involved in many Queensland coal exploration and mining projects. These projects include the highly successful Coppabella and Moorvale Open cut Coal Mines owned by the Coppabella Moorvale Joint Venture (CMJV).

The proponents are committed to the management of the Project consistent with the principles of Ecologically Sustainable Development (ESD), as defined in the National Strategy for ESD, (ESD Steering Committee 1992).

2. PROJECT DESCRIPTION

2.1 Project Overview

The Project is located approximately 45km south south west of the Nebo Township in Central Queensland and approximately 120km south west of Mackay which is the nearest major regional centre, see **Figure 1**. The Project is bisected by the Fitzroy Development Road approximately 25km south of where the road intersects the Peak Downs Highway.

The Project is proposed as an open cut coal mine and processing operation. It is anticipated that there will be potential for future underground activities as economic and geological factors determine. However, should underground activities be viable, environmental assessment for those activities will be initiated in the future, separate to the open cut assessment which is the subject of this document.

The coal resource identified to Joint Ore Reserves Committee Code (JORC Code) status is 59.4 Million tonnes (Mt). The proposed mine is expected to produce up to 5 Mtpa of ROM Coal, at an average rate of 3.8Mtpa. Following processing, an average of 2.7Mtpa of product coal will be exported to overseas customers. Based on expected production rates and the JORC Code resource a life of mine in the order of 16 years is proposed. However, it is anticipated that additional resources will be defined by the ongoing exploration program potentially extending the mine life beyond 16 years. The project is expected to require approximately 170 construction personnel and 240 permanent operational personnel.

ROM coal will be processed on site utilising conventional Coal Handling and Preparation Plant (CHPP) technologies. Process waste will be disposed of at an on site facility designed and constructed in accordance with standard industry practice. Product coal will be transported approximately 31km to the existing Moorvale Mine train load-out facility using road trains (nominally up to 200 tonne multiple trailer configuration) via a purpose built private haul road. Following loading of the product coal to trains at Moorvale Mine, coal will be transported to Dalrymple Bay Coal Terminal (DBCT) for export to overseas customers.

The project will consist of at least two Mining Lease (ML) applications, the main ML (Codrilla A) will contain the mining operations and infrastructure located on it. The second ML (Codrilla B) will be an infrastructure ML and is to contain the haul road from Codrilla A to either ML70355 (the Olive Downs haul road), or direct to ML70290 (Moorvale Mine). The ML applications will involve approximately 4,830 hectares (ha) for Codrilla A and in the order of 220ha to 230ha for the various Codrilla B options, resulting in a total ML area of approximately 5050ha.

At this early stage of project feasibility the Codrilla B haul road alignment options are in the below order of preference:

- Northern Option 1 - directly along the property boundary fence line;
- Northern Option 2 - aligned to avoid mapped Endangered Regional Ecosystems; or
- Southern Option - passing through numerous properties.

The primary reasoning behind the early preferences is the lower number of individual properties impacted and the subsequent reduced amount of segmentation of individual properties offered by the Northern haul road options. Therefore, baseline studies will focus on the Northern haul road options.

It is anticipated that the project will involve significant associated civil works, being the:

- realignment of the Fitzroy Development Road to enable full recovery of the economic coal resource;
- potential grade separated crossing of the Fitzroy Development Road by an internal mine haul road;
- crossing of Devlin Creek or minor tributaries with the haul road; and
- potential diversion of Devlin Creek to enable full recovery of the economic coal resource.

To ensure that any potential adverse effects associated with the proposed operations are abated or mitigated environmental management strategies consistent with standard industry practice will be implemented. These strategies will include:

- Land management;
- Water Management;
- Progressive Rehabilitation;
- Waste Management;
- Air quality management;
- Noise and vibration Management;
- Social management;
- Cultural Heritage Management; and
- Monitoring and reporting.

2.2 Operations

The development and operation of the project will be as a conventional truck and excavator open cut coal mine. The ROM coal will be processed through a Coal Handling and Preparation Plant (CHPP) located in the north western area of the Codrilla A ML. CHPP waste will be disposed of to a conventional facility, see **Figure 2**. The product coal will be trucked via a purpose built haul road (Codrilla B) to the existing Moorvale Mine rail loadout facility area for loading to coal trains and transport to Dalrymple Bay Coal Terminal (DBCT) for export.

The key activities associated with the operations will include:

- Clearing of vegetation (primarily pasture areas);
- Topsoil recovery and stockpiling;
- Overburden blasting;
- Overburden removal and dumping;
- Coal mining and stockpiling;
- ROM coal processing;
- Transport of product coal to Moorvale Mine rail loadout facility;
- Railing product from Moorvale Mine to DBCT;
- Shipping product coal to overseas export markets; and
- Progressive rehabilitation of disturbed areas.

In the order of 2,030ha is expected to be disturbed by the project footprint, including the following areas: the open cut pit, out of pit overburden dumps, haul road to Moorvale ML (or Olive Downs haul road ML), operational roads, CHPP, workshop, offices, water management infrastructure, and other infrastructure. The disturbance processes associated with these areas and the general operations include: vegetation clearing and topsoil stripping ahead of mining, overburden dumping and infrastructure development.

Vegetation Clearing

Clearing of pastoral grasses will be required ahead of topsoil stripping for the bulk of the mine areas, overburden dumps and infrastructure on Codrilla A. Clearing of remnant vegetation will be required ahead of topsoil stripping for areas of the mine adjacent to Devlin Creek, areas at either end of the potential diversion of Devlin Creek and along the path of the various Codrilla B haul road options. Flora studies are currently in progress and will involve the ground truthing of the remnant vegetation of the project area.

Using the Department of Environment and Resource Management (DERM) regional ecosystem description database and associated mapping data the proposed remnant vegetation clearing statistics have been calculated and are shown in **Table 1**. As planning progresses, opportunities for reducing the area of remnant vegetation clearing will be continuously assessed and consequently the values in **Table 1** are likely to represent an upper limit for vegetation clearing. It is anticipated that the majority of clearing will be completed during construction and early stages of operation. Clearing activities will be undertaken using bulldozers, with cleared vegetation piled up outside the footprint of the immediate area required for surface activities.

Table 1: Potential Disturbance of Mapped Regional Ecosystems

	Regional Ecosystem Status			Total
	No Concern	Of Concern	Endangered	
Codrilla A Mine area	1.6	13.7	11.4	26.7
Codrilla B Northern Option 1 (Boundary) (BN1)	19.3	13.1	20.0	52.4
Codrilla B Northern Option 2 (Environmental) (BN2)	32.4	11.5	2.0	45.9
Codrilla B Southern Option	0	0	0.5	0.5
Total Codrilla A + Codrilla BN1	20.9	26.8	31.4	**79.1**
Total Codrilla A + Codrilla BN2	34.0	25.2	13.4	**72.6**
Total Codrilla A + Codrilla BS	1.6	13.7	11.9	**27.2**

Topsoil Stripping

Following vegetation clearing topsoil will be recovered using bulldozers, scrapers, loaders and trucks. Topsoil will either be directly used on rehabilitation or stockpiled for later use if no areas for rehabilitation are available at the time of stripping.

Overburden Removal

Where overburden is not sufficiently weathered to facilitate free digging it will be blasted to enable machinery to excavate the material. Blasting will utilise conventional techniques applied within the mining industry. Overburden will be removed using conventional truck shovel methods, however alternative waste removal options are being considered, eg in pit crushing and conveying systems. Initially excavated overburden will be placed in out of pit dumps, then as sufficient room becomes available, overburden will be dumped in mined out areas of the pit. Overburden dumps will be geotechnically designed to ensure that the final landform is stable. Where it is physically and chemically suitable, overburden will be utilised in the construction of associated infrastructure such as roads, waste storage facilities and water management structures.

Coal Recovery and Stockpiling

Coal will be recovered from the mine following exposure by the overburden removal process. Once exposed, coal will be loaded by excavator or loader into trucks for transport to the ROM coal stockpile adjacent to the CHPP. Alternatively, the coal may be stockpiled at an interim ROM stockpile for later reloading and transport to the CHPP. Blasting of the coal may be required to assist in the recovery process.

Coal Processing

ROM coal will be processed using a conventional CHPP facility located on the Codrilla A ML. Fine reject material (tailings) and coarse reject material resulting from the processing of the ROM coal will be transported to a purpose built storage facility located on the Codrilla A ML.

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ROM coal will be processed using a conventional CHPP facility located on the Codrilla A ML. Fine reject material (tailings) and coarse reject material resulting from the processing of the ROM coal will be transported to a purpose built storage facility located on the Codrilla A ML.

The method of process waste disposal remains as yet undetermined, however one of, or a combination of the following methods is expected to be adopted:

- Fine tailings slurry and Coarse Reject disposed of separately;
- Fine tailings slurry and Coarse Reject combined and disposed of as co-disposal; and or
- Fine tailings slurry dried and disposed of combined with, or separately to coarse reject.

Railing

Processed coal will be stockpiled adjacent to the CHPP on the Codrilla A ML. The processed coal will be loaded to road trains (nominally 200 tonne triple configuration) and transported to the Moorvale rail loadout facility via the purpose built private haulroad located on Codrilla B ML. The Codrilla product coal will be stockpiled at the Moorvale Mine load out facility for transfer onto trains and transport to DBCT. All infrastructure for the loading and railing of the Codrilla project coal is currently in place on the Moorvale ML and apart from the addition of a coal rehandling and product stockpile area, no additional capacity or infrastructure is expected to be required. Rail and port capacity to accommodate the Codrilla project coal has been secured within the portfolio of companies related to the BB Coal JV.

2.3 Site Infrastructure Demands

On site infrastructure will be constructed to service the requirements of the operation, including:

- CHPP;
- Co-disposal;
- Workshop;
- Washbay;
- Offices;
- Warehouse;
- Hydrocarbon storage;
- Roads for access and coal haulage;
- Coal stockpile facilities
- Power Supply infrastructure;

- Raw Water supply and storage infrastructure for delivery of up to approximately 2,000 mega litres per annum of raw water from the Burdekin Falls supply system;
- Water management structures;
- Sewage treatment plant; and
- Water treatment plant.

The project will be supported by existing regional infrastructure including:

- Water supply from the Burdekin Falls supply system to nearby mines;
- State electricity grid;
- Rail and port facilities;
- State and local road network; and
- Accommodation facilities in the area, including Macarthur Coal owned single person quarters located adjacent to the Moorvale Mine.

2.4 Land Tenure

Mining Tenure

The Codrilla A ML will be wholly located within Exploration Permit Coal (EPC) 676 as the prerequisite tenure. Codrilla B Northern options (both) would be located within EPC676, EPC1044, EPC1146 and EPC649. Codrilla B Southern option would be located within EPC676 and EPC649 and may also cross small sections of EPC952 and EPC1146. Access for the purposes of conducting the necessary studies for the EIS will be via a combination of EPC access agreements and through landowner consent and negotiations.

ML70290 is the Moorvale Coal Mine ML that Codrilla product coal will be transported to for stockpiling and train loadout. Should either of the northern haul road options be selected ML70290 will contain the western section of the haul road from Codrilla. Should the southern haul road option be selected, ML70355 which covers the Olive Downs Coal Mine haul road, will be affected as product coal from Codrilla is delivered to ML70290 via that route. **Table 2** details the Mining tenure relative to the project and **Figure 2** shows the project relative to the surrounding mining tenure.

Table 2: EPC Tenure affected by the Codrilla Project

Codrilla Project	EPCs	Holder	Related to Proponents
Codrilla A	676	BB Coal JV	Yes
Codrilla B Southern Haul road Option	676 952 1146	BB Coal JV Qld Coal Resources Qld Coal Resources	Yes No No

	649	CMJV	Yes
Codrilla B – Northern Haul road Options 1 & 2	676 1044 1146 649	BB Coal JV Burt Terrence John Qld Coal Resources CMJV	Yes No No Yes

Petroleum Tenure

Two Exploration permits for petroleum (EPP) tenures are affected by the project. EPP364 is held by Arrow Pty Ltd and EPP759 is held by Pure Energy Resources Pty Ltd, see **Figure 2**.

Background tenure

Background tenure affected by and adjacent to the project are detailed in **Table 3** and shown on **Figure 3**.

Table 3: Real Property Descriptions for Proposed Codrilla Project

Property Name	Approximate area affected by Codrilla Project (Hectares)	Affected by	Real Property Description
Codrilla	4239 60 60	Codrilla A Codrilla B Nth 1 Codrilla B Nth 2	Lot 16 on Plan RP845112
20 Mile	591 99.6	Codrilla A Codrilla B Sth	Lot 5 on Plan SP113322
Devlin Creek	117.6	Codrilla B Sth	Lot 1 on Plan RP848589
Mavis Downs	12	Codrilla B Sth	Lot 5 on Plan RP866478
Daunia	0*	Codrilla B Sth	Lot 4 on Plan RP894192
Bundarra	161 168	Codrilla B Nth 1 Codrilla B Nth 2	Lot 20 on Plan KL168
Fitzroy Development Road	Included in the Codrilla Property figures (approx 59Ha)	Codrilla A	N/A
Road unnamed	Included in the Devlin Creek Property figures (1.2Ha)	Codrilla B Sth	N/A

*Areas may vary depending on alignment options

2.5 Alternatives Considered

Alternatives to the proposed open cut coal mine development have been considered including:

- Do not develop the defined resource;
- Project delay; and
- Alternate mining technologies.

Do Not Develop the Resource

Demand for PCI and thermal coal is currently high with international steal making markets expected to remain strong over the next decade. The Project will assist in the supply of the PCI coal required by the global steel making industry. The thermal products are in demand by overseas power plant operators. With strong global competition for supply of coal to world markets, should Queensland- based projects not progress the effects may include:

- Loss of direct and indirect employment opportunities;
- Loss of potential government revenue resulting from royalties; and
- Loss of international customer confidence in the ability of Queensland to provide reliable future coal supplies through ongoing development, and consequent loss of such customers, which may result in a downturn to Queensland's entire export coal industry and multiple flow on economic effects.

The "do not develop the resource" alternative would be inconsistent with Guiding Principles Four and Five of the National Strategy for Ecologically Sustainable Development.

Project Delay

Similar outcomes apply to this alternative as apply to the "do not develop the resource" alternative.

Alternative Technologies

The coal resource identified is most suited to the selected method of mining, being an open cut truck and shovel operation. Other open cut methods and underground methods are not economic alternatives for mining the deposit. However, as part of the project feasibility, planning and assessment process alternatives will be considered for various components of the operation, including but not limited to: in pit waste crushing and conveying system, transport routes, transport methods and power generation options.

2.6 Environmentally Relevant Activities

As part of the proposed mine activities the following Environmentally Relevant Activities (ERAs), as defined by the EP Act, will be undertaken on site.

- Level 1 Non Code Compliant Mining Activity;
- 8 - Chemical Storage;
- 63 - Sewage Treatment; and
- 56 - Regulated Waste Storage.

3. COMMUNITY CONSULTATION

3.1 General

Initially, the consultation process for the Project will focus on informing the community and stakeholders about the Project background and identifying the potential social, economic and environmental issues associated with the development. Feedback from the consultation process will be utilised to ensure that the mine planning and technical studies associated with the EIS address issues of concern to the community and stakeholders.

During the EIS process, the various stakeholders will require differing levels of detail on the Project and regulatory process.Consultation approach with stakeholders will include a combination of:

- One on one meetings;
- Public forums;
- Public notices and newsletters; and
- Fact sheets.

3.2 Affected and Interested Parties

In accordance with the requirements of the EP Act, Interested and Affected Parties have been identified and their contact details provided to the DERM.

4. EXISTING ENVIRONMENT, POTENTIAL IMPACTS AND ENVIRONMENTAL MANAGEMENT STRATEGIES

4.1 General

Coal mining activities in the Bowen Basin have been significant for the past 40 years. Consequently, environmental impacts are well understood and sound management strategies have been developed. As the proposed operations at this Project will be relatively standard for open cut mining, it is with a high level of confidence that the expected impacts and success of proposed management strategies can be predicted.

A commitment to continuous improvement will form the basis of environmental management systems utilised on site to minimise impacts to values and enhance values, wherever possible. This will be achieved through focusing on regular monitoring, auditing, review and reporting (both internal and external) providing the avenue for compliance, transparency and identification of potential improvements.

4.2 Land Resources

The geology of most of the project area consists of; Permian, sedimentary rock comprised of sandstone, siltstone and carbonaceous shale overlaid by Cainozoic unconsolidated sediments. The geology varies along the northern haul road routes and in addition to the geology described above would pass through; Permian, sandstone, conglomerate, mudstone carbonaceous shale, coal and cherty tuff geology with undefined cover material (NRMW ITRM June 2009). Assessment of the soil and overburden materials within the project area will be conducted.

The topography of the project area is typically gently undulating between 1 and 4% relief.

The primary drainage feature of the area is Devlin Creek which is further discussed below in Surface Water.

The existing land use in the area surrounding the project is primarily cattle grazing which along with coal mining is the dominant land use in the Bowen Basin region. The natural environment is highly disturbed as a result of historical clearing and grazing activities. Declared weeds are known to occur throughout the general area including Parthenium (*Parthenium hysterophorus*) and Harisia Cactus (*Eriocereus spp*), initial inspections of the project areas indicate weed infestation is not significant. There is little remaining remnant vegetation within the project Codrilla A area.

Of the remaining remnant vegetation the most significant areas are associated with Devlin Creek riparian zone, a remaining stand in the north east of the proposed Codrilla A area, surrounding a farm dam and the northern haul road routes. Much of the remnant vegetation is mapped as Endangered Regional Ecosystem by the EPA. **Table 4** details all of the Regional Ecosystems represented by the EPA mapping within the proposed boundaries of the MLs. **Figure 4** shows the EPA Mapped Regional Ecosystems. A vegetation assessment will be conducted on the proposed ML areas of the project.

Table 4: Regional Ecosystems Mapped Within Proposed MLs

Regional Ecosystem Number	Biodiversity Status	Brief Description (REDD)
11.3.2	Of Concern	Eucalyptus populnea woodland on alluvial plains.
11.4.9	Endangered	Acacia harpophylla shrubby open forest to woodland with Terminalia oblongata on Cainozoic clay plains.
11.5.3	No Concern	Eucalyptus populnea and/or E. melanophloia and/or Corymbia clarksoniana on Cainozoic sand plains/remnant surfaces.
11.3.1	Endangered	Acacia harpophylla and/or Casuarina cristata open forest on alluvial plains.
11.3.25	Of Concern	Eucalyptus tereticornis or E. camaldulensis woodland fringing drainage lines.
11.3.27	Of Concern	Freshwater wetlands. (Farm Dam).
11.4.9	Endangered	Acacia harpophylla shrubby open forest to woodland with Terminalia oblongata on Cainozoic plains, including weathered basalt.
11.5.2	No Concern	Eucalyptus crebra, Corymbia spp., with E. moluccana on lower slopes of Cainozoic sand plains/remnant surfaces
11.5.9c	No Concern	Eucalyptus crebra and other Eucalyptus spp. and Corymbia spp. woodland on Cainozoic sand plains/remnant surfaces. Plateaus and broad crests.
11.9.9	No Concern	Eucalyptus crebra woodland on fine-grained sedimentary rocks
11.11.1	No Concern	Eucalyptus crebra ± Acacia rhodoxylon woodland on old sedimentary rocks with varying degrees of metamorphism and folding

Potential impacts to the Land resources of the area are:

- Alteration of the general topography in the area surrounding the pit through creation of a final void and elevated landforms resulting from mining and overburden dumping operations;

- Land suitability changes, land use will shift from grazing to mining in the short term (during the period that the mine is active) and post mining would be expected to consist of a combination of grazing and native ecosystem with a focus on nature conservation;
- Remnant Vegetation Clearing including Mapped Endangered Regional Ecosystems (see **Table 1**);
- Soil erosion; and
- Land contamination by chemicals and hydrocarbons.

Land Management Strategies will include:

- Mine planning that considers the optimal backfilling of final voids;
- Geotechnical design of pit and overburden dumps to ensure landform stability is a key underlying principal.
- Scheduling of clearing activities to avoid exposed areas;
- Utilisation of erosion control measures, including incorporation of structures into rehabilitation designs where required;
- Minimising clearing of remnant vegetation;
- Recovery and reuse of topsoil resources;
- Progressive rehabilitation of disturbed areas, consistent with post mining land use objectives which would be expected to include a combination of rehabilitation to Grazing and native ecosystem inclusive of methods to enhance biodiversity values;
- Pest and weed management;
- Planning to ensure the final landform remains safe and does not endanger humans, wildlife or livestock;
- Appropriately designed (in accordance with Australian Standards) chemical and hydrocarbon storage facilities; and
- Tacking of chemicals, hydrocarbons and wastes.

The above strategies will be achieved through detailed planning and procedural control.

4.3 Fauna

Fauna of the Project area is expected to be relatively typical of the region and include a variety of bird, mammal, reptile and amphibian species. Of the threatened fauna species listed as may occur or likely to occur in the Matters of National Environmental Significance Report for the Codrilla project, the Squatter Pigeon is expected to be present as it is known to be common in the area. The fauna survey will also focus on other species identified by the Matters of National Environmental Significance Report and their potential habitat.

Pest fauna known to occur in the region include wild dogs, feral cats, feral pigs, the house mouse, rabbits and cane toads.

Potential impacts to the Land resources of the area include:

- Direct loss of habitat through vegetation clearing and physical alteration; and
- Alteration of habitat through a contaminant discharge or emissions.

Fauna Management Strategies will include:

- Planning activities to minimise clearing of potential habitat;
- Inclusion of nature conservation and biodiversity considerations in the progressive rehabilitation strategy;
- Pest and weed management;
- Utilisation of appropriate water management to ensure minimisation of discharge of contaminants to the surrounding aquatic environment.
- Minimising clearing of remnant vegetation; and
- Planning to ensure the final landform remains safe and does not endanger humans, wildlife or livestock; and
- Appropriately designed (in accordance with Australian Standards) chemical and hydrocarbon storage facilities.

4.4 Surface Water

The Project area naturally drains via tributaries to Devlin Creek which flows from west to east through the Project area, refer to **Figure 2**. The Project lies 25km to the south east of the head of the Devlin Creek Catchment area. Devlin Creek flows to the Isaac River, with the confluence approximately 38km to the south east of the proposed operations. The Isaac River flows to the Fitzroy River which drains the Fitzroy Basin into the Pacific Ocean, south of Rockhampton. The Fitzroy Basin is Australia's second largest water catchment area, being 142,600km^2 in size (Loch & Rolfe).

Rainfall of the region is seasonal, with a distinct 'wet' period throughout the summer months (December to April) which is when most flow events occur in the local watercourses. The average annual rainfall for Moranbah (the nearest meteorological station at 57km west) is 592.4mm (averaged over 35 years). Devlin Creek is ephemeral and predominantly dry for most of the year with only some areas of semi-permanent ponding remaining following flow events. The Isaac River is also predominantly dry for most of the year, although it retains some permanent waterholes during dry periods. Stock watering is the most common use of the ponded water remaining in these watercourses.

As surface water studies are yet to be undertaken the available water quality data is limited. Some data has been sourced from two local stream gauges operated by the Department of

Natural Resources and Water (DNRW). The gauging stations are located on Devlin Creek approximately 30km downstream of the project and the Isaac River approximately 70km upstream of the confluence with Devlin Creek (20km south west of the project). The data are summarised in **Table 5** and **Table 6** (NR&M 2008).

Table 5: Surface Water Quality – Devlin Creek 30km downstream of the project (Gauging Station 130214A - 1971 to 1988)

Variable	*n*	Minimum	Median	Maximum	Mean	SD
Conductivity @ 25C (uS/cm)	21	57	155	270	152	57.0
Turbidity (NTU)	4	40	-	100	85	30
pH (pH units)	21	6.4	7.2	9.2	7.4	0.59
Total Alkalinity as $CaCO_3$	17	21	57	80	57	15.3
Total Diss. Solids (mg/L)	18	34	97	140	97.4	27.1
Total Suspended Solids (mg/L)	14	9	64	690	125.5	178.5
Nitrate as NO_3 (mg/L)	9	0.2	-	10	2.5	3.0

Source: NR&W website – Devlin Creek _Bombandy Monitoring Station - 10 November 2008.

Table 6: Surface Water Quality - Isaac River 70km Upstream of confluence with Devlin Creek (Gauging Station 130410A - 1964 to 2000)

Variable	*n*	Minimum	Median	Maximum	Mean	SD
Conductivity @ 25C (uS/cm)	43	78.8	241	1,470	311.4	267.4
Turbidity (NTU)	14	4.00	46.00	5,192	737.1	1,728.4
pH (pH units)	44	6.6	7.6	8.5	7.7	0.45
Total Alkalinity as $CaCO_3$	43	22.1	78	192	78.5	38.4
Total Diss. Solids (mg/L)	41	47.4	151.8	842	186.3	148.9
Total Suspended Solids (mg/L)	40	5.0	127.5	3,605	637.3	1,018.3
Nitrate as NO_3 (mg/L)	28	0.3	1.97	18	2.6	3.2

Source: NR&W website - Isaac River_Deverill Monitoring Station - 10 November 2008.

As can be seen from **Tables 5** and **6** there is significant variability over the data, which is fairly typical of ephemeral systems in the central Bowen Basin. This variability reflects a number of

factors most importantly being seasonal changes in flow, high rates of evaporation, and differences in local geological conditions and land use.

Potential impacts to the Surface Water resources are:

- Alteration of the natural flow regime; and
- Physical and chemical alteration to the water quality of the associated creek and river systems through contaminated runoff and or discharge of contaminated water. .

Surface Water Management Strategies will include:

- Design of water management systems to ensure separation of clean and dirty water;
- Retention of dirty water on site and reuse in dust suppression activities;
- Treatment of potentially sediment laden runoff through sediment dams;
- Development of a strict controlled release system that will account for water quality objectives and background conditions;
- Utilisation of erosion control measures;
- Development of an appropriate waste management system that ensures containment of potential contaminants;
- Appropriately designed (in accordance with Australian Standards) chemical and hydrocarbon storage facilities;
- Tacking of chemicals, hydrocarbons and wastes; and
- Implementation of a detailed water monitoring and reporting program.

4.5 Groundwater

Groundwater in the area of the project is typically associated with alluvial sediments adjacent to the watercourses, the underlying coal seams and from other geological aquifers in the profile. There are no registered groundwater bores within the project area and consequently data is unavailable. A groundwater survey will be undertaken as part of the baseline studies which will include further searching for registered bores located near to the project area.

It is possible that Groundwater associated with alluvial sediments adjacent to Devlin Creek is used by some graziers in the area for stock watering as quality is generally suitable for that purpose. Non alluvial groundwater in the region is typically of poorer quality, and is generally not exploited for any purpose due primarily to salinity.

Potential impacts to the groundwater resources are:

- Alteration of the natural groundwater regime such as "draw down"; and
- Contamination of surrounding aquifers through uncontrolled discharge;

Environmental Management Strategies will include:

- Development of an appropriate waste management system that ensures containment of potential contaminants;
- Appropriately designed (in accordance with Australian Standards) chemical and hydrocarbon storage facilities; and
- Implementation of a groundwater monitoring program.

4.6 Ambient Air, Noise and Vibration

Air quality surrounding the project is typical of a Central Queensland rural setting. The primary air quality impacts are dust generated from cleared areas and general farming activities, exhaust emissions from vehicles using the Fitzroy Development Road and smoke and gasses produced by bushfires and back burning practices. Dust from exposed surfaces and mining activities within the region may also contribute to the air shed of the region.

The Nebo Township is the nearest centre of concentrated population to the project being some 45km to the north, north east.

The ambient noise of the area surrounding the project is likely to be typical of a quiet rural area; with low background sound levels at night and slightly elevated maximums during the day. Primary existing noise sources likely to affect sensitive receptors related to the project are insect noise, wind rustling, birdsong and farming activities (ASK 2002). Incidental noise associated with vehicles using the Fitzroy Development Road, including road trains, will also contribute to the noise character of the project area.

There are between three and six key noise sensitive receptors located within 5km of the project boundary (dependant on the haul road alignment option selected). They are:

- Valkyrie School - approximately 800m from the nearest point of the proposed Codrilla A ML boundary and 1.5km from the nearest point of the proposed operations;
- Regalo Homestead – approximately 2.6km from the nearest point of the proposed Codrilla A ML boundary and 3.4km from proposed operations.
- Codrilla Homestead - located approximately 3km from the nearest proposed Codrilla A ML boundary and 3.7km from proposed operations;
- Devlin Creek Homestead - located approximately 800m from the nearest point of the Codrilla B ML boundary (based on the unlikely southern haul road option being selected);
- Daunia Homestead - located approximately 5km from the nearest point of the Codrilla B ML boundary (based on the unlikely southern haul road option being selected); and
- Mavis Downs Homestead located approximately 3.2km from the nearest point of the Codrilla B ML boundary (based on the unlikely southern haul road option being selected).

Potential impacts to the Air, Noise and Vibration values of the area are:

- Increased dust generated from on site mining, processing and transport activities;
- Increase in emissions of exhaust resulting from machinery used by the project;
- Contribution of additional Greenhouse gasses to the atmosphere from fuel burning and coal methane release;
- Increase in noise by mining, processing and transport activities; and
- Additional vibration resulting from blasting activities associated with the mining process.

Air, Noise and Vibration Management Strategies will include:

- Minimising areas of clearing;
- Active watering of exposed surfaces to suppress dust, particularly those associated with active work areas;
- Participation in the National Greenhouse and Energy Reporting scheme (NGERs);
- Appropriate maintenance of machinery pollution control equipment;
- Installation and maintenance of appropriate mobile and fixed plant noise control measures;
- Detailed blast design to ensure vibration and overpressure (noise) are minimised and comply with statutory criteria;
- Development and maintenance of a complaints management system; and
- Implementation of appropriate air, noise, vibration and greenhouse gas emissions monitoring and reporting programs.

4.7 Waste

Existing conditions in relation to waste reflect the existing land use of grazing and consequently waste impacts on land values are essentially non existent in the area of the proposed mining leases. Therefore, the environmental values relative to waste are the unaffected landscape and diversity of the ecological process surrounding the proposed mine site and the health and wellbeing of the local community.

Potential impacts to the values of the area resulting from waste are:

- Direct impacts on native wildlife potentially resulting in death;
- Impacts on native habitat which may diminish the value of that habitat;
- Impacts on surrounding landholders through contamination of land and water resources;
- Impacts on air quality through odour emissions; and
- Reduction in visual amenity of surrounding area.

Waste Management Strategies will include:

- Separation of wastes into defined streams for appropriate treatment within the hierarchy of management (avoid, reduce, reuse, recycle, waste to energy, dispose);
- Designated storage areas on site;
- Use of existing disposal systems;
- Utilisation of licensed waste management contractors and recycling and disposal facilities; and
- Waste tracking and reporting.

4.8 Cultural Heritage

Aboriginal Cultural Heritage values in the region are becoming increasingly evident as inspection and survey work is undertaken by Aboriginal Parties in accordance with the *Aboriginal Cultural Heritage Act 2003* (ACH Act). It is anticipated that the project site may contain materials and areas of Cultural Heritage value. There is also potential for European Cultural Heritage values to be associated with the project, whilst these are not presently evident they will be investigated during the assessment process.

Potential impacts to the Cultural Heritage values of the area are:

- Damage to culturally significant items;
- Loss of items of cultural significance; and
- Damage to, or loss of, significant places.

Cultural Heritage Management Strategies will include:

- Engagement of the relevant Aboriginal Party to undertake a Cultural Heritage Survey of the project area;
- Development of a Cultural Heritage Management Plan prior to mining activities commencing; and
- Appropriate management, monitoring and reporting practices will be employed in consultation with the relevant Aboriginal Party.

4.9 Socio-economic

The Project is located within the Isaac Regional Council local government area. The area within a 40 km radius of the project contains at least six operational mines. There are many additional mines and mining leases outside the 40km radius. Therefore, the region is substantially supported by mining industry which provides direct employment and flow on employment in support industries. Agriculture, primarily grazing, is the other dominant industry within the region.

Employees within the mining industry surrounding the project are typically accommodated in houses in the nearby townships of Nebo (45km north, north east of the project) or Moranbah (57km west of the project) or reside in "camp style" accommodation which is located in Nebo, Moranbah and Coppabella. Nebo and Moranbah also serve as business centres for the surrounding agricultural industry.

Mackay (120km north east of the project) is the nearest major service centre to the region supplying substantial industrial support to the mining industry. Many employees of the mining industry reside in Mackay during non working periods commuting to the mine sites . The major coal export terminals of Hay Point and Dalrymple Bay are located approximately 19km south east of Mackay.

Potential impacts to the social values of the area are:

- Increase in traffic volume on local roads;
- Increased demand on accommodation resources;
- Reduced amenity from air, noise and visual impacts;
- Increased state royalty and tax revenue;
- Increased business opportunities to service mine activities and employees; and
- Increased employment opportunities (approximately 240 operational positions).

Social Management Strategies will include;

- A community consultation program which will be implemented during the assessment phase and will continue during operations; and
- Development and maintenance of a complaints management system

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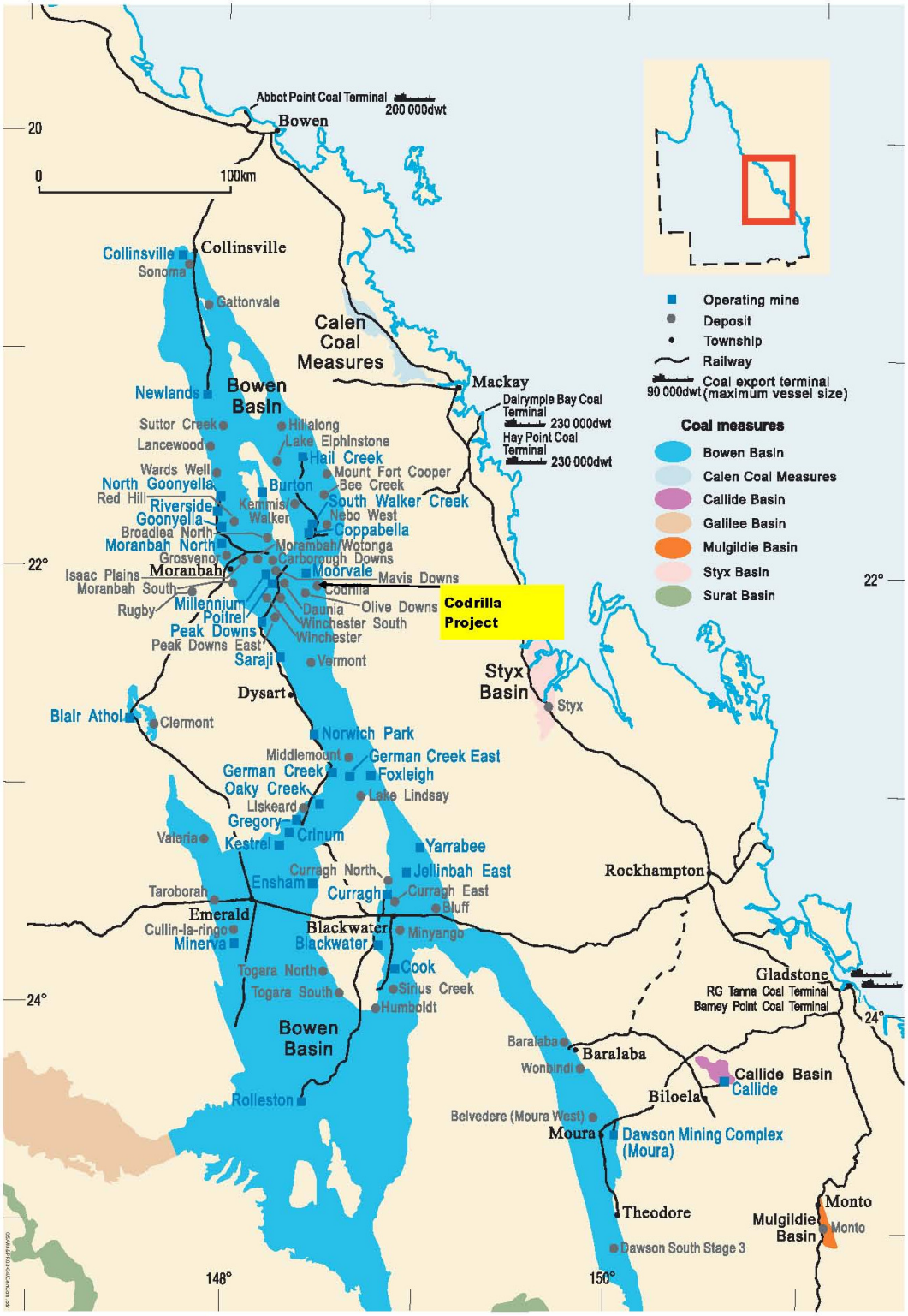
Central Queensland coal



NORTH

Map Adapted From NRMW Document
Queensland's World-class Coals (December 2005)
www.nrm.qld.gov.au/mines

McCollum Environmental Management Services

Figure 1
Codrilla Project
Regional Location

Author: McCollum Environmental - MEMS12	Date: 03 June 2009	Checked: PT
Scale: Not to Scale	Projection: N\A	
Plan:M:\GIS\Plans\2009\Codrilla\090603MP_Fig 1 for IAS		

McCollum Environmental

ML70291
ML70319
EPC1146
QUEENSLAND COAL
RESOURCES PTY LTD
ML70290
Moorvale Mine
Haulroad Northern Option 2
EPC1044
BURT TERRANCE JOHN
7565000m
Haulroad Northern Option 1
ML70355
Olive Downs Haulroad
7560000m
EPC649
COPPABELLA COAL PTY LTD
EPP759
DEVLIN CREEK
EPP364
Haulroad Southern Option
Offices Workshop
and Hardstand
Raw Water
Dam
Codisposal
CHPP and
Coal Stockpiles
Codrilla Mine
Final Landform
Final Landform
Fitzroy Developmental Rd
7555000m
ML70354
Olive Downs
Mine
EPC676
BB INTERESTS PTY LTD
640000m
645000m
650000m
655000m
660000m
665000m
670000m
©2007

- Proposed ML Boundary
- Haulroad Options
- Existing MLs
- Exploration Permit Coal
- Exploration Permit Petroleum
- Roads

NORTH

2 0 2 4 6
kilometres

McCollum Environmental

McCollum Environmental Management Services

Figure 2
Codrilla Project
Overview, Surrounding Mining and PetroleumTenure

Author: McCollum Environmental - MEMS11	Date: 06 June 2009	Checked: NT
Scale: 1: 80,000 (A3L)	Projection: MGA94, Zone 55, GDA94	
Plan: M:\GIS\Plans\2009\Codrilla\090603MP_Fig 2 for IAS		

ML70290
Moorvale Mine

Northern Haulroad Option 2 - Env

20KL168
Bundarra

20KL168
Bundarra

7565000m

5RP866478
Mavis Downs

Northern Haulroad Option 1 - Boundary

ML70355
Olive Downs Haulroad

Un-named Road

1RP848589
Devlin Ck

16RP845112
Codrilla

8KL142
Valkyrie School

16RP845112
Codrilla

17KL197
Reserve

7560000m

4RP894192
Daunia

22KL197
Valkyrie School

1RP845112
Weamber

RP894192

4RP894192
Daunia

Annandale Road

1RP848589
Devlin Ck

Southern Haulroad Option

5SP113322
20 Mile

DEVLIN CREEK

Fitzroy Development Road

Proposed ML
Codrilla A

3RP839291
Weona

1RP848589
Devlin Ck

7555000m

ML70354
Olive Downs
Mine

7KL108
Regalo

640000m

645000m

650000m

655000m

660000m

665000m

670000m

11KL135
Iffly

3KL104

Watercourse

Haulroad Options

Proposed ML Boundary

Existing MLs

Property Boundaries

NORTH

2 0 2 4 6

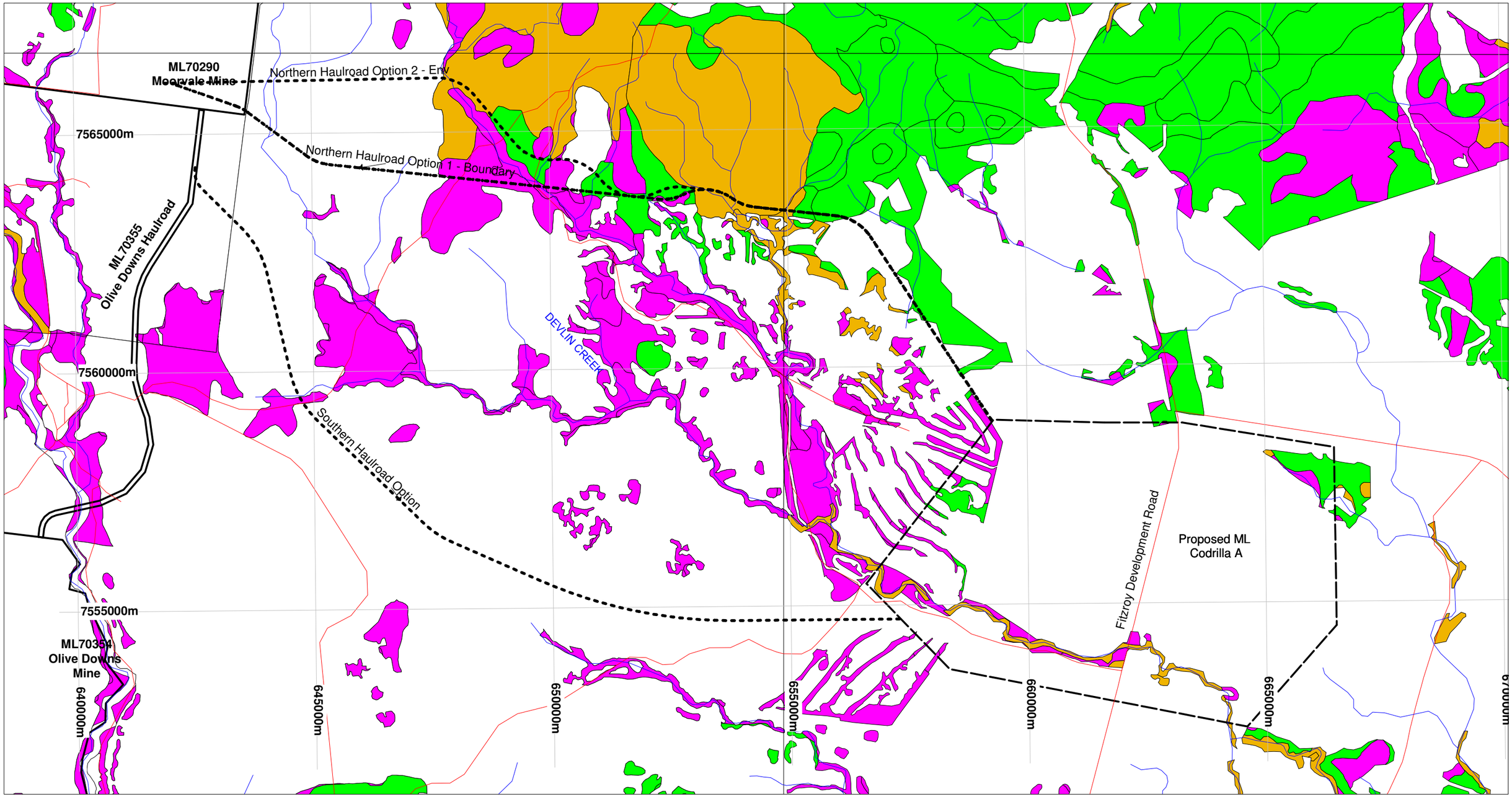
kilometres

McCollum Environmental Management Services

Figure 3
Codrilla Project
Background Tenure

McCollum Environmental

Author: McCollum Environmental - MEMS11	Date: 06 June 2009	Checked: NT
Scale: 1: 80,000 (A3L)	Projection: MGA94, Zone 55, GDA94	
Plan: M:\GIS\Plans\2009\Codrilla\090603MP_Fig 3 for IAS		



Drainage

Haulroad Options

Proposed ML Codrilla A

Existing MLs

Mapped Regional Ecosystems Biodiversity Status

- Non Remnant
- Endangered
- Not of Concern
- Of Concern

NORTH

2 0 2 4 6

kilometres

McCollum Environmental

McCollum Environmental Management Services

Figure 4
Codrilla Project
Mapped Regional Ecosystems (Biodiversity Status)

Author: McCollum Environmental - MEMS11	Date: 06 June 2009	Checked: NT
Scale: 1: 80,000 (A3L)	Projection: MGA94, Zone 55, GDA94	
Plan: M:\GIS\Plans\2009\Codrilla\090603MP_Fig 4 for IAS		