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**Adani Mining Pty Ltd
Environmental Management Plan
Exploration Permit for Coal (EPC) 1690**

September 2013

Adani Mining Pty Ltd

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1. INTRODUCTION

Adani Mining Pty Ltd (Adani) is the holder of Exploration Permit for Coal 1690 (EPC1690). EPC1690 currently operates under Level 1 Non-Code Compliant Environmental Authority (EA) MIN102643011. Due to recent changes in the exploration program on EPC1690, Adani seeks an amendment to this environmental authority (EA). This Environmental Management Plan (EMP) has been amended in support of the EA amendment application of 16 September 2013 for additional exploration activities. The additional activities consist of:

- An expanded 3D seismic survey program;
- The addition of access tracks over parts of EPC1690;
- Relocation of approved drill pads;
- The addition of Line of Oxidation (LOX) bore holes over parts of EPC1690; and
- A number of administrative amendments as a result of a report on the outcomes of a compliance inspection from the Department of Environment and Heritage Protection (DEHP) in August 2013..

This EMP describes the environmental values likely to be affected by the exploration activities and the potential adverse and beneficial impacts of the activities on the environmental values. For each environmental value, commitments for ensure its protection are proposed, including environmental protection objectives, standards, indicators and control strategies. If there is any inconsistency between a condition referred to in this Environmental Management Plan and a condition in the approved Environmental Authority (EA), the EA condition prevails to the extent of the inconsistency.

This EMP does not remove the need to obtain any additional approval for activities that might be required by State and/or Commonwealth legislation. Other legislation that may be triggered includes but is not limited to:

- *Environmental Protection and Biodiversity Conservation Act 1999 (Cwth)*
- *Nature Conservation Act 1992*
- *Vegetation Management Act 1999 Wild Rivers Act 2005*
- *Aboriginal Cultural Heritage Act 2003*
- *Land Protection (Pest and Stock Route Management) Act 2002 Mineral Resources Act 1989*
- *Water Act 2000*
- *Strategic Cropping Land Act 2011*
- *Forestry Act 1959*

This EMP has also been prepared in support of the EA amendment application lodged with DEHP on 16 September 2013. This EMP contains the following mandatory information as requested in the application form:

- A description of the environmental values likely to be affected by the proposed amendment
- Details of any emissions or releases likely to be generated by the proposed amendment
- A description of the risk and likely magnitude of impacts on environmental values
- Details of the management practices proposed to be implemented to prevent or minimise adverse impacts
- Details of how the land the subject of the application will be rehabilitated after each relevant activity ceases

2. DESCRIPTION OF EXPLORATION ACTIVITIES

2.1 Background

EPC1690 is located in the Galilee Basin approximately 250 kilometres (km) north west of Emerald and 220 km south of Charters Towers (Figure 1). Exploration is targeting three main coal seam groups across the Bandanna Formation and Colinlea Sandstone Formation. The long term objective of the exploration program on EPC1690 is to progress to a 60 Million tonnes per annum (Mtpa) product coal open cut and underground coal mine to supply Adani's India based clients.

2.2 Exploration Program

The objective of the exploration program on EPC1690 is to establish a highly detailed understanding of the coal resource within EPC1690 and to gather enough geological information to allow an Australian Joint Ore Reserves Committee (JORC) Coal Resource and Reserves Estimate. The detailed understanding of the coal seams is essential to enable accurate mine design for optimal operational efficiency. The methods employed in the exploration program involve standard exploration techniques used within the Queensland Coal Industry.

The scope of the exploration program and the exploration activities that has been approved under the EA MIN102643011 dated 1 March 2013 is based on the scope and activities described in Version 7 of this EMP. These activities are in various stages of commencement (refer to Section 2.3). An amendment to EA MIN102643011 is now being sought due to changes in the exploration program on EPC1690.

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Figure 1 **Regional Location of EPC1690**

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2.3 Exploration Activities Approved Under EA MIN1026403011, 1 March 2013

Figure 2 to Figure 4 illustrate the approved exploration program on EPC1690 and approved under EA MIN1026403011, dated 1 March 2013.

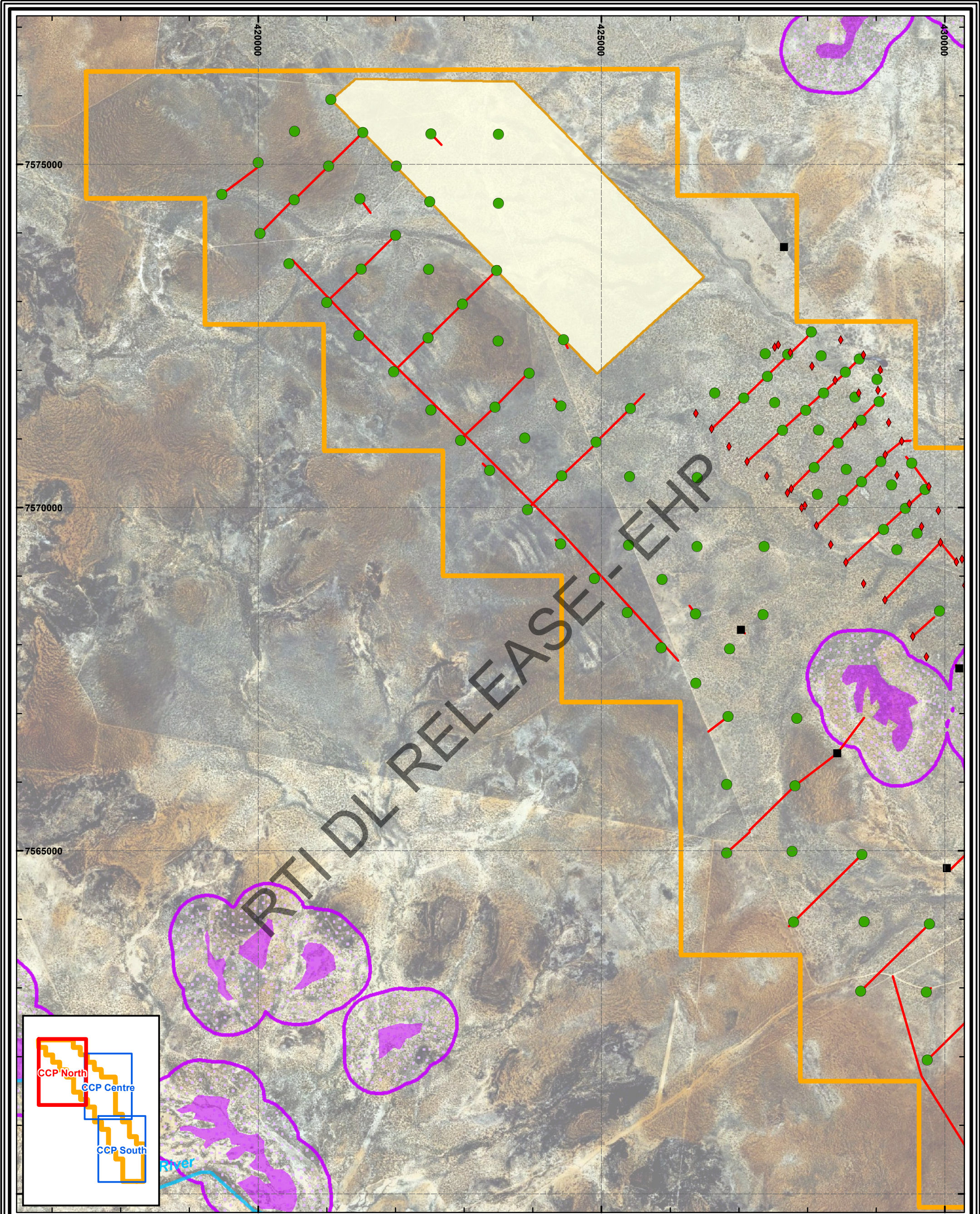
The status of approved activities on EPC1690 is outlined in Table 1 below. A description and management requirements for each activity are defined in Sections 2.10.2 and 2.10.7 respectively.

Table 1 Status of Activities Approved Under EA MIN1026403011, dated 1 March 2013

Activity	Status
<i>Mining Resource Exploration Drilling:</i>	
<ul style="list-style-type: none"> Core drilling for assessing coal seam quality <ul style="list-style-type: none"> Drill pad size 2000 m² Drilling grid spacing 1000 m 	2013 drilling program - ongoing
<ul style="list-style-type: none"> Further geotechnical drilling for the proposed underground and open cut areas <ul style="list-style-type: none"> Shallow drill holes Drill pad size 2000 m² No drilling grid – targeted holes based on data analysis 	2013 drilling program - ongoing
<ul style="list-style-type: none"> Chip hole drilling for structural definition of the coal seams, predominantly in the central potential open cut areas <ul style="list-style-type: none"> Drill pad size 2000 m² Drilling grid spacing 500 m 	2013 drilling program - ongoing
<ul style="list-style-type: none"> LOX holes along the length of the sub-crop zone on the lease <ul style="list-style-type: none"> No drill pad or additional tracks required. Drilled on existing 4.5 m access tracks. Line spacing based on drill lines (350 m). Hole spacing between drill holes determined by findings of the drilling program but should always be greater than 35 metres apart. Typically 3 holes per seam target and we have mostly target 4 seams 	2013 drilling program - ongoing
<ul style="list-style-type: none"> Large diameter holes (200 to 300 mm diameter) for detailed washability programs to give yield curves for potential wash plant design <ul style="list-style-type: none"> Drill pad size 2000 m² No drilling grid – targeted holes based on data analysis 	2013 drilling program - ongoing
<ul style="list-style-type: none"> Seismic survey <ul style="list-style-type: none"> 3D Seismic Survey – approximately 19 km² disturbance consisting of 513 SX lines (4.5 m wide at 35 m spacing) 	2013 drilling program - ongoing
<ul style="list-style-type: none"> Hydrogeological drill sites <ul style="list-style-type: none"> Drill pad size 2000 m² No drilling grid – targeted holes based on data analysis 	Completed 2013
<i>Infrastructure Geotechnical Drilling:</i>	
<ul style="list-style-type: none"> Test pits for assessing soil geotechnical characteristics <ul style="list-style-type: none"> Pad size 150 m² Spacing defined by infrastructure planned locations 	2013 drilling program - ongoing
<ul style="list-style-type: none"> Drilling for assessing soil geotechnical characteristics 	2013 drilling program - ongoing

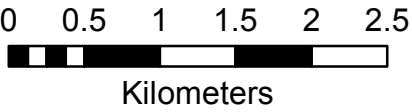
Activity	Status
<ul style="list-style-type: none"> Shallow drill holes No pad required (proposed to be completed on 4 m wide track) Spacing defined by infrastructure planned locations 	
<ul style="list-style-type: none"> Geotechnical California Bearing Ratio (CBR) test location <ul style="list-style-type: none"> Non-invasive "hardness" test May require track development in some cases to access location. 	2013 drilling program - ongoing
<p>To support the exploration activities, the following Environmentally Relevant Activities (ERA's) must be considered as part of the Environmental Authority:</p> <ol style="list-style-type: none"> ERA 63 – Sewage Treatment; and ERA 16 – Extractive and Screening Activities. 	ERA's are being undertaken in accordance with the EA conditions.

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Carmichael Mine Development
Exploration Planning (Indicative)

Page 1 of 3



Legend

- EPC1690 Boundary
- Proposed Track
- Infrastructure TestPit
- Drillhole (large pad)
- LOX site (6.5m track)
- ESA 500m Buffer
- 3D Seismic Study

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GDA94
MGA Zone 55

Sheet No.

2013-02-22_002

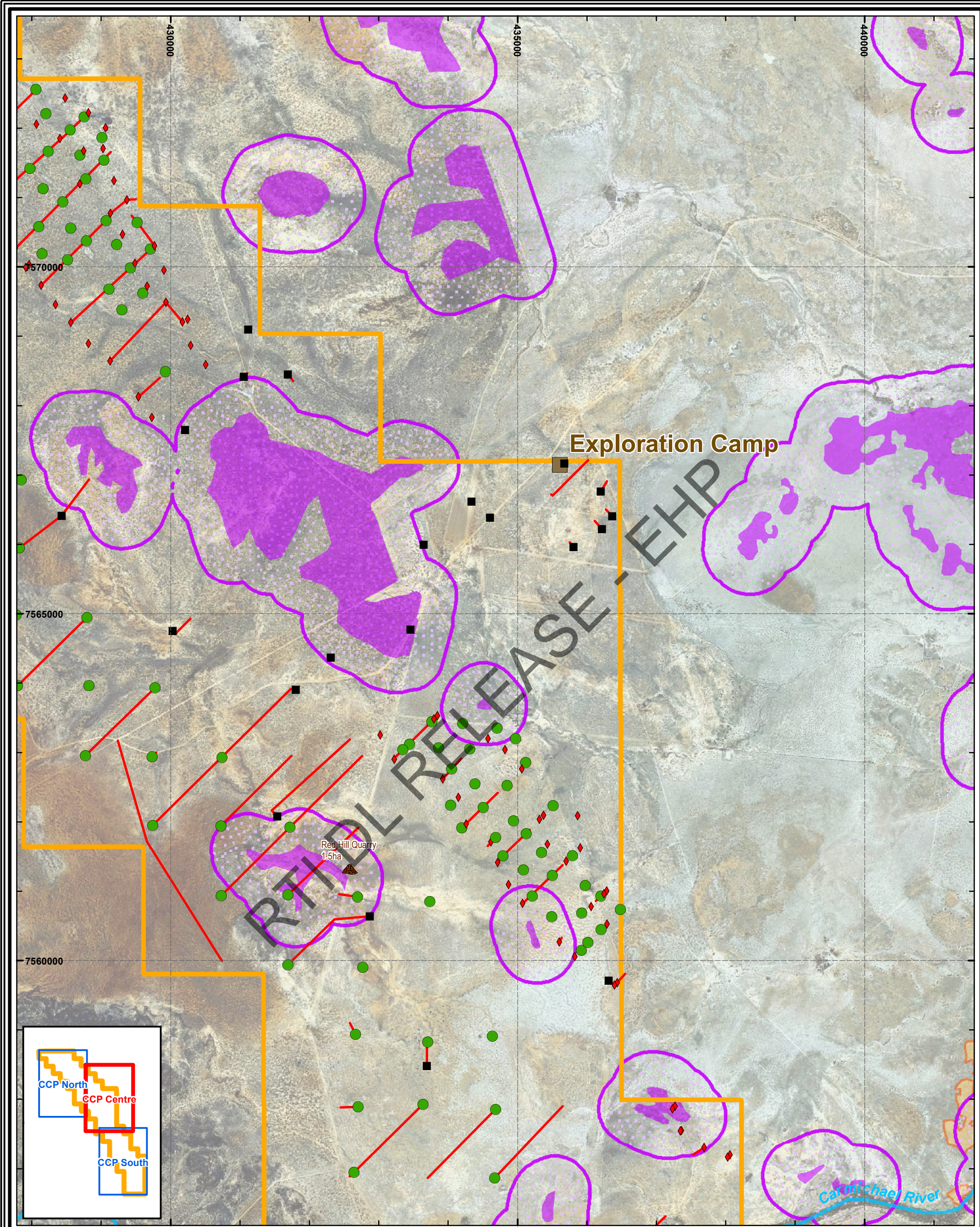
EPC1690
Exploration and
Environmentally
Sensitive Areas

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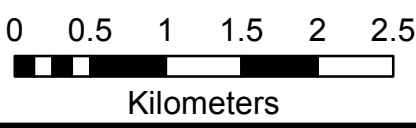
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Carmichael Mine Development
Exploration Planning (Indicative)

Page 2 of 3



Legend

- EPC1690 Boundary
- Proposed Track
- Infrastructure Test Pit
- Drillhole (large pad)
- LOX site (6.5m track)
- Quarry Location
- Endangered RE
- ESA 500m Buffer



EPC1690
Exploration and
Environmentally
Sensitive Areas

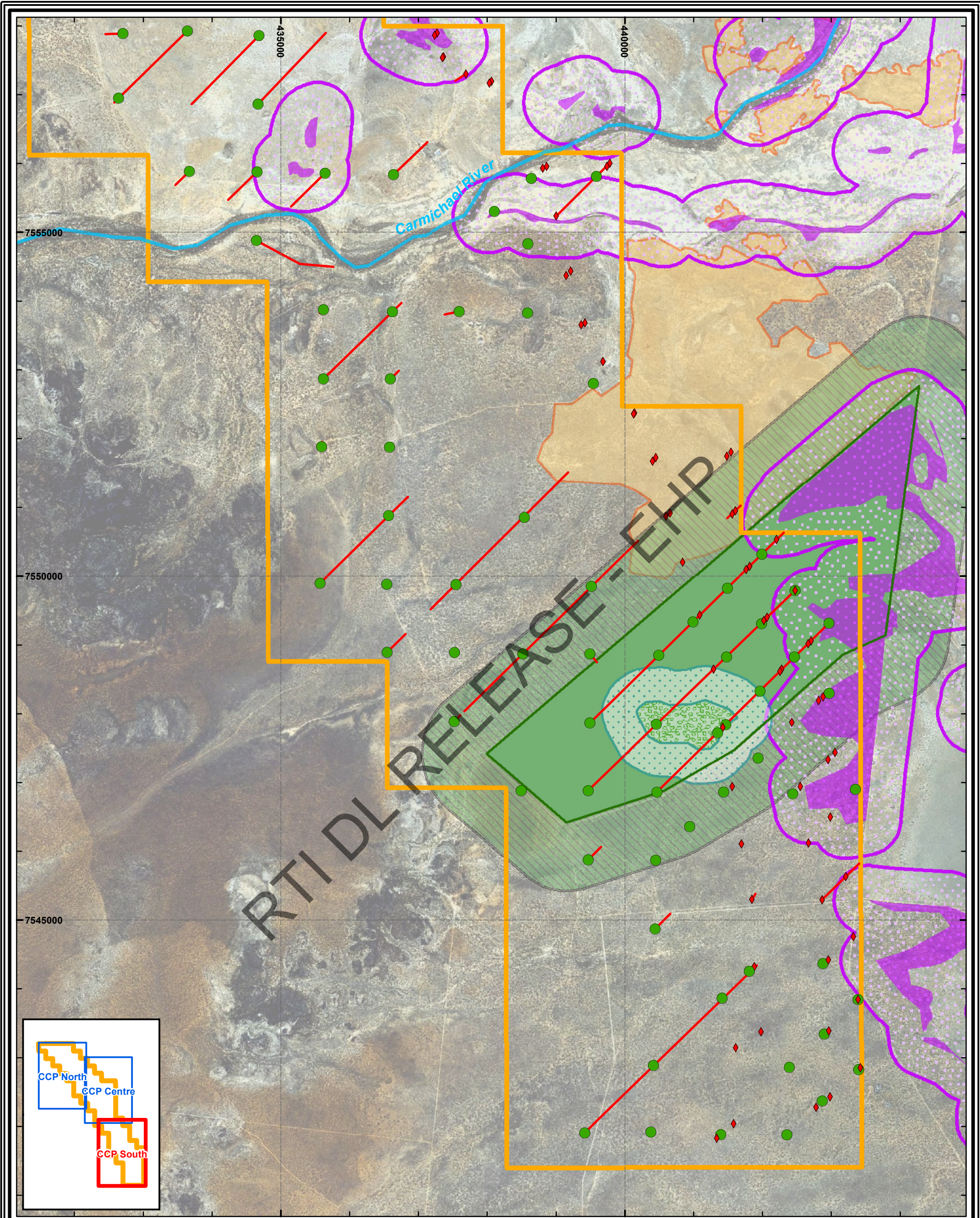
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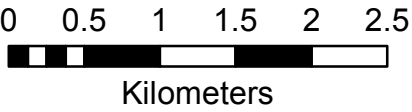
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Carmichael Mine Development Exploration Planning (Indicative)

Page 3 of 3



Legend

- EPC1690 Boundary
- Proposed Track
- Drillhole (large pad)
- LOX site (6.5m track)
- Restoration Area
- Nature Refuge
- Nature Refuge 1km Buffer
- Endangered RE
- ESA 500m Buffer
- May incl. wetlands (1-50%)
- Wetland 500m Buffer

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GDA94
MGA Zone 55

Sheet No.
2013-02-22_002

EPC1690
Exploration and
Environmentally
Sensitive Areas

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Date: 2013-02-22

2.4 Proposed Changes to Exploration Program and Administrative Changes

An amendment to EA MIN102643011 is requested due to a change in the exploration program and some administrative changes. The proposed changes in the exploration program consist of:

- An expanded 3D seismic survey program;
- Relocation of approved drill pads
- The addition of access tracks over parts of EPC1690;
- The addition of Line of Oxidation (LOX) drill holes over parts of EPC1690.

It is important to note that the 3D seismic survey, the creation of access tracks and LOX holes have been approved activities under the EA dated 1 March 2013. The proposed changes relate to numbers and locations associated with these activities only. The proposed change in the location of the drill pads does not result in additional number of drill pads or area of disturbance.

A number of administrative amendments are also requested as a result of a report on the outcomes of a compliance inspection from the Department of Environment and Heritage Protection (DEHP) in August 2013.

2.4.1 Expansion of 3D Seismic Survey Area

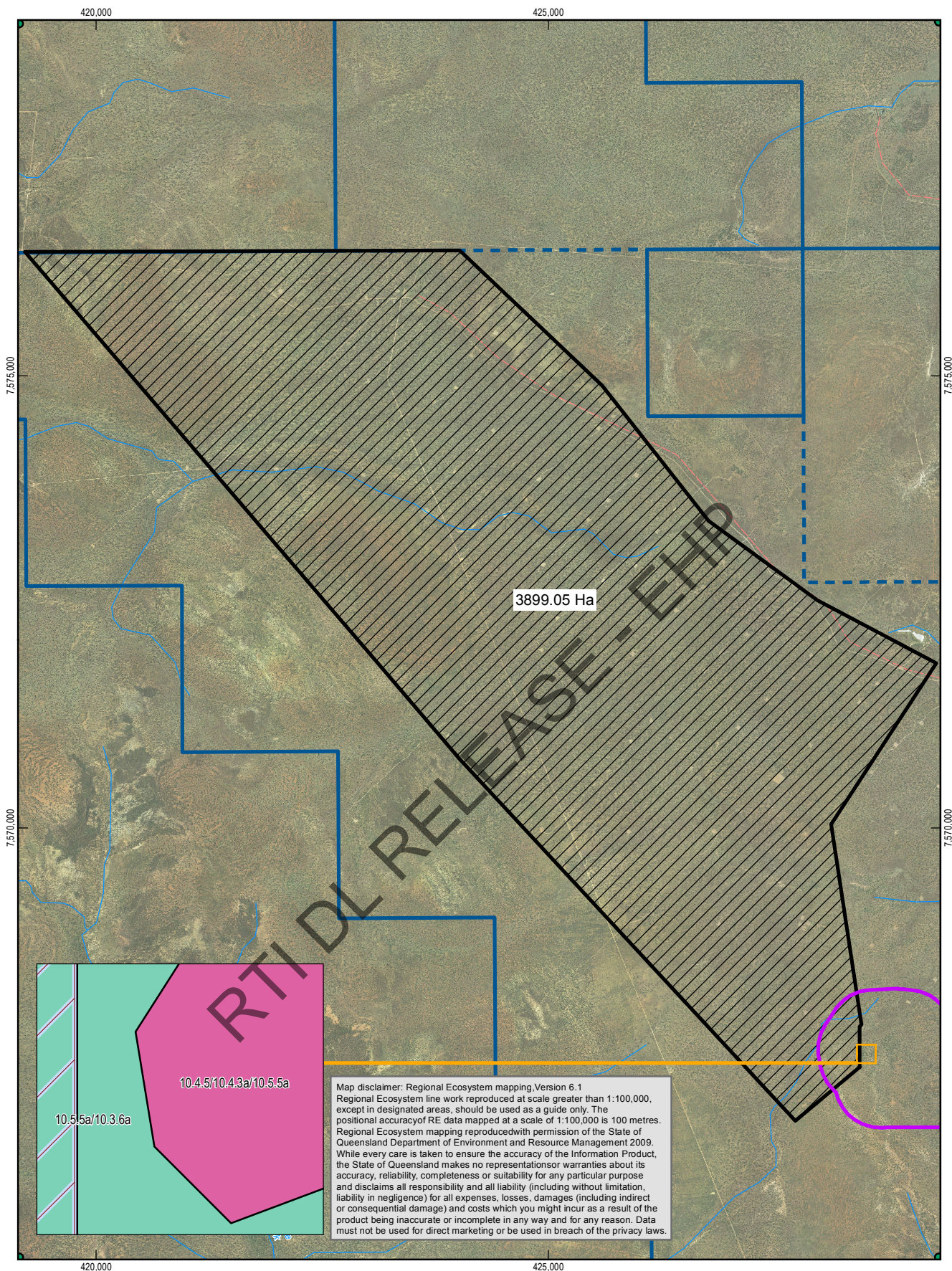
The area to be surveyed by 3D seismic survey has increased from 1034.8 ha to 3901 ha to better inform the planning and development of the underground coal mine. The amended 3D seismic survey will be carried out over an approximately 3901 ha area of EPC1690 and will consist of approximately 313 N-S signal lines and 403 W-E sensor lines, spaced at 32 m intervals at 45 degree angles. The N-S signal lines are buffered 1.5 m to give a 3 m wide track. The E-W sensor lines are buffered 2 m for a 4 m wide track. This information has been used for calculating the area of disturbance. It is estimated that approximately 807 ha of vegetation will be disturbed as part of the 3D seismic survey works. See Figure 5 for a map of the seismic survey area.

It should be noted that the reduction in area of disturbance from 1034.8 ha to 807 ha is due to the difference in calculating the area of disturbance. The area of 807 ha has been determined by calculating the actual area of disturbance from the dimensions of the survey lines. Previously, the area of disturbance was assumed to be equal to the total area targeted for seismic survey.

The expanded seismic survey will extend into a section of the 500 m buffer of Regional Ecosystem (RE) 10.4.5/10.4.3a/10.5.5a which is a Category B Environmentally Sensitive Area (ESA). The EA dated 1 March 2013 does currently not permit seismic survey to be conducted in this area. The area of disturbance in this buffer is calculated to be approximately 7.25 ha.

Additional information on the 3D seismic survey methodology is provided in Section 2.9.7.

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Map disclaimer: Regional Ecosystem mapping, Version 6.1
 Regional Ecosystem line work reproduced at scale greater than 1:100,000, except in designated areas, should be used as a guide only. The positional accuracy of RE data mapped at a scale of 1:100,000 is 100 metres. Regional Ecosystem mapping reproduced with permission of the State of Queensland Department of Environment and Resource Management 2009. While every care is taken to ensure the accuracy of the Information Product, the State of Queensland makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damage) and costs which you might incur as a result of the product being inaccurate or incomplete in any way and for any reason. Data must not be used for direct marketing or be used in breach of the privacy laws.

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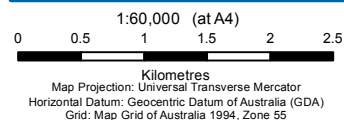
- Local Road
- Track
- Watercourse
- Mine (On Site)

- Seismic 3D indicative Lines 32m (2013-09-13)
- Seismic 3D Lines Indicative Footprint 32m (2013-09-13)
- Pit A Seismic 3D Extent (2013-09-13)

RE Biodiversity Status

- 10.4.5/10.4.3a/10.5.5a (OC/E/NC)
- 10.5.5a/10.3.6a (NC/NC)
- ESA 500 m buffer'

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Seismic Exploration

Figure 5

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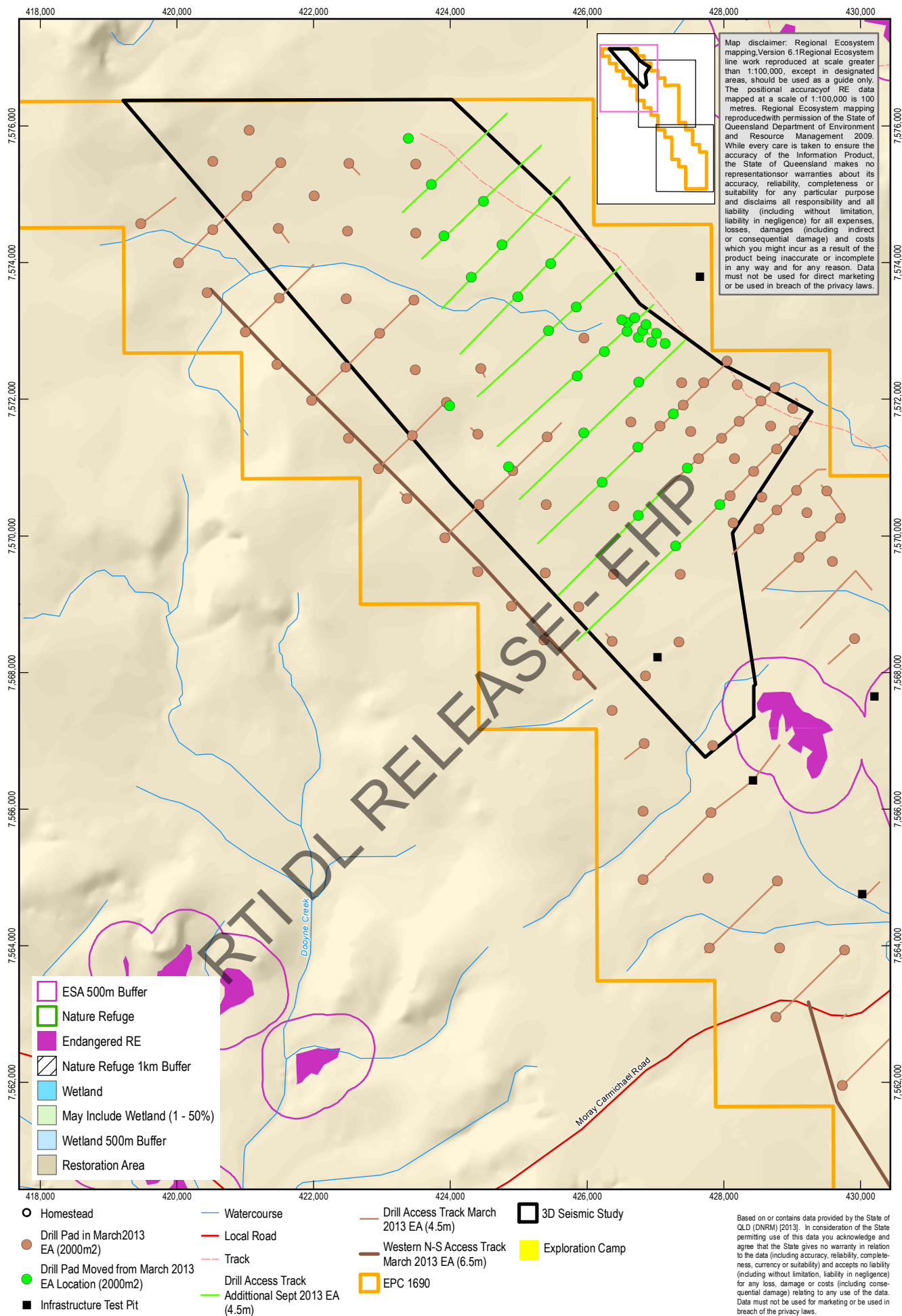
2.4.2 Relocation of Approved Drill Pads

Due to a change in the exploration program, drill pads for exploration drill holes that have been approved under the EA dated 1 March 2013 need to be relocated. An updated map showing the updated drill pad locations is provided in Figure 6. It should be noted that the number of drill pads will not increase due to this change. Existing drill pad locations previously approved are also shown in Figure 7 and Figure 8,

The location of the drill pads shown in Figure 6 should be considered indicative only, as actual location of drill holes will be determined prior to works commencing, taking into consideration environmental and cultural heritage constraints and changes in the requirements of the exploration program. All drill holes will be sited in accordance with the most current EA.

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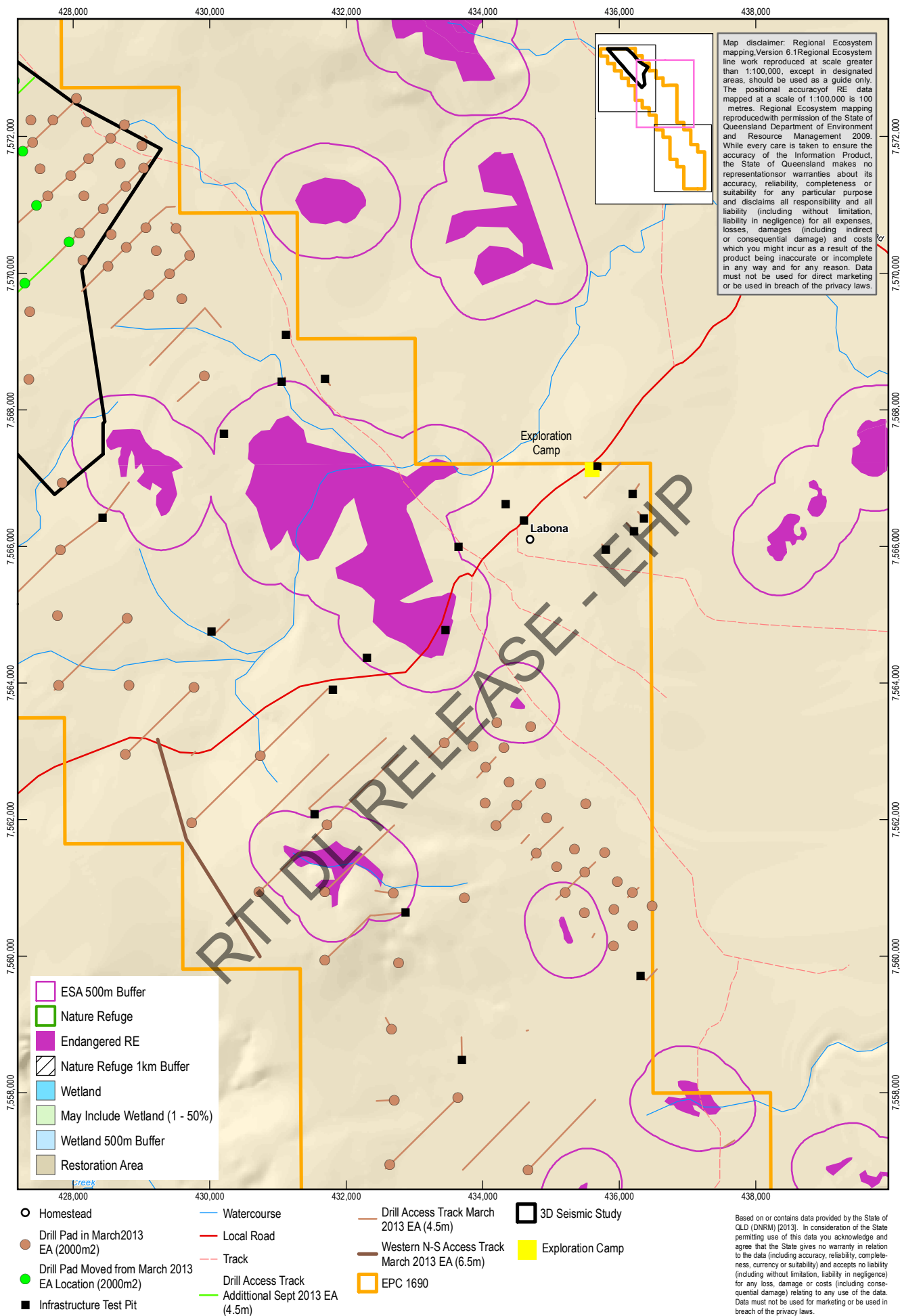
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Adani Mining Pty Ltd
Carmichael Coal Mine and Rail Project SEIS
Exploration Program
on EPC 1690 Map 2

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Date 13-09-2013

Figure 7

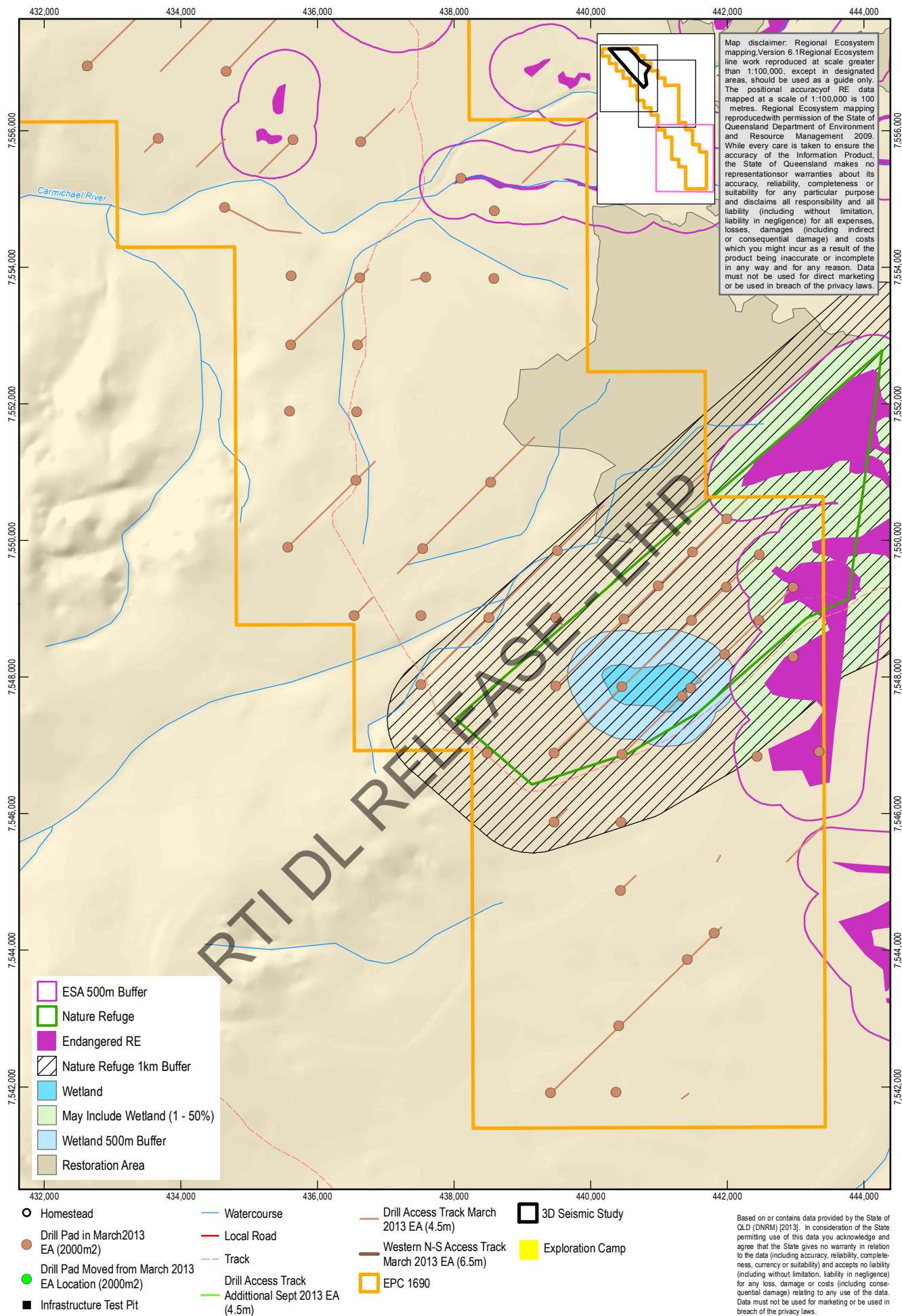
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Kilometres
Map Projection: Universal Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia (GDA)
Grid: Map Grid of Australia 1994, Zone 55



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Adani Mining Pty Ltd
Carmichael Coal Mine and Rail Project SEIS
Exploration Program
on EPC 1690 Map 3

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Figure 8

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2.4.3 Additional Number of Minor Access Tracks Over Parts of EPC1690

An additional number of access tracks is required to provide access to the relocated drill pads (see also Section 2.4.2). The proposed location is shown in Figure 6. These access tracks will have a maximum width of 4.5 m and are prepared using the methodology described (and approved) for minor access tracks in Section 2.10.6.

The additional area of disturbance due to the access tracks has been calculated to be 11.9 ha from a calculated length of 26.3 km and a maximum width of 4.5 m. None of the additional access tracks will be located in ESA or their associated buffer zones.

2.4.4 Additional number of Line of Oxidation (LOX) bore holes

In the future Adani may require additional LOX holes to be drilled in order to further define the resource. It is not possible to determine exactly where the holes will be required or how many may be needed. Adani requires approval for additional holes in the EA which would then provide Adani with the flexibility to carry out the LOX drilling without seeking a further amendment.

It should be noted that increasing the allocation of LOX holes will not result in a change of the overall level of disturbance on EPC1690, as the holes will be drilled on existing 4.5 m tracks and no additional tracks will be required. The EA dated 1 March 2013 has approved the widening of access tracks where LOX holes are proposed from 4.5 m to 6.5 m. This widening (and subsequent additional disturbance) is no longer considered necessary, and therefore LOX holes will be drilled in existing 4.5 m wide access tracks.

The additional number of boreholes cannot be shown on a map, as the final location of the bore holes will be determined during the execution of the drilling program. Further information on the LOX holes methodology is provided in section 2.9.5. The proposed change in the number of LOX bore holes is as follows.

Condition F15, Table 3: Category B Disturbance Areas

Activity	Limitation of Activity within category B Environmentally Sensitive Area	Limitation of Activity within category B Environmentally Sensitive Area 500 m buffer	Maximum Footprint of Disturbance Permitted for each Activity
LOX holes	Increase from 4 to 10	Increase from 18 to 50	Use existing 4.5 m tracks only

Condition F18, Table 4: Category C Disturbance Areas (Bygana West Nature Refuge)

Activity	Limitation of Activity within category B Environmentally Sensitive Area	Limitation of Activity within category B Environmentally Sensitive Area 500 m buffer	Maximum Footprint of Disturbance Permitted for each Activity
LOX holes	13 (No change proposed)	9 (no change proposed)	Use existing 4.5 m tracks only

Condition F23, Table 5: Category A, B and C Exclusion Disturbance Areas.

Activity	Limitation of Activity	Maximum Footprint of Disturbance Permitted
LOX holes	Increase from 95 to 250	Use existing 4.5 m tracks only

2.4.5 Administrative changes

A number of administrative amendments are also requested as a result of a report on the outcomes of a compliance inspection from the Department of Environment and Heritage Protection (DEHP) in August 2013. These changes are further described in Section 2.4.6.

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2.4.6 Proposed Amendments to Conditions of EA MIN 102643011 dated 1 March 2013

The proposed amendments to EA MIN 102643011 dated 1 March 2013 are provided in Table 2.

Table 2 Proposed Amendments to EA MIN 102643011, dated 1 March 2013

Existing condition	Proposed amendments	Justification
3D Seismic Survey		
F21 – The environmental authority holder is not authorised to undertake 3D seismic survey tracks in, or within, 500 m of category A, B and with 1 km of Category C Environmentally Sensitive Areas.	Reword condition F21 to allow seismic survey within 500 m of Category B ESA as indicated on Figure 5.	The area of seismic survey has been extended and work is required to be conducted in the buffer zone to obtain more accurate information on the extent of coal resources and support the design of the underground coal mine in the south east corner of the seismic survey area.
F22 – The environmental authority holder is authorised to undertake no more than a total of 1034.8 ha of disturbance associated with 3D seismic survey operations in accordance with the Adani EMP	Modify the area of disturbance in condition F22: F22 – The environmental authority holder is authorised to undertake no more than a total of 807 ha of disturbance associated with 3D seismic survey operations in accordance with the Adani EMP.	Recalculation of actual area of disturbance due to revised scope of seismic survey program. The calculations took into consideration proposed line width.
F49 – The holder of the environmental authority is authorised to construct tracks and roads as per Table 6: Tracks and Associated Activities and as identified in Attachments 3, 4 and 5. Table 6: Tracks and Associated Activities Activity – 3D Seismic Disturbance size – 4.5m wide per track at 35m spacing	Amend Table 6 in condition F49: Table 6: Tracks and Associated Activities Activity – 3D Seismic Disturbance size – a maximum of 4.5 m wide per track at 32 m spacing.	Change in scope of the previously approved 3D seismic survey.
F51 – Spacing of tracks must not be less than 350 m unless in accordance with the 3D seismic survey operation.	No amendment required	n/a
F60 – The environmental authority holder must comply with each of the 'Gridlines and Geophysical Surveys' standard environmental conditions contained in the Code of Environmental	No amendment required, as condition can be complied with.	n/a

Existing condition	Proposed amendments	Justification								
Compliance for Exploration and Mineral Development Projects.										
Seismic survey, drill pads, access tracks										
F23: Table 5: Category A, B and C Exclusion Disturbance Areas	Please amend the 'Limitation of Activity' regarding access tracks to F23: Table 5: Category A, B and C Exclusion Disturbance Areas to 45.74 ha (previously 33.879 ha). No requirement to amend width, as 4.5 m width will be retained.	Additional requirements for access due to the relocation of drill pads (see also Section 2.4.2).								
Attachment 3, 4 and 5 of EA	Replace existing maps in Attachments 3, 4 and 5 with Figures 6, 7 and 8 of this EMP to show updated extent of seismic survey and updated location of drill pads and access tracks. Please note the locations for drill sites shown on the maps are indicative only and actual locations may change due to environmental and cultural heritage constraints or changes in exploration program.	Change in scope of the previously approved 3D seismic survey, relocated drill pads, and additional access tracks.								
Additional LOX Holes										
Condition F15	Please amend Condition F15, Table 3 with following information: <table><tr><td>Activity</td><td>Cat B</td><td>Cat B buffer</td><td>Maximum footprint of Disturbance Permitted</td></tr><tr><td>LOX holes</td><td>10</td><td>50</td><td>Use existing 4.5 m tracks only</td></tr></table>	Activity	Cat B	Cat B buffer	Maximum footprint of Disturbance Permitted	LOX holes	10	50	Use existing 4.5 m tracks only	Increased need for LOX hole allocation due to requirement for flexibility in exploration program. No additional areas of disturbance proposed. 6.5 m would have required widening of existing 4.5 m wide tracks. This is no longer considered necessary. Only existing tracks will be used.
Activity	Cat B	Cat B buffer	Maximum footprint of Disturbance Permitted							
LOX holes	10	50	Use existing 4.5 m tracks only							
Condition F18, Table 4 (Bygana West Nature Refuge)	Replace '6.5 m wide tracks' for "Maximum Footprint of Disturbance Permitted' for LOX holes with '4.5 m wide tracks'.	6.5 m would have required widening of existing 4.5 m wide tracks. This is no longer considered necessary. Only existing tracks will be used. No additional disturbance proposed.								
Condition F23, Table 5 Category A, B and C Exclusion Disturbance Areas.	Please amend Condition F23, Table 5 Category A, B and C Exclusion Disturbance Areas with following information: <table><tr><td>Activity</td><td>Limitation of Activity</td><td>Maximum footprint of Disturbance Permitted</td></tr><tr><td>LOX holes</td><td>Increase from 95 to 250</td><td>Use existing 4.5 m tracks only</td></tr></table>	Activity	Limitation of Activity	Maximum footprint of Disturbance Permitted	LOX holes	Increase from 95 to 250	Use existing 4.5 m tracks only	Increased need for LOX hole allocation due to requirement for flexibility in exploration program. No additional areas of disturbance proposed. 6.5 m would have required widening of existing 4.5 m wide tracks. This is no longer considered necessary. Only existing tracks will		
Activity	Limitation of Activity	Maximum footprint of Disturbance Permitted								
LOX holes	Increase from 95 to 250	Use existing 4.5 m tracks only								

Existing condition	Proposed amendments	Justification
		be used.
Fire management		
F43 Burning of vegetation is not permitted	Replace Condition F43 with: <i>Burning of vegetation for the purpose of land management is permitted in accordance with a fire management plan, as approved by the administering authority.</i>	Active fire management through controlled burning is required in order to minimise the likelihood of uncontrolled fires that are hazardous to human life and property and damaging to environmental values. A fire management plan would consider health and safety issues, impacts on environmental values (especially the black throated finch habitat) and impacts on pastoral use, particularly grazing.
Remove reference to buffel grass		
F70, Table 8	Please amend Table 8 to update the species mix section to remove any references to buffel grass and instead stipulate native grasses.	Improved ecological outcomes.
Construction of sumps and topsoil stripping in conjunction with exploration drilling activities		
<ul style="list-style-type: none"> Condition F16: The construction of sumps and topsoil stripping in conjunction with exploration activities outlined in Table 3: Category B Disturbance areas must <u>not</u> exceed 16m² per sump. Condition F19: The construction of sumps and topsoil stripping in conjunction with 	Remove Conditions 16, 19 and 24 and replace with: <i>The construction of sumps and topsoil stripping in conjunction with exploration drilling activities must be contained within the approved drill pad site and conducted in such a way as to cause minimal disturbance.</i>	In some cases, a large amount of sediment is generated during the drilling process. If the sumps size is limited to 16m ² , in these cases the sump rapidly fills up and is no longer effective. A larger sump will allow sediment to settle out and keep drilling fluids clean and better environmental outcomes. Having a less prescriptive condition allows different sump configurations to be

Existing condition	Proposed amendments	Justification
<p>exploration activities outlined in Table 4: Category C Disturbance areas must <u>not</u> exceed 16m² per sump.</p> <ul style="list-style-type: none"> • Condition F24: The construction of sumps and topsoil stripping in conjunction with exploration activities outlined in Table 5: Category A, B and C Exclusion Disturbance Areas must <u>not</u> exceed 16m² per sump. 		<p>used that are more suited to drilling and environmental conditions. In some cases, slightly larger sumps may be more effective than 3 or 4 smaller sumps, and the overall footprint can be the same or smaller.</p> <p>When sumps are constructed, the top soil is kept separate from other material. As part of the drill pad rehabilitation, the top soil is reinstalled once the sump has been backfilled.</p>
All relevant conditions	Remove excess references to sump size limit (as described in points above).	Refer above
Definition for "mature tree"		
<p><u>Schedule J Definitions:</u> Definition of "mature tree" in relation to Condition F41.</p>	<p>Include in Schedule J: Definitions the following definition for "mature tree":</p> <p>A "mature tree" is defined as having a trunk diameter greater than 300 mm at chest height".</p>	<p>Better clarification to achieve compliance with Condition F41.</p>

2.5 Mining Tenure

This EMP covers the activities being undertaken on EPC1690 as held by Adani. Adani currently has a mining lease application (MLA) over EPC1690 (MLA70441). The proposed ML is known as the Carmichael Coal Project. Table 3 provides details regarding the mining tenure relevant to this EMP.

Table 3 Relevant Mining Tenure

EPC number	Status	Expiry Date	Principal Holder	Area (ha)	Mining District
1690	Granted	13 July 2015	Adani Mining Pty Ltd	26,015.0479	Central - Emerald

There is one Exploration Permit for Petroleum (EPP) underlying EPC1690. Table 4 provides details regarding the underlying EPP.

Table 4 Underlying Petroleum Tenure

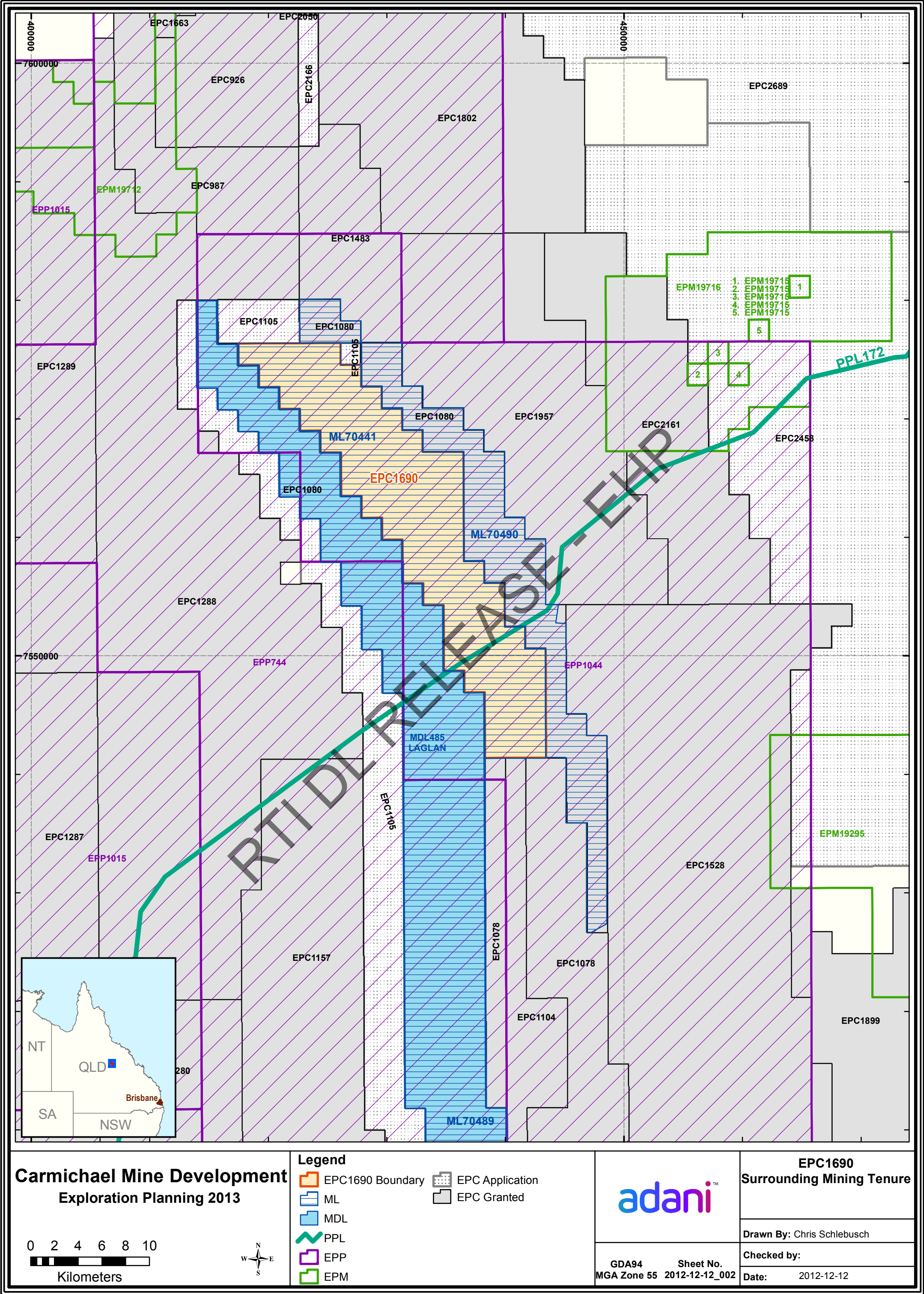
Tenure Type and Number	Status	Expiry Date	Principal Holder
EPP1044	Granted	30 November 2022	Queensland Energy Resources Ltd

EPC1690 is surrounded by three EPCs and one EPC application, as detailed in Table 5 and illustrated in Figure 9.

Table 5 Surrounding Mining Tenure

Tenure Type and Number	Status	Expiry Date	Principal Holder
EPC1080	Granted	1 November 2012	Waratah Coal Pty Ltd
EPC1105	Competing application	-	Waratah Coal Pty Ltd / Vale Coal Exploration Pty Ltd
EPC1078	Granted	9 January 2016	Vale Coal Exploration Pty Ltd
EPC1104	Granted	24 February 2014	Vale Coal Exploration Pty Ltd

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2.6 Stakeholders

A number of stakeholders relevant to the Project have been identified, including:

- Property owners within EPC1690 (Table 6)
- Surrounding mining tenement holders (Table 5)
- Underlying petroleum tenement holders (Table 4)
- Easement holders (Table 6)
- Stock route managers
- Surrounding landowners, landholders or land managers
- Local and regional service providers and agencies
- Isaac Regional Council including elected representatives
- Charters Towers Regional Council including elected representatives
- State Government departments and agencies including elected representatives.

2.7 Land Tenure

EPC1690 is situated within a rural area on which land is principally used for low intensity cattle grazing, and rural homesteads are sparsely located within the area. A gazetted stock route traverses the Project area.

Table 6 provides real property descriptions for the lot and plans located within EPC1690.

Table 6 Land Tenure

Lot	Plan	Tenure	Current Use	Approximate area within EPC1690 (ha)
1	AY35	Leasehold [rental]	Cattle grazing	174
662	PH1491	Leasehold [rental]	Cattle breeding	20,865
1	SP164918	Leasehold [rental]	Cattle breeding	4,233
633	SP228220	Leasehold [rental]	Cattle grazing	65
-	-	Stock route	Stock route	533
-	-	Road easement	Shuttleworth Carmichael Road	60
-	-	Road easement	Moray Carmichael Road	69

Of particular importance is that two lots are excluded from the surface rights of the MLA (Lot 1 AY35 and Lot 633 SP228220), therefore only two landowners' properties are being directly utilised.

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2.8 Activities within the Bygana Nature Refuge

Adani have approval to undertake exploration work within the Bygana Nature Refuge under EA MIN102643011. Due to the Joint Ore Reserves Committee (JORC) Code requirements of drilling for specific resource categories, such as Indicated Resources and Inferred Resources, a minimal exploration program is required within the Bygana Nature Reserve. The JORC code sets minimum standards for public reporting (in Australia & New Zealand) of Exploration Results, Mineral Resources and Ore Reserves. The approved activities have considered the environmental values and are the minimal requirements needed to obtain the required geological data.

The exploration requirements include up to 13 LOX holes within the Category C ESA. LOX holes have minimal pad requirements and are located within existing access tracks.

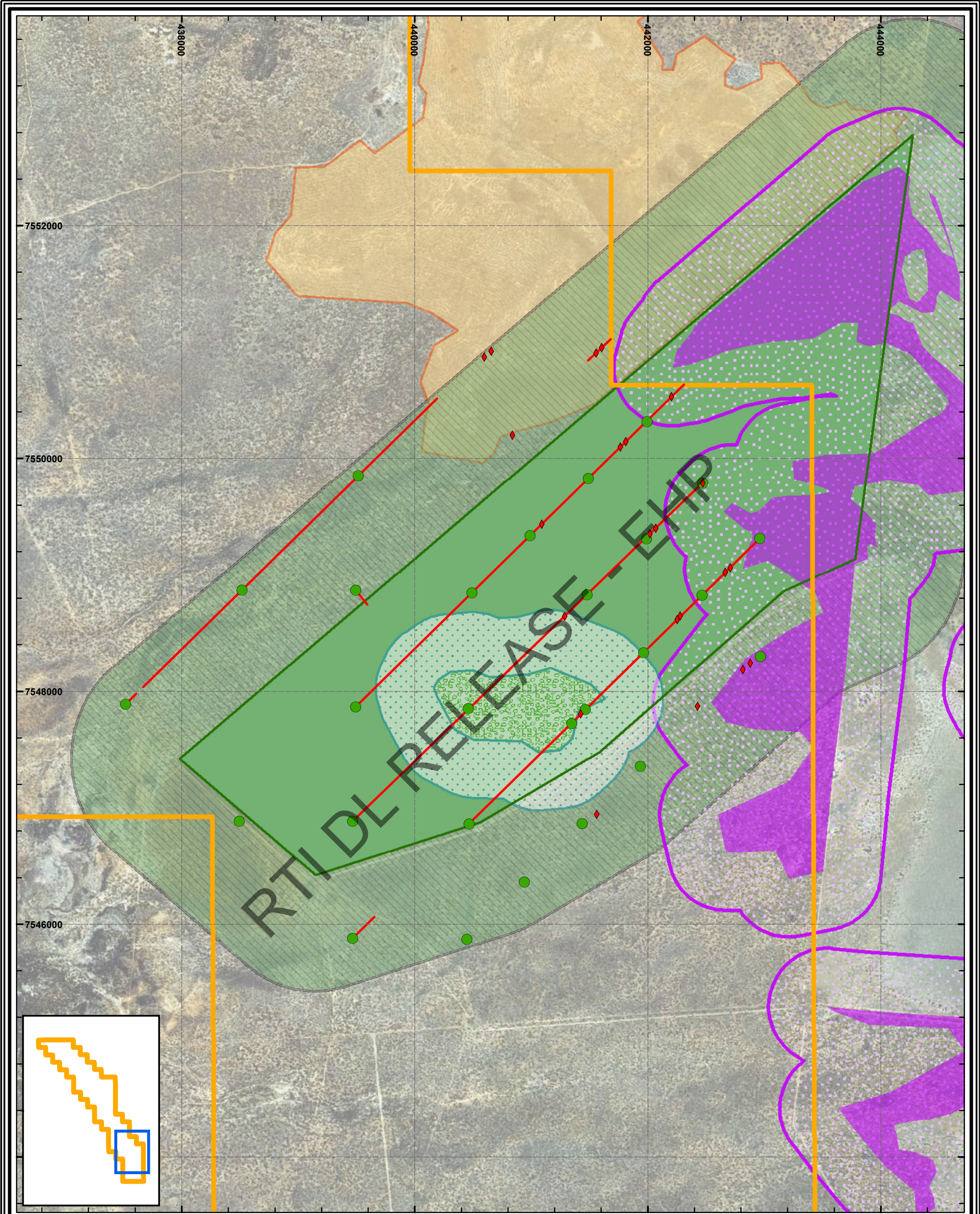
There are also up to 16 proposed coal quality holes within the Refuge, to minimise the pad size and disturbance Adani propose to minimise the impact of drilling through the use of pads up to a maximum of 2000 m².

Access tracks have also been approved to access these proposed sites, these will be planned "on the ground" to minimise impact. The approved work is outlined in Figure 10. Total approved disturbance within the Bygana Nature Refuge is approximately 8 ha in total, including the drill pads and the access tracks. This is approximately 3.5% of the total refuge area. Specific mitigation measures to be implemented when working in this area are outlined in Section 4.10.

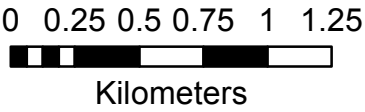
There is a mapped area where wetlands may occur. No potential aquatic habitat occurs within the nature refuge with the exception of gilgais which were observed during a visit (May 2011), to the area to ground-truth desktop information. Very little standing water was observed within the gilgais during wet season surveys Plate 1. Minor drainage lines occur, however, these are expected to drain flash flows only and no isolated pools were observed. These drainage lines are similar to those observed in areas north of the Carmichael River which were observed to provide a pathway for runoff during high volume downpours but did not accommodate long term flows. These observations were made over the 2011 and 2012 wet season.

Plate 1 Gilgais within Bygana Nature Refuge





**Carmichael Mine Development
Exploration Planning (Indicative)**



Legend

- EPC1690 Boundary
- Proposed Track
- Drillhole (large pad)
- LOX site (6.5m track)
- Restoration Area
- Nature Refuge
- Nature Refuge 1km Buffer
- Endangered RE
- ESA 500m Buffer
- May incl. wetlands (1-50%)
- Wetland 500m Buffer



GDA94
MGA Zone 55

Sheet No.
2013-02-21_003

**EPC1690
Exploration and
Bygana Nature Refuge**

Drawn By: Chris Schlebusch

Checked by:

Date: 2013-02-21

2.9 Details on Exploration Methods

2.9.1 Planning and Site Selection

Impacts from the locations of access tracks, roads, seismic can be reduced through the Adani Planning and Site Selection process.

A. Desktop site selection

The route or location of exploration activity is initially determined through GIS mapping from a desktop survey. The seismic routes and drill hole locations are chosen taking into account areas of subsurface interest, existing locations and obvious surface obstructions. The environment team will be required to review the proposed route / location to determine the most appropriate alignment or location with the least impact to environmentally sensitive areas. Environmental avoidance or mitigation measures should be employed at this early stage to determine the best route that can be taken that will minimise impacts to the environment.

B. Land access and landholder acceptance

For exploration activities not within the Adani owned leasehold the Adani personnel will head into the field to negotiate access with the relevant landholders known as consent to entry. Once consent to entry is given and access rules determined in consultation with the landholder the survey team will work with the landholder to incorporate any landholder route preference where possible.

C. Divisions sign off on route selection

The proposed route/ location will be inspected by the Field Environmental and Cultural Heritage advisors to ensure the routes selected are within compliance of the relevant Environmental Authorities and company requirements. The Field Environmental Advisor (FEA) will be required to check the route for flora, fauna, weed assessment and other Environmentally Sensitive Areas to ensure that the activity is performed with minimum disturbance to the surrounding environment. The final route will be pegged in consultation with the FEA and Cultural Heritage representatives. The finalised area to be disturbed must be issued a permit to disturb prior to undertaking any work, this is approved by the FEA and Principal Geology and will contain any specific conditions that must be met when undertaking the work. A copy of the permit to disturb form is provided in Appendix 1.

2.9.2 Drill Site Preparation

Sites are prepared by using a slasher to cut any long grass. No clearing of mature trees with a girth over 300 mm is permitted. A grader then strips the topsoil and stockpiles it for future reuse. A backhoe is used to construct the sumps. Clearing and earthworks must comply with the Adani Guideline for Clearing and Earthworks.

Drill pads are proposed to be up to 2000 m² in size and are required to be cleared for the construction of the sumps and associated drainage, laying out of drilled cores and placement of equipment (Plate 2). Each site will typically require two sumps.

In accordance with Adani's obligations under the *Coal Mining Safety and Health Act 1999*, Adani has assessed and determined that they cannot provide a safe work environment for 24 hour operations in the event they are restricted to the *Code of Environmental Compliance* Condition 2 drill pad disturbance area of less than 1000 m². A drill pad size of 1000 m² is not sufficient room for the equipment required for 24 hour drilling operations due to safety and equipment requirements. Increasing the drill pad sizes to up to 2000 m² reduces the risk of a health and safety incident occurring on site.

The proposed larger drill pad sizes will allow:

- Employees on site to work safely around the required equipment
- The use of lighting masts to facilitate night shift drilling
- Geologists on site to catalogue core samples as far from the drill rig as practicable within the cleared drill pad so that they are not impacted by dust produced by the drill rig and are not placed at risk due to mobile equipment
- Topsoil can be stockpiled as far from the drill hole and sumps as practicable within the cleared drill pad to prevent contamination or further disturbance
- Sufficient fire breaks in and around equipment and allow for better fire management on EPC1690

Plate 2 Drill pad set-up



2.9.3 Rotary Drilling

Rotary drilling involves drilling through the entire coal seam sequence. The hole will be drilled using compressed air or drilling muds which lifts the chips formed during drilling to the surface where they are stockpiled in the area immediately surrounding the hole for logging. Rotary holes will typically require casing only at the top of the hole. Depending on the findings from rotary drilling, the holes may be cored as well.

Rotary drilling will typically be undertaken within a 350 m grid spacing in the central area. Equipment used for rotary drilling involves a multipurpose 8 wheel drive drill rig, a water cart to supply water, and light vehicles (4WD). Drill holes will vary from 125 mm to 160 mm in diameter depending on the type of hole.

2.9.4 Core Drilling

Drilling techniques for core drilling is as per rotary drilling however complete core samples are taken from the hole. Core holes require casing. Core drilling will typically be undertaken within a 700 m grid spacing. Equipment used for core drilling will be essentially the same as for rotary hole drilling, with differences in drill bit attachments only. Drill holes will vary from 125 mm to 160 mm in diameter depending on the type of hole.

2.9.5 LOX Drilling

Line of oxidation (LOX) drilling is used to determine where a particular coal seam comes to surface (i.e. where the coal becomes oxidised). Typically a series of shallow holes are required to accurately locate the line of oxidation. This information is incorporated into the mine plan and defines the boundary between fresh coal to be mined and oxidised coal to be avoided. An accurate understanding of the line of oxidation is critical to optimise the efficiency of mining and to avoid unnecessary environmental impacts.

Resource models and coal seam depth predictions are used to decide where an initial LOX hole is to be drilled for a particular seam. Subsequent drill hole sites are then selected based on initial findings. For this reason a degree of flexibility is required when planning a LOX hole drilling program.

LOX drilling will typically be undertaken within a 350 m grid spacing along the length of the deposit subcrop zone. No casing is required and the equipment and drill pad requirements are the same as that for rotary and core drilling. Drill holes will vary from 125 mm to 160 mm in diameter depending on the type of hole. LOX holes do not require sumps or a drill pad as they are drilled on existing 4.5 m access tracks. In this way LOX holes can be drilled without requiring additional disturbance to vegetation.

Compressed air drilling will be utilised as opposed to mud drilling methods. Therefore for Adani to meet their obligations under the *Coal Mining Safety and Health Act 1999*, additional safe working areas are required.

2.9.6 Large Diameter Holes

Up to 20 large diameter holes will be drilled to undertake detailed washability analysis for plant design studies. The location of these holes will be determined in the course of the exploration program. These holes will be drilled next to existing core holes so a comparison relationship can be established. Exact locations will depend on core results, however will be undertaken within existing drill pads and will not require any additional disturbance.

2.9.7 Seismic Survey

This activity involves creating seismic waves within the local geology and measurement of the wave behaviour. Assessment of the recorded wave data provides information into the geophysical properties of the underlying strata, including indicating the potential presence of coal seams and structural disturbances (e.g. faulting).

Seismic surveying will be conducted as a 3D exercise which involves the clearing of multiple lines over a specified length. The 3D seismic survey will be carried out over an approximately 3901 ha area of EPC1690 and will consist of approximately 313 N-S signal lines and 403 W-E sensor lines, spaced at 32 m intervals at 45 degree angles. The N-S signal lines are buffered 1.5 m to give a 3 m wide track. The E-W45 sensor lines are buffered 2 m for a 4 m wide track. This information has been used for calculating the area of disturbance. It is estimated that approximately 807 ha of vegetation will be disturbed as part of the 3D seismic survey works.

Seismic surveying is conducted using light trucks (8 tonne Envirovibe see Plate 3), light vehicles (4WD), a whacker packer and up to 35 personnel. Approximately 32 km of cable is run along a seismic line and geophones (seismic wave measuring devices) placed every 16 m. An Envirovibe unit is driven along the seismic line and the geophones receive reflected seismic waves which are in turn transferred to data logging equipment contained in one of the light trucks for storage and analysis.

Plate 3 Envirovibe Unit



Existing tracks and fence lines are utilised for seismic lines wherever possible. However, where use of existing tracks and fence lines is not possible active clearing may be required. Clearing of seismic lines involves slashing of grass or grading of a track (at surface level) for whacker packer and vehicular access.

Where clearing cannot be avoided, seismic lines will be prepared using a slasher/mulcher such as the track mounted forestry mower shown in Plate 4. This equipment has been chosen to keep disturbance to ecological values at a minimum. This slasher/mulcher is capable of clearing grass, dead timber, small trees and underbrush while leaving topsoil and root systems unaffected. The low profile design of the mulching head provides excellent operator visibility and this allows the operator to accurately control the height of the mulching head to avoid contact with topsoil. As the machine is highly mobile, disturbance of mature trees will be minimal. Where impact to mature trees cannot be avoided trees will either be trimmed as required to provide access (preferable) or selectively felled. Given the open nature of the woodland vegetation there will be very little need to impact on mature trees. No habitat trees, trees containing nests of birds of prey (active or not) or visibly active non-raptor bird nests are to be disturbed.

Plate 4 Slasher/Mulcher



The site preparation team will consist of one operator with a GPS and a suitably qualified flora and fauna spotter. A suitably qualified fauna spotter will be present during line preparation in order to identify potential habitat trees to be avoided and in particular identify any black throated finch nests.

Minimal vegetation rehabilitation will be required with slashing and mulching, as any native grasses present will rapidly recover and there will be minimal opportunity for new weeds to colonise as the ground surface will remain undisturbed. Seismic lines are rehabilitated as per the *Code of Environmental Compliance for Exploration and Mineral Development Projects*, published by DEHP, 2013 (the Code).

2.9.8 Exploration program equipment

Table 7 provides a summary of the anticipated equipment for the activities required to undertake the exploration program.

Table 7 Equipment Required for Exploration Activities

Activity	Equipment Required
Minor access tracks	Tractor and slasher Grader Small dozer
Rotary drilling	Truck (approx. 10 t flat bed) mounted drill rig Water and compressor truck (approx 10t flat bed) Light vehicles (4WD) Backhoe

Activity	Equipment Required
Core drilling	Truck (approx. 10t flat bed) mounted drill rig Water and compressor truck (approx 10 t flat bed) Light vehicles (4WD) Backhoe
LOX drilling	Truck (approx. 10t flat bed) mounted drilling Water and compressor truck (approx 10 t flat bed) Light vehicles (4WD) Backhoe
3D Seismic Survey	Mulcher/slasher Light vehicles (4WD) Light truck (8 tonne Envirovibe) Whacker packer

In order to undertake the exploration program, Adani will have up to ten contracted drill rigs operating on EPC1690 at any one time. The workforce required to undertake the exploration program is anticipated to be up to 170 personnel operating in or around EPC1690. Operating hours will typically be 24 hours a day with 12 hour shifts running seven days per week.

2.10 Exploration Infrastructure

2.10.1 Workers Camp

With written consent from the landowner, Adani have previous approval under EA MIN1026443011 to expand the exploration camp to accommodate up to 400 people (100 x four single units with ensuites). The supporting infrastructure includes:

- 4 kitchen units
- 6 office units
- 2 ablution facilities with 4 showers and 4 washers/dryers
- Sewage treatment plant to support the number of people on site (see 2.10.2)
- 6 laundry units
- parking spaces
- 1 core shed
- 1 storage shed
- 1 reverse osmosis plant
- 20 x 46,000 L potable water storage tanks
- water storage dams
- 2 wet mess and recreation units
- 2 gym units
- 2 workshops
- decked walkways
- 210,000 L diesel storage
- 3000 kVA of three phase generators
- 2 x washdown facilities for trucks, dozers and light vehicles
- Communications facilities.

All diesel and chemical storage will be in accordance with Australian Standard - The storage and handling of flammable and combustible liquids (AS1940-2004). The storage of chemical and diesel on site will be considered an ancillary ERA under Schedule 2 of the EP Act – ERA8 (1)(a).

Waste will be managed through the use of a suitably licensed contractor. The contractor will supply general waste skip bins to the camp, and will transport and dispose of the waste at a licensed facility in Clermont. All records of waste generation will be retained by Adani for waste tracking purposes.

Up to 15 ha will be cleared for a 400 person camp and associated infrastructure such as:

- Equipment laydown area;
- Fuel storage and segregation area;
- Firebreak; and
- Effluent absorption distribution / trench area.

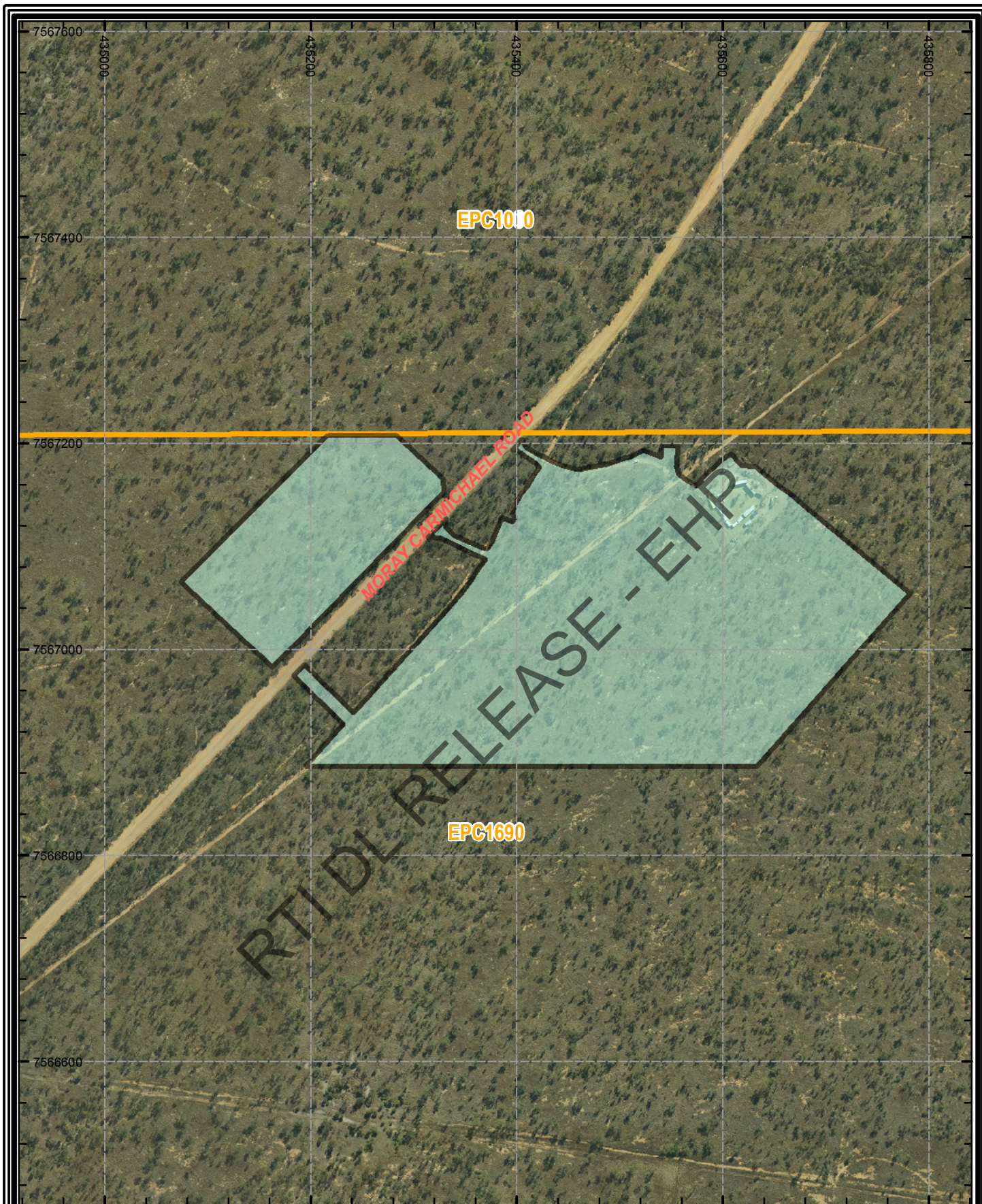
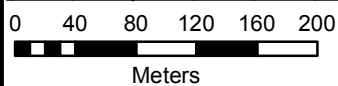
The camp size is based on the following additional requirements:

- 250 person for exploration work;
- 100 persons for civil works within the mining lease area; and
- 100 persons for contingency including environmental studies and investigations for sub-contractors.

Figure 11 shows the location for the proposed exploration camp.

Access to the camp is via the public Moray Carmichael Road from Clermont. The access road will be upgraded with the camp upgrade to ensure safe and reliable access to the camp area. A Road Maintenance Consent Deed has been executed between IRC and Adani Mining agreeing that Adani may access and carry out maintenance on the road.

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Carmichael Mine Development Infrastructure Planning



Legend

-  EPC Boundary
-  CCMP Camp Footprint

adani™

Significant Sites:
Camp Footprint

Drawn By: Chris Schlebusch

GDA94
MGA Zone 55

Sheet No.
2012-12-12_004

Checked by:

Date: 2012-12-12

2.10.2 Waste Water Management

All waste water from the camp will be transferred to the sewage treatment system. The operation of the sewage treatment system is an ancillary ERA 63 under the EP Act.

The system is designed based on the utilisation of 225 L per day per person, equating to around 400EP or 100,000 litres per day.

The treatment is via an "Ozzie Clean" system modular plant and details of the design and layout are provided in **Appendix 2**. The process uses a combined system of modular plants which can treat up to 120,000 L per day incorporating the following features:

- Balancing system
- Activated sludge biological treatment
- Ultra filtration membrane separation and uv disinfection
- Overflow and failure alarm system
- A monitoring process
- A modular system allowing efficient cleaning and maintenance of the system.

Up to 3 modular systems will use a distribution field for effluent disposal. The effluent will be treated to achieve a Class A recycled water quality and used for dust suppression, irrigation and to support other exploration activities. If a surplus of treated effluent is generated, Adani will engage the use of existing absorption trenches to manage the amount of treated effluent retained on site. The effluent distribution area will be fenced and signed to limit access. See Section 4.4 for more details.

A series of wet weather storage tanks have been installed to ensure the irrigation of effluent does not occur during wet weather periods. These tanks hold up to 200,00 litres. All treated water will be used to support exploration activities such as dust suppression or drilling.

2.10.3 Water Management

Water for the camp is sourced from existing man-made dams or groundwater bores and treated through a reverse osmosis plant or, alternatively, from external potable water supplier. Due to EPC1690 being located within the Great Artesian Basin recharge area, in accordance *Water Act 2000* requirements Adani will obtain a licence to take groundwater for use at the camp and a Development Permit for the installation of any new bores installed should existing ones not be able to be used. To ensure a supply of water required existing dams are used to support exploration activities.

Dams routinely requires the removal of silt, which will be removed and used to reinforce dam walls. Adani will also investigate the potential use this material in rehabilitation activities. Dams store water collected as a result of rainfall and overland flow. The water collected may form part of the camp water supply network. Construction activities to support dams will be during the hours of 6 am to 6 pm.

See Table 8, Figure 12, and Figure 13 for the dam locations.

Table 8EPC1690 Dam Coordinates

Name	mE_GDA94_z55	mN_GDA94_z55
10 Mile Dam	431119	7568220
No 2 Dam	429117	7572108
Swamp Dam	437289	7556159
Four Mile Dam	436022	7560877
Bushy's Dam	439768	7553077
Matheson's Dam	435264	7563522

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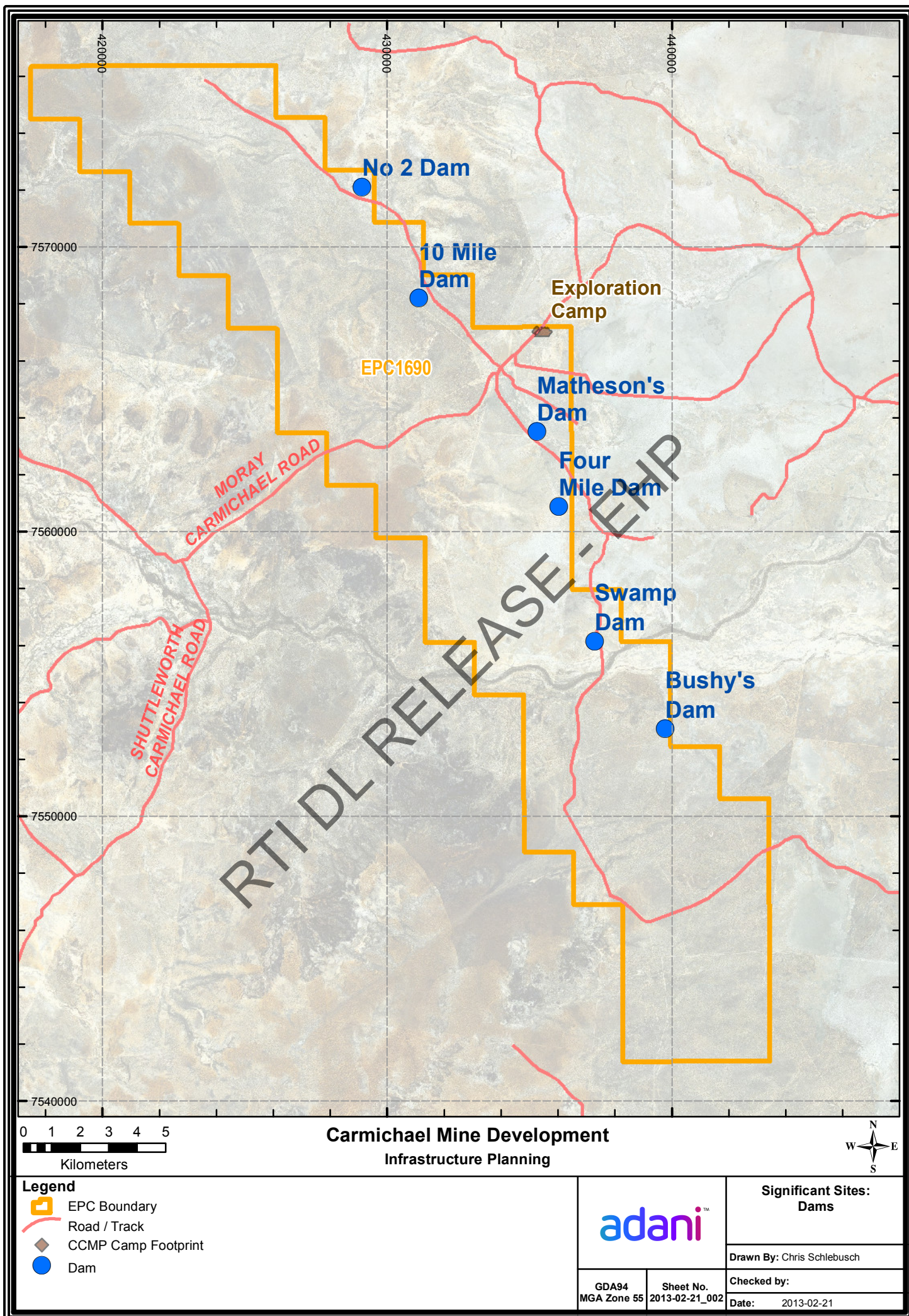


Figure 13 Dam Photograph



2.10.4 Workshops

Adani have previous approval under EA MIN1026443011 for two workshop facilities to be developed to support onsite maintenance of plant and equipment. Each workshop will be approximately 12 m x 20 m with a height of 18 m high to allow the drilling rigs to be worked on whilst raised.

Workshops will contain minor storage of cleaners, Oxyacetylene, oils and chemicals stored for maintenance activities. This minor storage area will be bunded with spill kits present.

The workshops will allow general machine and vehicle maintenance, including minor welding required for repairs. The workshop will be for plant and equipment maintenance for exploration, contractors and road work machinery and light vehicles. Workshops may operate 24 hours, seven days a week.

This is required due to frequent wet weather locking in plant and equipment, distance to offsite maintenance areas. Onsite workshops will reduce travel times and fuel consumption and weed distribution to keep equipment onsite.

The proposed workshops will be located on existing cleared areas and access will be via the Moray Carmichael Road.

2.10.5 Laydown area/ Contractors Compound

Adani have previous approval under EA MIN1026443011 for a 5 ha laydown area and contractors compound to be established on existing cleared areas. This area is required for the storage of materials for construction and plant and equipment, include storage for contractor plant and equipment. Access will be from the Moray Carmichael Road. This will involve minimal impact as it is a pre-cleared area previously used as an airstrip and no additional disturbance is required.

2.10.6 Access Tracks

Adani have previous approval under EA MIN1026443011 for a major access road which will provide all weather access to be constructed from the north to the south of the EPC area to improve current restricted access in wet weather. Proper access to various locations on site for drillings and vehicles to move is very important for the safety of the people working onsite. The major access road is proposed to be constructed after the wet season and will involve the improvement of formation, cut and fill and compaction. It will be an unsealed dual carriageway road of approximately 10 m in width with an additional 5 m either side for road drainage and erosion and sediment controls. The equipment required for construction will consist of a dozer, grader, trucks and a roller.

The final location of the access road will be subject to ground truthing, environmental considerations and cultural heritage.

An erosion and sediment control plan will be developed prior to works and dust will be mitigated with water trucks and if required a dust suppressant sealant on the road surface.

This major access road will involve the installation of a box culvert crossing of the Carmichael River. The bridge crossing will be constructed in accordance with the code of compliance for minor waterway barrier works as far as practicable and will have fish passage considerations built into the design. The design will be developed in

consultation with the Department of Forestry, Fisheries and Agriculture even though exempt from requiring a Waterway Barrier Works Permit.

Minor access tracks will be no more than 4.5 m wide. All tracks will be constructed using a tractor and slasher and a grader will be used to remove logs and small shrubs. Should clearing of larger vegetation be required, a small dozer will be used.

The location of proposed access tracks as part of the drilling program is shown in Figure 6, Figure 7 and Figure 8.

2.10.7 Quarry Material for Construction

Any quarry material required for the road construction will be first sourced locally (refer Figure 14) to reduce haulage distances, fuel usage, emissions and risk of weed distribution.

To ensure there is minimal impact from sourcing quarry material the following measures are to be implemented:

- Commitment to a disturbance register to track locations – available to DEHP upon request
- Site selection to consider environmental values
- Permit to disturb issued prior to work
- Rehabilitate within 12 months of not being required
- Detailed erosion and sediment control plans will be developed prior to works
- Dust will be mitigated with water trucks and if required a dust suppressant sealant on the road surface
- Sign in place stating operator and mining tenure holder
- No quarry material will be sourced from Endangered REs (EREs) or the Bygana Nature Refuge.

As far as practicable Adani will apply the relevant requirements under the Queensland Government's *Code of environmental compliance for certain aspects of extractive and screening activities (ERA 16) - Version 6*.

Adani will keep a register containing details of each activity site (e.g. voids) operated under this code. This register must be provided to the administering authority with the annual return for the activity and must include:

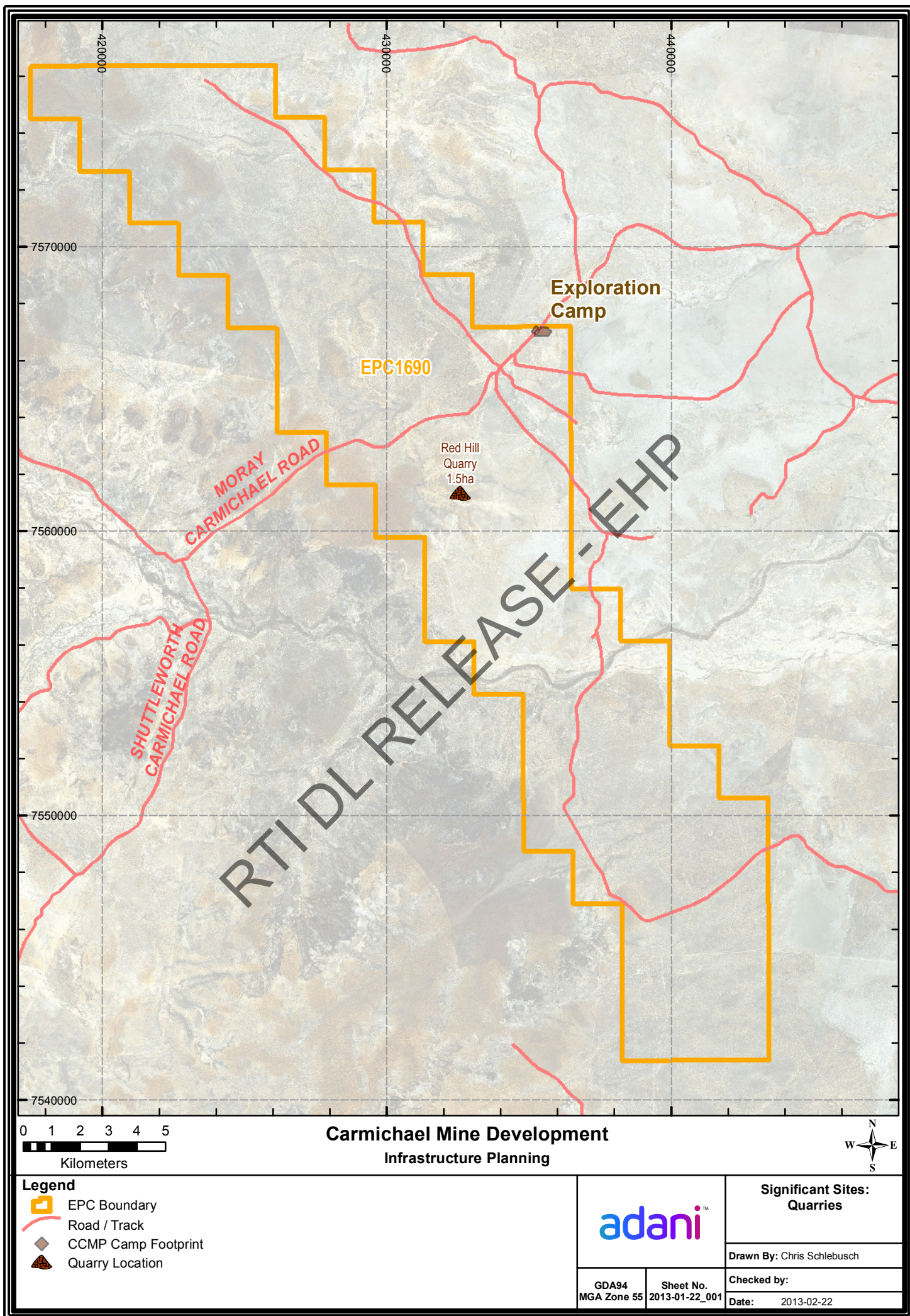
- The GPS (Global Positioning System) coordinates of each activity site (GDA94 datum)
- The date(s) on which it was accessed
- The amount of material removed
- Where land has been significantly disturbed, the date(s) each activity site was inspected for assessment, remediation or rehabilitation.

A sign will be displayed at each activity site that states the name of the registered operator and that the site is being operated under the EPC. The sign will include contact details for the registered operator. Any sites undergoing rehabilitation will have additional signage indicating that the relevant area is undergoing rehabilitation and is not to be accessed.

Table 9 provides the location and disturbance footprint for the existing and proposed quarry sites on EPC 1690. All material extracted from these quarries will be used for exploration activities on EPC 1690.

Table 9 Quarry location and disturbance footprint

Collar_ID	Status	mE_GDA94z55	mN_GDA94z55	Area (ha)
Red Hill Quarry	Existing	432586	7561318	1.5



2.11 Rehabilitation

All drill sites will be rehabilitated in accordance with the EA. This will typically involve:

- All unused drill chips will be disposed of into drill holes and/or sumps
- Grouting is required for underground areas or as directed by geology department. Holes are grouted to approximately 1 m below surface. Once grouted the casing is cut at least 300 mm below the surface and the hole backfilled with soil
- If grouting is not required an inflatable bag or concrete plug is placed down the collar to seal the borehole. Once sealed the casing is cut at least 300 mm below the surface and the hole backfilled with soil
- Steel markers will remain at each holes as an identifier
- As soon as practicable following completion of activities at drill sites, all excavations and drill holes will be backfilled
- Where sites are compacted, the sites will be tilled
- Stockpiled topsoil will be respread over the area
- Sites within a nature refuge or ere will be rehabilitated within three months of completion of activities at the site.
- Sites within category b environmentally sensitive areas are to be revegetated with native plant species endemic to the area.
- All other sites will be rehabilitated with 6 months of completion of activities at the site.

Once rehabilitation has been completed a final site inspection is conducted by the Field Environmental Advisor to ensure that full rehabilitation has been carried out in accordance with the EMP. A copy of the rehabilitation guidelines and final rehabilitation record templates are provided in Appendix 3.

All access tracks will remain disturbed until all activities in the area are complete. Should the landowner provide written consent to retain the tracks, no rehabilitation activities will be undertaken. If tracks require rehabilitation, it will be undertaken in accordance with the EA and involve the process described above.

In the event that EPC1690 does not progress to a ML, prior to the relinquishment, surrender or cancellation of the EPC, rehabilitation will be undertaken to the satisfaction of the administering authority and a Final Rehabilitation Report and Environmental Audit Statement will be developed.

Adani is committed to the long-term safety of the environment (ensuring the site is safe for animal and humans for the foreseeable future) and aims to achieve this by rehabilitating the disturbed areas to Non-Polluting, Stable and Sustainable land use. Adani will use the progressive and final rehabilitation requirements set out in the *Guideline: Rehabilitation requirements for mining projects*.

Table 10, Table 11 and Table 12 provide a summary of the exploration program and associated disturbance footprint from each exploration activity. The figures in this table will assist in scheduling disturbance activities and ensure that appropriate targets are set for the rehabilitation plan.

Table 10 Summary of Disturbance Areas – Category B ESA

Activity	Limitation of Activity within category B Environmentally Sensitive Area	Limitation of Activity within category B Environmentally Sensitive Area 500 m buffer	Maximum Footprint of Disturbance Permitted for each Activity
Drill holes	3	13	2000 m ² per drill pad
Infrastructure test pits	1	2	150 m ² per hole
LOX holes	10	50	Use existing 4.5 m tracks only
Access tracks	0.43 ha	2.79 ha	4.5 m wide tracks
Seismic survey	No activity permitted	7.25 ha	As per Section 2.9.7

Table 11 Summary of Disturbance Areas – Category C ESA (Bygana West Nature Refuge)

Activity	Limitation of Activity within category B Environmentally Sensitive Area	Limitation of Activity within category B Environmentally Sensitive Area 500 m buffer	Maximum Footprint of Disturbance Permitted for each Activity
Drill holes	16	11	2000 m ² per drill pad
LOX holes	13	9	Use existing 4.5 m tracks only
Access tracks	5.40 ha	1.94 ha	4.5 m wide tracks

Table 12 Summary of Category A, B and C ESAs Exclusion Disturbance Areas

Activity	Limitation of Activity	Maximum Footprint of Disturbance Permitted
Drill holes	177	2000 m ² per drill pad
Infrastructure test pits	16	150 m ² per hole
LOX holes	250	Use existing 4.5 m tracks only
Access tracks	45.79 ha	4.5 m wide tracks
Exploration camp site infrastructure	15 ha	150,000 m ²
Laydown and quarry areas	15 ha	150,000 m ²
Seismic Survey	Survey area of 3901 ha on EPC1690	800 ha of disturbance

3. ENVIRONMENTAL MANAGEMENT SYSTEM

3.1 Environment and Sustainability Policy

Adani is committed to the protection of the environment and to the sustainable management of its operations and activities.

Adani operates within an established Health, Safety and Environment (HSE) Management System. This system has been developed to comply with relevant legislative standards for operation of coal mines within Queensland, and comprises an Environment and Sustainability Policy and HSE Management Standards. The HSE management system will guide environmental management for the Project (Mine) by providing a framework to prevent or minimise environmental harm, ensure compliance and promote continuous improvement. Key components of the system include:

- Responsibility, authority and commitment
- Planning, objectives and legal obligations
- Training and competence
- Documentation, document control and records
- Incidents and performance measurement
- Communication, consultation and involvement
- Emergency preparedness and response
- Reviews, audits and inspections.

All contractors and staff involved in the Project (Mine) will be required to adhere to *Adani's Environment and Sustainability Policy*.

3.2 Responsibility, Authority and Commitment

Adani engaged a suitable contractor for the exploration phase (the Exploration Contractor/s) of the Project. Adani may delegate key responsibilities relating to environmental management to the Exploration Contractor via a contractual agreement. Adani will still retain overall responsibility for delivery of environmental outcomes during the exploration phase.

3.3 Responsibilities

The responsibilities for the exploration phase of the Project will conform to Adani's HSE Management Standard *HSE-ST-01 Responsibility, Authority and Commitment*.

3.3.1 Exploration Manager

- Responsible for the environmental performance during the exploration phase, including a responsibility for the effective implementation of this EMP and Adani's HSE Management Standards
- Ensure that all employees and subcontractors involved with the Project (Mine) receive environmental training appropriate to their role. The provision of training will be in accordance with the Adani's HSE Management Standard *HSE-ST-03 - Training and Competence*
- Ensure that environmental inspection processes are undertaken in accordance with Adani's HSE Management Standard *HSE-ST-18 Reviews, Audits and Inspections*

- Required to ensure that sufficient human, material and financial resources, including technical resources and support, are provided for the effective management of environment-related aspects of the operations for which they are responsible
- Required to regularly report to Adani on implementation of the Construction Environmental Management Plan (CEMP) and environmental performance
- Demonstrate visible and pro-active commitment to the environment at all levels

3.3.2 Exploration Contractor Supervisor

- Responsible for ensuring that exploration activities are conducted in accordance with this EMP, Adani's *HSE Management Standards and the Exploration Environmental Management Plan*
- Ensure that all personnel and sub-contractors understand their responsibilities and authorities relating to environmental issues
- Demonstrate visible and pro-active commitment to the environment at all levels

3.3.3 Field Environmental Advisor

- Understand relevant regulatory requirements and licence / permit conditions listed in the EA and communicate these conditions to employees and subcontractors
- Ensure all activities carried out by employees and subcontractors comply with the project specific environmental management plan
- Report back to Exploration Manager and Environment and Sustainability General Manager with respect to compliance issues
- Encourage an environmentally responsible workplace culture through maintaining an adequate level of housekeeping, the identification of hazards and reporting of issues
- Complete monthly environmental reporting and performance reviews and forward to Exploration Manager and Environment and Sustainability General Manager
- Identify areas for environmental improvement and communicate these to the project manager for assessment
- Conduct/allocate Planned Inspections and ensure these are completed as per the Activity Schedule
- Assist with corporate and certification surveillance audits as required
- Communicate with other Mining site environmental representatives
- Communicate with Mining Corporate, Client and government agencies with respect to environmental outcomes required
- Maintain environmental records in filing system
- Communicate with Project Manager regarding opportunities for continuous improvement and the identification reporting and rectification of environmental deficiencies
- Oversee and manage submissions of job safety environmental analysis documents JSEA.
- Review and update training matrix on a regular basis
- Ensure ERP and Incident Management guide is implemented in accordance with EMP
- Undertake mock simulations at regular intervals
- Assist the completion of objectives and targets, reporting status to the project manager monthly
- Ensure continued awareness of environmental issues on site through appropriate forums such as toolbox sessions, inductions and pre-start meetings where necessary.
- Maintain environmental action register and provide updates to the exploration/sustainability manager on status of action items monthly
- Conduct investigations on environmental incidents and document on All Incident Reporting Form
- Assist the exploration/sustainability manager in ensuring emergency environmental response procedures are in place and all staff including subcontractors has adequate training in these procedures

- Ensure Hazardous Materials (MSDS) sheets are up to date (5 years)

3.3.4 All Exploration personnel

- Responsible for the environmental implications of their own actions
- Have a duty to carry out their work in a manner which does not present a risk to themselves, to others or to the environment
- Have a duty of care to report all environmental issues they become aware of in a timely manner

3.4 Objectives and Targets

Adani has developed environmental objectives and targets (performance criteria) for the Exploration Program which are specific to the environmental values to be protected and the potential environmental impacts on these values. The objectives and targets (performance indicators) are contained in each of the Management Plans in this plan.

These objectives and targets have been developed in accordance with HSE Management Standard *HSE-ST-02 Planning, Objectives and Legal Obligations*. The processes proposed to monitor the implementation of these objectives and targets are further described in this plan.

3.5 Training and Competence

Staff induction training will be provided to ensure that personnel are aware of their obligations and requirements under the EP Act and other relevant legislation for EPC1690. Staff, contractors and visitors will be suitably inducted to ensure that they incorporate environmentally appropriate work practices on a day-to-day basis. This will enable staff to identify emerging environmental issues and respond proactively to avoid incidents of this nature.

The provision of training will be in accordance with the *Adani's HSE Management Standard HSE-ST-03 - Training and Competence*.

The induction program will include:

- Overview of relevant policies
- Duty of care and duty to notify
- Incident response and reporting
- Environmental awareness
- Key environmental management requirements such as spill management (as a minimum those requirements relevant to their role and responsibilities)
- Where monitoring is a requirement, only competent person(s) must conduct the required monitoring.

3.6 Communication

The Adani Environment and Sustainability Policy and this EMP will be communicated to all exploration and operational personnel. The Exploration Contractor and Adani will ensure that the general intent, scope and relevance of these documents are understood. A forum will be established to communicate environmental issues for the Exploration program:

- Environmental induction program and training
- Daily toolbox meetings
- Risk workshops
- Management meetings
- Noticeboards

- Environmental reports.

The Exploration Contractors and Adani will utilise a mix of these forums to ensure that effective communication takes place. The effectiveness of the communication will be assessed in third party environmental audits as measured through awareness of staff and subcontractors and compliance with day to day site environmental management requirements.

3.7 Documentation, Document Control and Records

The Exploration Contractor and Adani will ensure that an adequate document control system is in place to ensure that only current documentation is in use. The document control and records management system will meet the requirements of *Adani's HSE Management Standard HSE-ST-04 Documentation, Document Control and Records*.

3.8 Environmental Inspections

Environmental inspection processes will meet the requirements of *Adani's HSE Management Standard HSE-ST-18 Reviews, Audits and Inspections*.

Site inspections to verify compliance with the EMP, permits and approvals and other environmental performance requirements will be undertaken and documented for the exploration and operational phases. Site inspection checklists will be developed for the exploration and operational phases. Where inspections determine that the existing measures are not effective, corrective and preventative measures will be implemented.

3.9 Environmental Auditing

Fortnightly environmental monitoring will be undertaken to demonstrate that control strategies are operating effectively and to demonstrate that the exploration program is operating in accordance with the EA conditions.

Details of exploration planning and field activities undertaken will be maintained to ensure records of compliance with the EA conditions are available. These documents may include any relevant audit reports, performance of the exploration program, research reports and summaries related to environmental issues.

The administering authority will be informed as soon as possible of any known problems/incidents that have potential to cause or that have caused environmental harm.

3.10 Continuous Improvement

For continuous improvement to occur, Adani will:

- Conduct research and/or investigations into technical issues and/or complaints in order to resolve current or foreseen problems, improve environmental management and maintain statutory compliance as required
- Continue the development and implementation of environmental management programs on EPC16go.

3.11 Emergency Preparedness and Response

The Exploration Contractor and Adani will ensure that all staff and sub-contractors have adequate competence and training to respond to environmental emergencies. The Exploration Contractor and Adani will establish emergency response teams for the exploration and operational phase respectively that have received special training in emergency response including use of emergency response equipment.

The Emergency Response Plan will include emergency procedures and emergency contact details relevant.

3.12 Incident Management

Incident management will meet the requirements of the EP Act (such as sections 14 to 17 (A) and 319 to 320(G)) and *Adani's HSE Management Standard HSE-ST-06 Incident Management and Performance Measurement*. Note - where sections of this plan are inconsistent with the EP Act or policies issued by the administering authority, the EP Act and policies prevail to the extent of the inconsistency.

An incident is considered to be anything or actions that are not in accordance with the conditions of the EA or this plan. All reasonable actions are to be taken to minimise environmental harm, or potential environmental harm, resulting from any emergency, incident or circumstances not in accordance with the conditions of the EA or this plan.

In the event of an incident, the Exploration Contractor must immediately report the incident to Adani's HSE Manager.

The Adani General Manager of Environment (when determined necessary) will promptly report details of the incident to relevant agencies when required. The Exploration Contractor and Adani must carry out any lawful instruction received from the authorised representatives of relevant agencies.

All Incidents will be recorded on the Incident Register.

3.12.1 Administering Authority Notification

Adani must notify the administering authority by written notification as soon as practicable but within 24 hours after becoming aware of any emergency or incident which results in the release of contaminants not in accordance with the conditions of the EA.

The notification must include, but not be limited to, the following:

- EA number and name of the holder
- Name and telephone number of the designated contact person
- Location of the emergency or incident
- Date and time of the emergency or incident
- Time the holder of the EA became aware of the emergency or incident
- Where known:
 - The estimated quantity and type of substances involved in the emergency or incident;
 - The actual or potential cause of the emergency or incident
 - A description of the nature and effects of the emergency or incident including environmental risk, and any risks to public health or livestock
- Any sampling conducted or proposed, relevant to the emergency or incident
- Immediate actions taken to prevent or mitigate any further environmental harm caused by the emergency incident
- What notification of stakeholders who may be affected by the emergency or incident has occurred or is being undertaken.

As soon as practicable, but not more than 6 weeks following the initial notification of an emergency, incident or information about circumstances which result or may result in environmental harm, environmental monitoring must be performed and written advice must be provided of the results of any such monitoring performed to the administering authority.

3.12.2 Landholder and Stakeholder Notification

Adani must notify, in writing, the occupiers or registered owners of affected land and any other potentially impacted stakeholder as soon as reasonably practicable after becoming aware of any emergency or incident that has the potential to impact on environmental values or breaches any condition of this EA concerning releases of contaminants to the environment. The notification must include the following:

- a) Location of the emergency or incident
- b) Date and time of the emergency or incident
- c) Estimated quantity and type of any substances involved in the emergency or incident
- d) potential impacts to environmental values caused by the emergency or incident
- e) Where there is potential impact on livestock or human health, precautionary measures that should be taken.

3.13 Complaints

All internal and external complaints related to environmental aspects of the exploration and operation of the project will be recorded, acknowledged, considered and responded to as soon as is practicable. Complaints and concerns will be treated as incidents and investigated accordingly.

Complaints management procedures will be established for the exploration and operational phases.

This will entail the development and maintenance of a Complaints Register that will include:

- Responding to all complaints within agreed timeframes
- Investigating all complaints within agreed timeframes
- Follow-up with complainant on outcomes of investigation and proposed mitigation measures (where applicable)
- Implementing corrective and preventative actions as required
- Regular review of complaints to identify any trends which may require further corrective action

3.14 Environmental Reporting

3.14.1 Internal

The Exploration Contractor will be required to report any environmental incidents or breaches of the approval conditions immediately to Adani's key representative. Where there is an obligation to report to relevant authorities, this must also occur within the applicable timeframes Adani representatives notified. Reporting will be undertaken in accordance with the Communications Plan.

During exploration, the Exploration Contractor will be required to prepare and submit a monthly report to Adani which will include the site inspection records, monitoring results, training undertaken, initiatives, incident records and details of any corrective and preventive actions taken where non-conformances had been identified and all non-conformances that have not been closed-out.

3.14.2 External

Adani aims to provide timely, relevant and appropriately presented information to government authorities, the local community and the general public on the environmental performance of the Project (Mine). Reporting commitments under the environmental approval conditions and other legislation will be complied with and may include:

- Monitoring results as required by authorities
- Progress reports as required in approval conditions.

4. ENVIRONMENTAL VALUES, POTENTIAL IMPACTS AND MANAGEMENT PLANS

This section provides a description of environmental values likely to be affected by the previously approved activities on EPC1690, the new drill holes around the proposed box cut and the proposed amendments to the 3D seismic survey. For each environmental value identified, an assessment of the potential beneficial and adverse impacts from activities on the environmental value is described. Environmental objectives, control strategies and commitments have been proposed for the protection of each environmental value.

The following management plans are included in this section:

- Air Quality Management Plan
- Water Quality Management Plan
- Noise and Vibration Management Plan
- Waste and Resource Management Plan
- Erosion and Sedimentation Management Plan
- Native Flora and Fauna Management Plan
- Weed and Pest Management Plan
- Bushfire Management Plan
- Hazardous Substances Management Plan
- Rehabilitation Management Plan
- Bygana West Nature Refuge Management Plan.

4.1 Air Quality

4.1.1 Environmental Values – Air Quality

The local air shed is typically rural which is generally influenced by pastoral activities such as cleared land, the movement of cattle and other landowner activities in dry conditions. In recent times, the air shed has included local mining exploration activities.

The closest permanent residents, Doongmabulla Homestead, are located approximately 7 km to the west of the EPC boundary (Figure 15). Lignum Homestead and Bygana Homestead are located approximately 7.5km and 8.5km respectively to the east of the EPC boundary (Figure 15). According to Bureau of Meteorology data, the prevailing winds are from the north east, east and south east directions therefore any dust and emissions generated by exploration activities are not anticipated to be transported to the sensitive receptors.

4.1.2 Potential Adverse and/or Beneficial Impacts

The potential impacts on air quality environmental values are primarily related to the generation of dust from exploration activities. Local sources of dust will include a combination of rural activities and the use of local unsealed roads associated with exploration operations. Particulate matter from exploration activities is expected to be generated by the following activities:

- Vegetation clearing and topsoil stripping
- Gas emissions from mobile plant
- Vehicle movement on unsealed roads
- Wind erosion of cleared or exposed areas.

It is expected that there will be minimal air quality impact to surrounding sensitive receptors as the area is sparsely populated. Given the nature and extent of activities on EPC1690, the impacts on the environmental value of air quality on the immediate and surrounding environment are not expected to be significant.

4.1.3 Air Quality Management Plan

Legislative Requirements	<ul style="list-style-type: none"> • <i>Environmental Protection (Air) Policy 2008 (EPP (Air))</i> • <i>Environmental Authority MIN102643011</i> • <i>Air Quality Standard Environmental Conditions contained in the Code of Environmental Compliance for Exploration and Mineral Development Projects</i>
Management Objectives	<ul style="list-style-type: none"> • To complete exploration program in a manner that maintains ambient air quality of the local area • To control potential sources of air contaminants at the site to enable achievement of the statutory environmental protection objectives; • To minimise greenhouse gas emissions where practical to do so
Performance Objective	<ul style="list-style-type: none"> • No complaints from local landholders related to dust, odour or emissions • Dust must not exceed the following limits at the sensitive receptor: <ul style="list-style-type: none"> - Dust deposition of 120 milligrams per square metre per day, averaged over one month, when monitored in accordance with AS 3580.10.1 - A concentration of particulate matter with an aerodynamic diameter of less than 10 micrometre (um) (PM10) suspended in the atmosphere of 50 micrograms per cubic metre over a 24 hour averaging time, at a sensitive or commercial place downwind of the operational land, when monitored in accordance with the EA - Particulate matter – determination of suspended particulate PM10 high-volume sampler with size-selective inlet – Gravimetric method, when monitored in accordance with AS 3580.9.6 - Any alternative method of sampling PM10, permitted by the Air Quality Sampling Manual, as published by the administering authority
Implementation Strategies	<ul style="list-style-type: none"> • Equipment such as machinery, generators and other fuel related facilities will be maintained in good working order • Plant and equipment are operated in a proper manner and fitted with appropriate exhaust systems • Regular maintenance and repair practices for all of equipment and vehicles • Enforce speed limits on unsealed roads Reduce dust generation through minimising areas of disturbance, use of hardstand to stabilize exposed areas, watering, mulching cleared vegetation and retention of tree buffer zones • Exposed surfaces such as access roads and drill pads to be watered to minimise potential for dust • Progressive rehabilitation of disturbed areas as they become available; • Visual observations of dust emissions during windy/dry periods; and • Consult with and advise any landholders who may be impacted by temporary dust emission before activities commences • Avoid smoke generation by adhering to a strict no burning policy
Monitoring	<ul style="list-style-type: none"> • Regular visual inspections of access tracks and dill hole sites and drilling to assess the effectiveness of dust mitigation measures; • Monitoring of odour or dust must be undertaken on request from administering

	<p>authority, to investigate any complaint of environmental nuisance at any sensitive place, and the results must be notified within 14 days to the administering authority following completion of monitoring</p> <ul style="list-style-type: none"> • The sensitivity of the receiving environment has been considered in the adoption of the most applicable guideline values including: <ul style="list-style-type: none"> - PM10 concentration taken from EPP (Air) - 24-hour PM10 concentration taken from EPP (Air) and NEPM reporting standard - Annual TSP concentration taken from NEPM reporting standard - Annual TSP Deposition taken from the administering authority recommended EA Conditions
Reporting	<ul style="list-style-type: none"> • Any complaints to be recorded in the complaints register • All results of any dust or odour monitoring undertaken will be recorded and kept with the General Manager of Environment • Specific Investigation reports from complaints will be produced and provided to administering authority
Corrective Actions	<ul style="list-style-type: none"> • Instigate extra dust suppression watering runs where required; • Legitimate complaints in relation to dust or odour will be managed to identify the source/s and detail further actions to be undertaken, including a response monitoring program; and • Adani will address the complaint including the use of appropriate dispute resolution if required; and immediately implement odour/ dust abatement measures so that emissions of odour/ dust from the activity do not result in further environmental nuisance.

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4.2 Water

4.2.1 Environmental Values – Water

The key environmental values for water to be enhanced or protected under this EMP are:

- Physical, chemical and biological integrity of the water courses within the catchment and their amenity as potential water sources for stock and small-scale irrigation
- The qualitative and quantitative integrity of local groundwater as a potential water source for agricultural or other suitable uses
- The integrity of raw water supplies and associated infrastructure in the region.

The main waterway feature is the Carmichael River which crosses EPC1690 in an east-west direction (Figure 11). In addition, during the wet season, temporary minor drainage lines exist in the north-west portion of EPC1690.

The Carmichael River drops around 32.3 m over its 52.5 km length and flows in a west to east direction flowing into the Belyando River to the east of EPC1690. According to the Burdekin Water Quality Improvement Plan (June 2009), riparian habitat across the Carmichael River catchment has undergone a dramatic decline over the past 30 years and is currently assessed as very poor. Two areas within the Carmichael River catchment have been identified as containing freshwater High Ecological Values (HEVs) – Nairana National Park and Wilanspey Conservation Park. All other parts of the catchment are considered to be Slightly to Moderately Disturbed (SMD) due to the surrounding land use being predominately cattle grazing.

4.2.2 Potential Adverse and/or Beneficial Impacts

Potential impacts from exploration activities include possible:

- Soil erosion and sedimentation
- Water pollution from inappropriate placement and management of materials, equipment and waste
- Land contamination;
- Transfer of sediments, nutrients and pollutants to waterways by overland flow, inappropriate placement and management of equipment materials and wastes.

The HEV areas are located greater than 35km to the north east of EPC1690 therefore neither of the HEV areas will be impacted by activities on EPC1690. Given the nature and extent of activities on EPC1690, the impacts on the environmental value of water on the immediate and surrounding environment are not expected to be significant.

4.2.3 Environmental Management Plan –Water

Legislative Requirements	<ul style="list-style-type: none">• <i>Environmental Protection (Water) Policy 1997</i>• 'Erosion and Sediment Control' Standard Environmental Conditions contained in the Code of Environmental Compliance for Exploration and Mineral Development Projects• Environmental Authority MIN102643011,
Management Objectives	<ul style="list-style-type: none">• To maintain the existing chemical, physical and biological integrity of downstream water quality within acceptable parameters, so as to minimise potential impacts to the principal environmental value of stock watering• To minimise impacts on groundwater quality and quantity, so as to protect the existing and potential future environmental values• To manage raw water usage to minimise potential impacts on the water

	<p>supply system of the area</p> <ul style="list-style-type: none"> Minimisation of impacts on flooding levels and frequencies both upstream and downstream of the project
Performance Objective	<ul style="list-style-type: none"> No contaminants which would cause environmental harm to be released from the site to any waters or the bed and banks of any waters No failures of sediment and erosion control techniques leading to unacceptable sediment release Disturbance to watercourses minimised wherever possible.
Implementation Strategies	<p>Erosion and Sediment Control Measures</p> <ul style="list-style-type: none"> Minimise access and disturbance to only essential areas Minimise areas of exposed soil to avoid erosion, provide hard standing or soil stabilisation to reduce erosion Revegetation or rehabilitating disturbed areas within 3 months within Nature Refuges and EREs, within 6 months for other exploration areas and within 12 months for quarry areas Appropriate use of sediment control structures such as diversion drains, rock-check dams and silt fences or traps at key locations to capture suspended sediment In areas where the risk of soil erosion is medium or high, the seeding of perennial grass may be required Reinstate all drainage pits and clean out accumulated sediment or leaf litter in pits after storm/heavy rain events Reinstate all existing erosion-control structures after storm/heavy rain events Stabilise soils by revegetating exposed surfaces or by other means such as mulching or jute matting Take reasonable measures to minimise vehicle movements where possible during wet weather Remove temporary erosion-control structures when no longer required <p>Watercourses</p> <ul style="list-style-type: none"> Minimise crossings of watercourses where possible Locate crossing points where turbulence is minimal and away from bends in streams or where two drainage lines meet Sediment control measures must be implemented to minimise any increase in water turbidity if carrying out activities in a watercourse Access tracks across waterways will be at an angle of 90 degrees to the watercourse in order to limit the extent of clearing Watercourse flows should not be significantly altered Where practicable, large trees will be retained and root stock will, wherever practicable, be retained for stabilisation of the banks The exploration manager will be vigilant of flood warnings and where necessary, action will be taken in accordance with the Emergency Response Plan <p>Drilling Activities</p> <ul style="list-style-type: none"> All drilling fluids and mud resulting from drilling and exploration activities

	must be contained in constructed sump
Monitoring	<ul style="list-style-type: none"> • Visual assessment will be undertaken regularly through the vicinity of the project area to monitor any impacts from overland flow such as gullyng and impacts to sediment and erosion control structures • Routine visual monitoring must be undertaken when carrying out activities in a watercourse • Regular visual inspection of the areas disturbed will be performed. Where and, if necessary, remediation measures proposed
Reporting	<ul style="list-style-type: none"> • Any incidents of water contamination and or failed or insufficient erosion and sediment controls will be reported in the regular planned inspection reports
Corrective Actions	<ul style="list-style-type: none"> • Should an incident or failure to comply occur, the following corrective actions could be considered: <ul style="list-style-type: none"> o Repair soil erosion and sediment controls o Repair stormwater controls o Contain and remedy or dispose of contaminated materials o Improve level of housekeeping o Review the relevant environmental management plan

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4.3 Noise and Vibration

4.3.1 Environmental Values

The key environmental values for noise and vibration are outlined in the *Environmental Protection (Noise) Policy 2008* (EPP Noise) are:

The environmental values to be enhanced or protected under this policy are—

- (a) the qualities of the acoustic environment that are conducive to protecting the health and biodiversity of ecosystems; and*
- (b) the qualities of the acoustic environment that are conducive to human health and wellbeing, including by ensuring a suitable acoustic environment for individuals to do any of the following—*
 - (i) sleep;*
 - (ii) study or learn;*
 - (iii) be involved in recreation, including relaxation and conversation; and*
- (c) the qualities of the acoustic environment that are conducive to protecting the amenity of the community.*

The operation of noise emitting machinery associated with exploration activities must not impact on any noise sensitive place within the context of the social or economic amenity and the wellbeing of individuals including sleep, relaxation and conversation.

Statutory objectives relevant to the operation include those contained in EPP Noise - Part 2 Section 10. The EPP (Noise) specifies a long term Acoustic Quality Objective of achieving an ambient level of 55 dB(A) or less for most of Queensland's population. The 55 dB(A) however remains a broad overall guiding objective when there are no specific alternative guidelines. Noise standards have been selected based on the EPP (Noise) criteria. The EPP Noise compliance criteria are applicable for continuous noise sources such as exploration operations. Other relevant standards are the World Health Organisation's (WHO) criteria for good sleep and conversation amenity. They specify that the maximum noise levels should not exceed more than approximately 45 and 50 dB(A) inside any of the privately owned residences more than 10 to 15 times per night and day, respectively. The application of EPP Noise permissible noise levels as the primary noise standard will, by default, achieve the WHO sleep criteria standards.

It is not intended that, in achieving the acoustic quality objective, any part of the existing acoustic environment be allowed to significantly deteriorate. To establish whether the amenity at a sensitive place has "significantly deteriorated" in the event that a non-vexatious noise complaint is received, a noise assessment will be undertaken at the request of the administering authority. The assessment will be undertaken in accordance with the latest edition of the DERM Noise Measurement Manual.

For those residences closest to the activities on the MDL, the acoustic quality objective would be met if their existing acoustic amenity does not "significantly deteriorate" as a result of exploration activities.

The closest permanent residents, Doongmabulla Homestead, are located approximately 7km to the west of the EPC boundary (Figure 15). Lignum Homestead and Bygana Homestead are located approximately 7.5km and 8.5km respectively to the east of the EPC boundary (Figure 15). According to Bureau of Meteorology data, the prevailing winds are from the north east, east and south east directions therefore any noise generated by

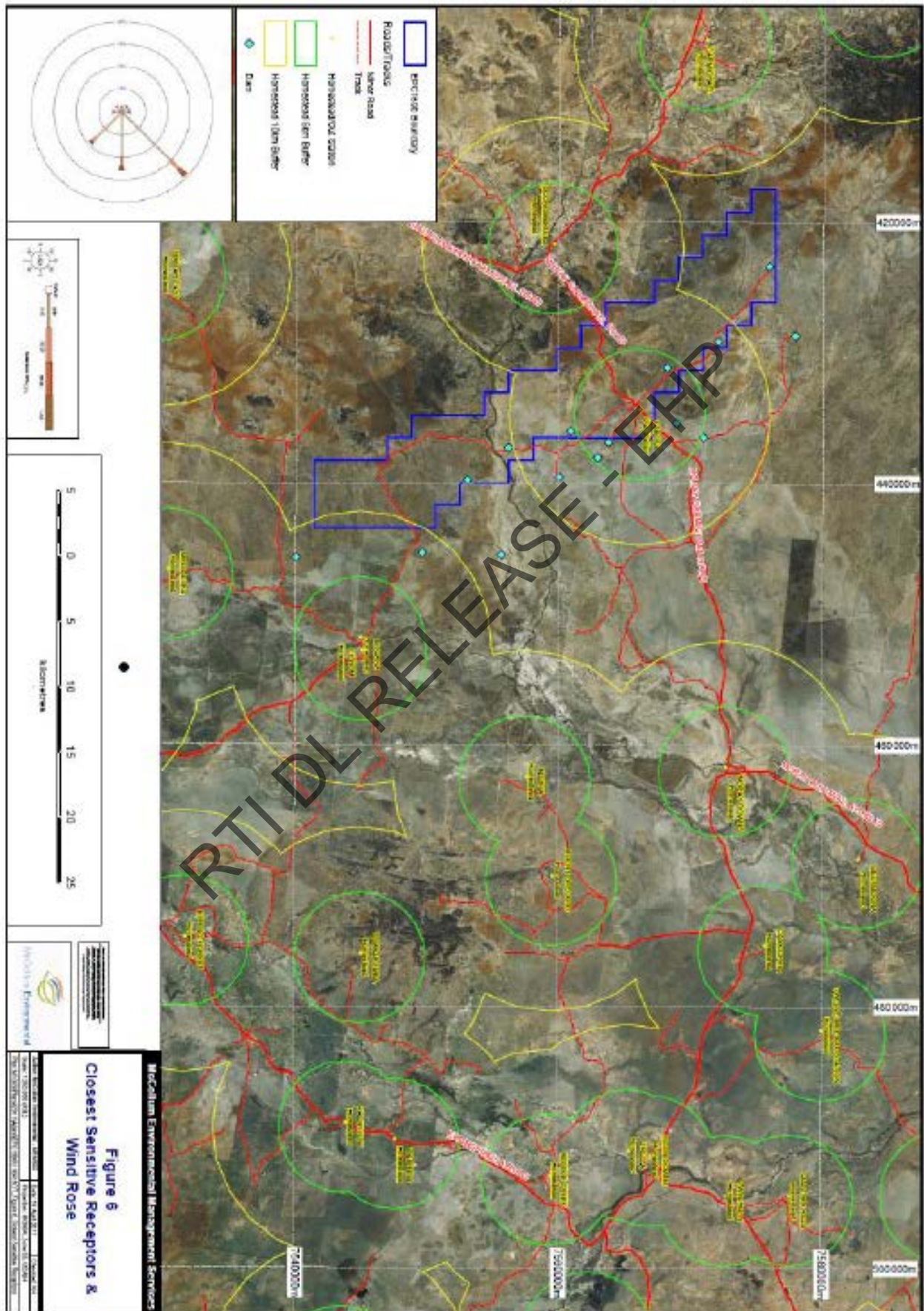
exploration activities are not anticipated to be transported to the sensitive receptors. The Labona Outstation is located within EPC1690 however is only utilised during mustering times therefore any impacts will be short term. Noise levels must comply with the following limitations outlined in Table 13.

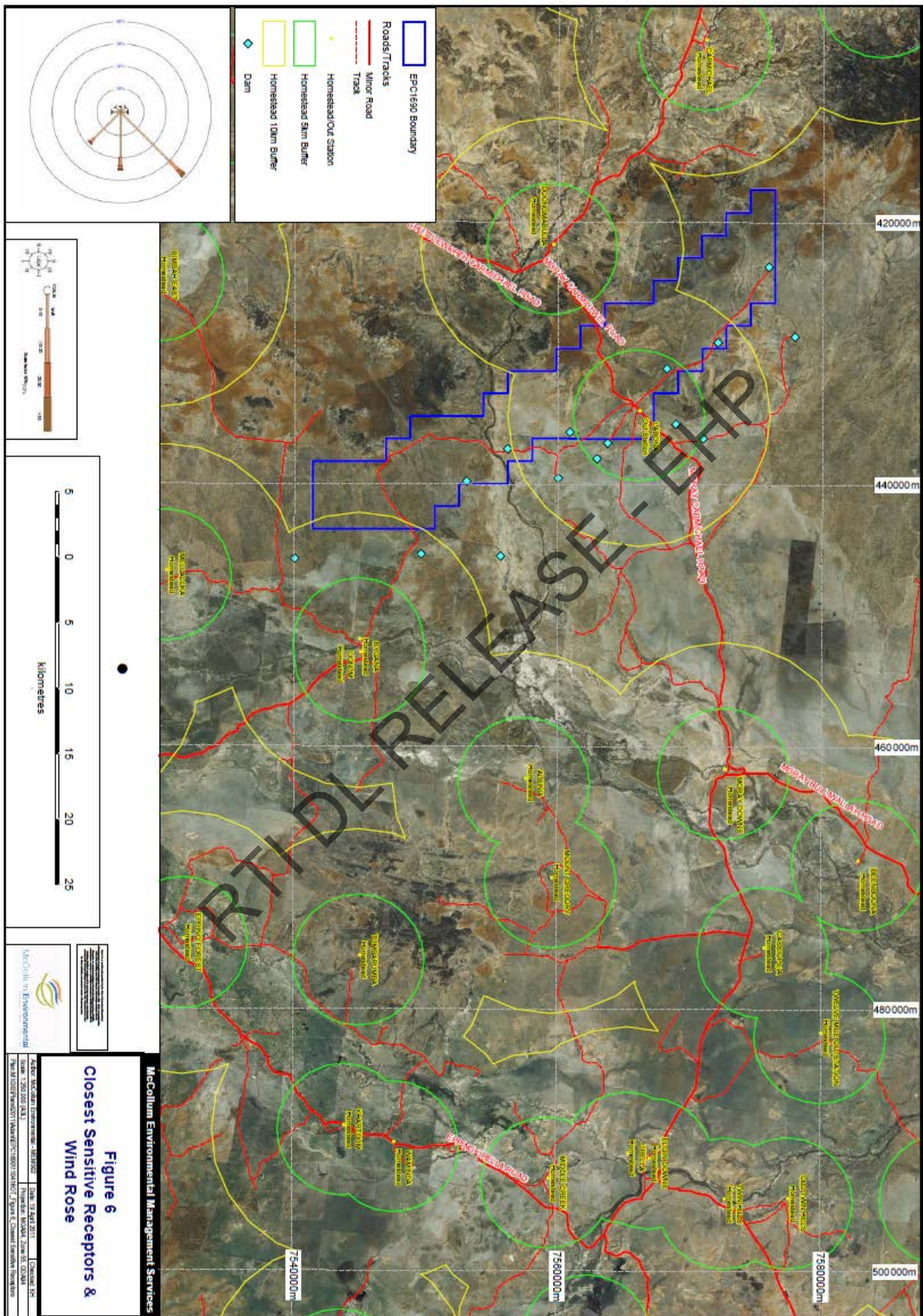
Table 13 Noise levels at sensitive receptors or commercial places

Noise level dB(A)	Monday to Sunday (including public holidays)		
	7 am-6 pm	6 pm-10 pm	10 pm-7 am
	Noise measured at a 'sensitive or commercial place'		
LA ₁₀ , adj, 10 mins	Background + 5	Background + 5	Background + 3
LA ₁ , adj, 10 mins	Background + 10	Background + 10	Background + 5

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Figure 15 Sensitive Receptors





4.3.2 Potential Adverse and/or Beneficial Impacts

Anecdotal evidence from previous drilling campaigns over the site indicates that the noise impact from exploration activities is expected to be minimal at all noise sensitive receivers. No complaints have been received in relation to prior drilling campaigns from sensitive receptors. Nearest sensitive receptor locations are identified in Figure 15.

No blasting activities will be undertaken on EPC1690, therefore no vibration nor airblast overpressure impacts will be possible. Given the nature and extent of activities on EPC1690, the impacts on the environmental value of noise and vibration on the immediate and surrounding environment are not expected to be significant.

Due to the nature of the activities and the distance of the nearest sensitive receptors, it is considered that the acoustic amenity will not be significantly affected by the activities. However, any legitimate complaints in relation to vibration will be managed to identify the source/s and detail further actions to be undertaken, including a response monitoring program.

4.3.3 Environmental Management Plan - Noise and Vibration

Legislative Requirements	<ul style="list-style-type: none">• <i>Environmental Protection (Noise) Policy 2008 (EPP Noise)</i>• Environmental Authority MIN102643011• 'Noise Emissions' Standard Environmental Conditions contained in the Code of Environmental Compliance for Exploration and Mineral Development Projects
Management Objectives	<ul style="list-style-type: none">• Ensure no unreasonable intrusive noise or vibration attributable to the exploration activities at the nearest noise sensitive locations• Control noise and vibration sources at the site to enable achievement of the statutory environmental protection objectives
Performance Objective	<ul style="list-style-type: none">• No noise complaints at a sensitive or commercial place• Noise levels at sensitive places below that specified in the relevant EA conditions
Implementation Strategies	<ul style="list-style-type: none">• All equipment will be well maintained and used in accordance with designs• All mobile equipment to be fitted with efficient silencing equipment to current Queensland mining standards• Engage nearby landholders and sensitive receptors prior to undertaking activities; All staff and contractors trained in best practice noise management• Time the use of loud machinery to minimise the disturbance to surrounding landholders and environment• Assess whether vibration may adversely impact any structures and mitigate accordingly; and Inform all potentially affected receptors of the expected time and duration of vibration activities
Monitoring	<ul style="list-style-type: none">• For any noise monitoring program undertaken, the latest edition of the EHP Noise Measurement Manual will be adopted as the standard.• Noise Monitoring shall be completed if required to determine impact of activities following a legitimate complaint. The results must be notified within 14 days to administering authority following completion of monitoring.

	<p>Monitoring must include:</p> <ul style="list-style-type: none"> • Relevant background sound level • The level and frequency of occurrence of impulsive or tonal noise • The atmospheric conditions including wind speed and direction • Location, date and time of recording
Reporting	<ul style="list-style-type: none"> • Routine Work reports with maintenance records will be recorded and reviewed by Exploration Manager or his delegate.
Corrective Actions	<ul style="list-style-type: none"> • Legitimate complaints in relation to noise will be managed to identify the source/s and detail further actions to be undertaken, including a response monitoring program.

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4.4 Waste

4.4.1 Environmental Values – Waste

Adani is committed to adopting the waste management hierarchy principles, namely:

- Waste avoidance
- Waste re-use
- Waste recycling
- Energy recovery from waste
- Waste disposal.

The waste streams and their sources that are likely to be produced at EPC1690 include:

- Clean general waste, primarily derived from the camp
- Sewage waste, generated through the operation of onsite sewage treatment system
- Drilling wastes- coal chips, slurry, waste drilling fluids and water.

Adani will use licensed contractors for the transport and processing of wastes to suitable facilities.

4.4.2 Potential Adverse and/or Beneficial Impacts

Potential adverse impacts during exploration activities resulting from poor waste management practices may include possible:

- 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 municipal infrastructure through increased peak demand, i.e. Sewerage treatment plants
- Impacts on air quality through odour emissions
- Reduction in visual amenity of surrounding area.

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4.4.3 Environmental Management Plan - Waste

Legislative Requirements	<ul style="list-style-type: none"> 'Waste Management' Standard Environmental Conditions contained in the Code of Environmental Compliance for Exploration and Mineral Development Projects, except condition 21, which is replaced with the management strategies below.
Management Objectives	<ul style="list-style-type: none"> Avoid contaminating land, surface water, groundwater or air through poor waste management practices Minimise the generation of waste in accordance with the waste management hierarchy Manage waste through the use of licensed contractors, transporters and disposal facilities.
Performance Objective	<ul style="list-style-type: none"> No contamination of land or waters Minimal environmental impacts related to waste management Maintain clean and waste efficient sites No litter left on or off site after deep natural gas exploration activities/ rehabilitation has taken place Volumes of waste generated from activities are minimised
Implementation Strategies	<p>General</p> <ul style="list-style-type: none"> General waste must not be disposed of within EPC1690 Regulated waste must not be disposed of within EPC1690 Install containers and other facilities for waste segregation. Install appropriate signage for their correct use Temporary field storages will be banded. Drums from 20L to 205L will be placed within banded areas when not in use Any sites that become contaminated will be investigated and managed in accordance with the requirements of the contaminated land provisions of the EP Act A register of all chemicals stored on site will be developed and maintained Only licensed waste contractors will be employed to collect, transport and dispose of waste from EPC1690. The waste management contractor will be required to dispose of the waste to a licensed waste management facility, with reporting requirements on the final destination of the waste. <p>Storage of Tyres</p> <ul style="list-style-type: none"> Scrap tyres stored awaiting disposal or transport for take-back and recycling, or waste-to-energy options must be stored in stable stacks and at least 10 metres from any other scrap tyre storage area, or combustible or flammable material, including vegetation All reasonable and practicable fire prevention measures must be implemented, including removal of grass and other materials within a 10 metre radius of the scrap tyre storage area. <p>Sewage Effluent</p> <ul style="list-style-type: none"> Adani will ensure its licensed waste contractor will not adversely impact STP efficiency due to sub-optimal scheduling of its operations The camp sewerage storage system will be operated in accordance with

manufacturers recommendations and be subject to regular inspections to ensure efficient operation of the system. If service or maintenance of the system is required a licensed plumber will be contracted to undertake the works

- Treated effluent must not be released from the site to any waters or the bed and banks of any waters
- Water or storm water contaminated by sewage treatment activities must not be released to any waters or the bed and banks of any waters
- Pipelines and fittings associated with the sewage treatment plant must be clearly identified. Lockable valves or removable handles must be fitted to all release pipelines situated in accessible areas
- In the first instance, Adani will use treated effluent for dust suppression, irrigation and other exploration activities. If a surplus exists, Adani will use existing absorption trenches to manage the treated effluent levels on site
- The release of treated effluent to the designated absorption trenches must be carried out in a manner such that:
 - o Vegetation is not damaged
 - o Soil erosion and soil structure damage is avoided
 - o No surface ponding of effluent
 - o Percolation of effluent beyond the plant root zone is minimised
 - o Capacity of the land to assimilate nitrogen, phosphorous, salts, organic matter as measured by oxygen demand and water is not exceeded
 - o Quality of groundwater is not adversely affected.
- Activities associated with maintenance and the potential waste types (biosolids) produced as a result of maintenance will be transferred off site using an accredited provider
- Notices must be prominently displayed on absorption trenches, warning the public that the area is irrigated with effluent and not to use or drink the effluent. These notices must be maintained in a visible and legible condition
- When conditions prevent the release of treated effluent to the designated absorption trenches (such as during or following rain events), the contaminants must be directed to a wet weather storage or alternative lawfully disposed. A record must be kept of any removal or discharge off site, including destination, transporter, dates and volumes.

Regulated Wastes

- Regulated wastes will be stored in designated locations to ensure that there is minimal risk of accidental release of regulated wastes to land. Regulated waste will only be removed from site by a licensed regulated waste contractor and will be taken to a licensed landfill that can accept regulated wastes. A register of hazardous materials and their location will be kept on site
- Waste batteries must be stored in a bunded and roofed area, or palletised and plastic wrapped.
- Regulated waste may be temporarily stored on EPC1690 before being directed to a facility that can lawfully accept such waste
- All regulated waste removed from the site must be removed by a person who holds a current approval to transport such waste under the provisions of the *Environmental Protection Act 1994*

- All petroleum products and other hazardous goods will be stored in bunded areas sized in accordance with *AS1940 Storage and Handling of Flammable and Combustible Liquids*

Storage of waste

- A designated area or storage containers must be set aside for the lay down and segregation of wastes
- An effective fire break must be provided and maintained around all waste lay down areas
- All reasonable and practicable fire prevention measures must be implemented, including removal of grass and other materials within a 10 m radius of all waste lay down areas
- Waste must not be burned or allowed to be burned on EPC1690 unless by approval of the administering authority
- The daily operation of the sewage treatment plant and pollution control equipment must be carried out by a person(s) with appropriate experience and/or qualifications to ensure the effective operation of that treatment system and control equipment

Monitoring

- Regular housekeeping checks to occur of the site and to ensure no litter is occurring
- Regular inspections to occur of regulated waste storage areas

Reporting

- Regulated wastes will be tracked under the *Environmental Protection (Waste Management) Regulation 2000*. Appropriate actions will be taken to ensure that the potential impacts of regulated wastes on land are minimised.

A record of the removal of treated effluent from site must be kept detailing the following information:

- date of pickup of treated effluent
- volume of treated effluent removed from the site
- destination of the treated effluent
- the transporter.

If the responsibility of the treated effluent is given or transferred to another person:

- the responsibility of such effluent must only be given or transferred in accordance with a written agreement (the third party agreement)
- include in the third party agreement a commitment from the person utilizing the effluent to use effluent in such a way as to prevent environmental harm or public health incidences and specifically make the persons aware of the General Environmental Duty (GED) under section 319 of the *Environmental Protection Act 1994*, environmental sustainability of any effluent disposal and protection of environmental values of waters
- upon being notified or otherwise becoming aware that the person's use of effluent is causing or threatens to cause environmental harm or is posing a human health risk, and if the person does not rectify the situation upon written request, the giving and transferring responsibility for such effluent must cease.

Corrective Actions

- Ensure appropriate waste disposal facilities are made available at all well site locations

- Ensure site is kept clean and tidy at all times
- Ensure all staff have been trained in appropriate waste disposal requirements that are consistent with this EMP

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4.5 Soils

4.5.1 Environmental Values – Soil

The environmental value for soil and land is the maintenance of the existing land suitability classification, i.e. suitability for low intensity grazing.

4.5.2 Potential Adverse and/or Beneficial Impacts

Potential impacts on land resources from exploration related disturbance include possible:

- Soil erosion and sedimentation
- Loss of or degradation of topsoil leading to reduced rehabilitation success
- Exposure of saline subsoil
- Soil contamination from hydrocarbon spills
- Possible land suitability changes
- Possible land use changes.

Given the nature and extent of activities on EPC1690, the impacts on the environmental value of land on the immediate and surrounding environment are not expected to be significant.

4.5.3 Environmental Management Plan - Soil

Legislative Requirements or Best Practice Guidelines	<ul style="list-style-type: none">• International Erosion Control Association, Best Practice Erosion and Sediment Control Guideline, 2008 (IECA, 2008)• Environmental Authority MIN102643011• Code of Environmental Compliance for Exploration and Mineral Development Projects, except condition 2, which is replaced with the management strategies below.
Management Objectives	<ul style="list-style-type: none">• Prevent the degradation of aquatic and terrestrial habitats from erosion and increased sediment load by minimising the disturbance to creek banks and control site runoff from all areas disturbed during exploration activities to manage land within the EPC so as to minimise impacts on surrounding properties and downstream water quality• To protect future land use values of areas by ensuring that only land within the EPC required for exploration activities is disturbed• To appropriately manage topsoil so as to minimise potential impacts on the surrounding environment• To progressively rehabilitate land disturbed by exploration activities• To ensure that adverse impact on the nature conservation and biodiversity value of the area is minimised• Avoid sterilisation of potential future coal resources.
Performance Objective	<ul style="list-style-type: none">• No unapproved discharge to receiving waters• No discharge to receiving water outside of approved limits• Erosion and sediment controls in place prior to works commencing for all sites

Implementation Strategies	<ul style="list-style-type: none"> • Clearing will only commence when suitable erosion control measures are in place • Topsoil and vegetation clearing will only be carried out where necessary for ongoing operations • Topsoil stockpiles will be located away from drainage paths and the final surface will be ripped to promote natural revegetation • Current best practice for erosion and sediment control measures will be undertaken in accordance with the Engineers Australia (formerly Institute of Engineers Australia) Erosion and Sediment Control Guidelines to minimise the potential for sedimentation of receiving waters • Planning strategies will be implemented to ensure unnecessary disturbance of land is avoided • Areas of pasture, remnant vegetation and remnant habitat not being disturbed will be managed to protect their value for post mining land use • Disturbance of areas will be limited to only those required for exploration related activities as identified in this EMP • Active control of weeds and pests on the EPC • A number of environmental management measures will be implemented to prevent land contamination which include but may not be limited to the following: <ul style="list-style-type: none"> a) where fuel storage is >200L, the design and construction of fuel storage areas in accordance with Australian Standard AS1940: <i>The storage and handling of flammable and combustible liquids</i> b) the provision of spill control kits at all hydrocarbon and chemical storage areas c) storage of chemicals in appropriately designed and covered chemical storage areas d) the maintenance of an environmental incident register on site to record details of any hydrocarbon or chemical spill include location, date, immediate actions taken and recommended remediation actions • Any sites that become contaminated will be investigated and managed in accordance with the requirements of the contaminated land provisions of the EP Act.
Monitoring	<ul style="list-style-type: none"> • All sediment control devices will be inspected regularly • Weather conditions will be monitored so that work in creek crossings and erosion prone areas will not take place if rain and/ or extreme weather is forecast • Regular water quality monitoring of nearby water resources will be conducted to confirm adequacy of management and mitigation measures • Steep slopes of overburden piles where it may take time for vegetation to establish will be monitored regularly for signs of erosion and where required corrective actions will be established to slow runoff velocities and/or reduce scour potential by using alternative stabilisation techniques
Reporting	<ul style="list-style-type: none"> • Ongoing tracking of rehabilitation completed sites, inspections, non-conformances and incidents

Corrective Actions

- Erosion and sediment controls will be repaired as soon as practicable
- Tracked in non-conformance register to ensure close out by the Field Environmental Officer

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4.6 Native Flora and Fauna

4.6.1 Environmental Values

Study Area (whole of EPC1690)

The Study Area referred to in this section is the entire area covered by EPC1690.

EPC1690 is located in Central Queensland within the Burdekin Catchment, at the boundary of the Brigalow Belt and Desert Uplands bioregions. Cattle grazing occurs across the entire EPC area, although the intensity of grazing varies with some areas retaining remnant vegetation status and other areas being cleared. The Bygana West Nature Refuge occurs over part of the southern extent of the Study Area, south of the Carmichael River. The nature refuge covers an area of approximately 1,487 ha, management of activities within the Nature Refuge are addressed in Section 4.10.

One EPBC Act listed threatened ecological community (TEC), Brigalow (*Acacia harpophylla* dominant and co-dominant), was recorded during field surveys in the Study Area.

Four EPBC Act listed threatened fauna species, black-throated finch (southern) (*Poephila cincta cincta*) (endangered), squatter pigeon (southern) (*Geophaps scripta scripta*) (vulnerable), koala (*Phascolarctos cinereus*) (vulnerable) and ornamental snake (*Denisonia maculata*) (vulnerable) were recorded during field surveys in the Study Area. One additional EPBC Act listed threatened fauna species is considered likely to occur. One EPBC Act listed threatened flora species, waxy-cabbage palm (*Livistona lanuginosa*) (vulnerable), was recorded during field surveys in the Study Area. No additional EPBC Act listed threatened flora species are considered likely to occur.

Four EPBC Act listed migratory species, eastern great egret (*Ardea modesta*), rainbow bee-eater (*Merops ornatus*) and satin flycatcher (*Myiagra cyanoleuca*) and white-bellied sea-eagle (*Haliaeetus leucogaster*), were recorded during field surveys in the Study Area. A further 11 EPBC Act listed migratory species are considered likely to occur.

There are no Category A ESAs located within the Study Area, approximately 1,054 ha of Category B ESAs (REs 10.4.3, 10.9.3, 11.3.1, 11.4.5, 11.4.6, 11.4.8 and 11.4.9 (endangered (biodiversity status))) are located within the Study Area (based on amended RE mapping). The Category C ESA of Bygana West Nature Refuge is located within the Study Area.

Six NC Act listed threatened fauna species, black-throated finch (southern) (endangered), squatter pigeon (southern) (vulnerable), ornamental snake (vulnerable), black-necked stork (*Ephippiorhynchus asiaticus*) (near threatened), cotton pygmy goose (*Nettapus coromandelianus*) (near threatened) and little pied bat (*Chalinolobus picatus*) (near threatened) were recorded during field surveys in the Study Area. One NC Act listed threatened flora species, waxy-cabbage palm (vulnerable), was recorded during field surveys in the Study Area.

Regrowth vegetation as defined by the VM Act comprises vegetation that is non-remnant. The Study Area includes four patches of regulated regrowth vegetation, with an area of approximately 45 ha and mapped as a least concern regrowth RE, located south of the Carmichael River.

Exploration activities are restricted to certain ESA areas as outlined in Table 14.

Seismic Survey Study Area, area of additional access tracks and relocated bore holes

The Seismic Survey Study Area is located in the northern extent of EPC1690, covering a total area of 3901 ha. Drill holes are also proposed to be relocated within this area and subsequently additional access tracks will need to be created.

As part of the works, approximately 807 ha of vegetation will be cleared across for approximately 313 N-S signal lines and 403 W-E sensor lines, spaced at 32 m intervals at 45 degree angles. The N-S signal lines will be buffered 1.5 m to give a 3 m track. The E-W sensor lines will be buffered 2 m for a 4 m track.

The additional access tracks have a width of 4.5 m. An additional area of 11.9 ha may be disturbed for additional access tracks.

Least concern REs make up the vast majority of vegetation within the Seismic Survey Study Area. The vegetation is predominately within open woodland that is dominated by eucalypt species including *Eucalyptus melanophloia*, *Eucalyptus crebra*, *Eucalyptus similis* and *Eucalyptus brownii*.

Two EPBC Act listed threatened fauna species, black-throated finch (southern) and squatter pigeon (southern), were recorded during field surveys in the Seismic Survey Study Area. Black-throated finch (southern) have been recorded within the Seismic Survey Study Area in 2011, 2012 and 2013 during the EIS surveys and targeted surveys for black-throated finch. As the Significant Impact Guidelines for the Endangered Black-throated Finch (southern) (*Poephila cincta cincta*) (DEWHA, 2009) define any habitat within five km of a post 1995 sighting as an 'important area' for the subspecies, the entire Seismic Survey Study Area occurs within an 'important area' for this subspecies. No EPBC Act listed threatened flora species were recorded during field surveys in the Seismic Study Area. Squatter pigeons have been recorded within the Seismic Survey Study Area during the EIS surveys and also opportunistically during subsequent field surveys within the area, particularly at locations nearby to water sources. This species is likely to be locally-abundant within suitable habitat areas across the broader landscape.

The southern edge of the Seismic Survey Study Area intersects with the 500 m buffer of a mixed RE polygon, containing endangered RE 10.4.3. This RE is a constituent RE for the EPBC Act listed Brigalow TEC. The mixed RE polygon (RE 10.45/10.4.3a/10.5.5a) is also mapped as a Category B ESA. An area of 7.25 ha will be disturbed in the 500 m buffer of the Category B ESA as a result of seismic survey activities.

No Category A or C ESAs are located within the Seismic Survey Study Area.

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Table 14 Exploration activities permitted within ESA area

ESA Category	Location	Exploration activities
A	Cat A and within 1 km buffer	No mining activities permitted
B ((Endangered Regional Ecosystems))	500 m buffer Apply site selection criteria	Drill pads must not exceed 2000 m ² Gridlines minimal intervals of 350 m Topsoil stripping for sumps and Sumps not to exceed 16 m ² No Quarry locations No camps Minimise disturbance from roads and tracks and avoid clearing trees where possible
C	Apply site selection criteria	Drillpads must not exceed 2000 m ² Gridlines minimal intervals of 350 m Topsoil stripping for sumps and Sumps not to exceed 16m ² Minimise disturbance from roads and tracks and avoid clearing trees where possible No camps
C (Bygana West Nature Refuge)	Within 500 m of Gilgai Wetlands within Byanga West Nature Refuge or within RE areas 11.3.10/11.4.6/11.4.8, 11.3.10/11.4.6 Apply site selection criteria.	No quarry locations Minimise road and tracks; new roads an tracks require written approval of landholder and consultation with administering authority. No more than 20 LOX and 27 Coal Quality holes, any additional exploration will require written approval from the landholder.
No Cat A, B, C area	Areas not identified above	Drill pads must not exceed 2000 m ² Topsoil stripping for sumps and Sumps not to exceed 32m ² Laydown areas Quarries/ Burrow pits Exploration camp Workshops

4.6.2 Potential Adverse and/or Beneficial Impacts

Potential impacts from exploration activities on environmental values include possible:

- Unnecessary destruction of fauna habitat, including potentially suitable habitat for the (EPBC and NC Act listed) black-throated finch (southern) and squatter pigeon
- Fragmentation of ecosystems through the establishment of access tracks
- Activities of machinery and exploration operations which may increase the likelihood of bushfires
- Movement of machinery and vehicles between areas has the potential to spread weeds and pests
- Removal of vegetation
- Fauna injury or fatality

The total Project site covers 26,015 ha. Total clearing extents for the previously approved exploration activities and associated infrastructure is approximately 937 ha of remnant and non-remnant vegetation. Of the 937 ha anticipated disturbance, approximately 19.2 ha will be from areas classified as ESA or within the ESA buffer.

Therefore, total disturbance of ESAs and buffer areas for the previously approved exploration activities represents less than 0.1% of the total Project area.

The mulching of some shrub and groundcover vegetation for the 3D seismic survey within EPC1690 is likely to disturb approximately 800 ha of land that is mapped as remnant vegetation and 7.25 ha will be disturbed within the 500 m buffer zone of the Category B ESA.

Given the nature and extent of previously approved activities on EPC1690, the impacts on the environmental value of nature conservation on the immediate and surrounding environment are not expected to be significant. Similarly for the amended 3D seismic survey area, impacts to nature conservation values are minimised due to the proposed method of vegetation clearing for site preparation (refer to Section 2.9.2). Only grass, shrubs, small dead timber and some small trees are proposed to be removed. This will allow for mature trees, potential fauna breeding sites (such as bird nests (particularly potential nests for the black-throated finch), termite mounds and large fallen timber), top soil and root systems to remain largely unaffected.

The previously approved exploration program and the amended exploration program have been designed to avoid, where possible, or minimise disturbance and vegetation clearing within ESAs and EREs and buffer zones on EPC1690. Where disturbance to vegetation is unavoidable, disturbance will be managed such that the minimum area required for safe access and operation is cleared. Trees and other vegetation will be removed only where required and vegetation outside exploration areas will remain undisturbed.

4.6.3 Environmental Management Plan – Flora and Fauna

Legislative and Policy Requirements	<ul style="list-style-type: none"> Nature Conservation Act 1997 Queensland Biodiversity Offset Policy 2011
Management Objectives	<ul style="list-style-type: none"> Avoid or reduce any impacts on local and regional availability of habitat for a diversity of common fauna species during the exploration activities Prevent or minimise impacts to terrestrial ecological values from the Exploration program
Performance Objective	<ul style="list-style-type: none"> No vegetation clearing outside the specified/approved boundaries No accidental clearing or stockpiling of cleared vegetation in sensitive areas No death or injury of native fauna attributable to construction and operational activities
Implementation Strategies	<ul style="list-style-type: none"> Unnecessary clearing of vegetation is to be avoided An onsite environmental clearance and site inspection must be conducted prior to any disturbance Unnecessary clearing of vegetation is to be avoided No vegetation or disturbance is permitted without permit to disturb The extent of vegetation clearing will be clearly identified on exploration plans and in the field Areas that must not be cleared or damaged will also be clearly identified on exploration plans and in the field. Clearing extents will be communicated to all necessary exploration personnel involved Vegetation clearing will be undertaken in a sequential manner to allow more mobile fauna species the opportunity to disperse away from clearing

areas

- All vehicles and plant associated with vegetation clearing will adhere to site rules relating to speed limits. Speed limits will be developed, and clearly signposted so as to minimise the potential for road kill
- Habitat trees must be protected
- Trees or shrubs with nests of birds of prey whether active or not, or visibly active non-raptor bird nests must be protected
- No clearing of mature trees is authorised except with approval of the administering authority
- Debris from clearing or felling of trees must not accumulate within two metres of any retained tree
- Burning of vegetation is not permitted unless for or the purpose of land management
- Larger vegetation materials including hollow logs and hollow bearing trees will also be stockpiled for use in rehabilitation and/or placed in adjoining bushland as fauna habitat
- Where vegetation is not reused (as either chip/mulch or habitat structures), it may be transported offsite to a facility for chipping, mulching and/or composting
- If any pits/trenches are to remain open after daily site works have completed, they will be securely covered by an impenetrable barrier, if possible, or fauna ramps (e.g. log ramps or wooden planks) will be put in place to provide a potential means of escape for trapped fauna
- Work areas will be checked for fauna that may have become trapped before work commences each day
- Where fencing is required around cleared areas, it will be designed such that fauna can move through it (excluding those instances where fenced areas seek to protect fauna from threats such as trenches)
- Employees will be made aware of environmental responsibilities during inductions and ongoing environmental awareness training
- Site inductions will include education regarding the local fauna of the site and identification of protocols to be undertaken if fauna are encountered
- Sites are to be accessed via existing tracks, where practicable;
- Keep work areas free from food scraps to prevent attracting scavenging animals to the site
- Vehicles and equipment to be washed down as required
- Implement staged biodiversity offsets as per Attachment 4.

3D Seismic Survey

- Ecologists and fauna spotter catchers are to be on site during scouting and site preparation work (vegetation clearing) to assist in the identification of fauna breeding places including, but not limited to, bird nests (active or inactive, including potential finch nests), important habitat trees, weeds, water sources, termite mounds and large fallen timber. Such identified features are to be avoided during site preparations. Fauna spotter catchers are required to relocate any fauna species that can't be avoided as required and help direct avoidance of fauna breeding places by

machinery during clearing.

- Limit 3D seismic track disturbance to the minimum width practical.
- Wherever possible, avoid surveying lines in proximity to water sources around dawn and dusk to minimise disturbance to fauna drinking locations.
- Existing water troughs, pipes and tanks are to be manoeuvred around during site preparation
- Shrubs and small trees overhanging or immediately adjacent to existing water troughs, pipes and tanks are to be retained as such features create cover protection for the black-throated finch whilst drinking.
- During site preparation works, where possible, avoid the removal of shrubs and small trees within open woodland environments by manoeuvring machinery around vegetation as this vegetation is preferred nesting vegetation for the black-throated finch (southern).
- All vehicles and equipment are to be washed of foreign seeds and pests before coming to site and before leaving site.
- Check regularly for weeds attached to equipment and vehicles when moving from one area to another. To reduce the spread of introduced grasses, vehicles and machinery are to be washed down after working in areas containing buffel grass and prior to moving into areas dominated by native grasses.
- Vegetation clearing/mulching for site preparation for 3D seismic tracks is to avoid the RE polygon 10.4.5/10.4.3a/10.5.5a which contains the endangered RE 10.4.3 and is mapped as a Category B ESA.

Access Tracks

- All new tracks must be recorded with a GPS and records kept of their location and made available to the administering authority upon request
- Any existing access and fence line tracks must be used
- Any new tracks are to be constructed by linking naturally cleared or disturbed areas where practical
- Track construction involving blade clearing of established ground cover vegetation and/or clearing of mature trees is to be prevented or minimised
- Spacing of tracks must not be less than 350 m.

Rehabilitation

- As soon as practicable after cleared areas are no longer required, rehabilitation will commence using flora species of local provenance and at least within 6 months of the completion of works in those areas
- Vegetated buffers will be maintained along the Carmichael Moray Downs Road
- Areas where vegetation has been cleared/mulched for the 3D seismic survey lines will be left to naturally regenerate as the seed bank and topsoil is not proposed to be disturbed.

Monitoring

- Review weed wash down process if the presence of declared weeds is identified in the work area
- Monitoring of wildlife during clearing activities to be undertaken to

	<p>identify any injury to wildlife</p> <ul style="list-style-type: none"> • Vegetation regrowth within 3D seismic survey impacted areas is to be monitored and corrective action (re-seeding) is to occur if percentage cover targets are not met.
Reporting	<ul style="list-style-type: none"> • Incidents involving animal strike or injury will be managed and reported as an incident in accordance with the incident management procedure • Monthly reporting by the Exploration Contractor to Adani on non-conformances, incidents (including deaths and injury of wildlife) and site inspections
Corrective Actions	<ul style="list-style-type: none"> • Review flora and fauna management procedures if FEA identifies it as necessary • In the event of a failure to comply with this EMP or EA conditions, investigations will be undertaken to overcome the problem and prevent recurrence

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4.7 Weed and Pest

4.7.1 Environmental Values

26 introduced plants were detected at the EPC Area (four of which are 'declared plants' under the LP Act: parthenium, prickly pear, velvety tree pear (*Opuntia tomentosa*) and rubber vine (*Cryptostegia grandiflora*)). Weeds were not found to be prevalent across much of the EPC area. Increasing the prevalence of weeds at the Study Area (and potentially beyond to the surrounding landscape), may reduce the quality of habitats for some flora and fauna species (aquatic and terrestrial). Terrestrial weeds can also invade riparian zones and aquatic habitats, whereby reducing aquatic habitat quality, diversity and availability.

4.7.2 Potential Adverse and/or Beneficial Impacts

The exploration program has the potential to introduce noxious pest and weed species to the region. The potential impacts on environmental values include possible:

- Introduced predators may gain access
- Displacement of other species either through predation or utilisation of scarce resources
- Deterioration and/or destruction of local fauna and flora species.

4.7.3 Environmental Management Plan – Weed and Pest Management Plan

Legislative Requirements	<ul style="list-style-type: none">• <i>Land Protection (Pest and Stock Route Management) Act 2002</i>
Management Objectives	<ul style="list-style-type: none">• To prevent the spread and/ or introduction of pest and weed species
Performance Objective	<ul style="list-style-type: none">• No new weed and pest species introduced to a property• Prevent the spread of existing weeds from exploration activities• No loss of agricultural production capability from land• No loss of biodiversity of native species
Implementation Strategies	<ul style="list-style-type: none">• All vehicles and equipment shall follow site wash down requirements• Prevent the spread of Declared Plants by ensuring that all vehicles and machinery are adequately cleaned before taking the vehicles and machinery out of a Declared Plant Area• Site locations with confirmed weed outbreaks will where possible only be accessed in dry conditions to minimise weed spread• Chemical weed controls(where deemed necessary) will be used in accordance with AS 2507 and applied by appropriately licensed personnel• Identified areas of weed infestation are to be reported to the Environment Team
Monitoring	<ul style="list-style-type: none">• Regular inspections of the site and undisturbed surrounding areas for pest and weeds infestation shall be performed• Regular inspections of vehicles and equipment when moving from one area to another• Weed wash down certificate inspections will be undertaken
Reporting	<ul style="list-style-type: none">• Landholder complaints will be recorded and reported as per the complaint management system• Non-compliance and incident reporting will be closed out by senior management as required
Corrective Actions	<ul style="list-style-type: none">• Weed control measures to be implemented in direct consultation with the

- environment team and landholder if a pest and /or weed infestation occurs
- Implement appropriate remedial action

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4.8 Hazardous Substances

Hazardous materials to be handled and stored during exploration activities will primarily include hydrocarbon based goods and minor chemical storage at camp accommodation. The safe and efficient handling and transport of these products throughout the project from delivery to disposal must be monitored and controlled to ensure health and safety standards are maintained and environmental standards are upheld.

4.8.1 Potential Adverse and/or Beneficial Impacts

Potential impacts upon environmental values include possible:

- Land, ground and surface water contamination from spills;
- Fire.

4.8.2 Hazardous Materials Management Plan

Legislative Requirements	<ul style="list-style-type: none">• Section 442 of the <i>Environmental Protection Act 1994</i> makes it an offence to release a prescribed contaminant. A prescribed contaminant is a contaminant prescribed by an Environmental Protection Policy or a regulation.• Section 443 of the <i>Environmental Protection Act 1994</i> makes it an offence to cause or allow a contaminant to be placed in a position where it could reasonably be expected to cause serious or material environmental harm or environmental nuisance
Management Objectives	<ul style="list-style-type: none">• To protect personnel, the public and the environment from harm due to the transport, storage, use and disposal of hazardous materials
Performance Objective	<ul style="list-style-type: none">• No un planned release of hazardous materials• No harm to the environment or personnel caused by hazardous materials• No contamination of the environment due to hazardous materials• All transport, storage and handling of hazardous materials is performed in accordance with applicable legislation, guidelines and standards.
Implementation Strategies	<ul style="list-style-type: none">• The holder of the environmental authority must plan and conduct activities on site to prevent any potential or actual release of a hazardous contaminant• Spills of hazardous contaminants are cleaned up as quickly as practicable. Such spillage must not be cleaned up by hosing, sweeping or otherwise releasing such contaminants to any watercourse, waterway, groundwater, wetland or lake• Spill kits must be kept at refuelling and chemical storage areas• No hazardous materials to be stored within 100 m of a waterway• An appropriate spill kit, personal protective equipment and relevant operator instructions/emergency procedure guides for the management of wastes, chemicals and flammable and combustible liquids associated with the activity must be kept at the site• Anyone operating with wastes, chemicals or flammable and combustible liquids under this approval must be trained in the use of the spill kit• All flammable and combustible liquids must be contained within an on-site containment system and controlled in a manner that prevents environmental harm and maintained in accordance with the current

	<p>edition of AS 1940 – Storage and Handling of Flammable and Combustible Liquids</p> <ul style="list-style-type: none"> • Spillage of all flammable and combustible liquids must be controlled in a manner that prevents environmental harm • All chemicals must be contained within an on-site containment system and controlled in a manner that prevents environmental harm and maintained in accordance with the current version of the relevant Australian Standard • Spillage of all chemicals must be controlled in a manner that prevents environmental harm • All explosives, corrosive substances, toxic substances, gases and dangerous goods must be stored and handled in accordance with the relevant Australian Standard • All chemicals and flammable or combustible liquids stored on site that have the potential to cause environmental harm must be stored in or serviced by an effective containment system that is impervious to the materials stored and managed to prevent the release of liquids to waters or land. Where no relevant Australian Standard is available, the following must be applied: <ul style="list-style-type: none"> o Storage tanks must be bunded so that the capacity and construction of the bund is sufficient to contain at least 110% of a single storage tank or 100% of the largest storage tank plus 10% of the second largest storage tank in multiple storage areas o Drum storages must be bunded so that the capacity and construction of the bund is sufficient to contain at least 25% of the maximum design storage volume within the bund
Monitoring	<ul style="list-style-type: none"> • Perform regular inspections of hazardous material storage facilities • Perform weekly inspections of spill kits and re-stock if required
Reporting	<ul style="list-style-type: none"> • All spills to be reported as incidents as soon as practical after a spill occurs
Corrective Actions	<ul style="list-style-type: none"> • FEA will review records of any spill and ensure appropriate remedial action has been implemented • Review storage and handling procedures as appropriate.

4.9 Rehabilitation Management Plan

Legislative Requirements	<ul style="list-style-type: none"> • Environmental Authority
Management Objectives	<ul style="list-style-type: none"> • To restore land to a stable condition and restore land use to a condition that is (as far as practicable) compatible with the proposed land use after exploration activities are complete
Performance Objective	<ul style="list-style-type: none"> • Progressive rehabilitation to occur on disturbed land within the time limits specified • Land is rehabilitated to pre-disturbed quality • Stable vegetation and habitat generation • Minimal modification of drainage patterns • No new weed species introduced

	<ul style="list-style-type: none"> • Minimal adverse impacts on existing land uses • Landholder relationships maintained.
Implementation Strategies	<ul style="list-style-type: none"> • Rehabilitation of areas disturbed by mining activities within any Category B Environmentally Sensitive Area or within the 500 m buffer must be completed as soon as practicable, but no longer than 3 months after completion of the disturbance activity. • Rehabilitation of areas disturbed by mining activities within the Category C Environmentally Sensitive Area must be completed as soon as practicable, but no longer than 6 months after completion of the disturbance activity. • Rehabilitation of areas disturbed by exploration activities within the Category C area of the Bygana Nature Refuge must be completed as soon as practicable, but within 3 months • Adani must revegetate disturbed areas with native plant species endemic to the area that will promote the same vegetation type and density of cover to that of the surrounding undisturbed areas, both in and within 500 metres of Category B Environmentally Sensitive Areas. • Adani must revegetate disturbed areas with native plant species endemic to the area that will promote the same vegetation type and density of cover to that of the surrounding undisturbed areas, both in and within 1 km of Category C Environmentally Sensitive Areas. • All land subject to mining activities must be rehabilitated to a non-polluting, safe, stable and self-sustaining landform.. • Vegetation cleared/mulched for the 3D seismic survey lines will be left to naturally regenerate as the seed bank and topsoil is not proposed to be disturbed.
Monitoring	<ul style="list-style-type: none"> • Inspections to be undertaken by FEA of rehabilitated areas to monitor success • The process of monitoring rehabilitated areas will only conclude when the site becomes stable • Vegetation regrowth within 3D seismic survey impacted areas is to be monitored and corrective action (re-seeding) is to occur if percentage cover targets are not met.
Reporting	<ul style="list-style-type: none"> • An annual report must be prepared each year and submitted with each annual return. The report must include details of exploration activities undertaken and details of progressive rehabilitation works completed to demonstrate compliance with the conditions of the EA
Corrective Actions	<ul style="list-style-type: none"> • Investigate why rehabilitation failed and instigate corrective measures in consultation with FEA

4.10 Bygana West Nature Refuge Management Plan

Disturbance (i.e. weeds, erosion, and cattle degradation) was not obvious at Bygana West Nature Refuge, although cattle grazing does occur. Habitats were typically in good condition, and retained connectivity to remnant vegetation to the northwest, west, south and east. Fauna diversity was similar to that from other open woodland habitats in the Study Area, comprising a variety of common woodland and grassland birds, reptiles and ground-dwelling mammals. The black-throated finch (southern) and squatter pigeon (southern) were observed near the southern boundary of the nature refuge – it is likely that both species utilise habitats within the nature refuge. Koalas were not recorded however are considered likely to occur, at low densities.

Legislative Requirements	<ul style="list-style-type: none"> Environmental Authority MIN102643011 DEHP Access Agreement into Nature Refuge
Management Objectives	<ul style="list-style-type: none"> To minimise the impact during exploration of the Bygana West Refuge
Performance Objective	<ul style="list-style-type: none"> Rehabilitate disturbed areas within 2 months of completion Minimise disturbance area and prevent unnecessary impacts
Implementation Strategies	<ul style="list-style-type: none"> All disturbance proposed within the Bygana Nature Refuge must have a site inspection and clearance provided in the form of a permit to disturb Ecological values within the Bygana West Nature Refuge prior to clearing for exploration will be monitored Clearly demarcate the Bygana West Nature Refuge on mining operation maps and in the field and minimise additional mining disturbance of this area up until the point where mining operation in that area is required Core Drilling pad size 2000 m. Reduced impacts to flora and fauna, where possible All exploration activities will be scheduled for the dry season to avoid impacts of using equipment in wet soil conditions No Quarry material to be removed from the refuge area Use of existing tracks and disturbed areas where possible Access tracks will be placed to avoid mature trees and use pre-disturbed areas where available to minimise impacts to the area Access tracks will be rehabilitated upon completion of exploration activities within the area <p>Weed Management</p> <ul style="list-style-type: none"> All vehicles entering the Bygana Nature Refuge will be washed down and hold a weed free certificate Where possible vehicle movement in and out of the area will be minimised through carpooling light vehicles and leaving drilling rigs and heavy vehicles within the area until drilling is completed Adani will undertake active weed monitoring and in the event of weed identification will undertake weed control Access roads into the area will be negotiated with the surrounding landholder to ensure they do not traverse near weed problem areas
Monitoring	<ul style="list-style-type: none"> An ecological monitoring program will be developed and implemented the Bygana West Nature Refuge prior to clearing for mining
Reporting	<ul style="list-style-type: none"> Annual reporting of rehabilitation in annual return

	<ul style="list-style-type: none">• Any incidents or complaints reporting according to correct procedure
Corrective Actions	<ul style="list-style-type: none">• Implement appropriate remedial actions

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4.11 Community

4.11.1 Environmental Values – Community

The community and social values relating to EPC16go include the amenity, liveability and sense of community. These values also consist of access to social, community services and infrastructure in the region surrounding EPC16go, including economic conditions and benefits within the affected community.

4.11.2 Potential Adverse and/or Beneficial Impacts

The main potential issues of concern to the community may include (but not be limited to) possible:

- Accommodation
- Road impacts and traffic generation
- Impacts on public amenity, such as dust
- Water supply for domestic consumption
- Cumulative impact on community services and infrastructure.

Given the nature and extent of activities on EPC16go, the impacts on the environmental value of community on the immediate and surrounding environment are not expected to be significant.

4.11.3 Environmental Protection Objectives and Control Strategies

The primary environmental objectives relating to the community are to:

- Manage operations in a manner that minimises negative impacts on the local and broader community, both during and post mining;
- Ensure that the Project assists in provision of community services and infrastructure to meet the increased demand created by the Project; and
- Manage the operation in a manner that contributes positively to the economy and services of local and broader community.

In order to minimise and/or mitigate potential social and community impacts, Adani propose to:

- continue the ongoing landowner liaison and consultation currently being undertaken
- develop and maintain a complaints management system during exploration activities
- participate and contribute to community organisations, activities and events in the Clermont district
- continue to utilise local suppliers wherever practicable.

4.12 Additional Considerations

4.12.1 Aboriginal Cultural Heritage

There is currently one active registered Native Title (NT) claim over the EPC1690 area. The Wangan and Jagalingou People are the active NT claimants (QCo4/6 and QUD85/04). Therefore for all NT issues Adani will liaise with the Wangan and Jagalingou People. As the current active NT registered claimant group, the Wangan and Jagalingou People are the relevant group to liaise with in regards to Aboriginal Cultural Heritage (CH) issues within EPC1690.

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5. REHABILITATION PROGRAM AND FINANCIAL ASSURANCE

Rehabilitation on EPC1690 will be undertaken in accordance with the principles of the Code and in accordance with the conditions of the EA. Table 15 outlines a schedule of rehabilitation detailing the types and areas of land to be significantly disturbed within EPC1690 for each financial year. The rehabilitation program has been used to determine the maximum amount of financial assurance derived from third party costs for different disturbance types. The financial assurance has been calculated in accordance with the Guideline *Calculating Financial Assurance for Mining Projects*.

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Table 15 Financial assurance

Category	Unit Rehab Cost (\$/ha)	Area (Ha)	Rehab Cost (\$)
A. Total EPC area		26,015	
B. Disturbed area			
Drill sites and tracks within "Endangered RE" areas	1759.5	1.4	2,463.30
Drill sites and tracks within "Of Concern" areas	1759.5	1.1	1,935.45
Drill sites and tracks within "Non-Remnant" areas	1759.5	14	24,633.00
Drill sites and tracks within "Not Of Concern" & other vegetation areas	1073.81	1102.1	1,183,446.00
Exploration camp site infrastructure	1759.5	15	26,392.50
Other laydown and quarry areas (non-ERE)	1073.81	15	16,107.15
Sub Total			1,254,977.40
Maintenance and monitoring (+10%)			125,497.74
GST (+10%)			138,047.51
TOTAL		1148.6	\$ 1,518,522.66

Current Financial Assurance held by the Queensland Government

\$459,089.00

Notes:

A = B + C + D (D1, D2, D3)

This Financial Assurance calculation covers the period up to the end of December 2013. The schedule will be extended at least 28 days prior to the expiry date of the schedule by an amendment of the EA.

It is assumed that 75% of all drill sites will be rehabilitated by 30 December 2013, if the mining lease application (MLA70441) is not approved.

Calculations:

Disturbance within ERE and Nature Refuge and exploration camp = 7.5 grader hours/ha + 5 backhoe hours/ha
= \$1125/ha + \$575/ha
= \$1700/ha

All other disturbance = 5 grader hrs/ha + 2.5 backhoe hrs/ha
= \$750/ha + \$287.50/ha
= \$1037.50/ha

Rehabilitation established= 2.5 contractor hrs/ha
= \$300/ha

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6. DEFINITIONS

"Artesian bore" includes a shaft, well, gallery, spear or excavation, and any works constructed in connection with the shaft well, gallery, spear or excavation, that taps an aquifer and the water flows, or has flowed, naturally to the surface.

"Authority" means environmental authority (mining activities) under the *Environmental Protection Act 1994*.

"Borehole" means either an artesian bore or a subartesian bore.

"Campsite" The area encompassing any dwelling, amenities (e.g. toilet block, power generator), sewage or general waste disposal facility and includes the office area and vehicle parking areas associated with a temporary or permanent exploration camp.

"Costeaning" The digging of a trench or pit across the seam or ore body for exposing, sampling and mapping of the ore body.

"Density of cover" In reference to trees and/or shrubs, it means the number of trees or shrubs in a specified area (e.g. 50 trees per square kilometre). With reference to understorey plant species (e.g. grasses and forbs), it means the percentage of surface area covered by a particular species.

"Disturbed" Any area that has had its natural state altered by the action or interference of carrying out an activity associated with the exploration project.

"Endangered regional ecosystem" means a regional ecosystem identified as endangered in the database maintained by the administering authority called 'Regional ecosystem description database' containing regional ecosystem numbers and descriptions.

"Environmental authority" means a licence or approval issued by the administering authority under the *Environmental Protection Act 1994*.

"Environmental authority holder" means the holder of this environmental authority.

"Environmentally Sensitive Areas" refers to locations, however large or small, that have environmental values that contribute to maintaining biological diversity and integrity, have intrinsic or attributed scientific, historical or cultural heritage value, or are important in providing amenity, harmony or sense of community. Refer to Appendix A of Code of Environmental Compliance for Exploration and Mineral Development Projects.

"Financial assurance" means a security deposit, either cash or a bank guarantee, that is held by the administering authority to cover the potential:

- (a) costs to rehabilitate areas disturbed by exploration activities; and
- (b) costs to restore property improvements disturbed by mining activities; and
- (c) failure of the tenure holder to pay rents and royalties.

"General waste" Schedule 9 of the *Environmental Protection Regulation 1998* defines general waste as "means waste other than regulated waste". Waste rock, overburden and the contents of tailings dams are not included in the definition of general waste for the purposes of these conditions.

"Habitat tree" A tree used or potentially used by hollow-dwelling fauna. Habitat trees are identified as a living tree with one or more visible hollows of 10cm or more diameter that are positioned at least 2m above the base of the tree.

"Mature tree" Are trees having a trunk diameter greater than 300 mm at chest height at breast height (measured at 1.3 metres from the ground).

"Native vegetation" Vegetation that occurs naturally in a certain area.

"Progressive rehabilitation" means rehabilitation (defined below) undertaken progressively or a staged approach to rehabilitation as exploration operations are ongoing.

"Rehabilitation processes" The measures and actions taken to achieve rehabilitation outcomes, including any or all of the following:

- removing all unwanted infrastructure;

- backfilling exploration excavations (e.g. pits) and capping drill holes;
- reshaping the land surface to a stable landform similar to that of surrounding
- undisturbed areas;
- spreading of topsoil;
- spreading seed or planting seedlings to promote revegetation;
- benching ridge cuts and removing any overhanging material.

"Significantly disturbed land" Land is significantly disturbed if –

(a) it is contaminated land; or

(b) it has been disturbed and human intervention is needed to rehabilitate it.

Significantly disturbed land includes:

- areas where soil has been compacted, removed, covered, exposed or stockpiled;
- areas where vegetation has been removed or destroyed to an extent where the land has been made susceptible to erosion; (vegetation & topsoil)
- areas where land use suitability or capability has been diminished;
- areas within a watercourse, waterway, wetland or lake where mining project activities occur;
- areas submerged by tailings or hazardous contaminant storage and dam walls in all cases;
- areas under temporary infrastructure. Temporary infrastructure includes any infrastructure (roads, tracks, bridges, culverts, dams, bores, buildings, fixed machinery, hardstand areas, airstrips, helipads etc) which is to be removed after mining has ceased; or
- areas where land has been contaminated.

However, the following areas are not included:

- areas off lease (e.g. roads or tracks which provide access to the mining lease);
- areas previously significantly disturbed which have achieved the rehabilitation outcomes;
- by agreement with the DEHP, areas previously significantly disturbed which have not achieved the rehabilitation objectives due to circumstances beyond the control of the mine operator (such as climatic conditions);
- areas under permanent infrastructure. Permanent infrastructure includes any infrastructure (roads, tracks, bridges, culverts, dams, bores, buildings, fixed machinery, hardstand areas, airstrips, helipads etc) which is to be left by agreement with the landowner. The agreement to leave permanent infrastructure must be
- recorded in the Landowner Agreement and lodged with the DEHP;
- disturbances that pre-existed the grant of the tenure unless those areas are disturbed during the term of the tenure.

"Standard environmental conditions" For an environmental authority, means the standard environmental conditions approved for the authority under section 549 of the *Environmental Protection Act 1994*.

"Subartesian bore" includes a shaft, well, gallery, spear or excavation, and any works constructed in connection with the shaft, well, gallery or excavation, that taps an aquifer and the water does not flow and never has flowed naturally to the surface.

"Watercourse" means a river, creek or stream in which water flows permanently or intermittently in a visibly defined channel (natural, artificial or artificially improved) with:

- continuous bed and banks;
- an extended period of flow for some months after rain ceases, and
- an adequacy of flow that sustains basic ecological processes and maintains biodiversity

7. REFERENCES

Environmental Authority MIN 102643011 effective from 1 March 2013

Environmental Protection Act 1994

Environmental Protection Regulation 2008

Environmental Protection (Air) Policy 2008

Environnemental Protection (Noise) Policy 2008

Environmental Protection (Waste Management) Regulation 2000

Environmental Protection (Water) Policy 2009

Environmental Protection and Biodiversity Conservation Act 1999

Land Protection (Pest & Stock Route Management) Act 2002

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Appendix 1 – Permit to Disturb

Permit to Disturb

Site Identification: _____

Site GPS Coordinates: _____ E: _____ N: _____

Name of Person Completing this Form: _____

Comments:

Is the proposed disturbance located within EREs or Environmental Sensitive Areas?

- ☐ Yes
- ☐ No
- ☐ Buffer (500m)
- ☐ Nature Refuge

Has Aboriginal Cultural Heritage clearance been obtained for the proposed activity area?

- ☐ Yes
- ☐ No

Permit to Disturb is:

✓ Approved by Adani Environmental Advisor with the below restrictions/alterations

Signature: _____ Date: / /

☐ Not approved by Adani Environmental Advisor

Site restrictions or alterations:

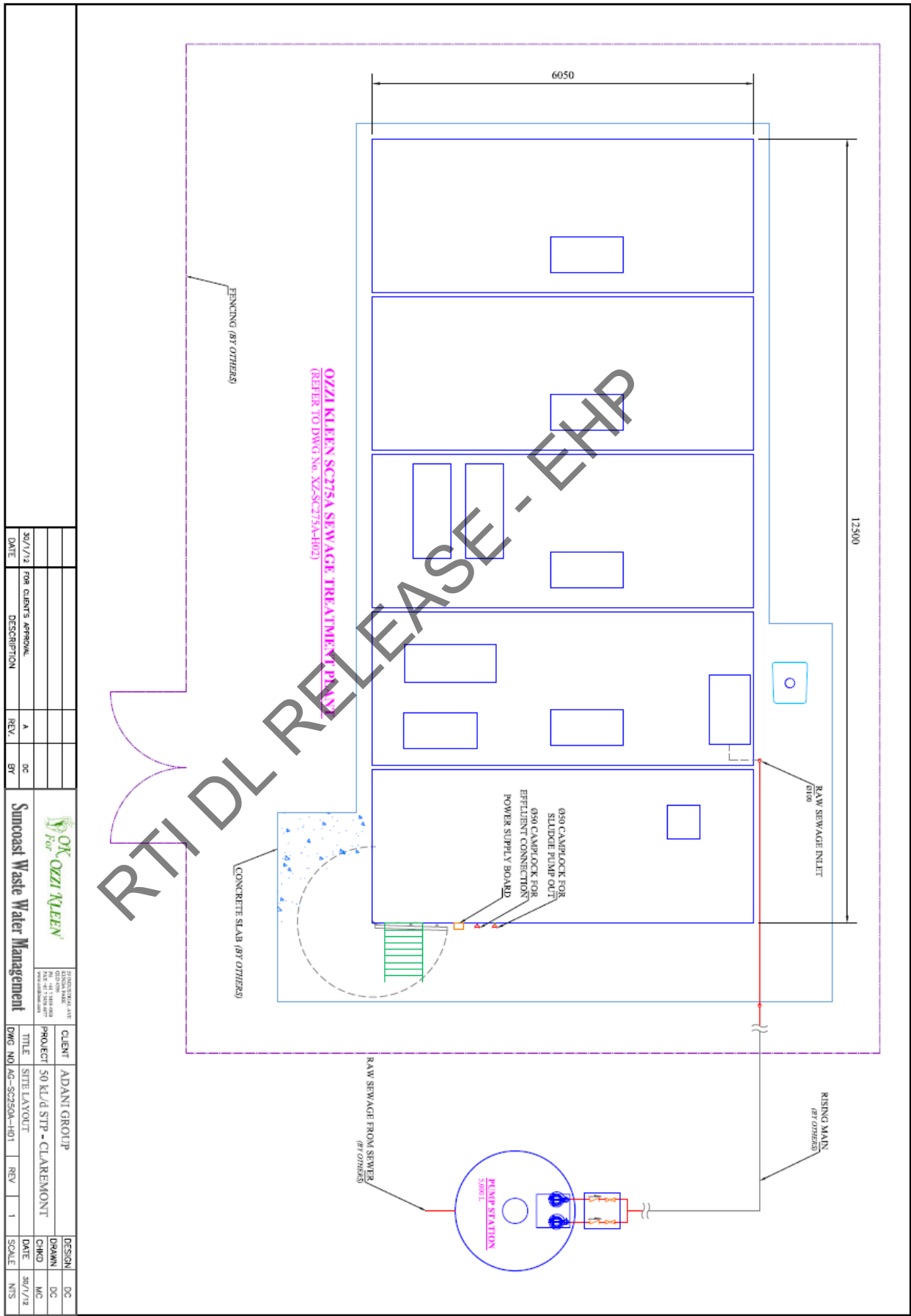
- Access track should be no wider than 4.5m except Lox lines which should be 6.5m.
- Pad should be no greater than 2000m² within Nature Refuge.
- Pre clearing/drilling, daily clearing/drilling and post clearing/drilling environmental checklists must be completed.
- Disturbance must be recorded on the EPC1690 Disturbance Register
- All activities must be undertaken in accordance with the *Code of Environmental Compliance for Exploration and Mineral Development Projects* where applicable.

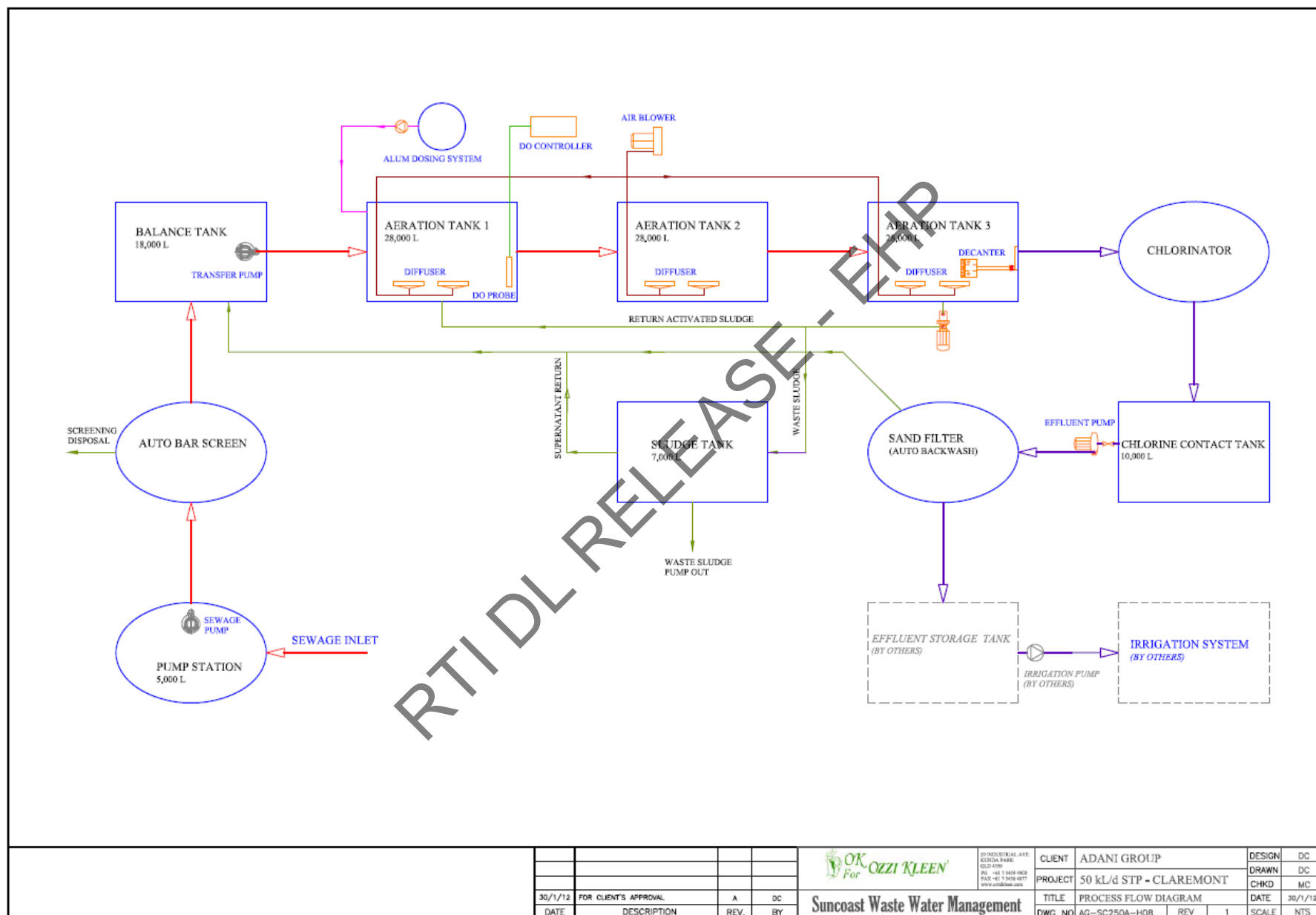
This permit is only active when signed by the Principal Geologist. It covers Aboriginal Cultural Heritage and environmental restrictions.

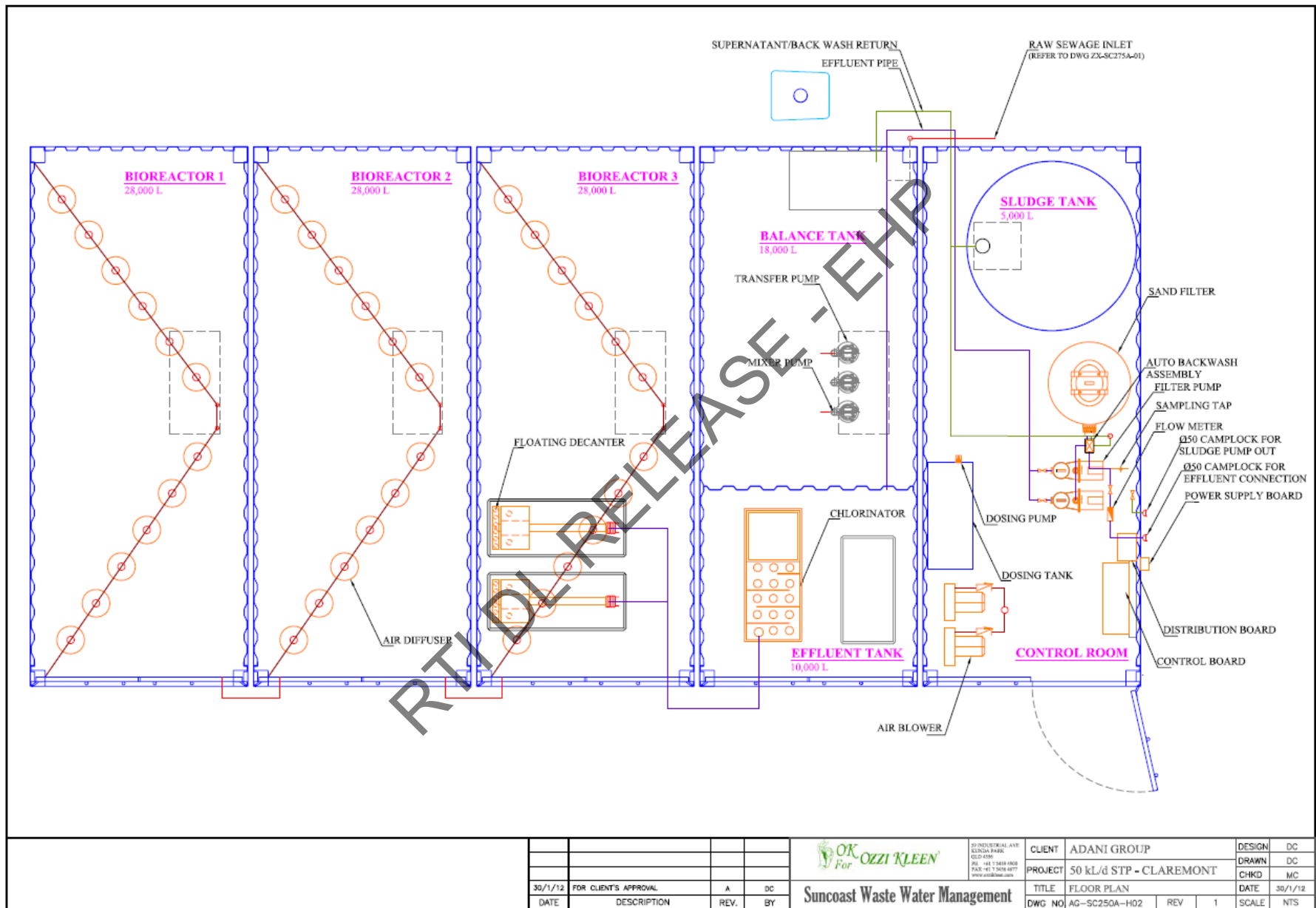
Principal Geologist: _____

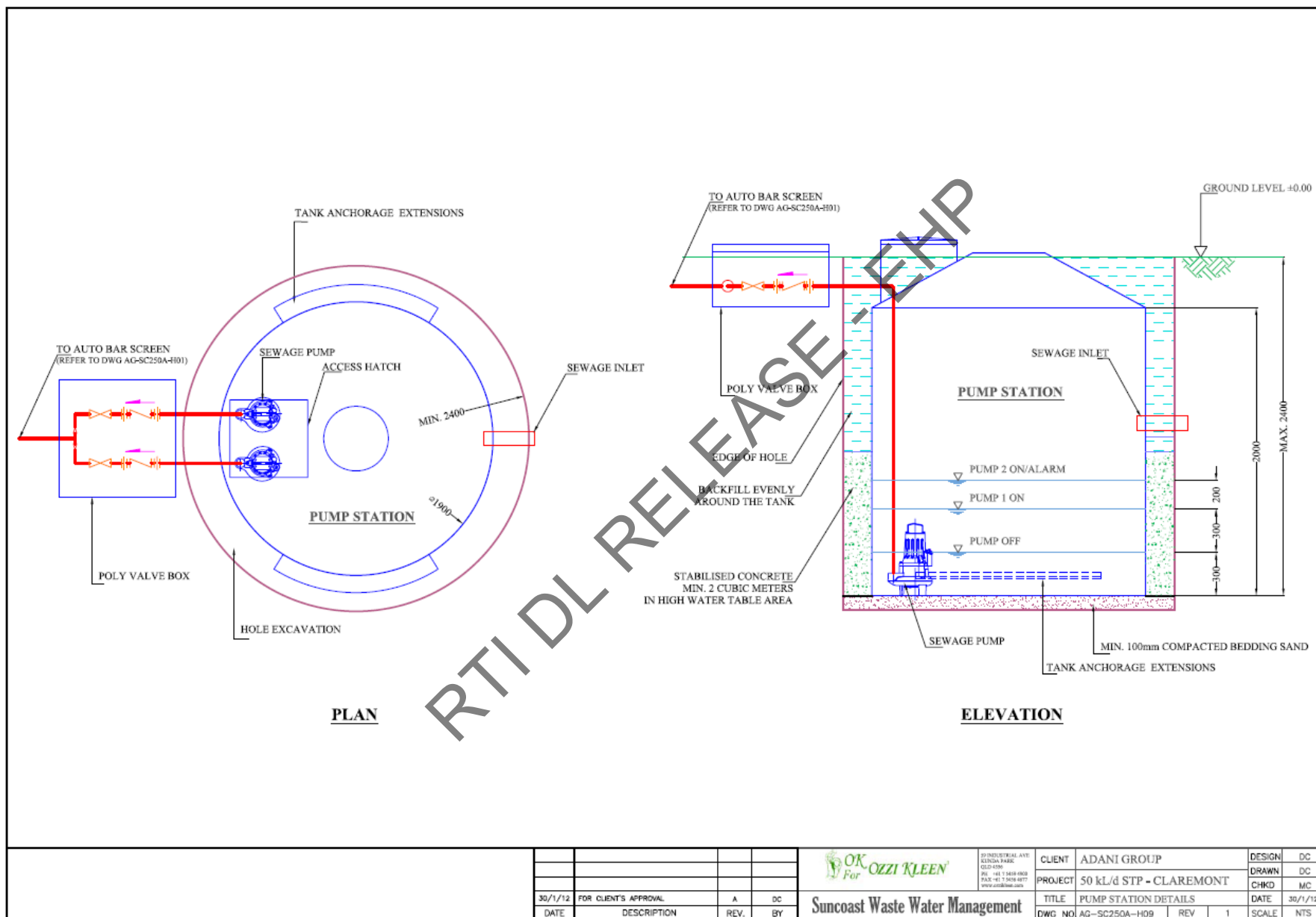
Signature: _____ Date: / /

Appendix 2 – Sewage Treatment Plant Details

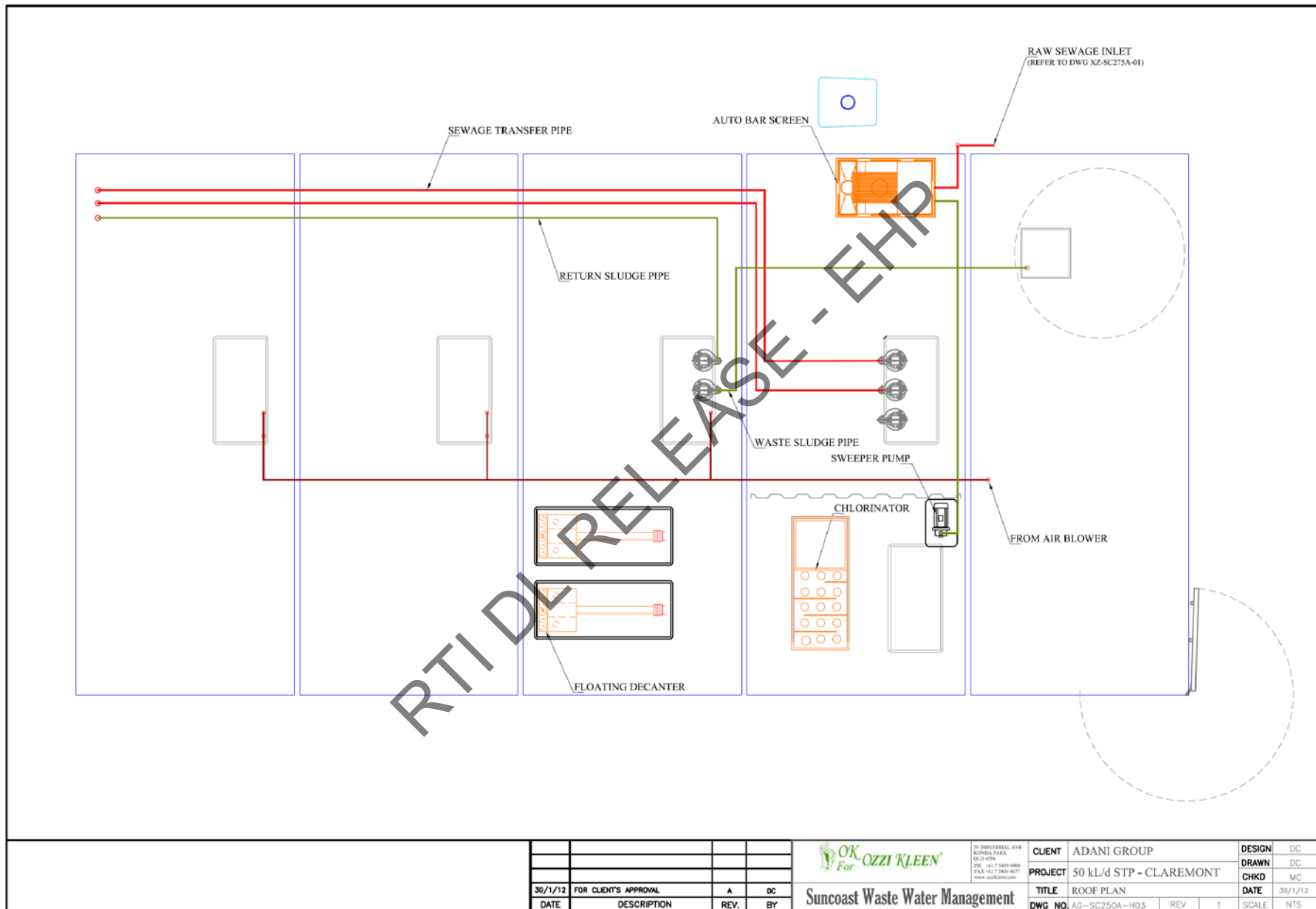








				 <div>30 INDUSTRIAL AVE. SUVA, FIJI TEL: +677 564 0000 FAX: +677 564 0077 www.okforozzi.com</div>	CLIENT	ADANI GROUP			DESIGN	DC			
					PROJECT	50 kL/d STP - CLAREMONT			DRAWN	DC			
					TITLE	PUMP STATION DETAILS			CHKD	MC			
30/1/12	FOR CLIENT'S APPROVAL	A	DC	Suncoast Waste Water Management				DWG NO	AG-SC250A-H09	REV	1	DATE	30/1/12
DATE	DESCRIPTION	REV.	BY					SCALE	NTS				



Appendix 3– Rehabilitation Guidelines and Form

CCP DRILL PAD REHABILITATION GUIDELINES

General

1. Pits need to be backfilled ASAP. Leave soil piled up on top of the pits (approx. 0.5m) to make it obvious where the pits are located. The area will settle in time leaving the ground flush and stable.
2. Gates to be moved only once pits have been backfilled – No open pits allowed.
3. ALL rubbish to be removed from the site

Earthworks

1. Site to be re-levelled to pre disturbance condition. Use surrounding landscape as a guide.
2. Any stockpiles, windrows or sunken pits are to be levelled.
3. If the ground has become compacted during drilling then it needs to be broken up to allow vegetation to grow.
4. Top soil is spread evenly once site is re-levelled
5. Any large logs and debris must be spread out over the site

Bore hole

1. Exact location picked up by surveyor
2. If grouting is required (for underground areas or as directed by geology department) - grout to approximately 1 m below surface. Once grouted the casing must be cut at least 300 mm below the surface and the hole backfilled with soil.
3. If grouting not required - place an 'inflatable bag' or concrete plug down the collar to seal the borehole then cut off the top metre of casing. Backfill sealed borehole with soil to surface level.
4. All holes to be marked with an ID plate an metal bolt placed on top of cut casing
5. Site photograph taken at time of rehabilitation

FINAL REHABILITATION FORM

Site Identification: _____

Site GPS Coordinates: _____ E: _____ N: _____

Name of Person Completing this Form: _____

Additional Comments / Information: _____

Is the site located within EREs?

☐ Yes

If yes has the area been re-seeded?

☐ Yes

☐ No -> Explanation: _____

☐ No

Rehabilitation Stages Completed:

- ☐ Pits backfilled
- ☐ All equipment and rubbish removed
- ☐ Hole grouted (if required – check with geology supervisor)
- ☐ ID tag and metal marker placed
- ☐ Site re-leveled to pre-disturbance condition and top soil spread
- ☐ Logs and branches distributed on site (where applicable)
- ☐ Post rehab site photograph taken
- ☐ Borehole picked up by surveyor
- ☐ Casing cut 300 mm below ground level and hole plugged

On site Environmental Advisor to sign once all stages are completed:

Signature: _____ Date: / /

Appendix 4– Environmental Offset Strategy

Note – An Environmental Offset Strategy has been prepared for the exploration program on EPC1690 and attaches to this Environmental Management Plan. The document is too large to attach electronically and should be sourced through the Adani Environmental Coordinator.

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