REPORT TITLE	**2015 Annual Review**
PREPARED BY	**Bloomfield Collieries Pty Ltd &** **HV Coking Coal Pty Ltd (Glencore)**
DATE	**March 2016**

DISTRIBUTION	**Bloomfield Collieries (2)** **Glencore (2)** **NSW Department of Industry, Division of Resources and Energy (1)** **NSW Department of Planning and Environment (1)** **NSW Office of Environment and Heritage (1)** **NSW Environment Protection Authority (1)** **NSW Department of Primary Industries Water (1)** **Singleton Shire Council (1)** **CCC Members**

Name of Mine:	Rixôs Creek North (formally known as Integra Open Cut Operations) and Integra Underground Mine - owner HV Coking Coal Pty Limited - ACN 605 492 804 (Glencore)
Name of Operators:	Bloomfield Collieries Pty Ltd - Rixôs Creek North Open Cut HV Coking Coal Pty Ltd ï Integra underground Mine
Development consent/ project approval:	**08_0101: and 08_0102**
Titles/Mining Leases:	CL 357, CL 382, ML 1437, ML 1518, ML 1551, ML 1630, ML 1648-1651, ML 1525, EL 5824, ML1676, A440 & A81
MOP Commencement Dates:	UG 23/12/2014; OC 1/10/2014
MOP Completion Dates:	UG 30/07/2017; OC 30/09/2017
Annual Review Commencement Date:	01/01/2015
Annual Review Completion Date:	31/12/2015
Name of Leaseholder:	Bloomfield Collieries Pty Ltd - Open Cut Operations HV Coking Coal Pty Ltd ï Underground Operations

I, Chris Quinn, certify that this audit report is a true and accurate record of the compliance status of Integra Coal Operations for the period January 1st 2015 – December 30th 2015 and that I am authorised to make this statement on behalf of Bloomfield Collieries Pty Ltd and HV Coking Coal Pty Limited

Note.

a) The Annual Review is an 'environmental audit' for the purposes of section 122B(2) of the Environmental Planning and Assessment Act 1979. Section 122E provides that a person must not include false or misleading information (or provide information for inclusion in) an audit report produced to the Minister in connection with an environmental audit if the person knows that the information is false or misleading in a material respect. The maximum penalty is, in the case of a corporation, $1 million and for an individual, $250,000.

b) The Crimes Act 1900 contains other offences relating to false and misleading information: section 192G (Intention to defraud by false or misleading statement—maximum penalty 5 years imprisonment); sections

307A, 307B and 307C (False or misleading applications/information/documents—maximum penalty

2 years imprisonment or $22,000, or both).

Name of authorised reporting officer	**Chris Quinn**
Title of authorised reporting officer	**Environmental Officer - Rix's Creek Mine**
Signature of authorised reporting officer	
Date	**31/03/2016**

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List of Abbreviations

AHD	Australian Height Datum
AR	Annual Review
bcm	Bank cubic metre
BIS	Brambles Industrial Services
CHPP	Coal Handling and Preparation Plant
CCC	Community Consultative Committee
DA	Development Application
dBL	Noise decibels (linear)
dBA	Noise decibels (A-weighted)
DPI	Department of Planning and Infrastructure
DRE	Division of Resources and Energy
EA	Environmental Assessment
EC	Electrical Conductivity
EIS	Environmental Impact Statement
EL	Exploration Licence
EMP	Environmental Management Plan
EMS	Environmental Management System
EPA	Environment Protection Authority
GHG	Greenhouse Gas
EPL	Environment Protection Licence
$g/m^2/mth$	Grams per square metre per month
HRSTS	Hunter River Salinity Trading Scheme
IEA	Independent Environmental Audit
ICO	Integra Coal Operations
ISO	International Standard
l/s	Litres per second
MCM	Monthly Communication Meetings
MIC	Maximum Instantaneous Charge
mm/s	Millimetres per second
MOP	Mining Operations Plan
MI	Megalitre
ML, MPL, CCL & CL	Mining Leases
Mt	Million tonnes
OGM	Organic Growth Media
NAG	Noise Assessment Group
NOC	North Open Cut
NOW	New South Wales Office of Water
NOEA	North overburden emplacement area
OC	Open Cut
PIRMP	Pollution Incident Response Management Plan
PM_{10}	Particulate matter (dust) with a diameter of less than 10 microns
PPV	Peak Particle Velocity
RCN	Rixs Creek North

ROM	Run-of-mine
SOEA	South overburden emplacement area
STP	Sewage Treatment Plant
TBT	Toolbox Talk
TEOM	Tapered Element Oscillating Microbalance
TPH	Total Petroleum Hydrocarbons
UG	Underground
ε S/cm	Micro Siemens per centimetre
ε g/m^3	Micrograms per cubic metre

Executive Summary

Integra Coal Operations (ICO) consists of an underground and open cut operations near the township of Singleton in the Upper Hunter Valley of New South Wales (NSW). This Annual Review details care and maintenance actives, environmental management and community relations for the operation during the 2015 calendar year period.

On the 18th December 2015, HV Coking Coal Pty Limited (100% Glencore-owned subsidiary) completed the purchase of 100% of the Integra Coal Operations.

The Bloomfield Group has subsequently purchased, from Glencore, the previous Integra Open Cut Operations, Coal Handling Preparation Plant, Train Loading Infrastructure and the Rail Loop. Bloomfield now operates the Open Cut Operations as ñRixôs Creek Northò

Glencore will continue to maintain Integra Underground in its approved care and maintenance status whilst analysis of future mining options is undertaken. During this period, a number of essential activities will continue to be undertaken, including mine ventilation and gas management and mine dewatering.

Integra Coal Operations Pty Ltd was the management company responsible for the environmental performance while the site was in care and maintenance from the 1st January 2015 to the 18th December 2015. Therefore for the purpose of this Annual Review (AR), the current Rixôs Creek North and Integra Underground Mine will collectively be referred to as Integra Coal Operations (ICO).

Care and Maintenance Activities

The ICO remained in Care and Maintenance for the duration of the 2015 reporting period. Care and Maintenance activities consisted of maintaining the mine site and equipment in a safe and serviceable state as well as maintaining legislative compliance, with the opportunity of recommence operational activities at a future date.

During the reporting period two (2) reportable incidents occurred at the ICO. These incidents related to passive releases of water from sediment dam B5 in the western extension in the April 2015 flood event and an uncontrolled release of water from a clean water dam C4 in September 2015.

Environmental Management and Performance

Environmental monitoring undertaken in 2015 included:

Air Quality - Dust deposition achieved acceptable levels and total suspended particulates (TSP) and PM10 levels were compliant with statutory limits.

Meteorological Monitoring - Total annual rainfall was 869 millimetres. Temperatures were generally consistent with the previous year. Wind direction was consistent with trends within the Hunter Valley, winds largely follow a northwest to southeast axis. During summer the prevailing wind direction is from the southeast, while in winter the prevailing wind direction originates from the northwest.

Surface Water - The results are very similar to previous annual results and pre-mining studies, suggesting minimal influence from mining activities. Electrical Conductivity (EC) and Total Dissolved Solids (TDS) results at most sites varied due to climatic factors such as rainfall and evaporation. Total Suspended Solids (TSS) and pH results were similar to previous years and pre-mining studies, suggesting no significant influence for mining activities

Ground water - Overall, no groundwater level triggers were exceeded and no reportable events occurred during the reporting period. The pH remained at relatively constant levels throughout the reporting period at all Glennies Creek series groundwater monitoring wells (neutral to slightly alkaline range). EC was consistently low at the Glennies Creek alluvial bore GC09 (311-444 μS/cm). The Richards Bore by comparison registered more saline groundwater (2170-4140 μS/cm). Monitoring of the coal seam aquifer GC05 has shown relatively high and consistent conductivity (12,000-12,600 μS/cm).

Flora and Fauna - The flora and fauna survey undertaken during November 2015 by independent consultants, allowed for quantitative flora and fauna attributes to be measured. Overall flora species diversity has increased across all MUs, although in some cases this is a result of increased herbaceous and grass weed species; Basal area of canopy species has varied across all MUs, some increasing and some decreasing. Grassland (Ironbark) and Grassland (Spotted Gum) have shown an increase due to ongoing seedling and sapling growth.

A total of 4 threatened species were recorded during surveys in the ICO Biodiversity Offset areas in November 2015. Threatened species recorded include 1 bird species and 3 mammals. The Grey-crowned Babbler was observed in a number of the offset areas, and new nests were detected also. Threatened mammals recorded include Squirrel Glider, Brush-tailed Phascogale and Grey-headed Flying-fox. The Squirrel Glider and Brush-tailed Phascogale are widespread within the offset areas, with many nest boxes utilised by both species.

Weeds ï No significant noxious weed infestations were recorded. Weed management occurred at Glennies Creek Riparian areas and biodiversity areas to reduce the recurrence of weeds

Hydrocarbon Contamination - There have been no significant areas of hydrocarbon contamination at the open cut operations during the reporting period. Actions rising from the previous reporting periods Annual Review inspection, conducted by DRE and DPE, highlighted that the bioremediation area, located at the RL 75 dump in the south pit, was not adequately signposted or clay lined and that reject material had been blocked dumped over the previous contaminated material. The ICO have addressed the matter by constructing a new bioremediation area located at the RL100 dump in the south pit.

Hydrocarbon contamination was identified at the underground operations during the Independent Environmental Audit conducted in December 2014. Remediation of the hydrocarbon contaminated area at the UG surface maintenance workshop included removal of hydrocarbon contaminated material by means of a bobcat and treatment of the UG surface operations using an activator agent (Microblaze) to further degrade spot stains via bacteria.

Rehabilitation

The ICO completed approximately 17ha of rehabilitation during the reporting period. Approximately 4 ha of native tree seed rehabilitation was completed on the North Open Cut RL105, adjacent to Stoney Creek Road and 13ha of pasture rehabilitation was completed on the North Open Cut RL 141 overburden dump.

Underground surface operation rehabilitation consisted of approximately 1.8 hectares of rehabilitation at the UG Fan site located on Forrest Road as well as rehabilitation of gaswell sites 11/5, 11/6, 11/9, 11/10, 11/12 and 12/10.

In 2015, an independent consultant conducted a rehabilitation monitoring assessment of six pasture sites and three pasture reference sites. Of the six pasture rehabilitations site, three appear to be moving towards achieving the completion targets (C301, C302 and TD01). The rehabilitation sites NP01, NP02 and SP01 need some further maintenance work before these sites move towards achieving proposed completion targets.

Community Relations

Three community complaints were recorded for dust during the reporting period. The ICO Community Consultative Committee (CCC) convened twice to discuss environmental performance and address community issues.

Activities proposed in next Annual Review

Environmental targets for the 2016 reporting period focus on:

Rixôs Creek North

- Increased weed control prioritising the Biodiversity Areas, topsoil stockpiles and Glennies Creek Riparian areas;
- Updating the Open Cut rehabilitation framework to align with Rixôs Creeks rehabilitation strategy; and
- Updating the Biodiversity Management Plan in line with best practice.

Integra Underground

- Alignment of Environmental Management System documentation and implementation with Glencore standards and protocols;
- Identifying opportunities for synergy with adjacent Glencore mining operations, such as the Mount Owen and Ravensworth Complexes, such as joint weed and pest control programs, consolidation of environmental monitoring and community consultation programs and events; and
- Reviewing and revising the currently approved Care and Maintenance MOP to reflect proposed management arrangements in consultation with DRE.

1. STATEMENT OF COMPLIANCE

Table 1 and **Table 2** summarise the compliance status of the operation in relation to its relevant approval condition.

Table 1– Statement of Compliance

Were all conditions of the relevant approvals complied with?	
08_0101 Underground Project Approval and 08_0102 Open Cut Approval	No
Mining Leases CL382, ML1630, ML1437, ML1518, Ml15512, ML1651, ML1649, ML1650, ML1648 and ML CL357	Yes

Table 2 – Non-Compliances

Relevant Approval	Condition	Condition Description (summary)	Compliance status	Comment	Where addressed in 2015 AR
DC	Sch.2,Con.2	Proponent to carry out OC project generally in accordance with OC project EA	Non-Compliant	It was determined from the 2014 Independent Environmental Audit that the eastern extent of TD2 was outside the Project Approval boundary but within the cadastral boundary of CL357.	Section 3.12 Section 10.2.6 pg. 101
DC	Sch3. Con35	Surface water discharges	Non-Compliant	B5 Sediment Dam passive release off site during the April 2015 flood events C4 clean water dam release offsite in a non-flood event	Section 11- pg. 102 & 103

2. INTRODUCTION

2.0 DOCUMENT PURPOSE

On the 18th December 2015, HV Coking Coal Pty Limited (100% Glencore-owned subsidiary) completed the purchase of 100% of the Integra Coal Operations. The Bloomfield Group has subsequently purchased, from Glencore, the previous Integra Open Cut Operations, Coal Handling Preparation Plant, Train Loading Infrastructure and the Rail Loop. Under the ñOperating, Infrastructure Access and Services Agreementò, entered into by Glencore and Bloomfield, all current mining operations covered by the 2010 Integra Complex Consent, Project 08_0101 Integra Underground Project and Project 08_0102 Integra Open Cut Project, can continue.

As of the 18th December, Bloomfield operates the Open Cut Operations as ñRixs Creek Northò. This will control Open Cut Mining in the North, South and Western Extension Areas. Delivery of Project 08_0101 ROM coal from the Underground Mine, Coal Preparation and Train Loading Operations will all be operated and managed as ñRixs Creek Northò

Glencore will continue to maintain Integra Underground in its approved care and maintenance status whilst analysis of future mining options is undertaken. During this period, a number of essential activities will continue to be undertaken, including mine ventilation and gas management and mine dewatering.

Integra Coal Operations Pty Ltd was the management company responsible for the environmental performance while the site was in care and maintenance from the 1st January 2015 to the 18th December 2015. Rixôs Creek North and Integra Underground Mine remained in care and maintenance phase from 18th December 2015 to 31st December 2015. Therefore for the purpose of this Annual Review (AR), the current Rixôs Creek North and Integra Underground Mine will collectively be referred to as Integra Coal Operations (ICO).

The AR endeavours to provide information to external stakeholders regarding policies, objectives, goals and environmental and social performance during the 2015 reporting period.

The AR is a requirement of statutory approvals and has been developed in accordance with the conditions of Mining Leases and Project Approval 08_0101 and 08_0102. The structure of this report was prepared in accordance with the Department of Planning and Environment (DPE) ñ*Post-approval requirements for State significant mining developments – Annual Review Guideline*ò (October, 2015).

Condition 3 of Schedule 5 of Project Approval 08_0101 and 08_0102 states that:

By the end of March 2012, and annually thereafter, the Proponent shall review the environmental performance of the projects to the satisfaction of the Director-General. This review must:

(a) describe the development (including any rehabilitation) that was carried out in the past year, and the development that is proposed to be carried out over the next year;

(b) include a comprehensive review of the monitoring results and complaints records of the projects over the past year, which includes a comparison of these results against the:

- *relevant statutory requirements, limits or performance measures/criteria;*
- *monitoring results of previous years; and*
- *relevant predictions in the documents referred to in condition 2 or 3 of schedule 2;*

(c) identify any non-compliance over the past year, and describe what actions were (or are being) taken to ensure compliance;

(d) identify any trends in the monitoring data over the life of the projects;

(e) *identify any discrepancies between the predicted and actual impacts of the projects, and analyse the potential cause of any significant discrepancies; and*

(f) *describe what measure will be implemented over the next year to improve the environmental performance of the projects.*

Copies of the report are distributed to various stakeholders including, but not limited to:

- NSW Department of Industry- Division Resources and Energy (DRE);
- NSW Department of Planning and Environment (DPE);
- Environment Protection Authority (EPA);
- NSW Office of Environment & Heritage (OEH):
- Integra Coal Operations Community Consultative Committee (ICO CCC) members;
- Department of Primary Industries (DPI Water) and
- Singleton Shire Council (SSC).

A copy of the Annual Review is also made available on the Rixôs Creek and Integra Underground (http://www.glencore.com.au.webauth/EN/who-we-are/integra/Pages/default.aspx) websites.

2.1 HISTORY

2.1.1. Introduction

Development Consent (DA 105/90) for Glennies Creek Colliery was granted on 1st November 1991 and was modified on six occasions to allow further surface facility development and increased production. An environmental assessment for mining within the Middle Liddell beyond 2012 and in the Hebden and Barrett seams was submitted in July 2009 with the application (PA_08_0101) being approved in late 2010 by the Department of Planning. Project Approval PA_08_0101 allows for underground mining operations to be undertaken until 31 December, 2035. To date, coal has been mined from the Middle Liddell seam with approval and development also covering the Hebden and Barrett seams.

Camberwell Coal Joint Venture (CCJV) was granted Development Consent (DA 86/2889) for mining operation on the 21st March 1990. Development commenced with the construction of the CHPP and rail loop facilities and the first coal was mined in the area known as the North Pit on the 1st March 1991. Ten modifications have been granted, which related to matters such as increased production and surface infrastructure changes and upgrades. An application (PA _0802) for open cut mining operations within the Northern and Western Extension mining areas was approved in late 2010 by the Department of Planning.

CCJV and Glennies Creek Joint Venture (GCJV) were integrated on the 4th August 2006 to form the Integra Coal Joint Venture (ICJV). AMCI Holdings Australia, part owner of ICJV, was bought by Brazilôs Companhia Vale do Rio Doce (CVRD), the worldôs largest iron ore miner on the 20th April 2007. CVRD changed the company name to Vale on the 29th November 2007 and subsequently on the 11th February 2008 renamed CVRD Australia Pty Ltd as Vale Australia Pty Ltd. In December 2014 Vale Australia (GC) Pty Ltd, a subsidiary of Vale Australia Pty Ltd, acquired 3.6% from POS-GC Pty Ltd, increasing its stake to 36%.

The ICO was operated as an unincorporated joint venture, with Integra Coal Operations Pty Limited being the management company responsible for all operations at both sites on behalf of the joint venture owners. Due to falling coal prices and increased operational costs at ICO, a decision was made by the Joint Ventures to transition ICO from an operational mine to one held in care and maintenance (C&M). Integra Underground Operations entered into C&M on the 28th July 2014 with Integra Open Cut Operations entering into C&M on the 15th August 2014.

On the 18th December 2015, HV Coking Coal Pty Limited (Glencore) completed the purchase of 100% of the Integra Mining Operations Complex. Bloomfield Collieries Pty Limited (BCL) has subsequently purchased, from Glencore, the previous Integra Open Cut Operations, Coal Handling Preparation Plant, Train Loading Infrastructure and the Rail Loop. Under the ñOperating, Infrastructure Access and Services Agreementò, entered into by Glencore and BCL, all current mining operations covered by the 2010 Integra Complex Consent, Project 08_0101 Integra Underground Project and Project 08_0102 Integra Open Cut Project, can continue. Bloomfield Collieries Pty Limited will operate the Open Cut Operations as Rixôs Creek North (RCN). This will control open cut mining in the North, South and Western Extension areas. Delivery of Project 08_0101 Run of Mine (ROM) coal from the Underground Mine, Coal Preparation and Train Loading Operations will all be operated and managed by RCN. Glencore will continue to maintain Integra Underground in its approved care and maintenance status whilst analysis of future mining options is undertaken.

Environmental Protection Licence (EPL) 3390 was in place across the Integra Coal Operations up until 21 December 2015. On 18 December 2015, EPL 3390 was transferred to HV Coking Coal when the sale process was finalised. On 21 December, the EPL was varied to cover the Integra Underground Mine only, with existing Rixôs Creek EPL (3391) varied to also cover Rixôs Creek North.

The divestment of mining leases as of the 18th December 2015 are shown in **Figure 1**.

The project approval PA 08_0101 and PA 08_0102 was granted on 26th November 2010 under Part 3A of the *NSW Environmental Planning and Assessment Act 1979* (EP&A Act) and is attached (as modified) in **Appendix 1**.

2.1.2. Location

The ICO is located in the Hunter Coalfields of the Sydney Basin, approximately 10km northwest of Singleton. The ICO is surrounded by a number of existing mines, predominately along the western boundary, including Mount Owen Mine and Ravensworth East Mine to the north-west, Glendell Mine and Ashton Mines to the west and Rixôs Creek Mine to the south-west.

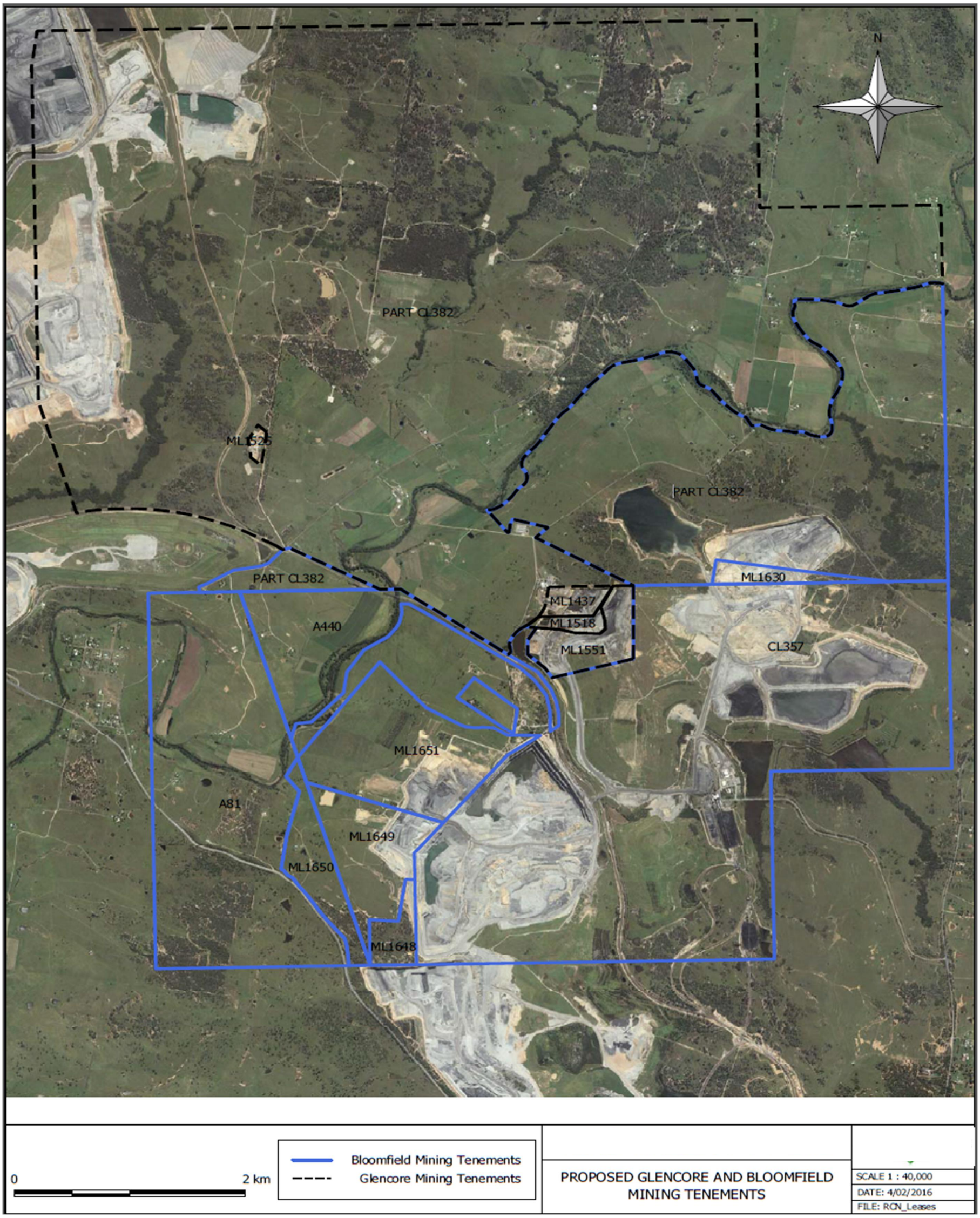

Figure 1– Mining Leases as of 31st December 2015

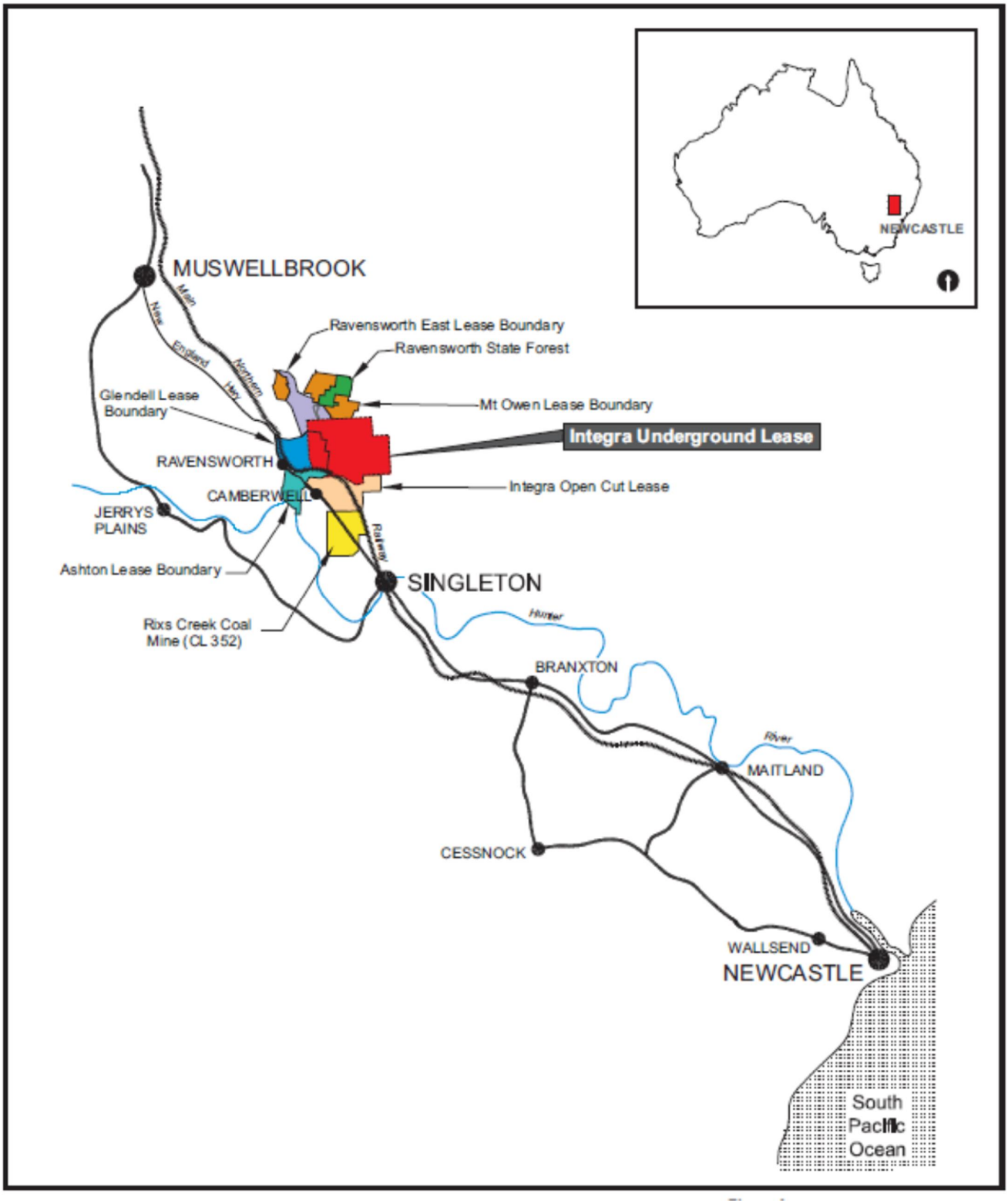

Figure 2 – Mine location

2.1.3. Resource

The Open Cut (OC) operations overlies part of the north plunging Rixôs Creek Syncline, which is flanked in the west by the eroded Camberwell Anticline, within the Vane Subgroup, Foybrook Formation, and Wittingham Coal Measures. Coal seams are numerous, thin and interbedded with sandstone, mudstone and a lesser amount of conglomerate.

The OC seams dip west or northwest at between 2 and 10 degrees. Seams occasionally show roll structures and paleo-river channels. The steepest dips are located on the western side of the OC South Pit.

The Underground (UG) Operations coal seams and surrounding strata are assigned to the Foybrook Formation, a stratigraphic unit of the Late Permian Singleton Supergroup. The Foybrook Formation contains at least six named coal seams, of which four are considered to have resource potential, and three are planned to be mined. Seams that have been identified in previous and current geological models within the Foybrook Formation Stratigraphic Sequence are shown in **Table 3** and **Figure 3.**

Table 3 - Seams identified in the geological models within the Foybrook Formation

<table>
<tr><th>Geological Seam</th><th>1987 Model (Coalesced)</th><th>1987 Model (Primary)</th><th>1997/98 Model</th><th>2003 & 2007 Models</th></tr>
<tr><td rowspan="11">Lemington</td><td colspan="3" rowspan="11">(these seams excluded from previous studies)</td><td>460</td></tr>
<tr><td>450</td></tr>
<tr><td>440</td></tr>
<tr><td>430</td></tr>
<tr><td>420</td></tr>
<tr><td>410</td></tr>
<tr><td>400</td></tr>
<tr><td>390</td></tr>
<tr><td>380</td></tr>
<tr><td>370</td></tr>
<tr><td>360</td></tr>
<tr><td rowspan="11">Pikes Gully</td><td colspan="2" rowspan="11">(these seams excluded from the 1987 study)</td><td>350</td><td>350</td></tr>
<tr><td>340</td><td>340</td></tr>
<tr><td>330</td><td>330</td></tr>
<tr><td>320</td><td>320</td></tr>
<tr><td>310</td><td>310</td></tr>
<tr><td>300</td><td>300</td></tr>
<tr><td>291</td><td>291</td></tr>
<tr><td>290</td><td>290</td></tr>
<tr><td>280</td><td>280</td></tr>
<tr><td rowspan="8">Arties</td><td rowspan="2"></td><td rowspan="2">270</td><td>271</td><td>271</td></tr>
<tr><td>270</td><td>270</td></tr>
<tr><td rowspan="6">255W</td><td rowspan="3">260W</td><td>261</td><td>261</td></tr>
<tr><td>260</td><td>260</td></tr>
<tr><td>259</td><td>259</td></tr>
<tr><td rowspan="3">250W</td><td>254</td><td>254</td></tr>
<tr><td>253</td><td>253</td></tr>
<tr><td>252</td><td>252</td></tr>
</table>

Geological Seam	1987 Model (Coalesced)	1987 Model (Primary)	1997/98 Model	2003 & 2007 Models
			251	251
			250	250
		249W	249	249
	240W	240W	242	242
			241	241
			240	240
	230W	230W	230	230
			229	229
Upper Liddell	220W	220W	220	220
	205W	210W	210	210
		200	200	200
Middle Liddell	190W	190W	192	192
			191	191
			190	190
	175W	180W	180	180
		170W	170	170
Upper Lower Liddell	160W	160W	163	163
			162	162
			161	161
			160	160
Lower Liddell	150W	150W	150	150
	135W	140W	140	140
		130W	130	130
CORRELATION HORIZON			127	127
Upper Barrett	120W	120W	121	121
			120	120
Lower Barrett	105W	110W	112	112
			111	111
			110	110
		100W	100	100
Upper Hebden	90W	90W	90	90
	75W		80	80
		70W	73	73
			72	72
			71	71
			70	70
Lower Hebden	55W	60W	60	60
		50W	50	50
			49	49
		40	40	40
	25W	30W	30	30

Geological Seam	1987 Model (Coalesced)	1987 Model (Primary)	1997/98 Model	2003 & 2007 Models
		20W	20	20
		10	10	10

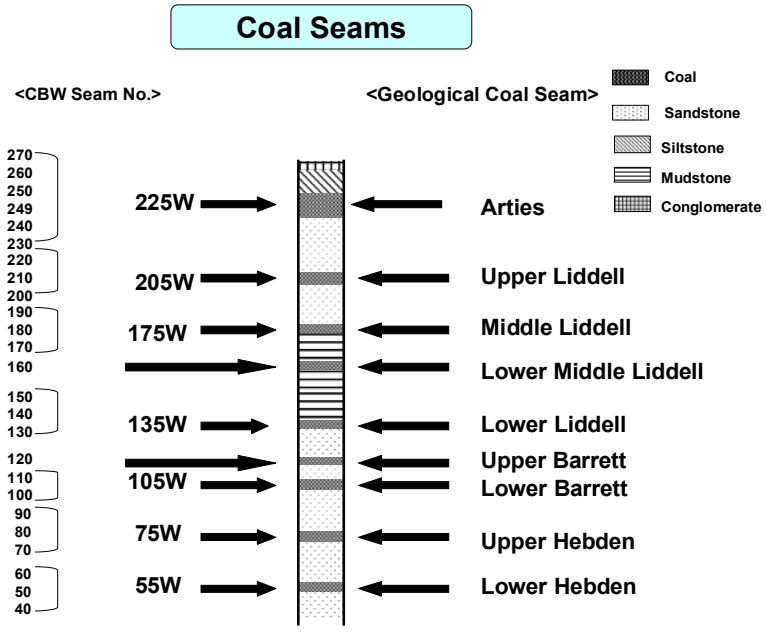

Figure 3 – The ICO Stratigraphic Sequence

The ICO resource is well suited to the production of export semi-soft coking and thermal coal. In accordance with Project Approvals 08_0101 and 08_0102, the operation has approval to dispatch up to 7.3 million tonnes (Mt) of product coal from the site each calendar year.

2.1.4. Description of Operations

Prior to C&M, operations consisted of multi-seam mining in four open cut areas and extraction from one underground coal seam which included:

- The former North Pit ï mining ceased in 1999 and the bulk of the pit was backfilled leaving a small section in the north-western corner without backfill to enable access to Glennies Creek Colliery, now Integra Underground Mine, via a portal on the former highwall;
- The former South Pit ï final coal was recovered in December 2011 with waste emplacement to the pit commencing the same month;
- The Western Extension (extension of the South Pit) ï approved in November 2010. Development work commenced in December 2010 with first run of mine (ROM) coal produced in May 2011;
- The North Open Cut (NOC) ï project approval granted on 2nd December 2008, operation commencing in August 2009; and
- Underground operations ï mining continued in the Middle Liddell seam. Development for the Hebden seam commenced in 2011, however the progression of the Hebden seam has been suspended due to ICO entering into care and maintenance.

The ICO utilised a number of facilities and equipment necessary for the mining and washing of coal which include: Infrastructure areas which incorporates workshops, administration buildings, coal handling and preparation plant (CHPP) and coal stockpiles; Rail loading facilities; and mobile plant and equipment. The operation of the CHPP and train load out facility was suspended during C&M. A preservation schedule has been formed to ensure that plant and equipment is maintained to an operational standard during C&M.

2.1.5. **Mine Contacts**

The Open cut operations is currently managed by Rixøs Creek Mine, with the OC currently being integrated into the existing Rixøs Creek management systems and framework. For the purposes of this annual review the current contact details for the Open Cut operation as follows:

Rixøs Creek Pty Limited

Site:-	Rixøs Creek Lane Singleton NSW 2330	Postal Address:-	P O Box 4 EAST MAITLAND
Telephone:-	02 65788800		NSW 2323.
Fax:-	02 65711066		

Rixøs Creek Community & Blasting Hotline:-
02 49302665 (24hr)

Mine Manager:- Luke Murray
Responsible for overseeing all operations on site.
Telephone No:- 02 65788802
Mobile:- 0427 292152
E-mail:- lmurray@rixs.com.au

Technical Services Manager:- Chris Moy
Responsible for survey and mine planning.
Telephone No:- 02 65788808
Mobile:- 0415 872425
E-mail:- cmoy@rixs.com.au

Senior Environmental Officer:- John Hindmarsh
Responsible for consulting with regulatory authorities as required, provide measures for continual improvement to site procedures and ensuring all personnel are trained and competent in relation to rehabilitation of the mine site.
Telephone No:- 02 65788806
Mobile:- 0427 436285
E-mail:- jhindmarsh@rixs.com.au

Environmental Officer:- Jason Desmond
Responsible for assisting monitoring and reporting on the environmental performance of the operation and co-ordinating the rehabilitation on the mine site. Provide support for the implementation of the Senior Environmental Officers responsibilities.
Telephone No:- 02 65788826
Mobile:- 0407 246311
E-mail:- jdesmond@rixs.com.au

Environmental Officer:- Chris Quinn
Responsible for assisting monitoring and reporting on the environmental performance of the operation and co-ordinating the rehabilitation on the mine site. Provide support for the implementation of the Senior Environmental Officers responsibilities.
Telephone No:- -
Mobile:- 0427 169302
E-mail:- cquinn@rixs.com.au

Bloomfield / Rixøs Creek Website:-
www.bloomcoll.com.au

As noted previously, care and maintenance activities at Integra Underground are managed by Glencore. The current contact details for the Integra Underground Mine as follows:

Mine Manager:- Jason Thomas
Responsible for overseeing all operations on site.
Mobile:- 0409 230 262

E-mail:- Jason.C.Thomas@glencore.com.au

Environment & Community Manager:- Vicki McBride
Responsible for compliance with regulatory approvals, maintenance, implementation and monitoring of the site environmental management system, and interface with our community and regulatory agencies.
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3. APPROVALS

3.1.1. Status

Mining operations at ICO are undertaken under various licences, approvals and leases, the current status of which are summarised in **Table 4**.

Table 4 - Approvals, Leases and Licences.

Site	Instrument	Authority	Validity Periods
Open Cut Operations	Project Approval 08_0102	DPE	26/11/2010 -31/12/2022
	Development Consent 86/2889	DPE	19/03/1990-19/03/2011
	Development Consent Modification 2	DPE	1/02/2013
	Development Consent Modification 3	DPE	5/10/2012
	Development Consent Modification 4	DPE	To be determined
	ML14 suspension of mining operations in care & maintenance	DRE	3/3/2015-30/6/2017
	Environmental Protection Licence 3390	EPA	Licence anniversary 30th June ï In Force
	Environment Protection Licence 3391	EPA	Licence anniversary 3rd April ï In Force
	Coal Lease 357	DRE	18/06/2013 ï 27/03/2032
	Coal Lease 382	DRE	10/10/2014 (renewed) ï 11/11/2033
	Mining Operations Plan for Care & Maintenance	DRE	1/10/2014 ï 30/9/2017
	Mining Lease 1437	DRE	28/04/1999-27/03/2032
	Mining Lease 1518	DRE	14/06/2004-27/03/2032
	Mining Lease 1630	DRE	16/03/2009-13/03/2030
	Mining Lease 1648	DRE	04/01/2011-04/01/2032
	Mining Lease 1649	DRE	04/01/2011-04/01/2032
	Mining Lease 1650	DRE	04/01/2011-04/01/2032
	Mining Lease 1651	DRE	04/01/2011-04/01/2032
	Authorisation 440	DRE	16/12/2015 (renewed)
	Authorisation 81	DRE	16/12/2015 (renewed)
	Notification of Dangerous Goods NDG028098	Work Cover	16/12/2016
	Surface Water Licence WAL874 (240 GS)	NOW	Issued 31/3/2005
	Surface Water Licence WAL672 (102 GS)	NOW	Issued 23/3/2005
	Surface Water Licence WAL833 (54 GS)	NOW	Issued 31/3/2005
	Surface Water Licence WAL797 (12 GS)	NOW	Issued 1/11/2006
	Surface Water Licence WAL1273 (1.2 SS)	NOW	Issued 1/11/2006
	Surface Water Licence WAL 10095 (230HS)	NOW	Issued 11/09/2006

Site	Instrument	Authority	Validity Periods
	Radiation Licence 10121 (Mod 1 Density)	EPA	31/07/2016
	Radiation Licence 10120 (Mod 2 Density)	EPA	31/07/2016
	Radiation Licence 10119 (Tailings 1 Density)	EPA	31/07/2016
	Radiation Licence 7561 (Tailings 2 Density)	EPA	31/07/2016
	Radiation Licence 684 (RC1 Coalscan)	EPA	31/07/2016
	Radiation Licence 683 (CC1 Coalscan)	EPA	Disposed of 01/08/2012
	Radiation Licence 685 (DC1 Coalscan)	EPA	31/07/2016
	Radiation Licence 23432 (Allscan)	EPA	31/07/2016
	Radiation Licence 23431 (Allscan)	EPA	31/07/2016
	Dangerous Work Licence 35/034651	Work Cover	09/03/2005-09/05/2016
	Water Access Licence 20BL 172249	Department of Water and Energy	24/07/2009-Perpetuity
	Bore Licence 20AL 200530	DPIW	Issued 01/07/2004
	Bore Licence 20AL 200940	DPIW	Issued 01/07/2004
	Bore Licence 20AL 201041	DPIW	Issued 01/07/2004
	Bore Licence 20AL 201231	DPIW	Issued 01/07/2004
	Bore Licence 20BL 167917	DPIW	Issued 15/08/2000
	Bore Licence 20BL 169571	DPIW	Issued 07/03/2005
	Bore Licence 20BL 169573	DPIW	Issued 07/03/2005
	Bore Licence 20BL 169574	DPIW	Issued 07/03/2005
	Bore Licence 20BL 169628	DPIW	17/08/2007-Perpetuity
	Bore Licence 20BL 169629	DPIW	17/08/2007-Perpetuity
	Bore Licence 20BL 169630	DPIW	17/08/2007-Perpetuity
	Bore Licence 20BL 169631	DPIW	17/08/2007-Perpetuity
	Bore Licence 20BL 169632	DPIW	17/08/2007-Perpetuity
	Bore Licence 20BL 169862	DPIW	Issued 26/09/2005
	Bore Licence 20BL 169864	DPIW	Issued 26/09/2005
	Bore Licence 20BL 171507	DPIW	03/09/2007-Perpetuity
	Bore Licence 20BL 171705	DPIW	17/08/2007-Perpetuity
	Bore Licence 20BL 171707	DPIW	17/08/2007-Perpetuity
	Bore Licence 20BL 171708	DPIW	17/08/2007-Perpetuity
	Bore Licence 20BL 171710	DPIW	17/08/2007-Perpetuity
	Bore Licence 20BL 171720	DPIW	16/02/2008-Perpetuity
	Bore Licence 20BL 171721	DPIW	16/02/2008-Perpetuity
	Bore Licence 20BL 171722	DPIW	16/02/2008-Perpetuity
	Bore Licence 20BL 171813	DPIW	03/04/2008-Perpetuity
	Bore Licence 20BL 171814	DPIW	03/04/2008-Perpetuity
	Bore Licence 20BL 172277	DPIW	15/09/2009-Perpetuity
	Bore Licence 20BL 172278	DPIW	15/09/2009-Perpetuity
	Bore Licence 20BL 172289	DPIW	15/09/2009-Perpetuity
	Bore Licence 20BL 009051	DPIW	Issued 20/04/1959
	Bore Licence 20BL 012970	DPIW	Issued 10/12/1962
	Bore Licence 20BL 169513	DPIW	Renewed 28/02/2015
	Bore Licence 20BL 171814	DPIW	Issued 03/04/2008
	Bore Licence 20AL 200530	DPIW	Issued 01/07/2004

Site	Instrument	Authority	Validity Periods
	Bore Licence 20AL 200940	DPIW	Issued 01/07/2004
	Bore Licence 20AL 201041	DPIW	Issued 01/07/2004
	Bore Licence 20AL 201231	DPIW	Issued 01/07/2004
	Bore Licence 20CA 200531	DPIW	01/07/2004-25/02/2018
	Bore Licence 20CA 201042	DPIW	01/07/2004-30/06/2017
	Bore Licence 20CA 201232	DPIW	04/07/2004-30/06/2017
Underground	Project Approval 08_0101	DPE	26/11/2010 -31/12/2022
	ML14 suspension of mining operations in care Maintenance	DRE	3/3/2015-30/6/2017
	Mining Lease 1437	DRE	28/04/1999-27/03/2032
	Mining Lease 1525 (Forest Road Ventilation Shaft)	DRE	18/11/2002-17/11/2023
	Mining Lease 1676	DRE	5/06/2013-4/01/2026
	Mining Lease 1518	DRE	14/06/2004-27/03/2032
	Mining Operations Plan for Care & Maintenance	DRE	23/12/2014 -30/7/2017
	Mining Lease 1551	DRE	10/01/2006-27/03/2032
	Mining Lease 1525	DRE	18/11/2002-17/11/2023
	Exploration Lease 5824	DRE	18/6/2013 (renewed) ï 18/3/2016
	Environment Protection Licence 3390	EPA	Licence anniversary 31st August ï In Force
	Water Access 961	DPIW	01/07/2004-Perpetuity
	Water Access 960	DPIW	01/07/2004-Perpetuity
	Water Access 484	DPIW	01/07/2004-Perpetuity
	Water Access 485	DPIW	01/07/2004-Perpetuity
	Water Access 1172	DPIW	01/07/2004-Perpetuity
	Water Access 1173	DPIW	01/07/2004-Perpetuity
	Water Access 1242	DPIW	01/07/2004-Perpetuity
	Water Access 10095	DPIW	01/07/2004-Perpetuity
	Bore Licence 20BL 167917	DPIW	15/08/2000-Perpetuity
	Bore Licence 20BL 169571	DPIW	07/03/2005-Perpetuity
	Bore Licence 20BL 169573	DPIW	07/03/2005-Perpetuity
	Bore Licence 20BL 169574	DPIW	07/03/2005-Perpetuity
	Bore Licence 20BL 171705	DPIW	17/08/2007-Perpetuity
	Bore Licence 20BL 171707	DPIW	17/08/2007-Perpetuity
	Bore Licence 20BL 171708	DPIW	17/08/2007-Perpetuity
	Bore Licence 20BL 171710	DPIW	17/08/2007-Perpetuity
	Bore Licence 20BL 171720	DPIW	16/01/2008-Perpetuity
	Bore Licence 20BL 171721	DPIW	16/01/2008-Perpetuity
	Bore Licence 20BL 171722	DPIW	16/01/2008-Perpetuity
	Bore Licence 20BL 172277	DPIW	15/09/2009-Perpetuity
	Bore Licence 20BL 172278	DPIW	15/09/2009-Perpetuity
	Bore Licence 20BL 172279	DPIW	15/09/2009-Perpetuity
	Dangerous Goods Licence NDG034651	WorkCover NSW	Expiries 02/12//2016
	Dangerous Goods Licence XSTR200018	WorkCover NSW	Expires 06/12/2017
	Development Consent 719/20033	Singleton Shire Council	Issued 13/02/2004

3.1.2. Modifications during the Reporting Period

Modification 4 has been submitted to DPE in 2014 in order to establish a proposed biodiversity offset strategy for the ICO. In particular, this Modification 4 application during the 2015 reporting period has progressed as follows:

- Due to the level of public interest in the Modification 4 proposal, Modification 4 was referred to the Planning Assessment Commission (PAC) for determination.
- On December 10th 2015, the PAC conducted a site inspection of ICO, which included a presentation the proposed Modification 4 and a site inspection of the Biodiversity Areas situated around ICO.
- On the 11th December 2015, the PAC meeting was held for Modification 4, whereby interested parties commented on the DPE's assessment and recommended conditions of approval, before a decision is made. Modification 4 is currently awaiting determination from PAC.

4. OPERATIONS SUMMARY

4.1 Mining Operations

The ICO remained in Care and Maintenance during the 2015 reporting period, therefore there was no overburden removal, coal extraction and no fine reject deposited on the prescribed Tailings Dam 2 (TD2) within the reporting period. Refer to **Table 5** for previous reporting periodôs production summary and forecast production summary for the Open Cut Operations.

Table 5 - Production summary

Material	Approved limit (specify source)	2014 reporting period (actual)	2015 reporting period (actual)	Next reporting period (forecast)
Waste Rock/ Overburden	NA	8,334,456 BCM	0	8,101,037 BCM*
ROM Coal	10,500,000 Tonnes	2,490,107 tonnes	0	2,067,365 Tonnes*
Coarse reject	NA	554022.6 Tonnes	0	553027.8 Tonnes*
Fine reject	NA	568153.4 Tonnes	0	569148.2 Tonnes*
Saleable product	7,300,000 Tonnes	1,362,945 Tonnes	0	1,005,503 Tonnes*

*Note * - Refers to Open Cut Operations activity in 2016. Underground to remain in C&M.*

4.2 Other Operations

During the 2015 C&M period, a preservation schedule was followed to preserve the heavy mining equipment from deteriorating. Periodically, the equipment has been mobilised to check functionality and to complete the maintenance requirements. Activities of this nature have been conducted during daylight hours. If any defects are identified they are recorded in the defects management system and rectified to ensure that the heavy mining equipment is maintained in a state of readiness with the potential to recommence operations.

Designated park up positions for mobile equipment were utilised. Haul trucks, water carts and front end loaders remained parked up at the south pit park up area and the maintenance hardstand and workshop area. Bull dozers, excavators and drilling equipment remained parked up at the south pit RL100 dump.

Water carts were operated on haul roads and elevated overburden dumps during reporting period to minimise dust from leaving site.

Mining machinery preserved at ICO during the reporting period are included in **Table 6** and **Table 7**.

Table 6 - Open Cut Mobile Plant and Equipment.

Equipment Type	Number Routinely in Use	Function	C&M park-up location
Bucyrus RH340B Excavator	1	Materials movement	South Pit RL 100 dump
Hitachi EX3600 Excavator	2	Material movement	South Pit RL 100 dump
Caterpillar 6040 excavator	1	Materials movement	South Pit RL 100 dump
Caterpillar 994 Loader	4	Materials movement	South Pit park up area
Drilltech DK75KS	1	Drill rig	South Pit RL 100 dump
Drilltech D75K	2	Drill rig	South Pit RL 100 dump
Drilltech D40K	1	Drill rig	South Pit RL 100 dump
Caterpillar D11	5	Materials movement	South Pit RL 100 dump
Caterpillar D10	2	Materials movement	South Pit RL 100 dump
Caterpillar 854 RTD	1	Materials movement	South Pit RL 100 dump
Caterpillar 16 G Grader	3	Road maintenance	Maintenance hardstand
Caterpillar 789 Rear Dump Truck	26	Materials movement	South Pit RL 100 dump/ Maintenance hardstand
Caterpillar 777 Water Cart	3	Dust Suppression	Maintenance hardstand
Caterpillar 773 Service Cart	1	Equipment servicing	Maintenance hardstand

Table 7 - Underground Mobile Plant and Equipment.

Equipment Type	Number Routinely in Operation	Function
Personnel Transporters	8	Personnel movement
Load Haul Dump (LHD/FBL)	6	Materials movement
Grader	1	Underground road maintenance
Continuous Miner	2	Mine development
Shuttle Car	2	Mine development
Bobcat	1	Underground belt cleaning
Surface Forklift	3	Surface and stores
Longwall Unit	1	Coal production
Surface Front End Loader	1 *	Loading coal trucks
Surface Haul Truck	4 *	Transporting coal to CHPP
Surface Water Truck	1 *	Dust suppression
* Plant also utilised by open cut operations.		

4.2.1. Evaporative Fan Operation and water sprays

Evaporative fans located at the RL100 south pit bench were in operation as ICO endeavoured to reduce the amount of water onsite. Pig tail water spray lines were operational at the North Open Cut and South Open Cut areas in order to aid in the evaporation of mine water.

4.2.2. Monitoring and Maintenance of Containment Facilities

Seepage through the southern and south western embankments of the prescribed Tailings Dam 2 (TD2) is minimised by the tailings selectively beaching against the dam wall. Any seepage that does occur is collected in drains constructed at the toe of the downstream batter and directs the water back to dam D1. Seepage to the north from TD2 is collected in containment facility dams W20 and W21 and can be pumped to dam D1.

Seepage from TD3 is understood to report to the UG Portal Sump, which is located at the lowest point of the old North Pit (underground dirty water sump). Water from the Portal Sump is pumped to D1 for reuse or to Possum Skin Dam.

The following checks and inspections are carried out on a weekly basis and documented by CHPP Maintenance personnel or Environment and Community Advisor:

- Tailings dams and pipelines are inspected regularly, with a written condition report produced weekly. The main tailings pipeline from the CHPP to the tailings complex is also fitted with an alarm to alert staff of potential blockages or leakage
- Location of water in relation to the southern and south western embankments. If the deposition of the tailings results in water ponding against the embankment the discharge point should be moved and/or the decant pump started; and
- Seepage water clarity should be clear and is checked for signs of contamination with dark tailings. Comments are made on the volume discharging from the drains at the base of the southern and south western embankment.

In addition to routine inspections, TD2 has six piezometers installed to monitor groundwater in the region of the dam wall; three are installed on the dam wall crest and three at the toe of the dam wall. The piezometers are currently monitored for ground water level, Electrical Conductivity (EC) and pH.

The piezometers installed on TD2 are imperative to understanding the stability and integrity of the dam wall by monitoring groundwater levels. It is essential for the ground water depth to be maintained at a relatively low level to ensure that the stability of the dam wall is not compromised. The depth of ground water may be influenced by rainfall, seepage or other factors. The monitoring results for the piezometers installed on TD2 are discussed further in Section 7.3 Ground Water and are presented in **Appendix 5**.

Two v-notch weirs for water flow measurement are installed on both the north and southern sides of the tailings facility. These weirs measure water flows which indicate the amount of seepage coming from the tailings facilities. A review undertaken during the reporting period indicated no significant increase in the seepage volumes from the tailings dams.

4.2.3. EXPLORATION

No exploration activities were undertaken at the ICO during the reporting period. Authorisation 440 and Authorisation 81 were renewed in December 2015.

4.2.4. Next Reporting Period

Forecast operations for the Open cut include the recommencement of mining operations. An operational MOP was approved by DRE on the 16th January 2016. Environmental Management Plans are in the process of being reviewed to reflect the recommencement of operations in the Open Cut area. Blast monitoring sites, air monitoring receptors and noise monitors are being recommissioned to reflect updates to the Environmental Management Plans.

Glencore took over care and maintenance activities at Integra Underground on the 18th December 2015 and has no plans to recommence mining operations in the near term. The intent of care and maintenance activities will be to maintain legislative compliance and maintain the mine in a safe and serviceable state with the potential to recommence operations if authorised to do so.

For further details on activities to be completed in the next reporting period, refer to Section 12.

5. ACTIONS REQUIRED FROM PREVIOUS ANNUAL REVIEW

A number of proposed environmental actions and improvements were listed in the previous reporting periodôs Annual Review. **Table 8** below outlines each of these environmental actions / improvements and the status of each.

Table 8 – Actions from previous Annual Review

Actions required from previous Annual Review	Requested by	Actions taken by the Operator	Due	Where discussed in the Annual Review
DRE encourages ICO to incorporate specific landform establishment and growth medium for each rehabilitation area (seed mix, topsoil/subsoil details, slope, drainage and design features such as contour banks) for historical and current rehabilitation areas.	DRE		2015 AR	Section 8 Rehabilitation
DRE encourages ICO to commence rehabilitation monitoring to assist the development of the Mine Closure Plan	DRE		2015 AR	Section 8 Rehabilitation
Figures were not clear and legible in the 2014 Annual Review. Ensure all figures within the 2015 report are clear and legible.	DPE		2015 AR	Various
Implement a Plan detailing the location of the Biodiversity Offset Area to be referenced in conjunction with text			2015 AR	Section 6.6.2 pg.50
It is required that an Executive Summary of significant activities, complaints, incidents, breaches and non-compliances which occurred during the reporting period is included in future Annual Reviews	DPE		2015 AR	Refer to Executive Summary.
ICO to provide an action plan to address and remediate the above issues of waste management of the bioremediation area. This is to include proposed analysis to evaluate the current material in the area, proposed actions to remediate the area and proposed methods to establish a functional bioremediation area including construction and location details	DPE	Completed during reporting period	2015 AR	Section 6.4 Contaminated Land Appendix 5
Include proposed strategies to manage Rhodes grass on rehabilitation area to prevent species dominating	DRE		2015 AR	Section 6.15 Weeds Pg. 56
Include strategies to provide water sources for stock in areas that are proposed to be returned to pasture	DRE		2015 AR	Section 8 Rehabilitation
Provide DRE with the action plan for removal of spoil and rehabilitation of the Fansite area.	DRE	Completed during reporting period	2015 AR	Section 8 pg. 80
Provide DRE with a summary of all gaswell sites including proposed maintenance plan for sites requiring remediation. Provide an update in subsequent ARôs	DRE		2015 AR	Section 8 pg. 84
Include monitoring data and report these results against the performance indicators and completion criteria as outlined in the MOP.	DRE		2015 AR	Section 8.3.2 Rehabilitation Monitoring pg. 92 Appendix 7

Actions required from previous Annual Review	Requested by	Actions taken by the Operator	Due	Where discussed in the Annual Review
Two waste grease drums were stored to the side of the wash bay. These bunds should be stored on secondary containment bunds	DPE	Waste Grease drums are stored on Secondary containment bunds	30/6/2015	Section 6.4 Contaminated Land Pg. 46
A large number of Intermediate Bulk Containers (IBC) were stored onsite at both the Open Cut and Underground Surface operations. These containers require removal or bunding by the 30th June 2015	DPE	IBCõs removed off site by licenced waste contractor. IBCõs that are still in use have been stored on secondary containment bunds.	30/6/2015	Section 6.4 Contaminated Land Pg. 46

6. ENVIRONMENTAL PERFORMANCE

The location of meteorological and air quality monitoring receptors during C&M is shown in **Figure 4**. Water monitoring sampling locations are highlighted in **Figure 16**.

6.1 METEOROLOGICAL

6.1.1. Introduction

The ICO has a permanent weather station which has location coordinates of E326672m, N6404260m. The weather station records 10 minute averages of rainfall, temperature, relative humidity, wind speed, wind direction and sigma theta. The data is transferred by a telemetry link to the ICO weather display and is used to evaluate weather conditions when blasting or after receiving a complaint. The weather station achieved good data recovery during the reporting period with over 90% of data being captured. Intermittent dropouts in sigma theta data and temperature data was recorded in June and September 2015 due to a technical issue with the temperature sensors. Due to Intermittent dropouts of the temperature data, the temperature data was substituted with data from Rixôs Creek Mine meteorological station.

All data is stored and managed onsite by the environment department. Monthly weather summaries are presented in **Appendix 2.**

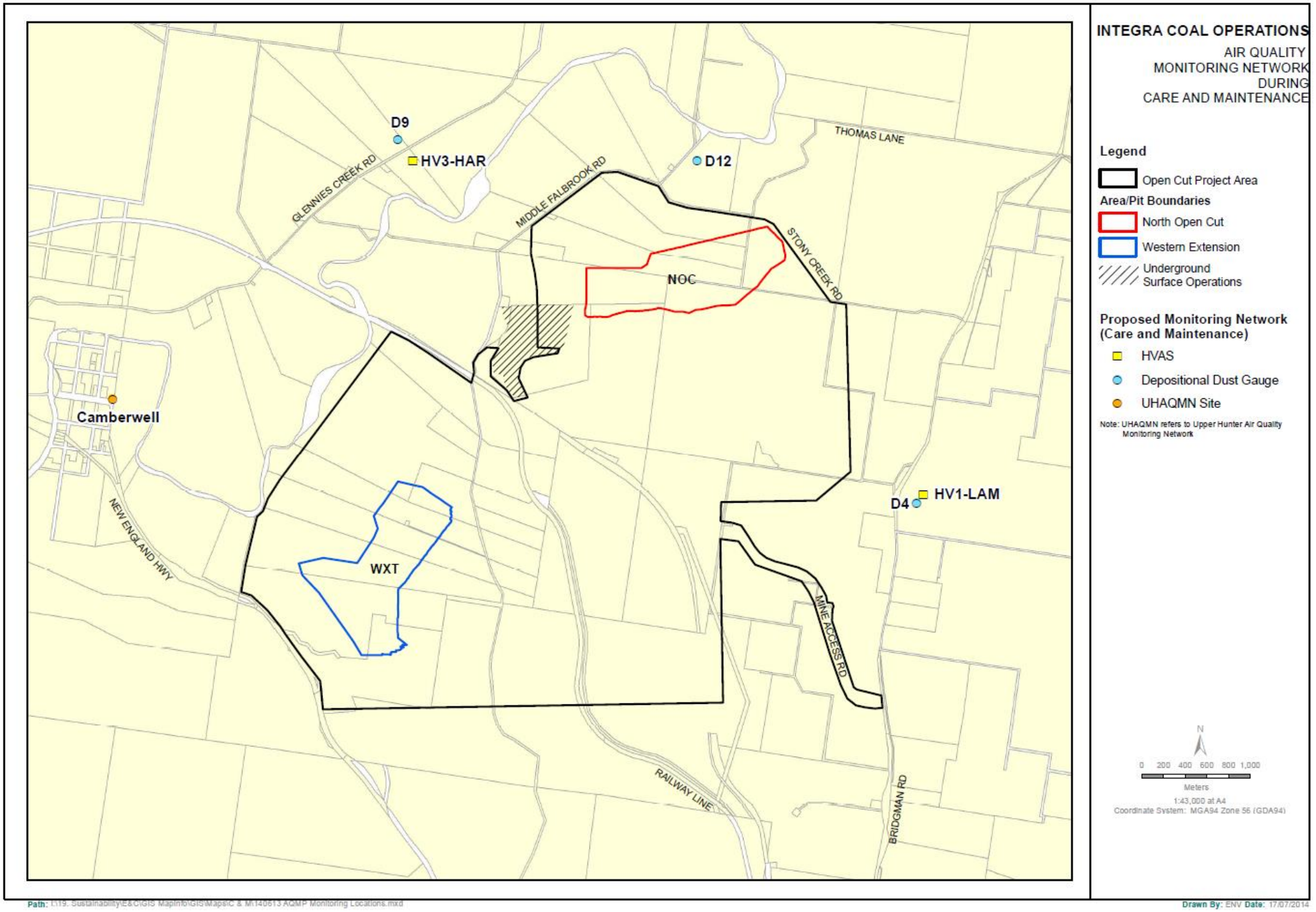

Figure 4 – Location of Monitoring Points during Care and Maintenance

6.1.2. Rainfall

A total of 869 mm of rainfall was received at the ICO weather station during 2015. Total rainfall has increased by 303mm during the reporting period when compared to the 2014 total of 566 mm, with monthly rainfall totals exceeding 100 mm on four occasions in 2015, compared with two occasions in 2014. **Figure 5** illustrates the monthly breakdown of rainfall for the reporting period including a comparison with the previous reporting period.

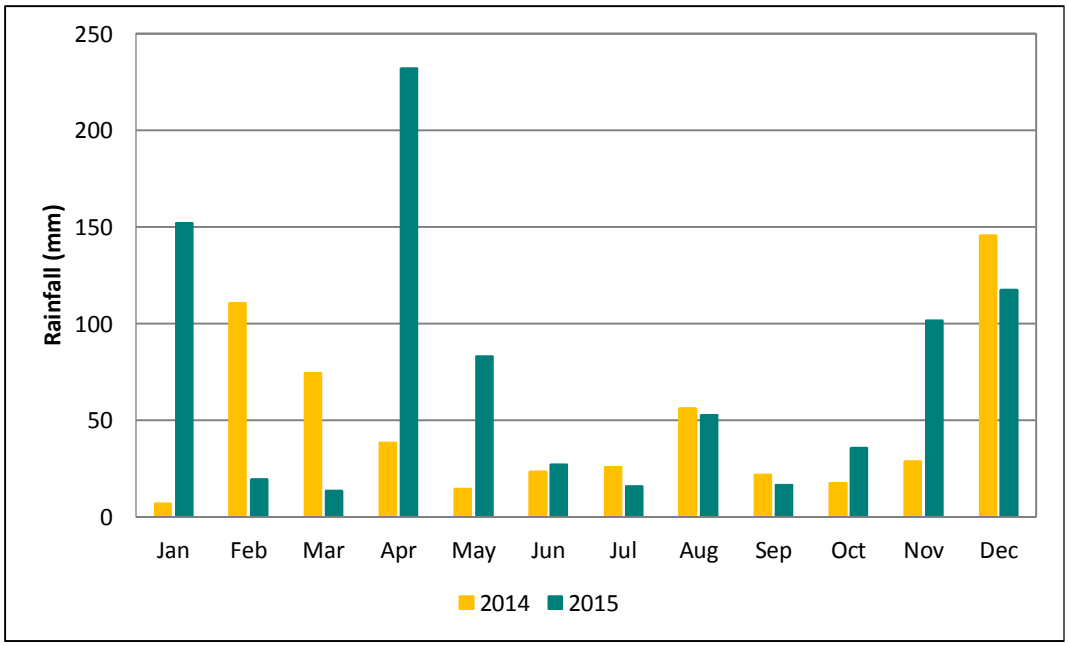

Figure 5- Monthly Rainfall 2015

6.1.3. Temperature

Figure 6 illustrates the monthly breakdown of temperatures for the previous and current reporting period. The results indicate similar trends in minimum and maximum temperatures for this reporting period compared to 2014. March 2015 recorded a maximum of 40^0C compared to a maximum temp of 42.8^0C recorded for November in 2014.

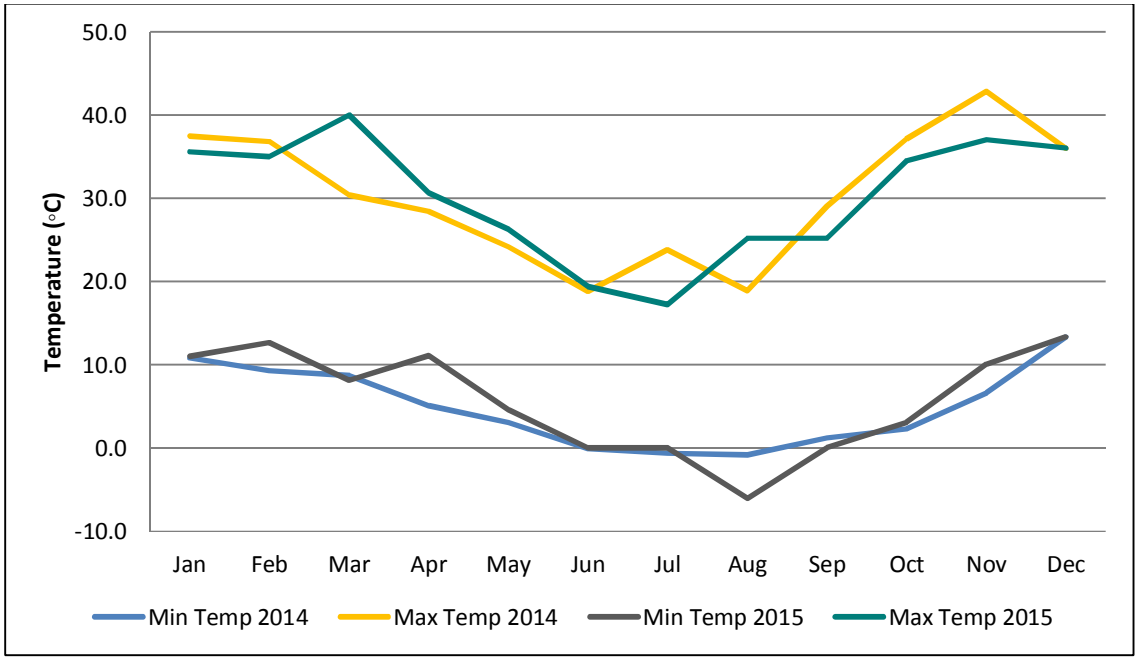

Figure 6 - Monthly Temperature 2015

6.1.4. Wind speed and Direction

The wind distribution pattern for the ICO shows that, consistent with trends within the Hunter Valley, winds largely follow a northwest to southeast axis. During summer the prevailing wind direction is from the southeast, while in winter the prevailing wind direction originates from the northwest. Annual wind rose data is shown in **Figure 7**.

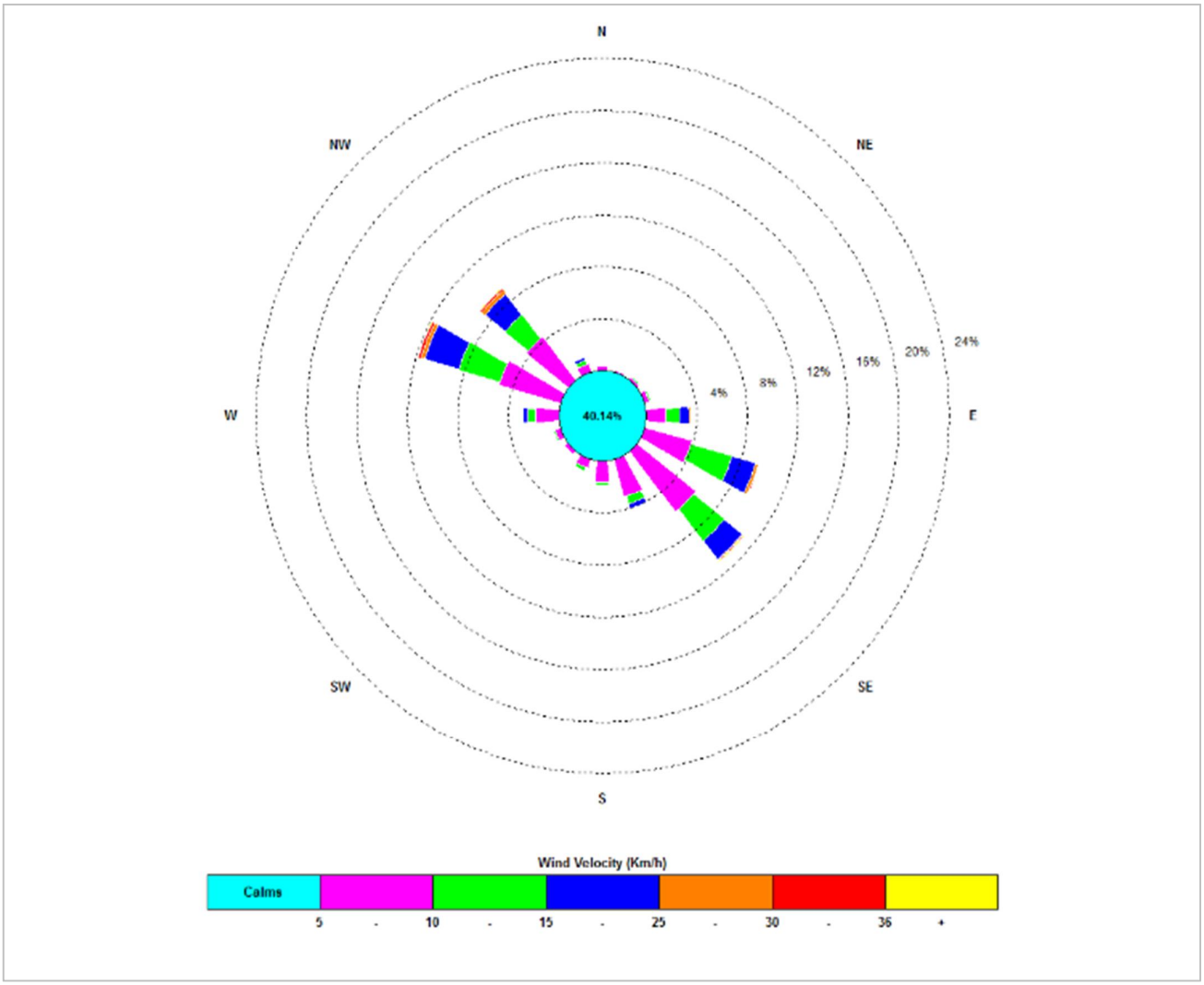

Figure 7 - Breakdown of wind direction for the 2015 period

6.2 AIR QUALITY AIR QUALITY

6.2.1. Environmental Management

Air quality management at the ICO incorporates routine dust management practices and an air quality monitoring network which operate in accordance with the Care and Maintenance Air Quality and Greenhouse Gas Management Plan (AQGGMP).

The AQGGMP addresses air quality and greenhouse gas management across both OC and UG sites and also considers potential cumulative issues caused by dust emissions from nearby mining operations.

The monitoring network seeks to:

- Facilitate compliance with existing Licence and Project Approval conditions;
- Support proactive dust management;
- Develop an integrated and coordinated approach to air quality management; and

- Consolidate existing monitoring, where possible.

The current AQGGMP air monitoring network has six (6) DDGs, two (2) HVAS units, and utilises information from the Upper Hunter Air Quality Monitoring Network unit located at Camberwell Village to monitor particulate matter less than 2.5 microns ($PM_{2.5}$).

The DDGs provided monthly dust fallout data while the HVAS measured Total Suspended Particulates (TSP) or Particulate Matter less than ten microns (PM_{10}) in air for a period of 24 hours every six days. All samples were collected by Carbon Based Environmental on behalf of the ICO.

Preventive routine dust management procedures implemented at the ICO include use of weather (wind speed, wind direction, rainfall, etc.) data, weather forecasting, regular water cart road spraying, site speed limits, water sprays on conveyors, tailings dam management, rehabilitation of exposed areas and workforce education.

An overall analysis of the results obtained during the period of this report is presented in Sections 6.2.2 - 6.2.8, with results contained in **Appendix 3**.

Disturbed areas are kept to a minimum and rehabilitated with vegetation as soon as practicable to minimise the potential for dust generation. Unsealed trafficable areas are maintained in such a manner as to reduce dust emission. Civil contractors working onsite are also required to utilise water carts to control their dust emissions as required. Dust from the ROM and product coal stockpile areas was managed by the use of water sprays during the reporting period.

Monitoring of greenhouse gas emissions is also undertaken monthly in accordance with the AQGGMP. This monitoring includes monitoring electricity and diesel usage, methane emissions and methane used for power generation.

6.2.2. Depositional Dust

Monitoring of depositional dust was undertaken on a monthly basis at 6 locations surrounding the mine site in accordance with Australian Standard AS/NZS 3580.10.1 (2003).

A total of 72 samples out of 72 depositional dust measurements were successfully analysed during the reporting period, giving a data capture rate of 100%. Note that some results were contaminated by excessive bird droppings, insects or vegetation and were excluded from the data set.

6.2.3. HVAS TSP

A total of 110 monitoring events occurred during the reporting period from a planned 110 measurements, giving a data capture rate of 100%. Note that only the Lambkin and Hardy TSP monitors were measured within the reporting period in line with the C&M AQGHGMP.

6.2.4. HVAS PM_{10}

A total of 110 PM_{10} monitoring events occurred during the reporting period from the 110 planned, giving a data capture rate of 100%.

6.2.5. Environmental Performance

Air quality assessment criteria for the open cut operation are outlined in **Table 9**.

Table 9 - Air Quality Assessment Criteria

Pollutant	Standard	Period	Agency
TSP	90εg/m³	Annual average	EPA/DPE
PM_{10}	50εg/m³	24 hour maximum	EPA/ DPE
	30εg/m³	Annual average	EPA/ DPE
	50εg/m³	24 hour average; 5 exceedances permitted a year	National Environment Protection Measure (NEPM)
Depositional Dust	4g/m²/month	Annual maximum total deposited dust level	EPA/ DPE
	2g/m²/month	Annual maximum increase in deposited dust level	EPA/ DPE

6.2.6. Depositional Dust

Monitoring of depositional dust was undertaken on a monthly basis from 6 locations surrounding the mine site in accordance with Australian Standard AS/NZS 3580.10.1 (2003). A total of 72 samples of 72 depositional dust measurements were undertaken during the reporting period. Note that some of the results were contaminated by excessive bird droppings, insects or grass clippings and were excluded from the data set as shown in **Table 10**.

The average annual depositional dust gauge data recorded in 2015 when compared with previous years (as far back as 2002) is consistent for recorded insoluble solids at each depositional dust gauge. With equal or decreased dust levels recorded at six 6 dust gauges during this reporting period when compared to the 2013 and 2014 reporting period.

Table 10 indicates the percentage of valid results from those collected at each site in the 2015 reporting period and the reason for exclusion. Results for Depositional Dust Gauges are summarised in **Table 11** and shown graphically in **Figure 8.**

Table 10 - Percentage of Uncontaminated Dust Deposition Gauges

Dust Gauge	Data Availability (%)	Details
D2	83	2 contaminated gauge (insects/vegetation)
D3	-	Decommissioned in C&M
D4	100	-
D5	83	2 contaminated gauge (bird/insects droppings)
D6	100	-
D7	-	Decommissioned in C&M
D8	100	-
D9	-	Decommissioned in C&M
D10	-	Decommissioned in C&M
D11	-	Decommissioned in C&M
D12	92	1 contaminated gauge (insects/vegetation)
D13	-	Decommissioned in C&M
D14	-	Decommissioned in C&M
D15	-	Decommissioned in C&M
D16	-	Decommissioned in C&M

D16N	-	Decommissioned in C&M
D16E	-	Decommissioned in C&M
D16S	-	Decommissioned in C&M
D16W	-	Decommissioned in C&M
D17	-	Decommissioned in C&M

Table 11 - Annual Average Insoluble Solids

Dust Gauge	Annual Average 2012 (g/m2/month)	Annual Average 2013 (g/m2/month)	Annual Average 2014 (g/m2/month)	Annual Average 2015 (g/m2/month)	Variance (2014-2015)
D2	4.8	4.9	2.7	2.6	-0.1
D3	2.8	2.8	2.6		
D4	1.7	1.4	1.4	1.0	-0.4
D5	2.1	2.5	2.0	2.0	0.0
D6	1.5	1.5	1.6		
D7	4.3	3.2	2.6		
D8	2.9	2.9	2.4	2.0	-0.4
D9	3.8	2.6	2.9	2.0	-0.9
D10	2.8	2.4	2.3		
D11	2.8	2.0	2.0		
D12	1.7	2.0	1.4	1.0	-0.4
D13	2.8	2.8	2.1		
D14	3.7	5.0	2.4		
D15	1.5	1.8	1.3		
D16	3.1	2.7	2.2		
D16N	4.5	5.6	5.1		
D16E	2.1	2.9	2.5		
D16S	2.5	2.4	2.9		
D16W	3.0	3.1	2.4		
D17	Gauge installed Dec 2013	2.6	2.1		

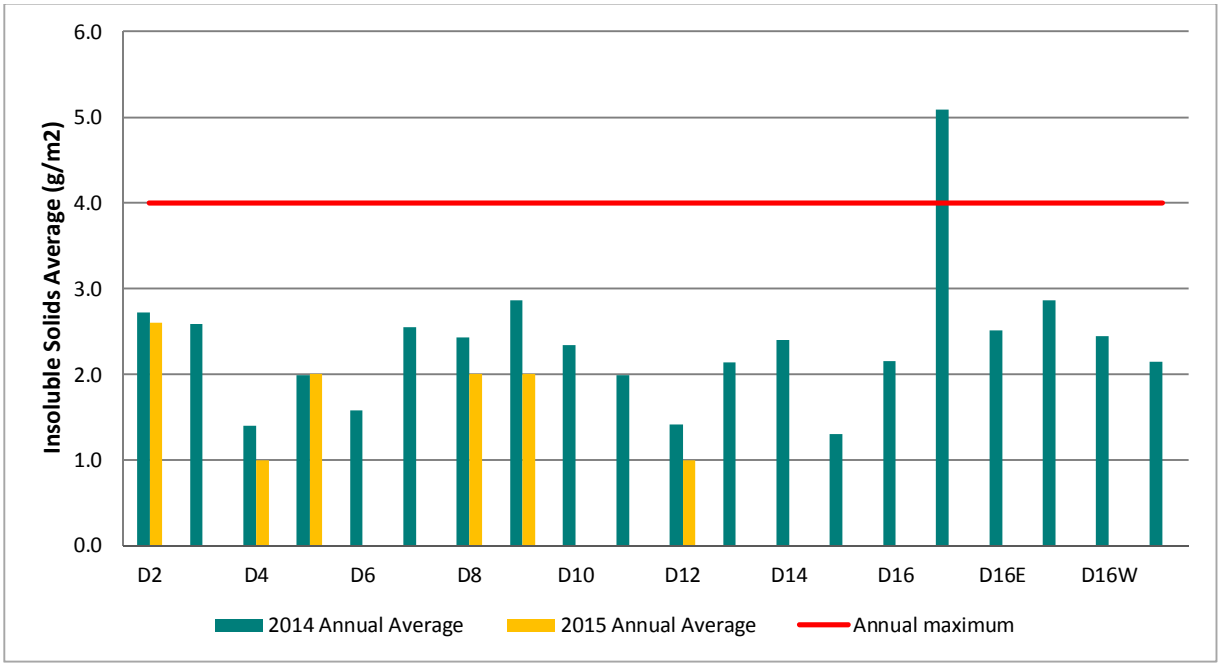

Figure 8 - Annual Average Depositional Dust Gauge Results 2014 and 2015

6.2.7. TSP

Annual average TSP results for sites HV1 and HV3 were less than the DPI annual criteria (90 εg/m^3), as shown in **Figure 9**. ICO remained in care and maintenance during the reporting period, which coincided with relatively lower levels than previous reporting period. There were no specified criteria for a 24-hour daily TSP maximum in the ICO EPL or Project Approval. Particulates recorded by the monitors are the total from all sources and not solely from the ICO. During the 2015 reporting period there was a decrease in the reported TSP annual average for HV-1 of 2 εg/m^3, and a decrease at HV-3 of 16 εg/m^3 respectively when compared to the 2014 reporting period. Both 2015 HV-1 and HV-3 TSP measurements in **Figure 10** compare the 3 yearly and 6 yearly predicted average in the environmental Assessment. Results show that both the HV1 and HV3 receptors recorded Average Annual TSP measurements below the 3 year and 6 year predicted Environmental Assessment TSP predicted model.

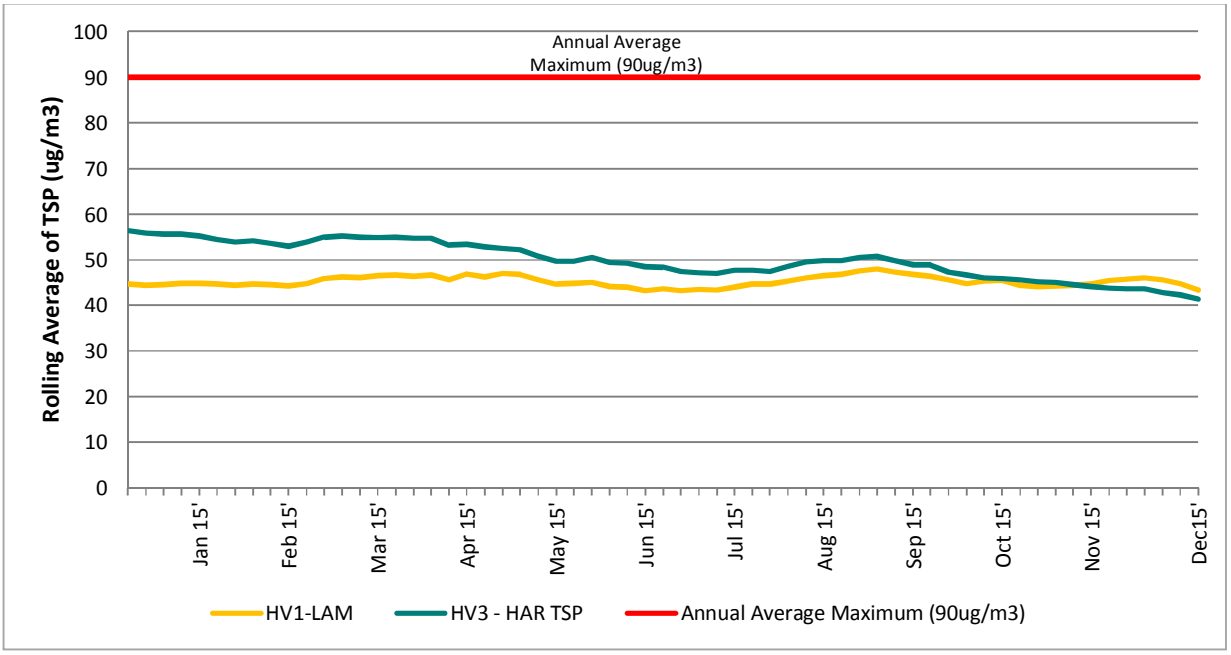

Figure 9 - Rolling Average TSP Over 2015 Reporting Period

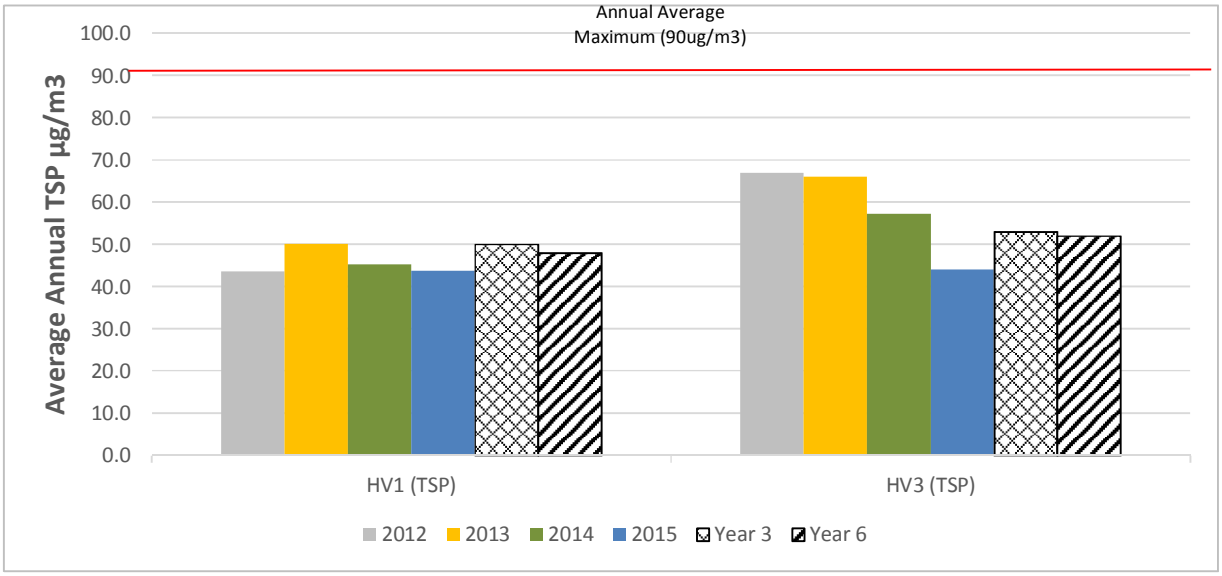

Figure 10 - Annual Average HVAS TSP Results 2012 - 2015

As part of the ICO Modification 2 environmental assessment an air quality assessment was completed in 2012 for operations at the ICO. Air dispersion modelling was completed for representative periods, using meteorological data from 2003. The Modification 2 environmental assessment predicted that no exceedances of the annual average TSP would occur for 2015. Monitoring results for the reporting period support the predicted results for 2015.

6.2.8. PM_{10}

Average PM_{10} results for sites HV-1 and HV-3 were 15.5 ε g/m^3 and 17.2 ε g/m^3 respectively, which is less than the EPA long term annual average criteria of 30 ε g/m^3, as shown in **Figure 11**.

Compared to the previous reporting period, HV-1 and HV-3 showed a decrease of 2.0 εg/m^3 at HV-1 and a decrease of 2.8 εg/m^3 at HV-3. Throughout the reporting period both HV1 receptor and HV-3 receptor recorded an annual rolling average well below the EPA long term average of 30 εg/m^3 as shown in **Figure 12**.

Figure 11 compares the longer term annual average PM_{10} from 2012 to 2015 as well as the annual average and the 3 year and 6 year predicted average from the Western Extension Environmental Assessment (EA). First ROM coal was extracted from the western extension in May 2011, therefore the 3 year predicted average provides a good indicator when compared with the 2015 reporting information. It can be identified that the HV1 receptor is slightly above the 3 year predicted range during the 2015 reporting period. The HV3 receptor has recorded measurements below the 3 and 6 year predicted model for the last three reporting periods.

There were no exceedances of the PM_{10} short term impact assessment criteria of 50εg/m^3 over 24 hours as per Condition 22, Schedule 3 of Project Approval 08_0101 and 08_0102 during the reporting period.

The ICO conducted dust suppression and associated tasks such as real time wind monitoring, weather forecasting, regular use of water cart road spraying, site speed limits, application of PetroTac on Underground surface roadways, water spray on conveyors, tailings dam management, rehabilitation of exposed areas, workforce education in air quality / dust control and in adverse conditions. If the forecast weather conditions were unfavourable a water cart was used to water down inactive dumps and haul roads to minimise dust from leaving site. The spigot lines that transfer water to Tailings Dam 2 were also activated prior to a gusty, hot weather conditions to mitigate dust from leaving site.

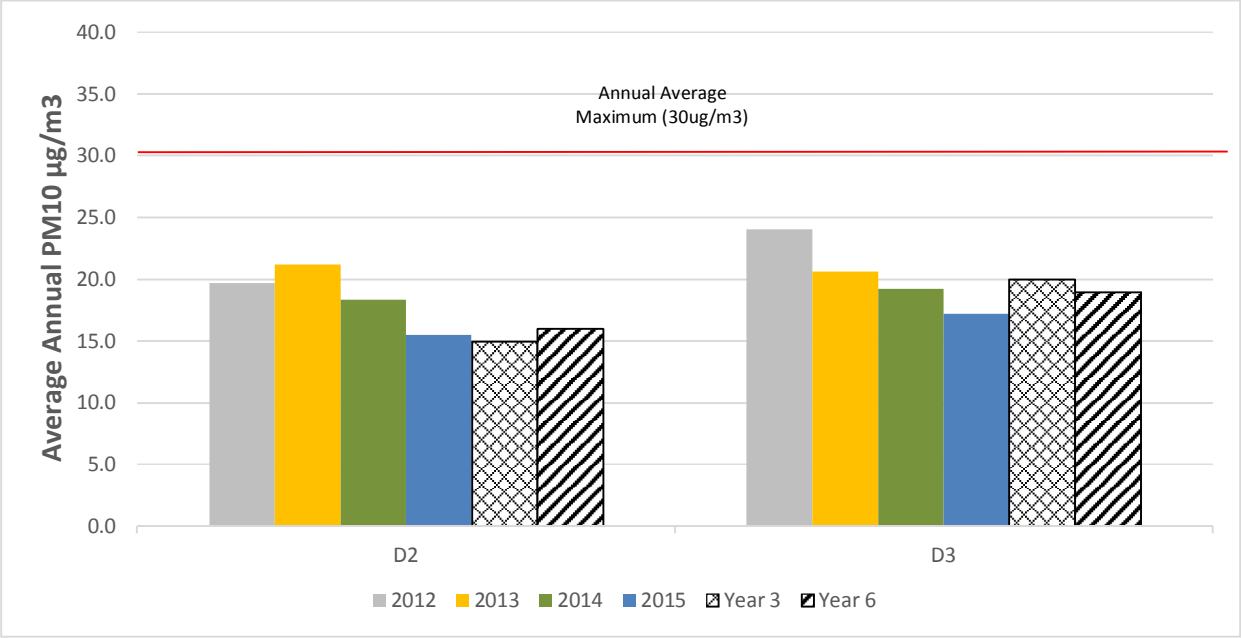

Figure 11 - Annual Average PM10 Results 2012 to 2015

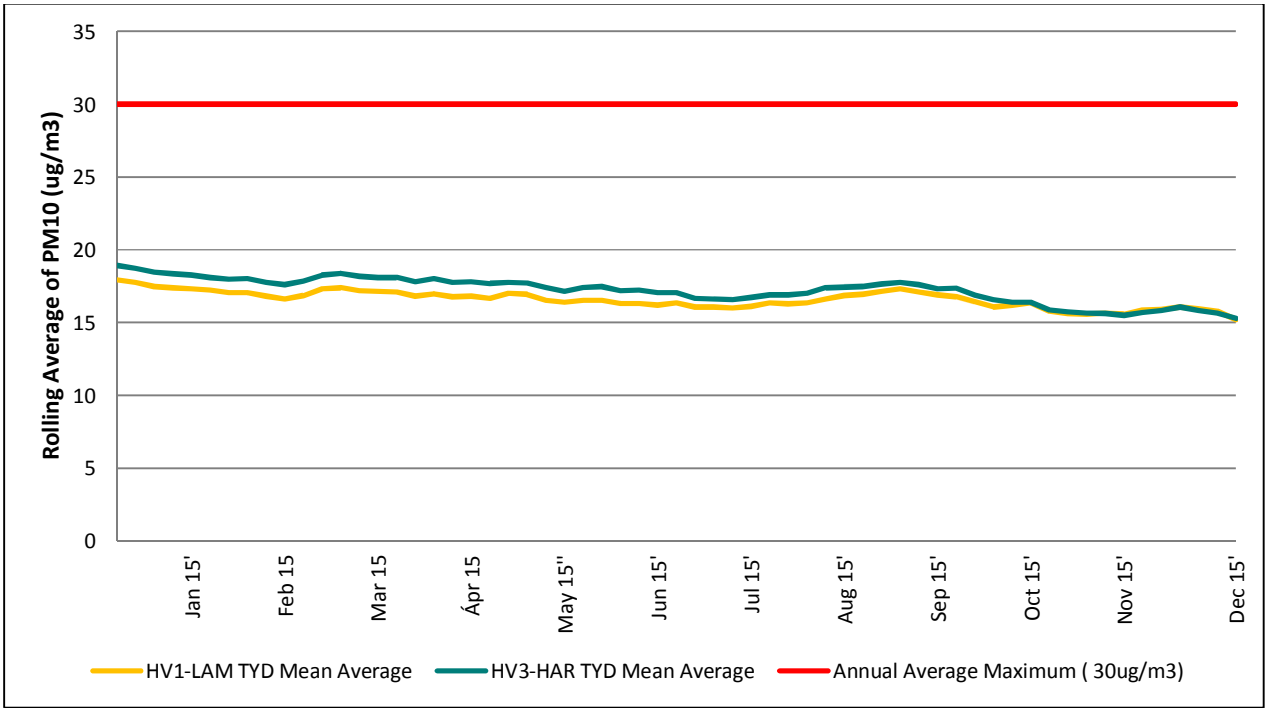

Figure 12 - Rolling Average PM10 Results over Reporting Period

ICO actively participated in the Upper Hunter Mining Dialogue environment workshops. The initiative was established by the NSW Minerals Council to provide a forum for collaboration between community, government, consultants and mining companies to focus on air quality across the region.

6.3 EROSION AND SEDIMENT CONTROL

6.3.1. Environmental Management

All personnel at the ICO have the responsibility to ensure that environmental issues relating to erosion and sediment control are considered when carrying out or reviewing any task on site. During 2015, training was provided to keep personnel informed of the company's environmental obligations and any changes or revisions to the Water Management Plan which the Erosion and Control Plan forms part of and are communicated via tool box talks (TBT), Pre Shift Communications (PSC) and Monthly Communication Meetings (MCM).

The principal objective of erosion and sediment control is to ensure that any clean water leaving site meets the appropriate quality standards. This objective is intrinsic to the design of erosion and sediment control measures at mine sites and will be achieved by implementing the following principles:

- Conducting best practice land clearing procedures for all proposed disturbance areas;
- Coordinating disturbance activities to minimise exposure of bare soils to the elements;
- Minimising run-off into the disturbance area from upslope catchment areas in order to reduce the amount of sediment laden water requiring management;

- Directing sediment laden runoff into designated water management structures for treatment, or pumping to the mine water management system;
- Restricting vehicle access (as much as possible) to designated access and haul roads;
- Appropriate storage of material stockpiles in areas away from roadways and other drainage lines;
- Erecting temporary erosion and sediment control structures such as silt fences;
- Maintaining water management structures to ensure that the designated capacities are maintained for optimum settling of sediments;
- Revegetation of disturbed areas (beyond the mine footprint) as soon as possible following the completion of disturbance activities; and
- Implementing an ongoing maintenance program for the site erosion and sediment control structures.

The aim is to prevent soil erosion at the source wherever possible. If erosion cannot be significantly reduced in situ, sedimentation control structures are used to capture and treat sediment laden water.

Sediment dams are often required down-slope of rehabilitation areas and in areas of high erosion potential. These dams are designed to reduce the velocity of sediment-laden water to facilitate the settling of coarse particulate matter.

Dams, contour banks, drainage routes and clean and mine water channels are inspected regularly to assess their ongoing integrity and suitability to the task of controlling and capturing water. Site drainage and erosion and sediment control structures are inspected regularly after rainfall events (in excess of 25mm during a 24 hour period) and until vegetative cover is complete and the soil is stable.

6.3.2. Environmental Performance

Existing sediment and erosion controls were inspected on a monthly basis with sediment fences being repaired if found defective. During the April 2015 flood event, B5 sediment dam located over the Western Extension over filled and passively released offsite into Station Creek. The sediment fence at B5 was repaired after the flood event. Please refer to Section 11 for detailed information on B5 sediment dam passive release offsite into Station Creek.

During the 2015 reporting period, vegetation was removed in the dirty water drains and clean water drains that run adjacent to D1 dam to improve the storage capacity and flow of both drains under significant rain events.

6.4 CONTAMINATED LAND

6.4.1. Environmental Management

The Environmental Management System (EMS) and complex procedures outline potential contaminant management for the site. The Pollution Incident Response Management Plan (PIRMP) in accordance with reporting obligations under the *Protection of the Environment Operations Act 1997* and the *Protection of the Environment Operations (General) Regulations 2009* provides guidelines in respect to potential site contamination and pollution. This management plan requires all personnel on site to report any identified pollution incident to their supervisor. The management plan outlines the process of reporting

pollution incidents to the relevant nominated bodies such as the DPI, the EPA, DRE and Singleton Council in addition to other stakeholders such as neighbouring landowners and the Community Consultative Committee.

All above ground hydrocarbon storage tanks are held within a bunded area, with a containment capacity of 110% of the largest tank. Emergency spill kits are placed throughout the ICO to enable prompt clean-up of minor hydrocarbon spills. Larger booms and spill kits are available at site at the UG and OC maintenance workshops.

6.4.2. Objectives and Management

The objectives of hydrocarbon management on site are to:

- Manage hydrocarbons and other chemicals in accordance with a dedicated site procedures;
- Contain all bulk hydrocarbons within bunded areas;
- Appropriately dispose of, or remediate (as applicable), hydrocarbon contaminated materials; and
- Contain any spillages prior to contaminated ósoilô excavation for either on site bio-remediation or transfer off-site by an appropriately licensed waste contractor.

6.4.3. Environmental Performance

There have been no significant areas of hydrocarbon contamination at the open cut operations during the reporting period. Actions from the 2015 Annual Review inspection included two waste grease drum located at the side of the OC wash bay to be stored on secondary containment bunds. This action was completed in June 2015.

Hydrocarbon contamination was identified at the underground operations during the Independent Environmental Audit conducted in December 2014. The relocation of underground equipment and infrastructure from the underground workings to the surface for preservation works culminated in some hydrocarbon staining of the longwall laydown area and the UG surface maintenance workshop area. Remediation of the hydrocarbon contaminated area at the UG surface maintenance workshop included removal of hydrocarbon contaminated material by means of a bobcat and bacterial degradation of spot stains by an activator agent (Microblaze). Intermediate Bulk Container (IBC) bunds were stored on secondary containment bunds to capture leaks, drips and spills when servicing long wall components and equipment at the long wall laydown area. The portal area and biz workshop were pressure cleaned and the triple oil water separator at the portal work area was repaired.

Actions rising from the previous reporting periods Annual Review inspection, conducted by DRE and DPE, highlighted that the bioremediation area, located at the RL 75 dump in the south pit, was not adequately signposted or clay lined and that reject material had been blocked dumped over the previous contaminated material. The ICO have addressed the matter by constructing a new bioremediation area located at the RL100 dump in the south pit. The Hydrocarbon Management Procedure was updated to reflect land farming processes in line with best practice. A remediation action plan for excess material dumped over the RL75 bioremediation area was implemented which involved Total Petroleum Hydrocarbon (TPH) testing of overburden blocked tipped over the bioremediation area to determine if any overburden was contaminated by hydrocarbons. TPH testing was also conducted for piles within the RL75 bioremediation piles to determine if the TPH within the material was below 1000 parts per million (PPM), which is considered satisfactory completion of the bioremediation process. An independent contractor conducted random sampling within the bioremediation piles and the overburden blocked tipped over the area at the RL 75 dump and samples were sent to a NATA certified laboratory for analysis. Sampling results confirmed that the bioremediation piles within the RL75 dump were below 1000ppm. Two piles that were recently placed near the RL75 bioremediation area resulting from hydrocarbon contamination clean up from the UG operations, recorded TPH results above the 1000ppm threshold and will require removal to the RL 100 bioremediation area for further hydrocarbon degradation.

The Hydrocarbon Management Procedure, Hydrocarbon remediation action plan for excess material dumped over the RL75 bioremediation area and NATA laboratory analysis from the TPH sampling at the RL75 bioremediation area can be found in **Appendix 4**.

6.5 FLORA

6.5.1. Environmental Management

The objectives of the Biodiversity Management Plan are to rehabilitate, revegetate and manage land for biodiversity within the biodiversity offset areas and the mine site during and post mining. One of the performance indicators relating to the Biodiversity Management Plan is the monitoring of flora to ensure the long-term resilience and natural regeneration, with success based on the establishment and subsequent development of groundcover, mid-storey and canopy series.

Flora monitoring was undertaken in spring 2015 to report findings and compare with baseline data collected in 2013 and annual flora assessment in 2014.

Sixteen permanently marked transects within six key management units (vegetation types): Bulloak (Allocasuarina luehamnnii), Ironbark (Eucalyptus crebra), Swamp Oak (Casuarina glauca), Spotted Gum (Corymbia maculata-Eucalyptus fibrosa), Grey Box (Eucalyptus moluccana), and Apple (Angophora floribunda) were established. Each transect spans a recognisable Remnant Forest-Grassland boundary, and has been used to collect quantitative data on species diversity, weed prevalence and distribution, canopy and shrub composition, canopy and shrub structure, and ground cover attributes within both Remnant Forest and Grassland.

In accordance with the Biodiversity Management Plan and Project Approval Statement of Commitments, pre-clearing surveys are carried out and groundcover clearance protocols established prior to any vegetation clearing being undertaken. No clearing occurred during the 2015 reporting period with no significant clearing occurring since early 2011.

6.5.2. Environmental Performance

The flora survey undertaken during November 2015 by independent consultants, allowed for quantitative flora attributes to be measured. Based on transect data for the 2015 monitoring period, the following key points summarise findings of monitoring undertaken during Spring 2015, which have been compared with previous data collected in 2013 and 2014.:

- Basal area of canopy species has varied across all MUs, some increasing and some decreasing. Grassland (Ironbark) and Grassland (Spotted Gum) have shown an increase due to ongoing seedling and sapling growth;
- mean DBH of canopy species has also been variable across MUs, the majority have experienced slight decreases;
- Canopy stem density has decreased or remained stable for most MUs, possibly due to mortality of seedlings due to dry conditions. Some Grassland MUs have shown increases where canopy species are beginning to colonise grassland areas after removal of cattle grazing pressure. A single canopy seedling within the Grassland (Grey Box) MU has commenced the grassland re-colonisation of this MU;
- overall species diversity has increased across all MUs, although in some this is a result of increased herbaceous and grass weed species;
- Woody shrub density has shown a decrease across many MUs, and the density of Acacia stems has also decreased to 2013 levels in the Spotted Gum MU (the only Forest MU yet to support this genus). Acacia has also shown a dramatic increase in Grassland (Ironbark), and a smaller increase in Grassland (Spotted Gum);

- Estimated weed cover remained more-or-less stable for all Forest MUs, with the exception of the Grey Box MU which showed an increase. Weed cover increased for most Grassland MUs, with others showing a decrease. Nearly all weed species are herbaceous in nature, and would have previously been controlled through grazing by cattle under earlier management;
- Estimated leaf litter cover remained stable or experienced slight increases or decreases for all MUs;
- Estimated bare ground remained relatively insignificant across most MUs, with the greatest change being reductions in the Bulloak and Ironbark MUs. This is probably in response to increased litter or grass growth

There were no instances where a threatened or endangered species was knowingly impacted by during the reporting period.

6.6 FAUNA

6.6.1. Environmental Management

The objectives of the Biodiversity Management Plan are to rehabilitate, revegetate and manage land for biodiversity within the biodiversity offset areas and the mine site during and post mining. One of the performance indicators is the comprehensive monitoring of fauna to determine persistence of current populations, including threatened species, and ensure no impact on fauna habitat outside of defined disturbance areas. Implementation of the BMP required more comprehensive fauna surveys in each of the biodiversity offset areas.

A decision was made to combine the previous fauna survey methodologies specified in the Threatened Species Management Plan and Biodiversity Management Plan (2013).

The fauna monitoring of ICO biodiversity offset areas by a suitably qualified ecologist includes the following:

- Inspection of 125 installed nest and roost boxes for a variety of tree hollow dependent fauna, including the threatened Brush-tailed Phascogale;
- Monitoring of feral predators by use of sand traps and remote infra-red cameras; and
- Comprehensive surveys for all fauna groups conducted every 2 years.
- Diurnal surveys along 9 designated transects for nests and individuals of the threatened Grey-crowned Babbler
- Nocturnal spotlight searches along 9 designated transects for the threatened and protected species

A total of 22 possum, 34 micro chiropteran bat and 69 phascogale / glider boxes were installed in 2009 and are monitored during the annual assessment. In November 2013, the installation of 40 new nest boxes (6 possum, 13 glider and 11 microbat boxes) and the repair and maintenance of 15 existing nest boxes were commissioned by the ICO.

6.6.2. Environmental Performance

Nest box usage, as determined by either presence of individual species, or nest material, decreased slightly in some offset areas in the 2015 monitoring period. The declines were exhibited in the Western, Supplementary, Northern and Martins Creek offset areas, due to several nest boxes falling off trees or being destroyed by fallen trees or branches. Evidence of the Brush-tailed Phascogale was again recorded at the ICO in 2015, with the species previously detected during surveys in 2014 and 2007. The absence of this species over the period 2007 ï 2014 is uncertain, but it is likely the species is uncommon across the landscape.

In contrast, the microbat boxes have yet to be utilised in significant numbers. An issue with the microbat boxes is the ongoing maintenance required for these boxes, with many lids falling off, or hanging upside down. Since commencement of monitoring

in 2009, only 1 box in 2012 recorded 4 individual Gouldôs Wattled Bat. Occupation rates are very low for the ICO, which contrasts markedly with the nearby Mt Owen Complex, in which microbat occupation rates in nest boxes are high. The absence of occupation of nest boxes at the ICO is attributed to the design, and also the quality of the construction.

A total of 4 threatened species were recorded during surveys in the ICO Biodiversity Offset areas in November 2015. Threatened species recorded include 1 bird species and 3 mammals. The Grey-crowned Babbler was observed in a number of the offset areas, and new nests were detected also. Threatened mammals recorded include Squirrel Glider, Brush-tailed Phascogale and Grey-headed Flying-fox. The Squirrel Glider and Brush-tailed Phascogale are widespread within the offset areas, with many nest boxes utilised by both species. The Brush-tailed Phascogale is very uncommon in the locality, with very few records of the species despite intensive survey effort across many nearby locations.

Monitoring of feral predators by field cameras recorded low abundance and diversity of introduced and native predators such as Dingo, domestic dog, Cat and Fox. The Biodiversity Management Plan indicates control of feral predators within the Offset areas. Regular baiting for these predators will assist recovery of the threatened Brushtailed Phascogale, a species most vulnerable to predation by terrestrial predators.

Locations of Biodiversity Offset Areas at the ICO are shown in **Figure 13**.

Figure 13 - Location of Biodiversity Areas at the ICO

6.7 PESTS (FERAL AND NATIVE)

6.7.1. Environmental Management

Pest (feral and native) animal management on the land associated with the ICO is addressed within the Weed & Pest Management Plan. The objectives of the Weed and Pest Management Plan are per previously noted in section 3.9.1: Manage the impact of feral (and native) animals upon biodiversity.

Pest management is essentially undertaken on a campaign basis. Management timing, chosen target species and mode of management are functions of the nature and scale of the pest problem as evidenced either by Environmental staff or via reports to the Environmental staff. Pest management includes such actions (on a needs basis) as:

- Monitoring of wild dog/dingo and red fox populations;
- Rabbit baiting;
- Baiting of wild dogs;
- Culling of large kangaroo populations (typically by shooting) and,
- Rodent control around facilities.

All baiting, trapping and culling operations are undertaken in accordance with relevant legislative requirements.

Previous studies have recorded the presence of a number of pest animals on various sections of the ICO lands. Recorded pest species have included:

- Acriditheres tristis (Common Myna);
- Canis lupus familiaris (Feral Dog);
- Capra hircus (Goat);
- Felis catus (Feral Cat);
- Lepus capensis (Hare);
- Mus domesticus (House Mouse);
- Orictolagus cuniculus (Rabbit);
- Rattus (Black Rat);
- Sturnus vulgaris([Common Starling); and
- Vulpes (European Red Fox).

6.7.2. 3.10.2 Environmental Performance

Kangaroo culling occurred in May and August 2015 with a combined total of 200 tags granted by the NSW National Parks and Wild life Service (NSW NPWS). The Kangaroo culling was carried out between the hours of 5pm-5am on 10th May concluding on 17th May 2015 and from 9th August concluding on 10th August 2015. The ICO notified adjoining land holders, community

residences and Singleton Police of the Kangaroo cull that took place. Kangaroo meat was harvested and donated to the Wild Dog Baiting Association.

6.8 BLASTING

6.8.1. Environmental Management

Due to the cessation of drilling and blasting activities while ICO are under care and maintenance, blast monitors were removed from the monitoring sites during October 2014. A contracting company was responsible for the safe removal of explosives and explosive precursors at the ICO once blasting was finalised. No explosives will be transported or stored onsite for the duration that ICO is held in care and maintenance.

6.8.2. Environmental Performance

No blasting occurred at the ICO during the reporting period.

6.9 OPERATIONAL NOISE

6.9.1. Environmental Management

The Noise Management Plan details the monitoring undertaken at the ICO. Under care and maintenance, no attended monitoring will occur unless prompted by valid complaints and/or directed by the DPE or Environmental Protection Agency (EPA). Where care and maintenance activities are carried out while attended noise monitoring is not occurring, added consideration was given to the timing and location of operations in order to, as far as practicable, reduce or eliminate noise generated by ICO impacting the community.

Operations during the reporting period comprised of:

- Suspended mining operations in all open cut pits and underground longwall and development workings;
- Surface water management infrastructure which will include;
    - Operation of ten evaporative fans located in the West pit for excess water reduction, as required;
    - Operation of the four 100m sections of evaporative spray lines, as required; and operation of water transfer pumps and use of poly pipe for surface water management and de-watering, as required.
- Maintenance and repair work on mobile plant equipment as required, with necessary operation to be generally carried out within the Workshop area during day shift;
- Maintenance and repair work at the CHPP as required, where possible to be carried out during day shift; and
- Rehabilitation works as necessary to cover disturbed areas, e.g. exposed spoil dumps.

The rail loop serving the CHPP was not used by the ICO during the reporting period, however Rixôs Creek mine and ARTC may utilise the rail loop.

6.9.2. Environmental Performance

No attended noise monitoring was undertaken during the 2015 reporting period. No noise complaints were received during the reporting period.

6.10 VISUAL AMENITY AND LIGHTING

6.10.1. Environmental Management

Light emitting equipment and facilities include mobile lighting plant, headlights on vehicles and heavy equipment, fixed lighting on workshops, open cut and underground administration areas, CHPP and off-site operations such as Forest Road ventilation shaft site and gas drainage sites. A number of management techniques are used to minimise the impacts of stray lighting and are employed across both sites which include:

- Visual bunds established to improve visual amenity and block light;
- Light positioning and orientation for mobile lighting plant;
- Positioning mine entrance and exit roads to prevent headlights shining towards adjacent residences;
- Utilisation of a ñlow spillò design for car park area lighting;
- Awareness training to educate employees regarding the sensitivity of the ICO proximity to local residents; and
- Procedures and standards for lighting.

6.10.2. Environmental Performance

There were no community complaints regarding lighting during the 2015 reporting period.

6.11 ABORIGINAL HERITAGE

6.11.1. Environmental Management

Aboriginal cultural heritage values are protected in accordance with the *National Parks and Wildlife Act 1974 (NP&W Act)* and the *Environmental Planning and Assessment Act 1979 (EP&A Act)*. The cultural importance of Aboriginal archaeological sites and how these and other sites in the Hunter Valley symbolise our past and connect to the Wonnarua people, is acknowledged. If during the course of works any previously unknown historical archaeological material or heritage sites/items are uncovered or identified, all work in the area of the item(s) shall cease immediately and a suitably qualified and experienced archaeologist will be consulted. If the archaeologist considers the archaeological material uncovered constitutes an archaeological órelicô the Heritage Branch, OEH will be consulted to determine an appropriate course of action prior to the recommencement of work in the area of the item.

The Aboriginal Heritage Management Plan sets out the procedures for the protection of Aboriginal sites as well as the salvage and care of Aboriginal objects found within the operational activities. Additional objectives of the Aboriginal Heritage Management Plan are:

- To establish an ongoing Aboriginal stakeholder consultation process;
- To describe the manner in which certain Aboriginal sites will be salvaged;

- To provide a summary research design and work plan for the sub surface excavation of select sites and areas; and
- To describe a program for Aboriginal site survey and assessment in areas not addressed by the original EA.

The Aboriginal Heritage Management Plan also outlines the importance of ongoing consultation with Aboriginal stakeholders during mining. All staff and contractors as part of a site induction are provided with information on Aboriginal heritage sites, their locations, what constitutes an artefact and what to do if an item of Aboriginal heritage is located.

6.11.2. Environmental Performance

No known items of Aboriginal heritage have been identified or impacted during the reporting period.

6.12 NON-ABORIGINAL HERITAGE

6.12.1. Environmental Management

A Non-Aboriginal Heritage Management Plan addresses management of non-Aboriginal heritage. Due diligence surveys for non-aboriginal archaeological assessment are conducted in conjunction with aboriginal assessments by suitably qualified archaeologists.

If during the course of works any previously unknown historical archaeological material or heritage sites/items are uncovered or identified, all work in the area of the item(s) shall cease immediately and a suitably qualified and experienced archaeologist will be consulted. If the archaeologist considers the archaeological material uncovered constitutes an archaeological órelicô the Heritage Branch, OEH will be consulted, in accordance with Section 146 of the *Heritage Act 1977* (NSW), to determine an appropriate course of action prior to the recommencement of work in the area of the item.

6.12.2. Environmental Performance

No known items of non-Aboriginal heritage have been identified or impacted during the reporting period.

6.13 SPONTANEOUS COMBUSTION AND ACID ROCK DRAINAGE

6.13.1. Environmental Management

Prior testing of in seam coal indicates that the coal has low to medium propensity for spontaneous combustion. There have been no identified incidents of spontaneous combustion at the ICO since production commenced and the risk of spontaneous combustion is considered to be low.

Notwithstanding the above, the ICO continued following management measures to minimise the risk of spontaneous combustion within the ICO:

Å Minimising the length of time coal is held in stockpiles;
Å Monitoring coal stockpiles for signs of spontaneous combustion;
Å Immediately reporting incidents;
Å Ventilation assessments; and
Å Extinguishment by excavation, spreading and saturation with water.

6.13.2. Environmental Performance

During the 2015 reporting period, there was no indication of spontaneous combustion or acid rock drainage.

6.14 BUSHFIRE MANAGEMENT

6.14.1. Environmental Management

The Bushfire Management Procedure is designed to manage and mitigate the risk of bushfires at ICO. Fire breaks around perimeters are most commonly utilised as a management tool to control the potential of fires.

6.14.2. Environmental Performance

Routine reinstatement of firebreaks was undertaken during the reporting period by way of mowing, slashing and / or soil tilling. There were no instances of fires occurring on the ICO lease during the reporting period.

Proactive management was undertaken which included clearing trees that could potentially come in contact with overhead power lines and implementing an inspection program for tree trimming near the overhead power lines around the ICO to reduce the occurrence of grass fires.

6.15 WEEDS

6.15.1. Environmental Management

The ICO has developed a site Weed and Pest Management Plan to provide guidance in the management of noxious weeds and pests (feral and native animals) on the lands associated with the Complex. The objectives of the Weed and Pest Management Plan are:

- To comply with legislative requirements for declared noxious weeds;
- Management of weeds other than declared noxious weeds; and
- Manage the impact of feral (and native) animals upon biodiversity.

The Weed and Pest Management Plan includes the following obligations relating to weed control:

- Systematic surveillance and treatment for noxious weeds;
- Staff training in the identification of noxious weeds;
- Treatment following a reported weed sighting;
- Prevention of the establishment of additional noxious weed species; and
- Maintain up to date knowledge of the latest weed control techniques and products.

The Weed and Pest Management Plan identifies the following noxious weeds as being present, or previously being present within the ICO based on five previous studies:

- Bryophyllum delagoense (Mother-ofï Millions);
- Cestrum parqui (Green Cestrum);
- Olea cuspidate (African Olive);
- Echium spp. (Paterson's Curse and Vipers Bugloss);
- Lycium ferocissimum (African Boxthorn);
- Opuntia humifusa (Creeping Pear);
- Opuntia stricta (Prickly Pear);
- Romulea rosea (Onion Grass); and
- Rosa rubiginosa (Sweet Briar).

The Weed and Pest Management Plan also identifies two other shrubby species which are not classified as noxious weeds but should be eradicated as both species have a capacity to rapidly invade the landscape. These species are:

- Ricinus communis (Castor Oil Plant), and
- Gomphocarpus fruticosus (Swan Plant).

Weeds considered to be in conflict with the objectives of the Biodiversity Management Plan, Rehabilitation Management Plan or other ICO related documents, will be subjected to weed management.

Where required, the management of Rhodes Grass throughout the mine site is via these integrated weed management practices:

- Cattle Grazing ï Some tropical perennial grasses are susceptible to being overgrazed when it is dry or when nitrogen levels are low. Rhodes grasses in particular are susceptible to having their runners (stolons) grazed to ground level. Tropical perennial grasses such as purple pigeon, Rhodes grass and green panic are susceptible to overgrazing in dry conditions and particularly when soil nitrogen levels are low.

- Ongoing maintenance ï an important aspect of the success of any weed control program is the ongoing maintenance that is the follow up actions that occur after the initial weed control has occurred. Monitoring treated sites for reinfestation will occur and treatment of any weeds as they appear. Photo points, records and maps may be used to determine the success or failure of weed control work.

6.15.2. Environmental Performance

There was no evidence of significant noxious weed infestation on-site or within buffer lands during the reporting period. Weed spraying was undertaken along the periphery of mine project areas / public roads and included the targeting of mother of millions, African olive, prickly pear, African box thorn, Green cestrum and Coolatai grass following site inspections. Opportune spot spraying was also conducted on site as part of routine maintenance. Species identified and sprayed within the Western and Supplementary Biodiversity Offset Areas included Coolatai Grass, Prickly Pear, African Olive and Box thorn. Follow-up investigations were carried out to confirm the success of spraying and mechanical removal. The Weed and Pest Management Plan continued to be implemented throughout the 2015 reporting period.

During the reporting period, work as per the Glennies Creek Riparian Management Plan continued, with preliminary targeted weed control through slashing and herbicides, installation of fencing to stop cattle eroding banks, and removal of debris along

sections of Glennies Creek undertaken. Weed identification and spraying occurred in and around surface facilities as a part of general grounds maintenance.

6.16 MINE SUBSIDENCE

6.16.1. Management/Monitoring

Longwall mining involves the removal of a substantial proportion of the coal seam which may result in the collapse of the overlying rock strata into the previously mined area known as the goaf, resulting in subsidence of the natural surface. The extent of subsidence depends on the width and thickness of the coal seam removed in each longwall panel, the characteristics of the overlying rock and the depth of mining. The settlement and binding of the strata to the surface results in a subsidence trough which is wider than the actual longwall panel extracted.

By contrast, development of first workings, such as the north-west and north mains, involves the removal of a minor portion of the coal seam, is designed for stability, does not cause any collapse of the rock strata and hence does not cause subsidence.

Subsidence management for the underground operations for all longwall panels mined to-date is in accordance with appropriate approvals. All mining beyond LW6 was undertaken in accordance with the subsidence management approval process administered by the Department of Primary Industries - Division of Resources and Energy. This process requires an assessment of the surface environment in the area of proposed underground mining; identification and characterisation of surface and sub-surface features that may be affected by the proposed mining; subsidence prediction, and an assessment of the subsidence impacts and risks. The Subsidence Management Plan (SMP) for longwall panels LW10 to LW17 was approved on the 17 October 2008 and is currently in use.

Central to the subsidence management plan is monitoring, reporting and a review of outcomes against predictions.

Subsidence monitoring at the Underground Operation is undertaken in three phases. The three phases are:

1. Pre-mining monitoring to establish a baseline for subsequent monitoring and impact assessment;
2. Monitoring within the predicted subsidence impact zone during mining to allow the implementation of subsidence impact management processes as required; and
3. Post-mining monitoring to establish that no further subsidence impacts are likely and to allow the completion of subsidence impact management processes.

During the reporting period, Phase 3 subsidence monitoring continued.

6.16.2. Results

Mine-induced subsidence recorded to-date over LW1 to LW12 has ranged up to 1.4 metres, with future subsidence as a consequence of Middle Liddell Seam extraction currently predicted to remain within the range of 1.6 metres, based largely on the expectation that maximum subsidence will not exceed 65% of seam thickness mined. These results are in line with subsidence predictions detailed in the SMP. .

During the reporting period, there were no reports noted or received of any subsidence-induced damage to residences or structures which are covered by the Mine Subsidence Board.

6.17 METHANE DRAINAGE AND VENTILATION

6.17.1. Monitoring

The Underground Operations undertakes an extensive program to assess air quantity and quality within its underground workings. Ventilation air and gas drainage is also closely monitored.

Monitoring methods include:

- Hand held monitors for use by personnel;
- Underground sensors that electronically measure and send gas concentrations in real time from underground locations to the surface; and
- A tube bundle monitoring system that constantly draws gas from underground locations and analyses it on the surface.

6.17.2. Methane Output

The total methane emission in Tonnes Carbon Dioxide equivalent [t CO2-e] recorded during the reporting period were:

- 390,697 vented through the main fan
- NIL through gas plants; and
- 355,758 transferred to the EDL power generation. Methane was transferred to the EDL site via a series of buried pipelines from gaswells in LW6-LW12 as well as the UIS Gas Riser.

During the reporting period, 6 decommissioned gas drainage boreholes were rehabilitated in accordance with the approved Underground Care and Maintenance Mining Operations Plan (2014-2017). When the gas drainage borehole is decommissioned, all infrastructure is removed, the borehole is grouted, gravel is removed to be used in future boreholes and the area is topsoiled and seeded. If the access road is required for future gas drainage boreholes, it is left in its current form.

The status of gas drainage boreholes at the end of the reporting period is detailed in the **Table 12** below.

Table 12 – Operational Status of Gas Drainage Boreholes

Operational Status	Number
Operational (In service or available for service)	13
Rehabilitated	6
Decommissioned ï partially rehabilitated and awaiting final rehabilitation	NIL
Decommissioned ï may be recommissioned at a later date	12
Proposed	6
To be commissioned	2

6.17.3. Methane Level Impacts on Mine Production

Barometer fluctuations and higher gas content within the mining area were considered to be the main causes for methane levels exceeding 2.0% in the tailgate roadway on a regular basis when in operation. Goaf seals are used to minimise the leakage from the adjacent goaf into the return.

The new gas extraction and flaring plant, commissioned in 2014, was briefly operated periodically to confirm its serviceability. The plant is intended to improve gas extraction capabilities and reduce lost time production caused by methane levels in the tailgate.

6.17.4. Methane Re-use

Condition 12(b) (viii) of DA 105/90 (as amended) requires that the Underground Operations provide an annual evaluation of the feasibility of methane drainage and re-use.

The construction of the Glennies Creek Colliery supplied methane fired power station commenced in 2006 with commissioning carried out in the latter half of 2007.

Since that time, a significant volume of methane has been captured and combusted to generate electricity. **Table 13** and **Figure 14** identify the volume of methane captured and used in electricity generation. During 2015, the power station consumed 16,828 tonnes of methane.

Table 13 – Methane Reuse 2015

Month	Methane [t CH4] sent to EDL
January	1,371
February	1,227
March	1,378
April	1,454
May	1,524
June	1,485
July	1,532
August	1,418
September	1,396
October	1,345
November	1,259
December	1,439
TOTAL	**16,828**

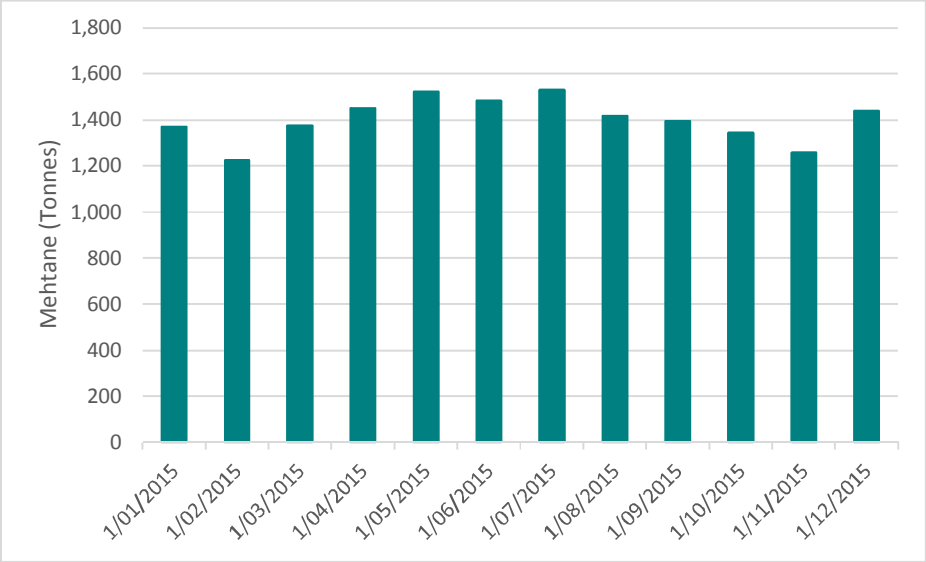

Figure 14 - Methane sent for re-use in Glennies Creek Power Station (EDL) 2015

6.18 SECURITY AND PUBLIC SAFETY

6.18.1. Management

Management of security and public safety is achieved through a combination of physical measures, education and training as outlined below.

6.18.2. Security

The two operational areas (Open Cut and Underground) are boundary fenced with a single main access roadway for each. Additional fencing is in place around sensitive areas such as the explosive magazines and biodiversity offset areas. Additional security fencing and swipe card entry was installed at the underground site during 2014.

Public entering the mine site are directed by a sign stating ñNO UNAUTHORISED ENTRY, ALL VISITORS AND CONTRACTORS TO REPORT TO THE MAIN OFFICEò with an additional sign which directs the visitors and contractors to the car park, workshop and main office complex.

Visitors and contractors must login using the electronic onsite tracking system, and logoff when leaving site.

Care and maintenance hours are generally between 6am and 6pm Monday to Friday, therefore licenced security contractors provide patrols of the mine site areas when employees are not on site to ensure 24 hours, 7 days per week coverage.

Upgrades of ICO security system completed within the reporting period included alarm systems with swipe card activation and de-activation on the OC Administration building and Maintenance workshop. Cameras were positioned at the front and back of the OC maintenance workshop and UG administration building to also deter theft onsite.

6.18.3. Mine Inductions

No visitor or contractor is allowed on the ICO without having an appropriate induction. The inductions, which determine the areas where visitors and contractors are allowed to go on the mine site, are valid for a period of two years.

When on-site, visitors are escorted by mine personnel at all times.

6.18.4. Personal Protection Equipment

Personal protection equipment (PPE), which complies with the relevant Australian Standards, is available to all visitors and contractors visiting the sites.

All areas where PPE is to be worn are clearly sign-posted.

6.18.5. Performance

The management procedures in place were effective throughout the reporting period, with no known incidents involving injury to any member of the public.

6.19 WASTE MANAGEMENT

6.19.1. Environmental Management

The Waste Management Plan guides the treatment and subsequent disposal of several waste streams which include wastes produced by mining and coal processing (overburden, tailings and rejects) and site general waste: sewage, general waste streams (rubbish), recyclables and hazardous wastes.

Any general waste removed from site is carried out by a registered waste disposal contractor and disposed of at a licensed waste facility. Large vehicle tyres are disposed of in pit and smaller tyres are removed from site by a licenced tyre handling facility.

Monthly reporting of waste management is undertaken internally and internal waste targets are set to encourage recycling, reuse and operational improvement.

6.19.2. Sewage Treatment/ Disposal

The ICO has on-site sewage treatment systems which includes a primary aeration tank with a secondary maturation pond and a package sewage treatment plant. Wastewater from the systems are dispersed by irrigation sprays on dedicated irrigation areas.

6.19.3. Rubbish Disposal

A consolidated waste contractor has continued to operate throughout the 2015 reporting period. The contractor consolidates a number of waste streams into a single contract to ensure all waste streams are accounted for and to assist/encourage greater recycling of all materials on site. Additional communication was provided for all employees via tool box talks, to ensure a greater understanding of the importance of segregating waste streams to achieve effective and responsible waste management.

6.19.4. Hazardous Waste Disposal

Hazardous wastes such as batteries, waste oils, greases, oil filters, oily rags and oily water were managed by JR Richards and Sons during the reporting period. JR Richards and Sons provided monthly waste tracking reports for all hazardous waste removed from site.

6.19.5. Environmental Performance

No waste related incidents occurred during the reporting period. Waste tonnages for both the Open Cut and Underground Operations is provided below in **Tables 14** and **15**.

Table 14 – Open Cut Waste Streams and Tonnes

Waste Category	Weight (tonnes)
Used oils and greases	9.3
Batteries	5.83
Waste and materials contaminated with oils and greases	17.23
Rubbers and tyres	0.05
Wood	0
Metallics	25.68
Paper and cardboard	3.24
Mixed waste	18.38
Total	**79.66**

Table 15 – Underground Waste Streams and Tonnes

Waste Category	Weight (tonnes)
Used oils and greases	11
Waste and materials contaminated with oils and greases	0.14
Batteries	1.42
Rubbers and tyres	0
Metallics	2.70
Paper and cardboard	0.20
Mixed waste	35.23
Total	**49.27**

6.20 HAZARDOUS MATERIAL MANAGEMENT

6.20.1. Fuel Containment

All fuel storage tanks have bunds with the capacity to hold 110% of the largest tank within that bunded area. There have been no significant areas of hydrocarbon contamination at the OC during the reporting period. As described in section 6.4, hydrocarbon staining was identified at the UG during the reporting period. The relocation of underground mining equipment and infrastructure from the underground workings to the surface for preservation works has culminated in some hydrocarbon staining of the longwall laydown area and the UG surface maintenance workshop area. Remediation of the hydrocarbon contaminated areas were completed during the reporting period, as described in section 6.4.

6.20.2. Oil Containment and Disposal

Open Cut bulk oil storage occurs within the same bunded area that the bulk fuel tanks are contained within and as a result the capacity of the bund for the bulk oil storage tank is well above 110% of the oil storage tank capacities. During the reporting period, all waste oil and radiator coolant from truck and vehicle maintenance was reclaimed and recycled. Underground waste oil is collected at the bench and Brambles Industrial Services (BIS) workshop and stored for waste oil collection. A licensed waste transport contractor collects waste oil and coolant for subsequent recycling.

The OC wash down area has a sump to collect the oil/water mix. Drains at the workshop are directed to the wash down bay area sump where a loop tube surface skimmer removes the majority of hydrocarbons before the remaining water is passed through a plate separator. Recovered oil is transferred to a storage tank and a licensed waste transport contractor collects the separated waste oil from the storage tank. Water post hydrocarbon recovery then flows to mine water dam D1.

6.20.3. Hazardous Materials

Inventories of hazardous materials and Material Safety Data Sheets (MSDS) are available through the OC and UG stores. The UG control room also holds hard copy MSDSs. The ICO also utilised the Chemwatch system which can be accessed via the ICO Intranet.

The ICO generates some wastes which are classified as hazardous under the Office of Environment and Heritage's waste classification system. These wastes must be tracked when transported into, within or out of New South Wales. The waste consignor, transporter and receiving facility all have obligations to ensure that the waste is tracked, transported and dealt with in accordance with the Protection of the Environment Operations Act, 1997. The volumes of hazardous waste generated at the ICO and disposed of are monitored and collated monthly.

6.20.4. Explosives

During the reporting period there was no explosives or detonators stored on site. The ICO maintained licenses to store explosives (refer **Table 2**). Open cut explosive materials, such as ammonium nitrate prill and emulsion, which are used to blast overburden, can be stored in the explosives compound ("Orica compound"). Detonators can be stored in a separate compound as per the *Explosives Act 2003 No. 39* and *Explosives Regulation 2005*.

7. WATER MANAGEMENT

7.1.1. Introduction

The ICO does not hold a water discharge licence and separates clean water, sediment laden water, and mine water to minimise adverse environmental impacts. Clean water is allowed to run off site and includes captured water from upstream catchment areas that are designated as undisturbed or rehabilitated and are not affected by mining activities. Sediment laden water is water captured on disturbed ground which may or may not be subject to mining activity and includes areas such as roads, hardstand, drill pads and unfinished rehab areas. Mine water generally includes all water coming into contact with overburden, tailings and infrastructure surfaces.

Water management infrastructure is shown in **Figure 15** and includes dams, pipelines and associated drainage structures which allow for catchment of water from undisturbed areas to be diverted, where possible, away from disturbed and sediment laden mine water. Controls are implemented to ensure storm water and groundwater from the mining area is diverted to either mine water dams or the pit void to prevent discharge of dirty water off site.

A Water Management Plan for the operations (North Open Cut, the Underground Mine, South Pit and the extended South Pit (Western Extension)) outlines surface water and groundwater management practices including monitoring requirements, performance indicators and response plans.

7.1.2. Clean Water Management

In the OC mining lease area east of the main Northern Railway Line, rainwater runoff from non-mined or rehabilitation areas, as well as from the diversion of the Martins Creek and Blackwattle Creek catchments, is collected in a series of four dams (C1, C2, C3 and C4). A vegetated clean water channel connects these dams. Water from C3 and C4 can be pumped to other water storage dams for on-site use as required. C3 and C4 are maintained with sufficient freeboard to ensure adequate surge capacity during storm events. Three further dams, C5, C6 and C6a are sediment laden water dams in the south of the mining lease and these dams bywash to Dam C3.

The area west of the Main Northern Railway Line had several dams constructed in 2000 due to the increase in South Pit operations and the need to separate clean and mine water. The water management system comprises clean water dams C7 to C11. The dams and diversion banks divert clean runoff water from entering mine workings. Dams C7, C8 and C11 bywash and flow into C4 via the vegetated channel, while dam C9 (west of the south pit) bywashes into Station Creek. Dam C10 was located in the active mining area and was ómined-throughô in 2001.

The passive release of water from C4 has occurred in the past during storm events. Water is decanted after these events in order to keep the dam at 70% of maximum capacity. This maintains enough freeboard to allow sufficient residence time to settle solids in the next first flush event.

Clean and mine water separation at Underground is achieved by means of an earthen bund which extends along the western margin of the access road to the hardstand/storage areas and traverses the southern and western sides of the stores lay-down area. Flows from the west of the bund, which originate from areas largely undisturbed by mining, are directed to the clean water areas via natural or constructed drainage lines and channels. Possum Skin Dam, a structure for the storage of mine water, is isolated from clean surface runoff by a perimeter cleanwater diversion drain. All captured mine water is directed to the Portal Sump.

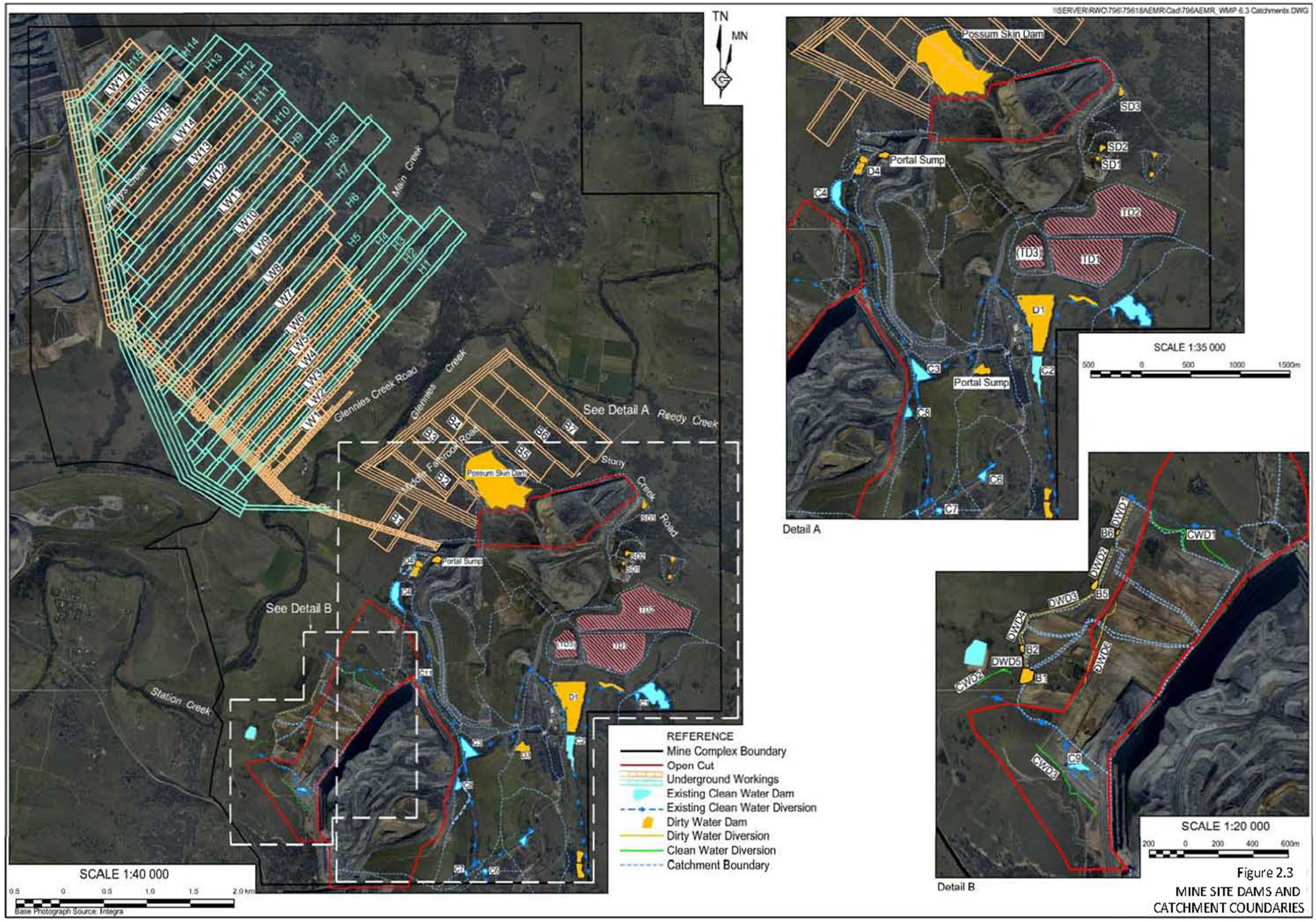

Figure 15 - Water Management System

7.1.3. Mine Water Management

Mine water is a product of water captured within the mine water footprint in areas such as: roads, hardstands, and infrastructure and surface facilities. Typically, due to the local geology, mine water is characterised by elevated salinity levels.

All runoff from OC surface facilities is intercepted by diversion drains and directed to Dam D1. Mine water and tailings dam return water is pumped or drained to Dam D1. A dedicated pipeline returns water collected from the underground operations Portal Sump to Dam D1 or PSD. Groundwater inflows during mining operations are dewatered from the pit to D1 for use in the coal processing system. Development of the North Open Cut included construction of three sediment dams (Sediment Dams 1, 2 and 3) at the eastern end of the pit to collect disturbed area surface runoff. In the Western Extension and North Open Cut project areas there have been a number of smaller in-pit dams constructed to aid in the removal of captured mine water from the pit. Water from these dams is pumped back to D1 as required. Four sediment control dams (B1, B2, B5 and B6) have also been constructed in the Western Extension project area to capture sediment laden runoff. A pump is permanently located at B5 dam and pumps run at dam B1, B2 and B6 as required to return water to D1 or the South Pit void.

An oil separator located at the OC truck wash is used to remove hydrocarbons contained in wash down water. Floating oil booms are also located at the inlet to Dam D1 to remove any extra hydrocarbons from the water before it enters Dam D1. A mechanised oil skimmer is also installed at the holding sump prior to the oil separator. There have been no incidents where oil contaminated water was released off site during the reporting period. Mine water runoff from underground footprint surface facilities is diverted to the Portal Sump via the mine water drainage system. As described in Section 2.8.2, clean and mine water separation is achieved by means of earthen bunds. Overland pipelines transport water from the Portal Sump to Possum Skin Dam or D1 as required. Water is also diverted from the portal sump to the process water dam which supplies water underground for fire fighting and mining purposes. A sedimentation dam, positioned next to Possum Skin Dam, captures sediment laden water originating from the clean water diversion drains.

Table 16 outlines the characteristics of water storages and catchment areas located within ICO to manage water.

Table 16 – Details of the Mine Water Management System and Catchment Areas

Storage	Type of Water Stored	Total Catchment Area (ha)	Max. Surface Area (ha)	Capacity at Spill Level (ML)	Function	Inspection Regime
C1	Clean	624	6.0	243	Collect surface runoff	Monthly
C2	Clean	215	2.3	173	Collect surface runoff	Monthly
C3	Clean	180	2.0	97	Collect surface runoff	Monthly
C3A	Clean	58	1.0	25[a]	Collect surface runoff	Monthly
C4	Clean	25	2.2	90	Collect surface runoff	Monthly
C5	Clean	69	0.7	16	Collect surface runoff	Monthly
C6	Clean	50	0.3	4	Collect surface runoff	Monthly
C6A	Clean	9	0.3	4	Collect surface runoff	Monthly
C7	Clean	3	0.1	2	Collect surface runoff	Monthly
C8	Clean	4	0.4	18	Collect surface runoff	Monthly
C9	Clean	2	0.2	2	Collect surface runoff	Monthly

Storage	Type of Water Stored	Total Catchment Area (ha)	Max. Surface Area (ha)	Capacity at Spill Level (ML)	Function	Inspection Regime
C11	Clean	4	0.08	0.8	Collect surface runoff	Monthly
TD1	Mine	31	23.9	205	Dewatering and disposal of tailings generated from processing coal. Note: Tailings dams are not used for water storage.	Monthly
TD2	Mine	53	28.9	1,000	Dewatering and disposal of tailings generated from processing coal. Note: Tailings dams are not used for water storage.	Monthly
D1	Mine	89	11.0	440	Supplies CHPP and also used for dust suppression Central repository for Open Cut mine water.	Monthly
D3 / TD3	Mine	16	6.0	600[a]	Dewatering and disposal of tailings generated from processing coal. Note: Tailings dams are not used for water storage.	Monthly
D3	Mine	36	0.9	39		Monthly
D4	Mine	3	0.7	2.5		Monthly
Process Dam	Mine	N/A	0.69	22	Process water for underground use.	Monthly
Vent Shaft Dam	Mine	N/A	0.07	1.5	Water for use in drilling operations at ventilation shaft site.	Monthly
New Vent Fan drill water settling pond	Mine	N/A		1	Settling pond holds transit water from the new vent fan drilling program	Weekly
New Vent Fan drill water temporary holding pond	Mine	N/A		12	Temporary pond constructed to hold drill water in the shaft construction phase	Weekly
Clean water run-off pond	Clean	N/A	0.2	2.05	Storage of clean water run-off.	Monthly
Possum Skin Dam	Mine	138	32.7	1560[b]	Store excess water from both open cut and underground operations for evaporation Provide water for dust suppression.	Monthly
Portal Sump	Mine	85	0.5	1900[b]	Overflow storage for Underground.	Weekly
Sediment Dam 1	Sediment Laden	9	1.3	15.6	Settle sediment prior to discharge.	Monthly
Sediment Dam 2	Sediment Laden	5	1.5	26.8	Settle sediment prior to discharge.	Monthly

Storage	Type of Water Stored	Total Catchment Area (ha)	Max. Surface Area (ha)	Capacity at Spill Level (ML)	Function	Inspection Regime
Sediment Dam 3	Sediment Laden	5	0.6	9.7	Settle sediment prior to discharge.	Monthly
Sediment Dam B1	Sediment Laden	41	0.59	>10.5	Settle sediment prior to discharge.	Monthly
Sediment Dam B2	Sediment Laden	3.5	0.19	>1.2	Settle sediment prior to discharge.	Monthly
Sediment Dam B5	Sediment Laden	19	0.29	>6.1	Settle sediment prior to discharge.	Monthly
Sediment Dam B6	Sediment Laden	22	0.43	>7.0	Settle sediment prior to discharge.	Monthly
Sediment Dam (underground)	Sediment Laden	0.3[a]	0.87[a]	>6[a]	Collects run-off from hardstand.	Monthly
Sewage Treatment Dam	Sewage System Water	N/A	0.07[a]	>10[a]	Storage of sewage system water prior to irrigation.	Monthly
Possum Skin Dam Sediment Dam	Sediment Laden	50[a]	0.56[a]	>8[a]	Settle sediment prior to discharge.	Monthly

[a] Estimate only

[b] Existing conditions, Capacity to Maximum Operating Level (MOL) = 1090 ML, Expansion of North Open Cut will reduce capacity to MOL = 710 ML

[c] Portal Sump storage at RL 41m AHD in the open sump / backfill with a 10% assumed porosity

7.1.4. Water Supply and Use

Water was drawn primarily from Dam D1, which can be supplemented by water pumped from the clean water system if required. The bulk of this water is returned to D1 through the tailings disposal process. Mine water from the underground operations is pumped to the Portal Sump and then pumped, via overland pipeline, to either mine water dam D1 or Possum Skin Dam. Mine water from the underground can also be pumped to Ashton Coal on an as needed basis. Surface water trucks collect water from Possum Skin Dam for dust suppression at the OC and ROM pad as required. No water was sourced from the clean water system or Glennies Creek for mining operations during the reporting period.

Water is or may be made available from the following sources:

- Singleton Town Supply ï this water is primarily used for the bathhouse and drinking water; and
- Glennies Creek ï The ICO has a licence to pump from Glennies Creek.

7.1.5. Treated Water

Treated waste water from the OC sewage treatment system is applied to a rehabilitated area. There have been no adverse impacts observed resulting from the irrigation of rehabilitation areas during the 2015 reporting period.

The Underground sewage treatment plant processes waste water and delivers treated water to a holding pond from which irrigation is undertaken.

7.2 SURFACE WATER

7.2.1. Environmental Management

The WMP outlined the primary water demands at the ICO during care and maintenance which included:

- Operation of ten evaporative fans located in the West pit for excess water reduction;
- Operation of the four 100 metre sections of evaporative spray lines;
- Operation of water transfer pumps and use of poly pipe for surface water management and de-watering, as required; and
- Maintenance and repair work on mobile plant equipment as required, with necessary operation which was carried out within the workshop area during day shift.

The surface water monitoring program is designed to measure potential impacts upon surface waters in the vicinity of operations specifically:

- Impacts (if any) on the surface water catchments of Glennies Creek, Reedy Creek, Station Creek, Bettys Creek and Main Creek.

The surface water monitoring program for implementation during care and maintenance has been designed to monitor key water storage structures on-site that may potentially be impacted by the remaining activities on site. The main risks identified to surface water management during this phase include:

- Overtopping of dams due to insufficient freeboard;
- Contamination of the surrounding environment as a result of leachates or chemicals coming from dam/s;
- Unauthorized water releases to the surrounding environment; and
- Failure of containment bunds or drains

Throughout the term of care and maintenance, the ICO continued to monitor the quantity and the quality of the water flows within the receiving waters and respond to any potential signs of contamination or inadvertent diversion of water.

The previous ICO Environmental Protection Licence (EPL 3390) and now the current Rixs Creek North EPL (3391) requires the monitoring of surface water for pH, EC, TSS and TDS at the following sites on a monthly basis:

1. Station Creek, where it leaves the mine site (site W1);

2. Martins Creek, where it enters the mine site (site W3);

3. Blackwattle Creek, where it enters the mine site (site W6); and

4. Dam C4, final dam in Open Cut clean water system (site W10).

Integra monitors twenty-nine (29) other sites surrounding the operations. These additional sites are also monitored monthly and samples are analysed for pH, EC, TSS and TDS. All monitoring sites are indicated in **Table 17** and **Figure 16**.

Table 17 –Water Monitoring Sites

Monitoring Point	Location
W1	Station Creek
W3	Martins Creek
W4	Glennies Creek upstream of the Station Creek confluence
W5	Glennies Creek downstream of the Station Creek confluence
W6	Blackwattle Creek
W7	Stony Creek where it crosses Stony Creek Road
W10	Clean Water Dam ï C4
W11	Glennies Creek downstream at Camberwell where it crosses the New England Highway
W12	Clean Water Dam ï C1
W13	Clean Water Dam ï C6
W14	Clean Water Dam ï C3
W15	Clean Water Dam ï C6A (after C5 spillway channel before clean water channel)
W16	Sediment Control Dam ï C7
W17	Clean Water Dam ï C2
W18	Clean Water Dam ï C5
W19	Mine Water Dam D1
W20	Northern Stock Water Dam No. 1
W21	Northern Stock Water Dam No. 2
W22	Station Creek Up
W23	Station Creek Down
GCS001	Process Dam
GCS002	Portal Sump
GCS003	Possum Skin Dam
GCS004	PS Dam Seepage Collector
GCS005	PS Dam Clean Water diversion Sediment Pond
GCS006	Sewage Pond
GCS007	Portable Water
SD1	South Sediment Dam
SD2	Central Sediment Dam
SD3	North Sediment Dam
GC1	Middle Falbrook Rd Bridge
GC2	Glennies Creek Nobles Crossing

Nobles Crossing	Nobles Crossing

7.2.2. Water balance

As dust generating activities will be reduced during care and maintenance, water consumption through dust suppression was limited during the reporting period. Annual evaporation rates (from evaporative systems and water storage evaporation) will be dependent on seasonal weather conditions and operational reliability.

Table 18 provides estimates of the mean annual inflows to and outflows from the mine water management system based on site data, (including daily rainfall-runoff data) and mine site water balance modelling undertaken by WRM Water & Environment Pty Ltd (WRM, 2009).

Evaporation from site process water dams totalled 918 ML in 2015. The major evaporation occurred at:

- The tailings dams, approximately 397 ML;
- The Possum Skin Dam, approximately 211 ML;
- The in-pit voids, approximately 126 ML;
- Dirty Water Dam 1; approximately 132 ML.

There was an estimated 100 ML of groundwater inflow into the open cut voids during the reporting period. The groundwater inflow and seepage from rehabilitated emplacements and spoil dumps into the Underground Portal Storage was estimated at 511 ML. The estimate is based on an average flow of 1.4 ML/day determined from detailed measurements done in 2007-2008.

Measured site inventory increased from 775 ML to 2,472 ML during 2015, a nett gain of 1,697 ML. OPSIM model results indicate site inventory increased from 775 ML to 2,505 ML during 2015, a nett gain of 1,730 ML. The difference between the two results is attributable to errors inherent in the methods used to estimate the inventory of surface water storages.

The overall site water balance will vary depending on coal production rates and climatic conditions. The ICO currently has an agreement in place to supply up to 900 ML per year, or a maximum of around 2.5 ML per day, to Ashton Coal, subject to water availability. However, this agreement has not been activated in some years and it is not anticipated that it will be reactivated in the next reporting period.

Emergency water storage will be available in the mining voids if water consumption activities are not adequate to meet necessary site capacity requirements. **Table 19** and **Table 20** refer to the allocation of Water Access Licences for both the open cut and underground areas. Passive take and active pumping are recorded for the period between July 2014 and July 2015.

Table 18. Sample Static Water Balance (July 2014 – June 2015)

Water Stream	2015 (ML)
Inputs	
Imported Fresh Water	0
Imported Potable	10
Groundwater & Spoil Seepage To Portal	511
Groundwater Seepage To Open Cuts	110
Underground Dewatering	336
Rainfall Runoff – Into Dirty Water System	2159
Recycled to CHPP from Tails & Storage (not included in total)	0
Water from ROM Coal	0
Total Inputs	**3,126**
Outputs	
Groundwater Seepage Out	0
Dust Suppression – Water Carts	100
Exported to Other Mines – Dirty Water	0
Evaporation Fans & Sprays (Operated Jan – Oct)	368
Evaporation - Mine Water & Tailings Dams	918
Entrained in Process Waste	0
Water in Product Coal	0
Potable Usage	10
Total Outputs	**1,396**
Estimated Change in Pit Storage (increased)	**1,730**

Table 19 - Open Cut Water Licences

LICENCE TYPE	LICENCE NUMBER	SHARE COMPONENT (ML/YR)	CATEGORY	WATER SOURCE	LAND REFERENCE (LOT//DP)
Water Access Licence	10095	230	High Security	Hunter Regulated River ï Zone 3A Glennies Ck	1//799154
Work Approval	20CA201232				
Water Access Licence	833	54	General Security	Hunter Regulated River ï Zone 3A Glennies Ck	2//810309
Work Approval	20CA200941				
Water Access Licence	672	102	General Security	Hunter Regulated River ï Zone 3A Glennies Ck	2//597205
Work Approval	20CA200531				
Water Access Licence	785	23	General Security	Hunter Regulated River ï Zone 3A Glennies Ck	
Work Approval	20WA200819				
Water Access Licence	797	14	General Security	Hunter Regulated River ï Zone 3A Glennies Ck	2//802596
Work Approval	20CA200847				
Water Access Licence	874	240	General Security	Hunter Regulated River ï Zone 3A Glennies Ck	71//777661
Work Approval	20CA201042				
Water Access Licence	1273	1.2	Supplementary Water	Hunter Regulated River ï Zone 3A Glennies Ck	2//802596
Work Approval	20CA200847				
Water Access Licence	18002	6	Unregulated River		various

LICENCE TYPE	LICENCE NUMBER	SHARE COMPONENT (ML/YR)	CATEGORY	WATER SOURCE	LAND REFERENCE (LOT//DP)
Work Approval	20WA207397			Hunter Unregulated and Alluvial Water Sources	
Water Access Licence	18004	5	Aquifer	Hunter Unregulated and Alluvial Water Sources	71//777661
Work Approval	20CA207373				
Work Approval	20WA207362	-	Basic Rights	Glennies Water Source	2//810309
Water Access Licence	8045	-		Hunter Regulated River Water Source	4//600327
Work Approval	20CA200493				
Bore	20BL169513	100	Mining	n/a	various
Bore	20BL172249	100	Mining	n/a	various
Bore	20BL169513	5	Irrigation	n/a	71//777661

Table 20 - Underground Water Licences

LICENCE TYPE	LICENCE NUMBER	SHARE COMPONENT (ML/YR)	CATEGORY	WATER SOURCE	LAND REFERENCE (LOT//DP)
Water Access Licence	484	3	High Security	Hunter Regulated River ï any part of Glennies Ck	93//75244
Work Approval	20CA200060				
Water Access Licence	960	50	High Security	Hunter Regulated River ï Zone 3A Glennies Ck	100//633743
Work Approval	20WA201234				
Water Access Licence	961	150	High Security	Hunter Regulated River ï Zone 3A Glennies Ck	1//799154
Work Approval	20WA201236				
Water Access Licence	1172	3	High Security	Hunter Regulated River ï Zone 3A Glennies Ck	3//606344 1//799154
Work Approval	20CA201763				
Water Access Licence	1172	303	High Security	Hunter Regulated River ï Zone 3A Glennies Ck	3//606344 1//799154
Work Approval	20CA201763				
Water Access Licence	485	99	General Security	Hunter Regulated River ï Zone 3A Glennies Ck	93//75244
Work Approval	20CA200060				
Water Access Licence	1242	13	Supplementary Water	Hunter Regulated River ï Zone 3A Glennies Ck	3//606344 1//799154
Work Approval	20CA201763				
Water Access Licence	17999	450	Aquifer		1//940619

Work Approval	20WA207369			Hunter Unregulated and Alluvial Water Sources	
Bore	20BL169862	450	Mining	n/a	1/13/940619
Bore	20BL169864		Mining (excavation)	n/a	various
Bore	20BL172505	500	Mining	n/a	various

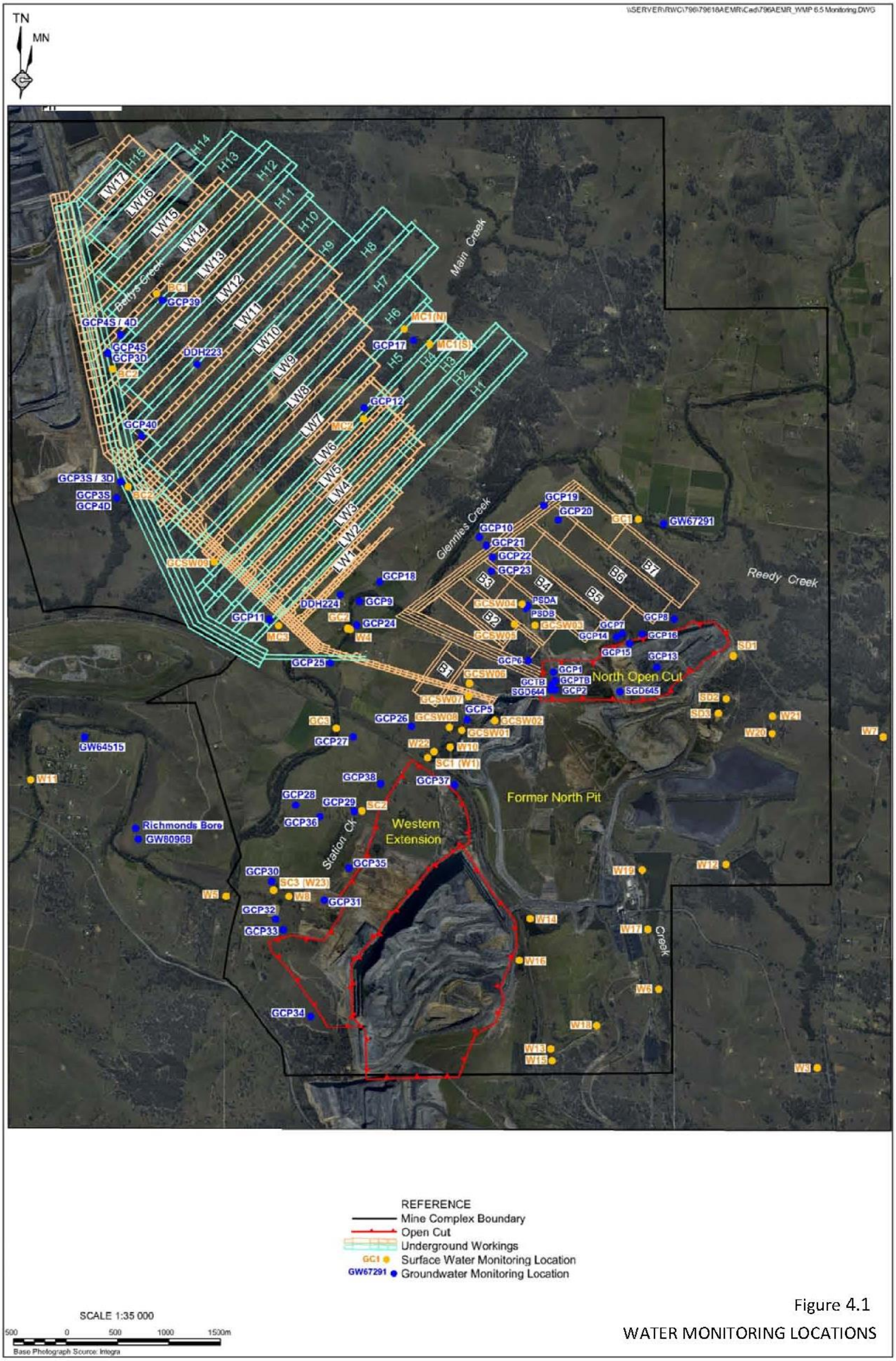

Figure 16 - Water Monitoring Points (inclusive of annual monitoring)

The volumes of water inflow, storage, transfer and use within targeted elements of the water management system are monitored using a series of flow meters and water level gauges at strategic locations. Telemetered flow meters and water level gauges were maintained and recorded during the reporting period.

An overall analysis of the results obtained during the period of this report is presented in Section 7.2.3, with results contained in **Appendix 5**.

7.2.3. Environmental Performance

pH

Summary

The results for pH analysis, including range, mean and standard deviation, are presented in **Appendix 5**. pH levels ranged from 6.3 at W3 Martins Creek Site in November 2015 to 9.8 at site W10 (Dam C3) in October 2015, with the more alkaline sites being dams as runoff from overburden materials is typically mildly alkaline.

Low rainfall between September and November 2015 may have resulted in the low pH reading at W3 Martins Creek site. Martins creek resides upstream of the mine with flow being stagnate in drier periods, this may be attributed to the lower pH readings at Martins Creek in November. Acid generation was not observed on site from mined materials or groundwaters. Runoff from overburden materials is typically mildly alkaline.

Site Analysis

The pH level at the EPL monitoring site W1 (Station Creek), was alkaline during the majority of the monitoring period, with pH values ranging from 8.2 to 9.1. EPL monitoring site W3 (Martins Creek) ranged from 6.2 to 7.1. EPL monitoring site W6 (Blackwattle Creek) ranged between 7.3 and 8.0.

The pH levels in W4 (Glennies Creek up), W5 (Glennies Creek down), W1 (Station Creek) and W12 (Dam C1) were very similar to each other throughout the monitoring period. All sites indicated slightly alkaline water, W4 ranged from 7.4 to 8.0, W5 ranged from 7.3 to 8.2, W11 ranged from 7.6 to 8.4 and W18 ranged from 6.9 to 7.7.

pH levels at dam sites in the series W12 - W21 remained slightly alkaline throughout the reporting period. The pH levels at the final dam in the clean water system, W10 (Dam C4, EPA site) were all slightly alkaline, ranging from 8.4 to 9.2.

Most other creeks and site dams had variable pH levels consistent with variations due to climatic factors such as rainfall and evaporation. No indications of acid generation were observed during the reporting period.

A number of sample points, including W3 Martins Creek, W6 Blackwattle Creek, W7 Stony Creek, W16 Dam C8, W23 Station Creek Dam, GCS005 Sediment Pond and the Northern Sediment Dam were not sampled for one or more months as the sample points were either too low to sample or too wet to access due to significant rain events.

Electrical Conductivity (EC)

Summary

The results for EC analysis, including range, mean and standard deviation, are presented in **Appendix 5**. The results are very similar to previous annual results and pre-mining studies, suggesting minimal influence from mining activities. EC results at most sites varied due to climatic factors such as rainfall and evaporation.

Site analysis

The EC levels at the EPL monitoring site W1 (Station Creek) fluctuated generally in accordance with climatic conditions, with results ranging from 3720 µS/cm to 7630 µS/cm. Lower EC results were recorded during months of very low rainfall between March, October and November 2015, when evaporation would have led to higher salt content and the relative contribution of more groundwater (relatively saline) to stream flow would have been greater. The lowest results were obtained after periods of high rainfall in April, May and December 2015.

At EPL monitoring site W3 (Martins Creek), EC results remained generally constant, ranging from 141 µS/cm to 946 µS/cm. EC results for W6 (Blackwattle Creek) are anticipated to have fluctuated with responses to rainfall, groundwater contribution and evaporation ranging from 509 µS/cm to 9990 µS/cm. Blackwattle Creekõs water flow is usually stagnate in drier periods with low rainfall. In April 2015, Blackwater Creek recorded a 509µS/cm, which coincided with a significant rain event.

All three creeks are ephemeral and generally saline groundwater inflows are predominate when the fresh water flow slows. There is a correlation between relatively low rainfall and elevated EC results in May and between September and November 2015.

The EC levels at W4 (Glennies Creek Up), W5 (Glennies Creek Down) and W11 (Glennies Creek NEH) all followed a similar trend throughout the monitoring period.

EC levels at clean water dam C4 (W10, EPA site) generally fluctuated with variations in rainfall, ranging from 3430 µS/cm to 7100 µS/cm during the 2015 reporting period.

Total Dissolved Solids (TDS)

The results for TDS analysis, including range, mean and standard deviation, are presented in **Appendix 5**. As expected, TDS results generally followed similar trends as per discussion within the electrical conductivity section.

Total Suspended Solids (TSS)

Summary

The results for TSS analysis, including range, mean and standard deviation, are presented in **Appendix 5**. Results are similar to previous years and pre-mining studies, suggesting no significant influence from mining activities.

Site analysis

The TSS levels at the EPL monitoring site W1 (Station Creek) and W6 (Blackwattle Creek) remained relatively low and consistent with W1 recording an average of 16mg/L and W6 recording an average of 28.4mg/L throughout the monitoring period. TSS levels peaked at 946 mg/L at site W3 (Martins Creek) which may have been due sampling being taken directly after a high rainfall event, with associated runoff potentially increasing the TSS. The TSS levels in W4 (Glennies Creek Up), W5 (Glennies Creek Down) and W11 (Glennies Creek NEH) were also low and generally remained consistent throughout the monitoring period. Slight fluctuations can generally be attributed to rainfall events.

TSS levels at W10 (Dam C4, EPA site) remained generally consistent, ranging from 5 to 19 mg/L throughout the year. Slight fluctuations at W10 can generally be attributed rainfall events throughout the reporting period.

Overall, no surface water level triggers were exceeded. There were two reportable water release incidents during the reporting period. For more information please refer to Section 11.

7.3 GROUNDWATER

7.3.1. Environmental Management

The ground water program is designed to measure the impacts (if any) upon local groundwater resources. Piezometers are utilised to monitor groundwater, especially the depth to, and quality of, groundwater.

Piezometers (groundwater bore) locations are shown in **Figure 15.**

7.3.2. Environmental Performance

Overall, no groundwater level triggers were exceeded and no reportable events occurred during the reporting period. The results for groundwater analysis, including range, mean and standard deviation are presented in **Appendix 5**.

The pH remained at relatively constant levels throughout the reporting period at all GC series groundwater monitoring wells (neutral to slightly alkaline range). EC was consistently low at the Glennies Creek alluvial bore GC09 (311-444 μS/cm). The Richards Bore by comparison registered more saline groundwater (2170-4140 μS/cm). Monitoring of the coal seam aquifer GC05 has shown relatively high and consistent conductivity (12,000-12,600 μS/cm). Readings at GC02 was slightly above the ranges sighted in the EIS for coal seam aquifers (13,700-16,700 μS/cm).

Monitoring wells B1 to B3 have been installed in order to evaluate hydrological impacts on TD2 dam wall. As such, results from these bores do not reflect groundwater impacts generally. The results recorded in each piezometer installed on TD2 were fairly consistent throughout the reporting period and similar to results recorded in previous years. Bore 1 was recorded as being dry for the entire reporting period. Variances in Bores 1-3 standing water levels are expected to respond to changes in water levels of the tailings dam TD2.

The depth to water recorded in Bore 2 ranged from 15.61 to 15.77 metres during the reporting period with pH ranging from 6.9 to 7.4 and electrical conductivity ranging from 9.9 to 10.1 mS/cm. The depth to water in Bore 3 was consistent throughout the reporting period ranging from 11.31 ï 11.37 metres with pH ranging from 7.1 to 7.7 and electrical conductivity ranging from 5.8 to 9.0mS/cm. The slight variance in bore water depths for Bore 1 and Bore 3 can be attributed to efforts to remove water off TD2.

Bores B4, B5 and B6 have the purpose of assessing seepage from the tailings dam complex. These bores were dry during the reporting period.

Hydrological interpretation from an independent specialist is referred in Appendix 5. Based on the available data during the 2015 reporting period, alluvial groundwater monitoring indicated:

- no response to mining outside of the normal climatic variability in groundwater levels at the Underground in the Main Creek and Bettys Creek catchments;
- no response to mining outside of the normal climatic variability in groundwater levels from the North Open Cut or Underground operations in the Glennies Creek catchment; and
- no response to mining outside of the normal climatic variability in groundwater levels from the Western Extension in the Glennies Creek and Station Creek catchments.

The available basement groundwater monitoring data in the 2015 reporting period indicated:

- no response to mining outside of the normal climatic variability in groundwater levels in the Main Creek catchment over the Underground. GCP24 is continuing to show effects of cementation of the piezometer intake zone, although its water levels have remained within an essentially level band between 16.2 to 17.5m;

- a continuation of depressurisation in GCP7, 8, 13 and 14 along with normal climatic variability within the remaining piezometers within the North Open Cut suite; and

- continued depressurisation and recharge of GCP34 within its basal piezometer range in the Western Extension piezometer suite along with normal variability within the historic range for the remaining piezometers in the suite.

No change in the trend of gradually reducing pressure heads in DDH224 was observed during 2015.

Piezometer array SGD644 in the North Open Cut area showed no definitive mining induced depressurisation during 2015. The intake at 53.75m below surface in SGD645 indicates a minor depressurisation of approximately 6m since late March 2013, along with no variation outside of the historic range for the other two intakes in the borehole.

Piezometer array GCP35 in the Western Extension open cut area indicates no variation outside of the historic range in the deepest intake at 195m below surface, a continuation of the gradual depressurisation of the 147m below surface intake, along with a definitive depressurisation of the shallowest intake (72mbgl) of around 14m that gradually started in the first 3 months of 2013.

GCP37 showed no definitive mining induced depressurisation during 2015 outside of its historic range.

8. REHABILITATION

The land at the ICO prior to the commencement of mining operations had a long history of clearing for agricultural or pastoral land use which resulted in considerable modification of native vegetation and faunal habitat. The majority of the area was cleared for pasture with irrigation on the Glennies Creek floodplain. Clearing resulted in both grasslands devoid of trees and artificially induced open woodland with scattered mature trees.

The Mining Operations Plans (MOPs) address proposed rehabilitation objectives at the ICO. The ICO operated under C&M MOPs for both Open Cut and Underground operations which were approved in December 2014.

Rehabilitation at the ICO is undertaken progressively as outlined in the EA, Project Approval and Biodiversity Management Plan commitments. The rehabilitation of the final landform features will be integrated across the underground, open cut and surrounding natural landforms.

The major objective of the rehabilitation process is to:

- return the site to a suitable land capability class;
- reshape all slopes to gradients which provide long term stability;
- locate dams on natural and reformed watercourses and gullies to provide short term retention and sedimentation control during mining and rehabilitation, and long term stock watering;
- prevent contaminants from leaving the site;
- revegetate lands disturbed by mining activities; and
- minimise dust generation during the rehabilitation process.

Surface preparation activities for rehabilitated areas are commenced as soon as possible following the completion of mining activities. A general overview of surface preparation activities undertaken include:

- overburden dumps will be reshaped to around 10 degrees slope with a maximum of 18 degrees, where steep slopes are constructed, suitable erosion control structures such as contour banks, drop structures may be utilised to provide for stability;
- prior to revegetation activities, spoil and topsoils will be characterised to determine the type and application rate that may be required for the addition of soil ameliorants (e.g. gypsum, fertiliser, organic growth medium.);
- shaped landform surface is ripped along the contour to remove surface compaction by machinery and raked with rocks removed and buried in current dumping areas;
- appropriate soil ameliorants will be applied for incorporation into the final shaped surface;
- topsoil will be applied, where available, at a nominal depth of 100mm in thickness;
- where direct tree seeding is planned, final shaped surfaces will be deep ripped parallel with the contour prior to the application of seed to provide for an adequate seed bed;
- where pasture seeding is planned the surface will be cultivated across the contour to provide for an adequate seed bed;
- suitable erosion control measures (e.g. silt fences, mulches etc.) will be implemented, where required, to minimise soil loss from areas undergoing rehabilitation; and

- where appropriate and practical, structures such as tree hollows/logs and rock piles may be incorporated into the final landform to increase habitat value of proposed areas.

Regular monitoring of rehabilitated areas is undertaken during the initial vegetation establishment period and beyond to demonstrate that the objectives of the rehabilitation strategy are being achieved, and that a sustainable, stable landform has been created. Depending on the outcomes of the monitoring, the ICO may be required to undertake some rehabilitation maintenance to repair any areas that have failed. This may include, but not be limited to, the repair of diversion drains and banks, and the reseeding or fertilizing of areas that may have failed to establish.

The monitoring results of rehabilitated areas will be compared to at least two representative reference sites to allow a comparison of the development and success of the rehabilitation against remnant vegetation. Reference sites indicate the condition of surrounding undisturbed areas and allow comparisons to be made between the rehabilitated sites and the undisturbed areas. A detailed assessment of rehabilitation success was carried out in 2015, refer to 8.3.2 Rehabilitation Monitoring for more detail.

8.1 LAND PREPARATION

There were no new areas disturbed at the ICO during the reporting period.

The ICO covers approximately 583 hectares of current disturbed land, with available topsoil/subsoil resources sufficient to provide approximately 100 mm coverage.

This estimate is in accordance with the target coverage of 100mm of material to be applied to areas that have had bulk shaping completed. It must be noted that the majority of this material is subsoil.

A figure outlining the location of topsoil and subsoil stockpile locations is presented in Section 6 ï Rehabilitation (**Figure 17**: Mining and Rehabilitation Map 2015).

8.2 BUILDINGS AND OTHER INFRASTRUCTURE

No buildings were renovated, removed or constructed at the ICO during the reporting period. Safety fences with key card entry were established at the UG in accordance with UG Care and Maintenance Plan and an alarm system was installed at the ICO administration and maintenance buildings as a theft deterrent.

8.3 REHABILITATION PERFORMANCE DURING REPORTING PERIOD

The summary **Table 21** and **Table 22** provides rehabilitation completed prior to the reporting period, works undertaken during the reporting period and the areas proposed for the rehabilitation in the next reporting period for both the OC and UG operations.

Table 21 – Rehabilitation Status Open Cut

Mine Area Type	Previous Reporting Period (Actual) 2014 -1 (ha)	This Reporting Period (Actual) 2015 (ha)	Next Reporting Period (Forecast) 2016 +1 (ha)
Total Mine Footprint	*1917*	*1917*	*1917*
Total Active Disturbance	*567*	*550*	*507.3*
Land being prepared for rehabilitation	*40*	*0*	*19.7*
Land under active rehabilitation	*374.1*	*391.1*	
Completed Rehabilitation	*0*	*0*	

Table 22 – Rehabilitation Status Underground

Mine Area Type	Previous Reporting Period (Actual) 2014 -1 (ha)	This Reporting Period (Actual) 2015 (ha)	Next Reporting Period (Forecast) 2016 +1 (ha)
Total Mine Footprint	*4137.5*	*4137.5*	*4137.5*
Total Active Disturbance	*135.8*	*133.8*	*131.8*
Land being prepared for rehabilitation	*0*	*1.82*	*0*
Land under active rehabilitation	*20*	*22*	
Completed Rehabilitation	*0*	*0*	

8.3.1. Underground Rehabilitation

The 2015 rehabilitation requirements in Underground C&M MOP consisted of approximately 1.8 hectares of rehabilitation at the UG Fan site located on Forrest Road as well as rehabilitation of gaswell sites 11/5, 11/6, 11/9, 11/10, 11/12 and 12/10. It was identified from the 2014 Annual Review site inspection that prior rehabilitation of gaswell sites did not adhere to DRE rehabilitation standards. Remedial rehabilitation of gaswells 11/4, 11/7 and 11/8 were completed during the reporting period with sites being disked by a tractor and Camberwell pasture seed mix direct seeded to outcompete weeds that previously resided on the gaswell sites.

The rehabilitated gaswells consisted of a short outer blowout preventer (BOP) casing and a longer conductor casing which were grouted in. The well depths ranged from approximately 395m to 411m, each requiring approximately 15-20m3 of course sand cement to seal to a point near the surface. Removal of gaswell heads involved trenching around the wellhead to bedrock, then cutting off the well heads. The trench was back filled and the sites were levelled off. Topsoil was spread over the areas and direct seeding via tractor was used to sow the Camberwell seed mix into the topsoil. Pictures of gaswell site rehabilitation are shown in **Table 23.**

Fan site rehabilitation included relocating spoil material from drill cuttings stockpile to the eastern side of the Vent Fan Site. The berm on the eastern side of the Fansite was extended south. From the northern edge of stage 1, a fall of 2% gradient enables water caught on the shaped batter to freely flow to a water storage dam at the Southern end of stage 1, the lowest point of the site. The topsoil stockpile located at the north of the Vent Fan Site was used to establish a 100mm topsoil cover over the shaped area. The topsoiled area was direct seeded via tractor in line with the Camberwell seed mix.

Table 23 - Gaswell site Rehabilitation for 2015 reporting period

Gaswell 11/5		Gaswell 11/6	

Gaswell 11/9		Gaswell 11/10	
Gaswell 11/12		Gaswell 12/10	

8.3.1. Open Cut Rehabilitation

The ICO completed approximately 17ha of rehabilitation during the reporting period. Approximately 4 ha of native tree seed rehabilitation was completed on the North Open Cut RL105, adjacent to Stoney Creek Road and 13ha of pasture rehabilitation was completed on the North Open Cut RL 141 dump during the reporting period. The open cut was ahead of schedule with rehabilitation as per the C&M OC MOP commitments at the end of the reporting period as the North Open Cut RL 105 rehabilitation area was proposed to be completed in the 2016 reporting period.

North Open Cut RL141 dump was rehabilitated from March to July 2015 totalling 13hectares. In 2014 the NOC RL 141 was shaped to final height and capped using clay and subsoil from the North Open Cut operation. The NOC RL 141 was shaped into a flat area to the maximum final height. The area was overlaid with approximately 100mm -150mm of topsoil from the North Open Cut soil stockpile area located near the North crib park up area. After the area was topsoiled, gypsum was applied to the area at a rate of 3 tonnes per hectare. The NOC RL 141 was seeded with Camberwell seed mix as shown in **Table 24**

North Open Cut RL 105 batter was shaped and rehabilitated from May to December 2015 totalling 4 hectares. The area was shaped to final landform prior to entering care and maintenance with the batter being shaped to 10 -12 degree slope. A v notch drain constructed on the batter that angled water from the western edge of the batter to the eastern edge in order to capture rain runoff and report it to the Northern sediment dam. 100 -150mm of topsoil was placed over the area with a tractor direct seeding the topsoil with native tree seed shown in **Table 24**.

Rehabilitation, as well as waste placement and landform establishment completed during the 2015 reporting period is outlined in **Figure 17.** Rehabilitation commitments for the 2015 include completion of the 13ha of the North Open Cut RL 141. Rehabilitation commitments for 2016 is shown in **Figure 18.**

Table 24 – Indicative ICO Seed Mixes

Pasture Seed Mix			Tree Seed Mix	
Common Name	**Scientific Name**		**Common Name**	**Scientific Name**
Phalaris	*Phalaris aquatica*		Spotted Gum	*Corymbia maculate*
Green Panic	*Panicum maximum*		Grey Box Gum	*Eucalyptus moluccana*
Wimmera rye grass	*Lolium rigidum*		Forest Red Gum	*Eucalyptus tereticornis*
Kangaroo Valley rye	*Lolium perenne*		Red Ironbark	*Eucalyptus fibrosa*
(Aurora) Lucerne	*Medicago sativa*		Narrow Leaf Ironbark	*Eucalyptus crebra*
Setaria Narok	*Setaria sphacelata var. narok*		Butter bush	*Pittosporum angustifolium*
Purple Pigeon Grass	*Setaria incrassata*		Broom Bitter-pea	*Daviesia genisitifolia*
Fescue	*Festuca elatior*		Blunt Bush Pea	*Pultenaea retusa*
Cocksfoot	*Dactylis glomerata*		Dolly Bush	*Cassinia aculeata*
Premier Digitaria	*Digitaria smutsii*		Spiney-head Mat-rush	*Lomandra longifolia*
Namoi Vetch	*Namoi vetch spp dasycarpa*		Kangaroo Grass	*Themeda australis*
(No. 2) Kikuyu	*Pennisetum clandestinum*		Western Silver Wattle	*Acacia decora*
Couch	*Cynodon dactylon*		Lomandra	*Lomandra multiflora*
Haifa White	*Trifolium repens*		Rough-barked Apple	*Angophora floribunda*
Renegade Red	*Trifolium pratense*			
Clare	*Trifolium subterraneum*			
Woodgeneop	*Trifolium subterraneum*			
Seaton Park	*Trifolium subterraneum*			

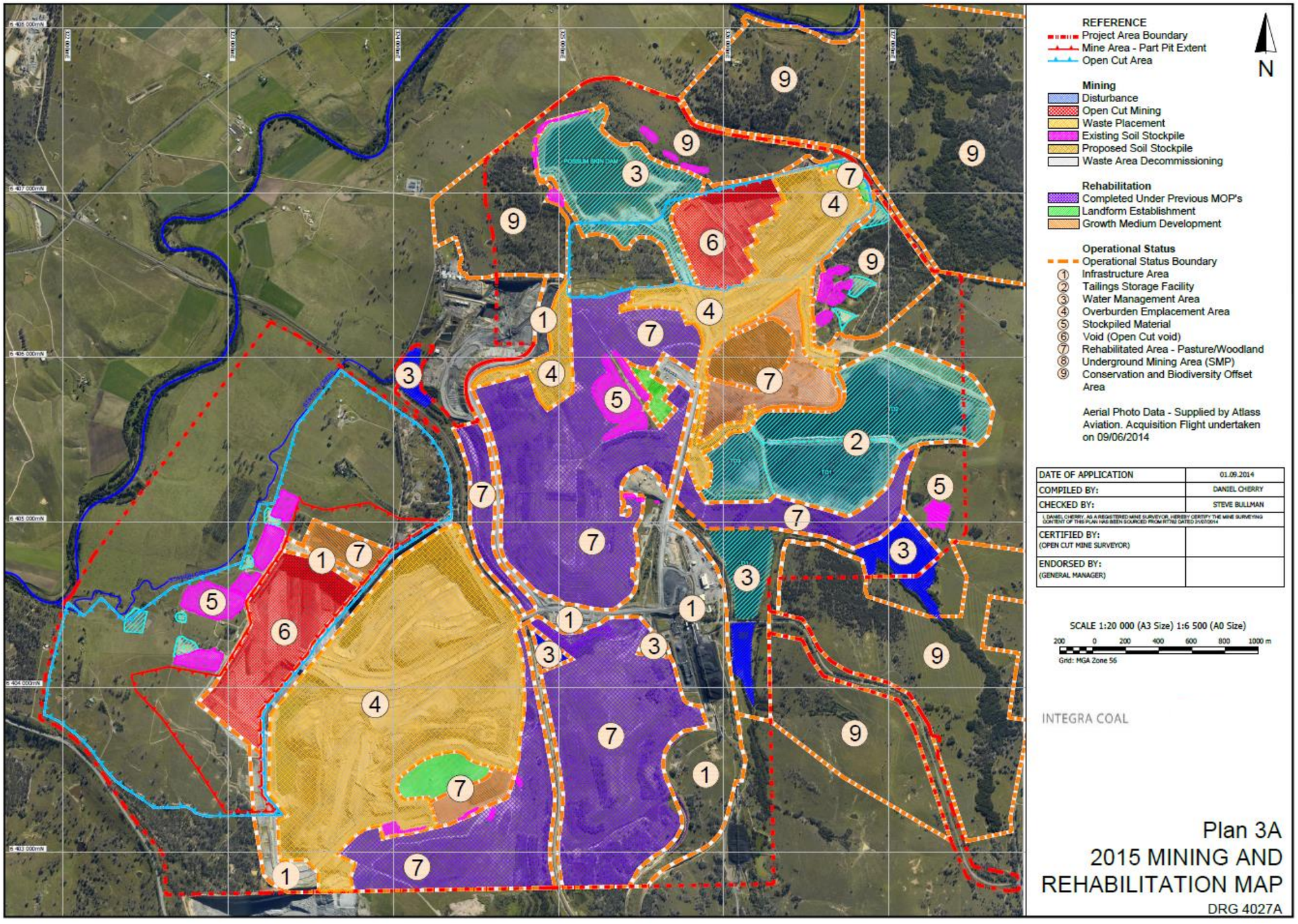

Figure 17 - Mining and Rehabilitation Map 2015

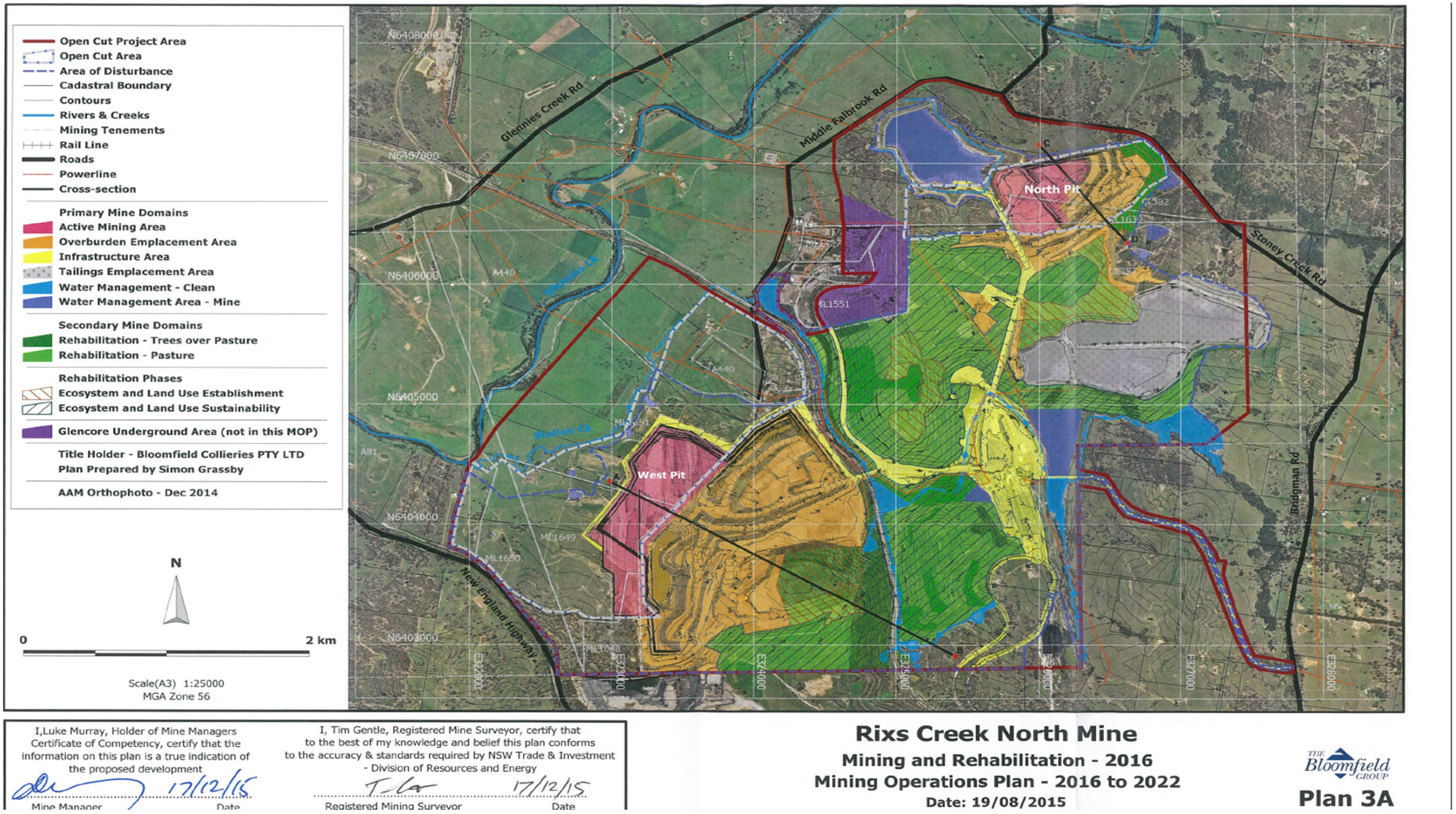

Figure 18 - Mining and Rehabilitation Map 2016 (as provided in Rix's Creek North 2016/2022 MOP)

8.3.2. Rehabilitation Monitoring

During the reporting period, rehabilitation monitoring of landforms and associated water management structures, plus plant vigour and cover, were monitored by way of inspections to assist in the management of instability, erosion and/or failure. This process will continue over the life of the mine, with the extent and nature of activities undertaken being consistent with the MOP. Rehabilitation monitoring for the 2015 period can be found in **Appendix 6**.

In 2015, Carbon Based Environmental conducted a rehabilitation monitoring assessment of six pasture sites and three pasture reference sites. Rehabilitation monitoring was undertaken on the 7th and 8th December 2015. The condition of the six rehabilitation sites (NP01, NP02, C301, C302, SP01 and TD01) were compared to condition of three pasture reference sites (RPast01, RPast02 and RPast03) and the ICO rehabilitation completion criteria list developed in the OC C&M MOP. Of the six pasture rehabilitations site, three appear to be moving towards achieving the completion targets (C301, C302 and TD01). The rehabilitation sites NP01, NP02 and SP01 need some further maintenance work before these sites move towards achieving proposed completion targets. The location of the rehabilitated sites compared to the pasture reference sites is identified in **Figure 20**.

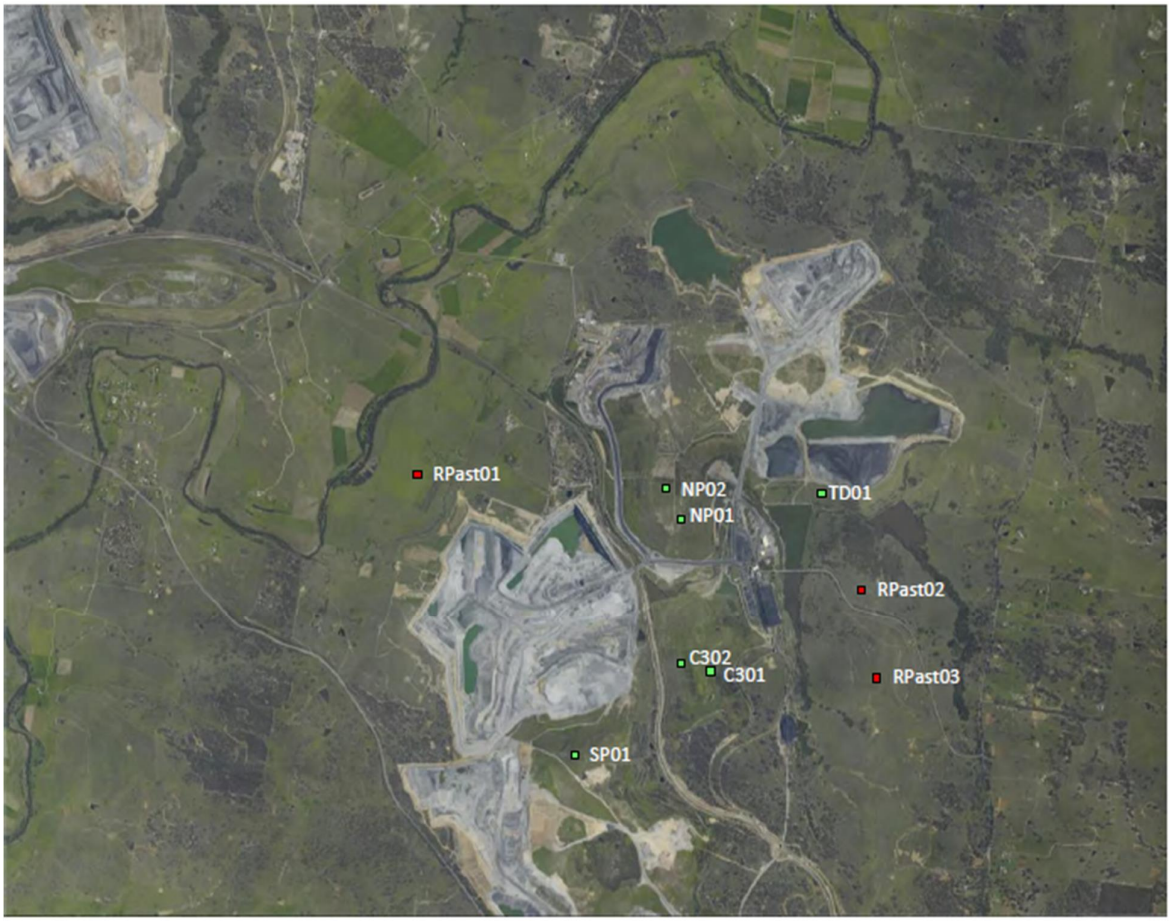

Figure 19 - Locations of monitoring sites in relation to reference sites

8.3.3. Biodiversity Management

The Biodiversity Management Plan, which guides the management of biodiversity offset areas, was approved during the reporting period. The biodiversity offset strategy will be integrated into the overall rehabilitation of the ICO through the development of linkages between the offset areas, revegetated habitats in the rehabilitated mine site, and riparian habitat within Glennies Creek, Bettys Creek and Main Creek.

Key management actions were completed in the 2015 reporting period to assist in the maintaining and improving the condition of biodiversity offset areas. Actions taken related firebreak maintenance, flora and fauna monitoring, and weed and pest management. Coolatai Grass *(Hyparrhenia hirta)* was targeted in the Martins Creek Biodiversity Area during 2015 following recommendations from the Independent Biodiversity Assessment conduct in November 2014.

8.3.4. Glennies Creek and Station Creek Riparian Rehabilitation 2015 Progress

Under the project approval, ICO has committed to rehabilitate 1000 metres of riparian area adjacent to Glennies Creek and Station Creek to establish linkages between the Project Site, the biodiversity offset areas and the riparian vegetation adjacent to Glennies Creek.

During the reporting period, targeted weed spraying of *Junctus Acutus* (Spikey Rush) and *Cestrum parqui* (Green Cestrum) was conducted in March 2015 in Areas 1 & 2.

Minor damage was caused by the April 2015 flood event of Glennies Creek in Area 3. An inspection in May 2015 determined that majority of the tubestock planted previously in Area 3 were still intact. Minor fence repairs were conducted in Area 3 after the flood event and weed management was conducted after the flooded event in May 2015 to reduce Green Cestrum (*Cestrum parqui)* and annual weed species from repopulating the area after the flood event.

Weed management was undertaken in March 2015 with Honey Locus *(Gleditsia triacanthos)* and Green Cestrum (*Cestrum parqui)* being sprayed. Majority of the native tubestock that were planted from July to September 2014 did not survive the flood event in April 2015, refer to **Table 25**. Currently an additional 3500 native tubestock have been ordered and will require replanting in Area 4. The boundary fence along the eastern and southern edges of Area 4 was repaired in May 2015. Inspection of the banks have determined that no erosion of the bank occurred during the April 2015 flood event.

Initial weed control has occurred in Area 5 and 6 in February 2016, with follow up weed management occurring in November 2015. It was identified in previous inspections that Area 6 was infested by Honey Locus *(Gleditsia triacanthos)*, an extremely invasive species that can smother pastures and native vegetation. Castor Palm Oil *(Ricinus communis)* and Green Cestrum (*Cestrum parqui)* were also targeted. Additional spot spraying was conducted in November 2015 to determine the amount of debris located within the area, which is scheduled for removal in 2016.

Table 25 – Glennies Creek Riparian Area Progress

Area 1	 *27/11/2015 – Area 1 Geotextile fabric and rock embankments implemented to prevent Gully head erosion*	Area 2	 *Area 2 - 27/11/2015– Southern end of Area 2*

Area 4	 *Area 4 – slashing and weed control occurred in September 2015 in anticipation for planting of native tubestock*	Area 4	 *Area 4 – April 2015 Flood event that washed away recently planted tube stock*
Area 6	 *Area 6 – Photo point 6b -27/11/15 Weed Management to determine rubbish removal*	Area 6	 *Area 6 - Photo point 6c – 27/11/15 Gully head with debris.*

9. COMMUNITY

9.1 EXTERNAL COMMUNICATIONS

The ICO is committed to building good working relationships with the community through effective communication. The ICO commenced implementation of the Community Engagement Strategy in 2012. The aim of the Community Engagement Strategy is to provide accurate, accessible and timely information about the operation to stakeholders including understanding key regulatory, industry and community impacts and concerns in the area of the ICO. Community engagement and community participation are one of the keys to maintain ICO licence to operate and to promote industry and community growth. These objectives are achieved through the operation of a 24 hour hotline and other methods as detailed in **Table 26.**

The ICO 24 hour Environmental Hotline service is advertised on the Company website, in newsletters and in local newspapers on a regular basis.

Table 26 – Methods of Communication

Stakeholder	Method of Communication
Adjacent Residents	• Personal visits and phone conversations • Newsletters (by mail) • Integra Coal Operations website • Community Consultative Committee
Singleton	• Newsletters (accessible by ICO website) • Site Tours and Presentations • Community Consultative Committee • Integra Coal Operations website
Singleton Shire Council	• Presentations • Newsletters (accessible by ICO website) • Integra Coal Operations website • Phone conversations • Community Consultative Committee
Government Departments	• Scheduled external reporting of monitoring results and performance • Newsletters (accessible by ICO website) • Personal visits and phone conversations • Integra Coal Operations website
Aboriginal Groups	• Newsletters (accessible by ICO website) • Meetings and site inspections (as required) • Integra Coal Operations website
Employees and their Families	• Monthly Communications Meetings • Tool Box Talks • Notice Boards • Job Safety Observations (JSO) • Newsletters (handed out on site) • Integra Coal Operations intranet and website
Educational Providers	• Site tours and presentations
Neighbouring Industry	• Site tours and presentations • Integra Coal Operations website

9.2 COMMUNITY CONSULTATION

9.2.1. Community Consultative Committee

The Community Consultative Committee (CCC) was established in 2011 as per Condition 5 of Schedule 5 in the Project Approval. The ICO CCC replaced the separate CCCs operating at the Open Cut and Underground projects. In accordance with the Guidelines for Establishing and Operating Community Consultative Committees for Mining Projects (Department of Planning 2007). During 2015 the ICO was represented by members of the Sustainability, Environment & Community and Management team. The remainder of the Committee was comprised of local residents, representatives of Singleton Shire Council and relevant stakeholders. There were three (2) meetings conducted within 2015 reporting period with minutes of each meeting distributed to CCC members and available on the ICO website. The minutes of the meetings held during the reporting period are presented in **Appendix 7**.

Two CCC meetings were held during the reporting period occurring on:

- 6th February, 2015; and
- 15th July, 2015.

9.3 COMMUNITY LIAISON

In addition to community liaison through CCC meetings, ICO personnel also undertook irregular informal discussions with local landholders and residents and formal one-to-one discussions with those members of the local community who considered that they had been adversely impacted by operations at the ICO.

9.4 MINE CLOSURE PLANNING

The current Project Approval allows open cut operations to continue until 2023 and underground mining to occur until 2036. The ICO prepared conceptual mine closure plans for the open cut and underground operations in December 2012 and February 2013 respectively. Due to ICO ceasing operations and entering into care and maintenance, a requirement from the Care and Maintenance Mining Operations Plans is that detailed mine closure planning would need to be completed in 2015. However, due to Bloomfield group taking ownership of the ICO in December 2015, a request to extend the mine closure plan to June 2016 was granted to allow Bloomfield to develop a conceptual mine closure strategy.

9.5 SOCIAL/ECONOMIC CONTRIBUTIONS, DONATIONS AND SPONSORSHIP

No donations or sponsorships budget was allocated in 2015 due to the ICO being in care and maintenance.

9.6 EMPLOYMENT STATUS AND DEMOGRAPHY

The ICO remained in care and maintenance for the 2015 period. There has been a reduction in the amount to employees in the reporting period with 24 employees being employed at ICO at the end of 2014 reporting period compared to 18 employees working at the ICO at the end of the 2015 reporting period. The reduction in staff at the ICO were due to planned cost cutting measures in care and maintenance period. **Table 27** provides information on employment levels by classification.

Table 27 – Employment Numbers

Classification		Employees at 18/12/15
Integra Coal Operations	Staff	6
	Contractors	-
Open Cut	Staff	6
	Contractors	-
Underground	Staff	6
	Contractors	-
Total		18

Singleton is the principle place of residence for ICO employees and contractors, with other employees commuting mainly from Maitland and Hunter areas.

9.7 ENVIRONMENTAL COMPLAINTS

9.7.1. Environmental Management

The ICO operated a 24 hour Environmental Hotline, **1800 505 361**, whereby ICO can be made aware of any concern held by a member of the public. The hotline also serves to provide information on upcoming blasting activities. Since the Open Cut operations was taken over by Rixôs Creek mine, the current 24 hour Community Hotline, which includes blasting information is 02 49302665.

Since Glencore obtained ownership of Underground Mine, the current community hotline for the underground operations is 1300 57 33 52.

9.7.2. Environmental Performance

There were three (3) community complaints received by the ICO during the 2015 reporting period. The primary nature of the complaints is displayed in **Table 28** and illustrated in**. Figure 21** displays the monthly breakdown of complaints for 2015. The 3 complaints received represent an overall decrease of 12 complaints compared to the previous reporting period.

Table 28 – Nature of Complaints

Primary Nature of Complaint						
Site	Blast	Dust	Light	Noise	Other	Total
Western extension	0	0	0	0	0	0
North Open Cut	0	3	0	0	0	3
Underground	0	0	0	0	0	0
Off-site	0	0	0	0	0	0
Total	0	3	0	0	0	3

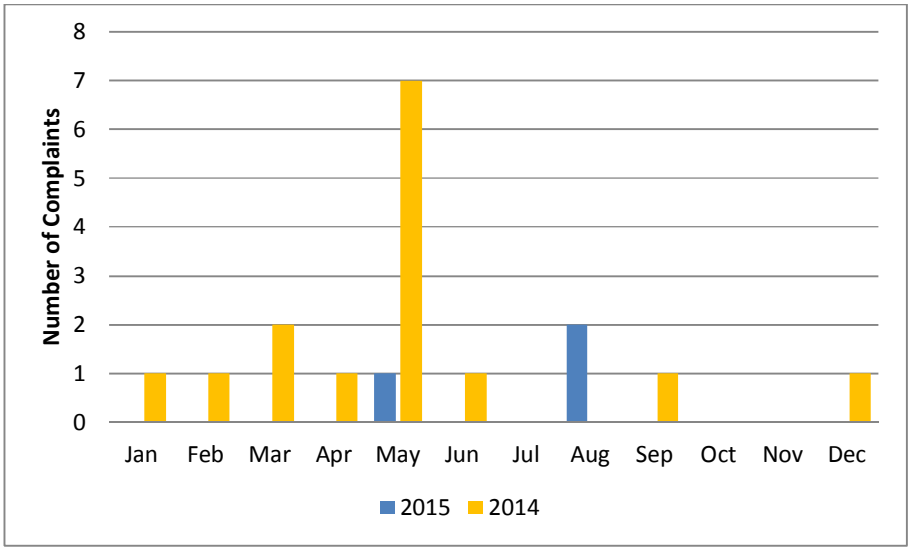

Figure 20 - Comparison of Monthly Complaints 2014 and 2015

The ICO remains committed to managing complaints in a proactive manner. All comments are filed in the ICO Complaints Register as required by the Environmental Protection Licence and Project Approval Condition 10 of Schedule 5.

A summary of all complaints and actions taken is provided in **Appendix 8**.

10. INDEPENDENT AUDIT

10.1 2011 - 2014 INDPENDENT ENVIRONMENTAL AUDIT

In accordance with Schedule 5, condition 3 of the Project Approval 08_0101 and 08_0102, an Independent Environmental Audit (IEA) was conducted in December 2014 addressing the reporting period from the 3rd December 2011 to the 4th December 2014. The ICO has been on care and maintenance since operations ceased. The last mining took place on 15th August 2014 and last coal was dispatched on 22nd September 2014. Therefore, the IEA was considered both the operational documentation for the relevant period and documentation prepared for the care and maintenance period.

10.2 SUMMARY OF AUDIT OUTCOMES

Key audit outcomes from the 2011- 2014 IEA included the following summaries. The independent audit executive summary can be found in **Appendix 9**.

10.2.1. Noise and Vibration

During the audit period, no non-compliances were recorded during noise monitoring with limits set in EPL3390 and criteria specified in Project Approval 08_0101 and 08_0102. It is acknowledged that monitoring did record results exceeding the specific limits however, these were recorded in meteorological conditions under which limits/criteria do not apply. As identified in SLR's peer review, in such instances a review and statement of compliances under applicable conditions should be provided, such as through repeat monitoring or use of a validated model.

Blast monitoring recorded exceedances of the overpressure limit (115dBL) on more than 5% of blasts during the 2011/2012 and 2012/2013 EPL reporting periods. Exceedances of the maximum blast overpressure limit (120dBL) were recorded on four occasions and vibration limit (10mm/s) on one occasion.

10.2.2. Groundwater

During the audit period, groundwater monitoring was undertaken in accordance with the Water Management Plan, with no groundwater level triggers being exceeded and no reportable events occurring. Monitoring also indicated that the alluvial aquifers showed no response to mining actives.

During the audit period the measurement or calculation of groundwater inflows were not reported. In order to determine inflows and determine compliance and to determine the inflows and to demonstrate compliance with the Project Approval and confirm that adequate water entitlements are held for the water take, the volume of groundwater inflows is to be estimated.

10.2.3. Air Quality

During the audit period, no non-compliances were recorded with applicable air quality criteria nominated in the Project Approval 08_0101 and 08_0102. The total number of air quality complaints accounted for 14.7% of all accounts received, ranking third behind noise and blasting.

10.2.4. Hydrocarbon Management

Improved hydrocarbon storage, handling and spill response is required, principally within the underground surface infrastructure areas. A range of opportunities for improvement at the current RL75 Bioremediation Area were identified including; improved separation of material at different stages of treatment; provision of advisory signage; and recording and

reporting volumes of material placed at the date of placement. For more information on improvements to bioremediation area refer to section 6.4.

10.2.5. Rehabilitation

A review of rehabilitated documentation and audit inspection established that the rehabilitation status for the ICO is currently acceptable in that the bulk of the final landform can be re-shaped, topsoiled and vegetated has been completed. Greater emphasis needs to be placed on future monitoring of rehabilitation so that the biodiversity values of the final landform are meeting the objectives set out in the Biodiversity Management Plan and Rehabilitation Management Plan, particularly with respect to connectivity.

10.2.6. Tailings Dam 2 being outside project approval boundary

Following a site inspection it was identified that the eastern extend of Tailings Dam 2 (TD2) appears to cross the Project Approval boundary as shown in the figures attached to the Project Approval 08_0101 and 08_0102. Despite the fact the Project Approval was issued on the basis of these figures and that TD2 remains wholly within the cadastral boundaries listed within the mining tenements, it was recommended that this matter be investigated to determine if TD2 was indeed outside the Project Approval boundary. A plan has been lodged with DPE in Modification 6 proposing boundary changes to include the eastern extend of TD2 within the project approval boundary.

10.3 Discuss progress in line with recommendations timetable.

The ICO submitted a recommendation timetable to DPE on the 8th May 2015. The response to recommendations provided timelines for completion from the independent audit findings. The response to the IEA recommendations can be found in Appendix 9.

Implementation target date for hydrocarbon management improvements at the Underground surface infrastructure areas was to be completed by November 2015, with work being conducted from March to August to rectify the concerns raised during the IEA. DPE and DRE conducted a site inspection during May 2015, with the only action rising for the inspection was the removal of empty IBCôs that populated the site.

An assessment was conducted to determine the location of Tailings Dam 2 in relation to the Project Approval boundary. An independent consultant completed a survey of the area and determined that the eastern extend of Tailings Dam 2 was outside the project approval boundary but within the CL357 mining lease. DPE were notified of the issue and a plan and its currently being rectified to ensure that project approval boundary includes the eastern extend of TD2.

10.4 Progress with the IEA Response to Recommendations Timetable

The next IEA for the Underground mine is scheduled for December 2017. However, due to Rixôs Creek taking ownership of the Integra Open Cut, in order to align the existing open cut operations with Rixôs Creek mine, an IEA may be required to be completed in accordance with Rixôs Creek mines IEA schedule.

11. INCIDENTS AND NON COMPLIANCES DURING THE REPORTING PERIOD

11.1 ENVIRONMENTAL INCIDENTS

Two (2) reportable environmental incidents occurred at the ICO during the 2015 reporting period in relation to passive release of water offsite. A summary of the reportable incidents are presented in section 11.1.1 and 11.1.2. The Incident reports with diagrams of the locations of the events can be found in **Appendix 10**.

An incident is defined in Project Approvals 08_0101 and 08_0102 as ó a set of circumstances that causes or threatens to cause material harm to the environment, and / or breaches or exceeds the limits or performance measures / criteria in this approvalô

11.1.1. Release of water offsite from B5 Sediment Dam

During the 21st April 2015 the ICO meteorological station recorded a total of 112.9mm rainfall. The 3-day duration rainfall from 20th-22nd April totalled 182.5 mm significantly exceeding the design capacity of the sediment dams on-site by a volume equivalent to 139.7 mm rainfall.

Due to the intensity of the rainfall event on 21st April, sediment basin B5 was observed to be bywashing during an inspection at approximately 10:40 am on 21st April 2015. Water was passively released across the adjacent downstream paddock and eventually into Station Creek.

The event was reported to the Environmental Advisor who inspected the Western Extension sediment dams. The release was first noted 21st April 2015 at 10:40 am and had ceased by 22nd April 2015.

Prior to this rainfall event, water levels in each of the sediment basins located in the Western Extension Area were below the survey marker pegs (20% level) in accordance with the Site Water Management Plan. Pump 508 was in operation at the B5 sediment basin prior to the overflow of water. Pumps were also located at B1 sediment basin and B2 sediment basin in the western extension prior to the event on the 21st April 2015. Prior to the event, pump 508 was operational and pumping water from B5 sediment basin to the western Extension In pit void. Due to the inflow of water into the western extension sediment dams, the pump could not keep up with the inflow of water and was relocated from the B5 pump pad to higher ground to stop the pump 508 from being inundated.

The source of the water was stormwater runoff originating from the disturbed and undisturbed catchment areas of the Western Extension Area. A number of water samples were collected during the event to determine characteristics of the stormwater: within the overflowing B5 sediment basin, upstream and downstream of the release location in Station Creek

Prior to the rain event, B5 dam was pumped out below the marker survey pegs (20%) in accordance with the Site Water Management Plan. The low EC measurement at the B5 dam suggests that the dam was inundated with rainwater prior to releasing into an adjacent paddock then into Station Creek.

Following the Event occurring on the 21st April 2015, it was identified the 5-day rainfall total exceeded the sediment dams operational design. Ongoing actions in line with the current site Water Management Plan include:

- Regular inspections of erosion and sediment controls, dam levels and pumping infrastructure and current weather forecast;
- Seeding topsoil and subsoil stockpiles to reduce mobilisation in a rainfall event (ongoing);
- Inspect, repair and replace sediment fences damaged as a result of the rain event as required;

- Re-align survey markers to allow dam depths to be gauged;
- Dams were pumped to reduce the water levels to below 20% survey peg within the 5 day period following the rainfall event.

Actions rising from the incident from DPE included updating of the water management plan to add additional controls to potentially minimise the recurrence of future overtopping of B5 sediment dam. The ICO Water Management Plan was approved by DPE on the 28th May 2015.

11.2 Release of water offsite from C4 Clean Water Dam

A near neighbour, whilst discussing an unrelated matter, mentioned to an ICO representative that there was water ponding in Station Creek. The neighbour noted that he had noticed the water ponding for ôabout a weekôand wanted to mention this as he believed it was unusual with the recent drier weather.

Upon receiving this information an investigation into the C4 dam was undertaken where it was identified that the gate valve was approximately one third of the way open. On identifying this, the gate valve was inspected, which found damage to the bolt of the locking mechanism allowing the valve to be operated. A padlock was in place in the locking mechanism but due to the bolt being bent this has allowed the operation of the gate valve.

The gate valve was closed immediately to prevent any further release of water. The damaged bolt was repaired and a new lock installed and the incident was reported to the EPA, DPE and DRE on the same day.

The release was first identified by ICO 22nd September 2015 at 10:45 am and had ceased by 10:45am 22nd September 2015 when the gate valve was closed. A further inspection of the Station Creek drainage area was conducted on Wednesday the 23rd September to ensure that no further flow was evident into this creek from this C4 Dam.

Detailed action taken to prevent or mitigate against a recurrence of the event included:

- Fixing the locking mechanism engaged to prevent unauthorised use.
- Identify additional engineering controls for the gate valve locking mechanism to prevent unauthorised opening of the valve. A monthly inspection regime was also implemented of C4 gate valve to ensure that the locking mechanism remained adequate and free from vandalism.
- A tool box talk providing an overview of the clean water system, which included the valve location, to ensure awareness of non-release requirements, other than passive release in certain rain events.

12. ACTIVITIES TO BE COMPLETED IN NEXT REPORTING PERIOD

12.1 MODIFICATIONS

12.1.1. Modification 4

Modification 4 has been submitted to DPE in 2014 in order to establish a proposed biodiversity offset strategy for the ICO. In particular, this Modification 4 application has been progressed as follows:

- The Environmental Assessment (EA) for the ICO proposed modification 4 to its project approval was submitted to DPE on the 17th April 2014.
- There was a significant delay in the exhibition period approval from DPE due to õMinisterial / Departmental changesô Subsequently the final approved exhibition dates were from the 23rd May to the 9th June 2014.
- A meeting was held with DPE in June 2014 that discussed: the assessment process; response to submissions; as well as the potential requirement for an extension of timeframe due to the assessment process in order to meet the requirements of Condition 43. It was identified by DPE that due to the number of submissions for the Modification this application may subsequently require PAC referral. It was generally agreed that the assessment process would be completed by the September deadline but an extension of timeframe could be granted if this was not met.
- An extension was sort by ICO and approved by DPE in September 2014 due to significant delays in the assessment process. To date, the assessment is still awaiting determination from the Director General.
- Due to the level of public interest in the Modification 4 proposal, Modification 4 was referred to the Planning Assessment Commission (PAC) for determination. On December 10th 2015, the PAC conducted a site inspection of ICO, which included a presentation of the proposed Modification 4 and a site inspection of the Biodiversity Areas situated around ICO.
- On the 11th December 2015, the PAC meeting was held for Modification 4, whereby interested parties commented on the DPEôs assessment and recommended conditions of approval, before a decision is made. Modification 4 is currently awaiting determination from PAC.

12.1.2. Modification 5

Bloomfield Collieries is seeking a Modification 5 to allow ROM coal to be processed at either CHPP within the combined consent areas. The ongoing operation of Rixôs Creek Mine will in the majority of cases involve processing of Rixôs Creek North coal at Rixôs Creek North and Rixôs Creek South at the Rixôs Creek South CHPP. However the following circumstances may offer greater operational flexibility if ROM coal can be transported and processed at the adjacent consent area;

- Maintenance shutdowns at either CHPP - Maintenance shutdowns at either Rail Loading facility - Operational restrictions to product coal stockpile space
- Building and storing of specific customer coal quality shipments (stockpile)
- Opportune change of ROM coal route to assist with environmental performance (e.g. noise levels associated with prevailing metrological conditions).

In all instances production levels will be managed to ensure the individual development consent maximum production levels are not exceeded. This will ensure the environmental impact stays within the assessed impact levels of the consent's EIS's.

12.1.3. Modification 6

On 18 December 2015 the Complex was acquired from Integra Coal Operations Pty Limited (Integra Coal Operations) after it had been put into care and maintenance in May 2014. The underground operations were acquired by HV Coking Coal Pty Limited (HV Coking Coal), a subsidiary of Glencore Coal Pty Ltd (Glencore), and the open cut mine and surface facilities were acquired by Bloomfield Collieries Pty Limited (Bloomfield), with operations renamed as Rix's Creek North.

HV Coking Coal (Glencore) and Bloomfield are seeking approval from the Minister for Planning and Environment for Modification 6 to the Combined Project Approval pursuant to Section 75W of the EP&A Act. The proposed modification relates solely to the separation of the Combined Project Approval into two separate approvals for the respective underground and open cut operations, which will be referred to as the Integra Underground Mine and Rix's Creek North open cut. Glencore will continue to manage the Integra Underground Mine in a care-and-maintenance status whilst further reviews of future mining options are undertaken. The Open Cut component will be operated and managed by Bloomfield as an integrated part of the existing Rix's Creek Mine.

Some minor modifications to the conditions of approval will be required to enable the two mines to operate as separate operations in the future, including:

- To enable effective ongoing community consultation the ICO Community Consultation Committee (CCC) will be modified to allow Committee members focused on the open cut operations to be integrated with the Rixs Creek CCC and those members focused on the underground mining activities to be integrated into Glencore's adjacent Mt Owen Mine CCC; and
- A minor variation is required to the open cut project boundary to include the previously excluded eastern wall of Tailings Dam 2 (TD2).

No changes to the Approved mining activities are proposed as part of the proposed modification. The proposed modification does not involve any new physical works, including any additional mining, disturbance, physical alterations, vegetation clearing, or the like.

12.2 OPEN CUT ACTIVITIES

Bloomfield Collieries intend on recommencing operations during the 2016 period. An operational MOP was approved by DRE on the 16th January 2016. Environmental Management Plans are in the process of being reviewed to reflect the recommencement of operations in the Open Cut area.

With the mine entering into a care and maintenance phase from May 2014 active mining across the open cut operations ceased. The reserves in the South Pit at the cessation of operations were approximately 20 million tonnes (Mt) of ROM coal and the remaining reserves in the North pit were approximately 5 Mt. At the consented maximum extraction rate for the South Pit's Western Extension of 4.5 Mtpa that implies a South Pit life of approximately 4.5 years and approximately 3.5 years for the North mine. As operator of the mine BCL will vary production from the two pits to suit the market conditions and hence the life of the mine may be extended by a smaller extraction rate, and if required by subsequent mining approvals or modification of the consent conditions to permit a different production profile. The recommencement of the operations which form part of the approved MOP will see coal mining operations at Rix's Creek North from two pits:

- The former South Pit ï final coal was recovered in December 2011 with waste emplacement to the pit commencing the same month;
- The Western Extension (extension of the South Pit) ï approved in November 2010 and current until November 2022. Development work commenced in December 2010 with first run of mine (ROM) coal produced in May 2011 with a coal production (as per project Approval 08_0102) of 4.5mtpa in a calendar year; and

Planned MOP maximum annual coal production is approximately 1.0 Mtpa of product coal from the movement of approximately eight million bank cubic meters of overburden. This production will be carried out under limited hours to comply with development consent conditions. The North open cut will be utilised as a water management area. Overburden and coal removal will be then undertaken in the western extension area.

12.3 UNDERGROUND ACTIVITIES

Glencore took over care and maintenance activities on the 18th December 2015 and has no plans to recommence mining operations in the next reporting period. The intent of care and maintenance activities will be to maintain legislative compliance and maintain the mine in a safe and serviceable state with the opportunity to recommence operations if authorised to do so.

During 2016, rehabilitation of gaswell sites and the ventilation shaft site will continue as per the current Underground Care and Maintenance MOP commitments.

12.4 ENVIRONMENTAL IMPROVEMENTS

Rixôs Creek North Open Cut Operations has a number of improvements planned for the 2016 reporting period, which include:

- Increased weed control prioritising the Biodiversity Areas and Glennies Creek Riparian areas;
- Updating the Open Cut rehabilitation framework to align with Rixôs Creeks rehabilitation strategy; and
- Updating the Biodiversity Management Plan in line with best practice.

The Integra Underground Mine environmental improvements for the 2016 period consist of:

- Alignment of Environmental Management System documentation and implementation with Glencore standards and protocols;
- Identifying opportunities for synergy with adjacent Glencore mining operations, such as the Mount Owen and Ravensworth Complexes, such as joint weed and pest control programs, consolidation of environmental monitoring and community consultation programs and events; and
- Reviewing and revising the currently approved Care and Maintenance MOP to reflect proposed management arrangements in consultation with DRE.