SOUTH32

ILLAWARRA COAL

BULLI SEAM OPERATIONS

ANNUAL REVIEW FY2016

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TITLE BLOCK

Name of operation	
Name of operator	South32 – Illawarra Coal – Bulli Seam Operations
Development consent / project approval #	08_0150
Name of holder of development consent / project approval	Illawarra Coal Holdings Pty Ltd
Mining lease #	CCL 767, CCL 724
Name of holder of mining lease	Illawarra Coal Holdings Pty Ltd, Endeavour Coal Pty Ltd
Water licence #	10WA103794; 10WA118766; 10WA118778
Name of holder of water licence	Endeavour Coal Pty Ltd
MOP/RMP start date	1 Oct 2012
MOP/RMP end date	30 Sept 2019
Annual Review start date	01 July 2015
Annual Review end date	30 June 2016

I, David Gregory, certify that this audit report is a true and accurate record of the compliance status of South32 – Illawarra Coal – Bulli Seam Operations for the period 01 July 2015 – 30 June 2016 and that I am authorised to make this statement on behalf of Illawarra Coal – Bulli Seam Operations.

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	David Gregory
Title of authorised reporting officer	Environmental Officer
Signature of authorised reporting officer	
Date	21/09/16

1. STATEMENT OF COMPLIANCE

Table 1: Statement of compliance				
Development Approval	**Purpose**	**Issue Date**	**Expiry date**	**Compliant?**
08_0150	Bulli Seam Operations Project Approval under Section 75J of the EP&A Act 1979.	22/12/2011	31/12/2041	Yes
EPBC 2010/5350	Federal Government approval of the Bulli Seam Operations Project under Sections 130(1) and 133 of the EPBC Act 1999.	15/05/2012	15/05/2042	Yes
10_0079	Appin Ventilation Shaft No.6 Approval under Section 75J of the EP&A Act 1979.	04/05/2011	04/05/2041	Yes[1]
EPBC 2010/5722	Federal Government approval of the Appin Mine Ventilation Shaft No.6 under Sections 130(1) and 133 of the EPBC Act 1999.	01/04/2011	01/04/2041	Yes
Mining Lease / Sub-Lease	**Number**			
Coal Lease	388	22 Jan1992	22 Jan 2034	Yes
Mining Lease	1382	20 Dec 1995	19 Dec 2016*	Yes
Mining Lease	1433	24 Jul 1998	23 Jul 2019	Yes
Mining Lease	1574	09 Jul 2008	30 Dec 2023	Yes
Mining Lease	1678	27 Sep 2012	26 Sep 2033	Yes
Mining Lease	1698	26 Jun 2014	26 Jun 2035	Yes
Consolidated Coal Lease	724	4 Jul 1991	18 Dec 2031	Yes
Consolidated Coal Lease	767	29 Oct 1991	08 Jul 2021	Yes
Coal Lease	381	24 Oct 1991	24 Oct 2033	Yes
Mining Purposes Lease	200	13 Jan 1982	13 Jan 2024	Yes
Mining Purposes Lease	201	1 Jan 1982	13 Jan 2024	Yes
Mining Lease	1473	20 Nov 2000	29 Nov 2021	Yes

1Application has been submitted to incorporate the VS#6 Approval requirements into the BSO Approval.

Table 2: Non-compliances					
Relevant approval	Condition #	Condition description	Compliance status	Comment	Where addressed in Annual Review
N/A					

Refer to Appendix D: BSO EPBC Approval 2010/5350 Compliance Report & Appendix E: BSO Consent Compliance Report and Summary of Non-compliances for more detail.

2. INTRODUCTION

2.1. BACKGROUND

This Annual Review for the Bulli Seam Operations (BSO) details the environment and community performance for the 12 month period ending 30th June 2016 and meets the requirements set out in the *Annual Review Guidelines* (NSW DPE, 2015).

The Review has been prepared to meet the requirements of Schedule 6 Condition 4 of the BSO Development Consent, Schedule 4, Condition 3 of the Ventilation Shaft No.6 Development Consent and the Department of Resources and Energy (DRE) requirement to submit an Annual Environmental Management Report (AEMR) under the Mining Lease for the BSO.

A copy of the report is publicly available via the South32 website under Bulli Seam Operations: http://www.south32.net/our-operations/australia/illawarra-coal/regulatory-document.

2.2. OVERVIEW OF OPERATIONS

The NSW Government granted approval for the Bulli Seam Operations Project (BSOP) in December 2011. The BSOP combines future mining operations and provides for the continuation of coal mining operations at the Appin Mine and West Cliff Colliery. The Bulli Seam underground longwall mining operations have transitioned wholly to the Appin areas (Area 9 and Area 7) following completion of longwall mining activities at West Cliff in early 2016. The locations of all sites associated with the BSOP are illustrated in Plan 1 - Regional Location Plan.

Appin

Appin Mine consists of the merged Appin and Tower collieries. Appin Mine is owned and operated by Endeavour Coal P/L, a subsidiary company of Illawarra Coal Pty Ltd (ICHPL) which is 100% owned by South32. Appin Colliery (located at Appin) commenced operations in 1962 and Tower Colliery (located at Douglas Park) commenced operation in 1978. The underground infrastructure, roadways, conveyor and ventilation systems were joined in 2003 to become the Appin Mine. The original Appin Colliery is located adjacent to Appin Village, approximately 37 kilometres Northwest of Wollongong.

Tower Colliery (Now Appin West) was officially opened in November 1978. Following the sinking of the access and ventilation shafts, underground development of the mine was undertaken from 1978 through to 1988 when longwall operations were introduced. Tower Colliery completed extraction of 20 longwall blocks between 1988 and September 2002. The mine was redeveloped underground to establish mining operations in the current longwall Area 7 mining domain.

Key areas associated with the current Appin operations include the Appin East (Central) pit top site (Plan 2 - Appin East (Central) Mine Site), the Appin West pit top site (Plan 3 – Appin West Mine Site), the Appin East (Central) No.1 and No.2 fan site (Plan 4 – No.1 & No.2 Shaft Site), the Appin West No.3 fan site (Plan 5 – No.3 Shaft Site), No.6 fan site (Plan 6 – No.6 Shaft Site) and the Douglas Park substation site (Plan 7 – Douglas North Substation).

West Cliff

West Cliff Colliery is located 26km northwest of Wollongong, NSW. West Cliff Colliery is operated by Endeavour Coal Pty Ltd, a subsidiary company of ICHPL with South32 as the parent company. South32 owns 100% of the West Cliff assets.

Illawarra Coal has conducted underground coal mining operations at West Cliff since 1997. Prior to this, West Cliff was operated by Kembla Coal and Coke Pty Limited (KCC). Longwall mining at West Cliff concluded in early 2016. The latest mining area, Area 5, was completed in February 2016 and consists of part of Consolidated Coal Lease 767 and Coal Lease 381 which were both transferred from Appin Colliery to West Cliff Colliery in 1997. West Cliff merged with Appin Mine in February 2016.

Key areas of the West Cliff Colliery Site include the pit top (Plan 8 – West Cliff South Site), the West Cliff Emplacement Area and Coal Preparation Plant (CPP) at the North Site (Plan 9 – West Cliff North Side) and the redundant North Cliff Mine site within the Dharawal National Park Area (Plan 10 – North Cliff Site).

2.3. MINE CONTACTS

Table 3: Contacts.

Position	Name	Number
Appin Colliery Manager Production	Heath Hannigan	(02) 4640 4032
Production Superintendent - WCCPP	Carl Ernst	(02) 4640 4130
Environmental Officer	David Gregory	(02) 4286 3386
Environmental Supervisor	Peter McMillan	(02) 4286 3415

3. APPROVALS

Tables below describe the Development Approvals, Mining Leases, Licences and Exploration Leases associated with the BSO.

Table 4: Development Approvals associated with the BSO

Document	Issue Date	Expiry date
Appin Gas Drainage Project – Initial	Oct 2009	
Appin Gas Drainage Project – 2010	Dec 2010	Drilling Feb 2017
Appin Gas Drainage Project – 2012	Feb 2012	Extraction wells Oct 2017
Bulli Seam Operations Project Approval (NSW Government)	22 Dec 2011	31 Dec 2041
Bulli Seam Operations Project Approval (EPBC Act)	15 May 2012	15 May 2042
No. 6 Ventilation Shaft (NSW Government)	4 May 2011	4 May 2041
No. 6 Ventilation Shaft (EPBC Act)	1 Apr 2011	1 Apr 2041

Table 5: Mining Leases and Licences associated with the BSO.

Mining Lease / Sub-Lease	Number	Issue Date	Expiry Date
Coal Lease	388	22 Jan1992	22 Jan 2034
Mining Lease	1382	20 Dec 1995	19 Dec 2016*
Mining Lease	1433	24 Jul 1998	23 Jul 2019
Mining Lease	1574	09 Jul 2008	30 Dec 2023
Mining Lease	1678	27 Sep 2012	26 Sep 2033
Mining Lease	1698	26 Jun 2014	26 Jun 2035
Consolidated Coal Lease	724	4 Jul 1991	18 Dec 2031
Consolidated Coal Lease	767	29 Oct 1991	08 Jul 2021
Coal Lease	381	24 Oct 1991	24 Oct 2033
Mining Purposes Lease	200	13 Jan 1982	13 Jan 2024
Mining Purposes Lease	201	1 Jan 1982	13 Jan 2024
Mining Lease	1473	20 Nov 2000	29 Nov 2021
Environment Protection Licence	2504	---	---
NSW Office of Water Licences	10WA103794; 10WA118766; 10WA118778	01 07 2011 01/07/2013 01/07/2013	30/06/2024 24/06/2018 18/02/2018

*Application for renewal submitted

Table 6: Exploration Leases associated with the BSO.

Mining Lease / Sub-Lease	Site	Issue Date	Expiry Date
A199	West Cliff	27 Jun 1980	27 Jun 2019
A201	Appin	27 Jun 1980	27 Jun 2019

A248	Appin	13 May 1981	19 Dec 2015*
A306	West Cliff	19 Jul 1983	27 Jun 2019
A312	Appin	10 Aug 1983	10 Aug 2018
A370	Appin	8 May 1986	27 Jun 2019
A395	Appin	23 Nov 1987	10 Aug 2018
A396	Appin/West Cliff	28 Jun 1988	27 Jun 2019
A397	West Cliff	4 Aug 1987	27 Jun 2019
A432	West Cliff	12 Feb 1991	31 Aug 2018
EL 4470	Appin	5 Jan 1993	19 Dec 2015*

*Application for renewal submitted

4. OPERATIONS SUMMARY

4.1. EXPLORATION

During the reporting period the Bulli Seam Exploration Program totaled 1 exploration borehole (coal quality) in CCL767. No exploration was conducted in CCL724. Plan 11 – Exploration for The Period) provides a position of the borehole. Rehabilitation of the drill site on the property has been completed, which includes a standpipe for ongoing monitoring of the piezometer string installed in the borehole.

4.2. LAND PREPARATION

Mine Safety Gas Drainage

Two vertical wells, (one of which had two steered lateral branches and the other one steered lateral branch), were constructed and are being progressively commissioned to service gas from the extraction of Longwall 707. These wells targeted the Bulgo Sandstone unit, which is located in strata above the Bulli Coal seam. These wells are located on ICHPL owned property in paddocks adjacent to Menangle Road, Douglas Park.

During 2015/16 rehabilitation activities to address Appin operations included:

- Two of four Longwall 706 wells have been grouted to surface.
- Area 9 – STIS 2 and 3 have been grouted to surface above an inflated packer.

Emplacement Operations

During the reporting period 2.5 Ha of vegetation was cleared within the Stage 3 Emplacement in accordance with the two-stage clearing process outlined in the West Cliff Coal Wash Emplacement Area Management Plan. This area was surveyed during the 2015/16 reporting period. Vegetation and topsoil removed from the cleared area was relocated to the active rehabilitation sites. Plan 12 – Land Preparation Plan) illustrates the active emplacement and rehabilitated areas.

The rehabilitated emplacement areas are inspected regularly to determine the progress and effectiveness of the rehabilitation. The monitoring program consists of quarterly inspections undertaken by an Illawarra Coal Environmental representative which are supplemented by a more extensive annual monitoring program. The quarterly emplacement rehabilitation inspections were undertaken during the reporting period. The Annual monitoring program was undertaken in spring FY16. The report is provided in Appendix A: Annual Rehabilitation Report.

4.3. CONSTRUCTION

The following construction activities were undertaken during the 2015/2016 reporting period:

Ventilation Shaft No. 6

The primary construction activity completed during the reporting period was the earthen noise barrier. This was constructed using coal wash and capped with topsoil and planted with native vegetation. Shaft was commissioned in August 2015.

Figure 1: VS#6 precinct during commissioning.

Water Filtration Plant Upgrade

The Appin West Water Filtration Plant is currently being upgraded to:

- increase the capacity to pre-treat underground pump-out water;
- increase surface storage;
- maximise reuse of treated mine waters for underground operations and reduce potable water usage;
- increase the processing capacity of mine water.

Works undertaken during the reporting period include:-

- Commenced construction of the *pre- treatment* plant upgrade
- Bulk storage and blending plant which included the installation of two 1,000KL water tanks
- Increase the processing capacity of mine water – Civil works have commenced which included clearing and reshaping of land. Project has moved into the detail design phase and commissioning is planned for 2017.

Figure 2: Pre-treatment Plant and storage tanks.

Appin East (Central) & West Gas Drainage Plant Flaring Units

The Appin West (tower) Gas Drainage Plant has been upgraded to increase the volume of gas extracted and transported to the EDL operated power station. The upgrade included the installation of a 900mm gas extraction pipe down the existing (unused) bulk coal winder shaft as well as flaring units. The flares abate the methane content of the gas when there is no power generation occurring at the EDL power station. This project generates Australian Carbon Credit Units (ACCU's) as regulated by the Commonwealth Government Clean Energy Regulator. Gas flaring units are also partway through construction at the Appin East (Central) Gas Drainage Plant. These also generate ACCU's.

Figure 3 Upgraded gas drainage plant at Appin West.

4.4. MINING

Longwall Status

The Bulli Seam underground longwall mining operations have transitioned wholly to the Appin areas following completion of longwall mining activities at West Cliff in early 2016. Appin and West Cliff mines extract coal from the Bulli Seam within the Southern Coalfield.

During the reporting period, Appin Mine continued extracting coal from Longwalls 706 and 707. As of 30th June 2016, Longwall 707 had extracted 855m, with 2472m remaining.

At West Cliff Longwall 38 commenced extraction on the 3rd of February 2015 and was completed on the 1st of February 2016.

Longwall Production

Appin and Westcliff extracted 6.1 million tonnes of 'Run of Mine' (ROM) coal via roadway development and longwall extraction methods for the reporting period, an 18% decrease from the 2014/15 reporting period. The ROM production levels from FY09 through to the current reporting period are provided in Figure 4.

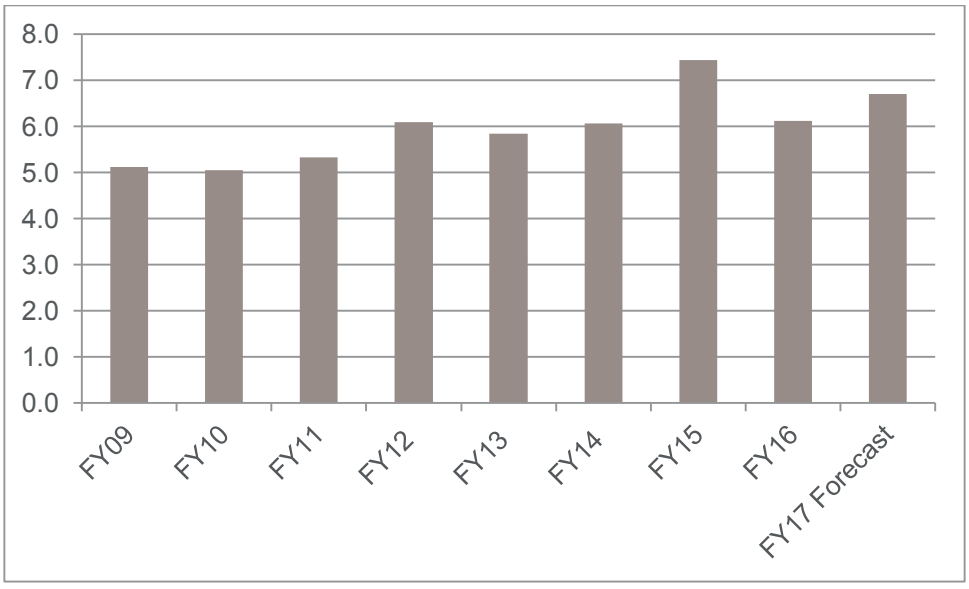


Figure 4: ROM production – BSO

The average yield for the Bulli Seam operations for the reporting period was 78%. The production and waste summary for the reporting period is provided in Table 7.

Table 7: Production Summary				
	Approval Limit	**Previous Reporting Period**	**This Reporting Period**	**End of Next Reporting Period (Est.)**
Waste rock/Overburden	N/A	N/A	N/A	N/A
ROM Coal/Ore	10.5MT	7.4MT	6.1MT	6.69MT[2]
Coarse Reject (Coal Wash Tonnes)[3]	N/A	1.89MT	1.6MT	1.3MT[4]
Saleable Product	9.3MT[5]	5.6MT	4.9MT	5.4MT

4.5. MINERAL PROCESSING

Mineral processing facilities include the West Cliff Coal Preparation Plant (CPP), the West Cliff Emplacement Area and the Dendrobium CPP (located at the Port Kembla Steelworks). The majority of ROM coal from Appin and West Cliff is directed to the West Cliff CPP for processing. The Emplacement Area is used to emplace coal wash from the West Cliff CPP and Dendrobium CPP.

ROM Coal is transported to West Cliff CPP by:

- Coal trucks from the Appin East (Central) site, along Appin and Wedderburn Roads.
- Bulk coal winder from the West Cliff mining domain.

ROM Coal from Appin Mine is also directed to the Dendrobium CPP on an 'as required' basis to maintain work continuity and maintain reduced stockpile sizes at the Appin Site. ROM coal is transported via Mt Ousley to the Dendrobium CPP (located within the BlueScope Steel complex). Clean coal from the West Cliff CPP is trucked to BlueScope Steel (Port Kembla Steel Works) coal handling facilities or to the Port Kembla Coal Terminal for distribution.

Daily road haulage volumes associated with both the Appin and West Cliff sites is available on the South32 website: http://www.south32.net/our-operations/australia/illawarra-coal/regulatory-document

4.6. ORE AND PRODUCT STOCKPILES

No coal is stockpiled at the Appin West Site as ROM coal is transported underground to the Appin East (Central) Site. The Appin West coal storage bins are currently under care and maintenance.

The Appin East (Central) mine site has a total raw coal stockpiling capacity of up to 50,000 tonnes. The stockpile is recovered with front-end loaders directly into the coal haulage trucks for transport by road to either the West Cliff (Appin North) or Dendrobium CPP's.

West Cliff (Appin North) operates six primary coal stockpiles for both clean coal and raw coal. The stockpile capacities at West Cliff (Appin North) are outlined in Table 8.

[2] Appin Area 7 & 9

[3] Total processing waste produced at West Cliff CPP (includes Appin Coal Wash) for Annual Review period only – does not include coal wash produced at Dendrobium CPP

[4] Assume ~80% yield of predicted ROM tonnes for FY17

[5] Transport Limit

Table 8: West Cliff (Appin North) Stockpiles Capacities	
Area	**Capacities**
No.1 Stockpile	650,000t nominal capacity - 600,000t coking coal , 20,000t jig coal, 30,000t Middlings coal (Note: The capacity of this stockpile has been temporarily reduced to allow space for a temporary lay down area as part of the RCRIP)
No.2 Stockpile	150,000t nominal capacity – generally coking coal
No.3 Stockpile	600,000t nominal capacity – generally coking coal
No.4 Stockpile	800,000t nominal capacity – generally Appin ROM coal
No.5 Stockpile	90,000t nominal capacity – generally Appin ROM coal
No.6 Stockpile	90,000t nominal capacity – generally West Cliff (Appin North) ROM

A Stockpile and Slope Stability Management Plan is in place to manage the stockpile operations. This plan is a framework document where the operational risks and controls are documented. Risks associated with the stockpile operations are also detailed in the West Cliff (Appin North) CPP Risk Register, which is reviewed regularly by the site management team to test the effectiveness of controls.

Monitoring and management review indicates that the current plan effectively controls all potential stockpile management issues effectively.

5. ACTIONS REQUIRED FROM PREVIOUS ANNUAL REVIEW

Table 9: Actions from Previous Annual Review

Action Required	Where covered in this Annual Review
Nil actions from last report	N/A

6. ENVIRONMENTAL PERFORMANCE

6.1. AIR POLLUTION

Environmental Management

Air quality is managed in accordance with the BSO Air Quality and Greenhouse Gas Management Plan (AQMP) which details the air quality and emissions control measures for the project, compliance procedures, monitoring programs, evaluation protocols, notification and communication processes.

The AQMP was prepared to comply with the intent and requirements of Condition 12, Schedule 4 of the BSO approval.

The objectives of the AQMP are to:

- Provide the frame work for the responsible management of air quality and emissions associated with the project;
- Describe the control measures for management of dust, odour, greenhouse gas (GHG) and other emissions to atmosphere;
- Prevent adverse air quality impacts on the local communities and environment;
- Describe the compliance criteria for air quality for the project;
- Describe the air quality monitoring program;
- Comply with the relevant requirements of Environment Protection Licence (EPL) No. 2504 and the Bulli Seam Operations (BSO) Project approval;
- Describe measures for the reduction of project GHG emissions; and
- Comply with South32 and other relevant standards and requirements.

The air quality monitoring program incorporates:

- Collection and measurement of dust samples from strategically placed dust deposition gauges at representative sites;
- Use of real-time air quality monitors: fixed Optical Photometers, portable Optical Photometers;
- Use of a High Volume Air Sampler (HVAS) to determine the land acquisition values; and
- Dust emission surveys and spot checks using hand held photometers; and
- Visual inspections and audits.

Table 10: BSO Air Quality Monitoring Sites and their Function		
Location	**Equipment and Monitoring Point ID**	**Function**
Appin East (Central)	Dust Deposition Gauge 14	Particulate dust deposition rate at SE corner of Stockpile at property boundary Operational Control - Stockpile and internal roadway dust control measures performance reference
	Dust Deposition Gauge 15	Particulate dust deposition rate at NE corner of Stockpile Operational Control - Stockpile and internal roadway dust control measures performance reference
	Dust Deposition Gauge 16	Particulate dust deposition rate at NW corner of Appin East (Central) pit top property boundary Amenity goal reference Operational Control - Site dust control performance reference
	Dust Deposition Gauge 17	Particulate dust deposition rate at NE corner of Appin East (Central) pit top property boundary Amenity goal reference Operational Control - Stockpile and public road dust control measures performance reference
	Dust Deposition Gauge 18	Particulate dust deposition rate at SE corner of Stockpile Operational Control - Stockpile and internal roadway dust control measures performance reference
	Real-time Photometer (fixed) Photometer ID: (AE-PF3) (NW corner of Appin East (Central) pit top boundary between nearest residential receivers)	Amenity goal reference Real Time Operational Control Site dust control performance reference
	High Volume Air Sampler High Volume Air Sampler ID:(AE-HV1)	Amenity goal reference Review against land acquisition levels Real Time Operational Control
	Real-time Photometer (fixed) Photometer ID: (AE-PF1) (NE corner of pit top property boundary – coal stockpile vehicle entry/exit point)	Real-time monitoring of dust emissions at the coal stockpile area truck entry/exit point onto public roads Real-time Operational Control – Stockpile, internal roads and public road dust control measures performance reference monitor
	Real-time Photometer (portable) Photometer ID: (AE-PS1) Coal truck exit point onto Appin Road	Monitor dust emissions at the coal truck exit point onto Appin Road Quarterly survey dust monitoring point Real-time Operational Control
	Real-time Photometer (portable) Photometer ID: (AE-PS3) Residential Area to the NW of Appin East (Central) Pit Top	Monitor dust emissions at the Appin residential area immediately NW of Appin Pit Top Quarterly survey dust monitoring point Real-time Operational Control
Appin West	Dust Deposition Gauge No.1 Gauge ID: (AW-DD1)	Particulate dust deposition rate at Appin West pit top Operational Control – Site and road dust control measures performance

Table 10: BSO Air Quality Monitoring Sites and their Function

Location	Equipment and Monitoring Point ID	Function
	(Appin West pit top – adjacent mine access road, employee car park and EDL power plant)	reference
	Dust Deposition Gauge No.2 Gauge ID: (AW-DD2) (Appin West property boundary at Mine Entrance Point off Douglas Park Drive	Particulate dust deposition rate at the Appin West Mine Gate Entrance Point and the public road Amenity goal reference Operational Control – Site and mine access road dust control measures performance reference
	Real-time Photometer (portable) Photometer ID: (AW-PS1) Northern property boundary between Appin West Pit Top and St. Mary's Towers property	Monitor dust emissions at the Northern pit top property boundary Quarterly survey dust monitoring point Real-time Operational Control
Appin West	Real-time Photometer (portable) Photometer ID: (AE-PS2) Main mine road intersection with Douglas Park Drive	Monitor dust emissions at the mine road intersection with Douglas Park Drive Quarterly survey dust monitoring point Real-time Operational Control
West Cliff (Appin North)	Dust Deposition Gauge No.1 Gauge ID: (W-DD1) (West Cliff (Appin North) southern property boundary at the Wedderburn Rd and-Appin Rd junction)	Particulate dust deposition rate at the Wedderburn Rd and-Appin Rd junction Operational Control – Mine entrance road and coal truck dust control measures performance reference
	Dust Deposition Gauge No.3 Gauge ID: (W-DD3) (West Cliff (Appin North) pit-top south site)	Operational Control – Site dust control performance reference for the West Cliff (Appin North) pit-top south site
	Dust Deposition Gauge No.8 Gauge ID: (W-DD8) (Brennans Creek Dam)	Amenity goal reference Operational Control – Site dust control performance reference Indicator for dust deposition rates between the emplacement area activities and the nearest Appin township residential area Baseline and historical dust deposition trends related to the expansion of the emplacement area north towards the nearest residential receivers
	Dust Deposition Gauge No.10 Gauge ID: (W-DD10) (West Cliff (Appin North) property boundary between the product stockpiles adjacent to Wedderburn Road and the Dharawal State Conservation Area boundary)	Site dust control performance reference for product stockpiles and Wedderburn Road coal truck transport corridor
	Real-time Photometer (fixed) Photometer ID: (W-PF1) (West Cliff (Appin North) southern property boundary at the Wedderburn and Appin Road intersection)	Fixed monitor for real-time monitoring of dust emissions at the Wedderburn Road and Appin Road intersection Real-time Operational Control – Roadway dust emissions

Table 10: BSO Air Quality Monitoring Sites and their Function		
Location	**Equipment and Monitoring Point ID**	**Function**
	Real-time Photometer (portable) Photometer ID: (W-PS1) (Brennans Creek Dam locality to the north of the West Cliff (Appin North) Emplacement Area)	Monitor real-time dust emissions at the Brennans Creek Dam locality. Quarterly survey dust monitoring point Operational Control and baseline reference point
	Real-time Photometer (portable) Photometer ID: (W-PS2) (Dust emissions survey locality at the western boundary between the emplacement operations and Appin Road)	Monitor real-time dust emissions at the zone between the active emplacement area and Appin Road Quarterly survey dust monitoring point Operational Control
	Real-time Photometer (portable) Photometer ID: (W-PS3) (Dust emissions survey locality along Wedderburn Road between the coal stockpiles and the Dharawal National Park)	Monitor real-time dust emissions along Wedderburn Road
	Real-time Photometer (portable) Photometer ID: (W-PS4) (Cataract Scout Camp Reserve to the South West of the West Cliff (Appin North) Site)	Quarterly survey dust monitoring point Operational Control

Three weather stations and temperature inversion monitoring equipment were installed during FY14. The weather stations are located at Appin East (Central) (with mains power), West Cliff (Appin North) (along Wedderburn Road with solar power) and the Vent Shaft 6 precinct (with solar power).

Environmental Performance

Results of the air quality monitoring are reported online every 14 days in accordance with Section 66 (6) of the POEO Act and Schedule 6, Condition 11 of the BSO Project Approval; and on an annual basis to the OEH via the EPA Annual Return (Appendix B – 2015/16 EPA Annual Return). The online report is available via the following link:

http://www.south32.net/our-operations/australia/illawarra-coal/regulatory-document

A comprehensive summary of all air monitoring results for the BSO is provided below:

BSO Dust Deposition Gauge Monitoring

The Appin East (Central) and West Cliff (Appin North) sites non-operational gauges were below the long term criteria/amenity goal of 4 g/m^2/month for deposited dust during the reporting period (Figure 5). This is evident at all sites located near the perimeter of the Appin and West Cliff (Appin North) sites (i.e. AE-DDG14, 15, 16 and 17; and AW-DD1 and 2; and WC-DD1, 3 and 8).

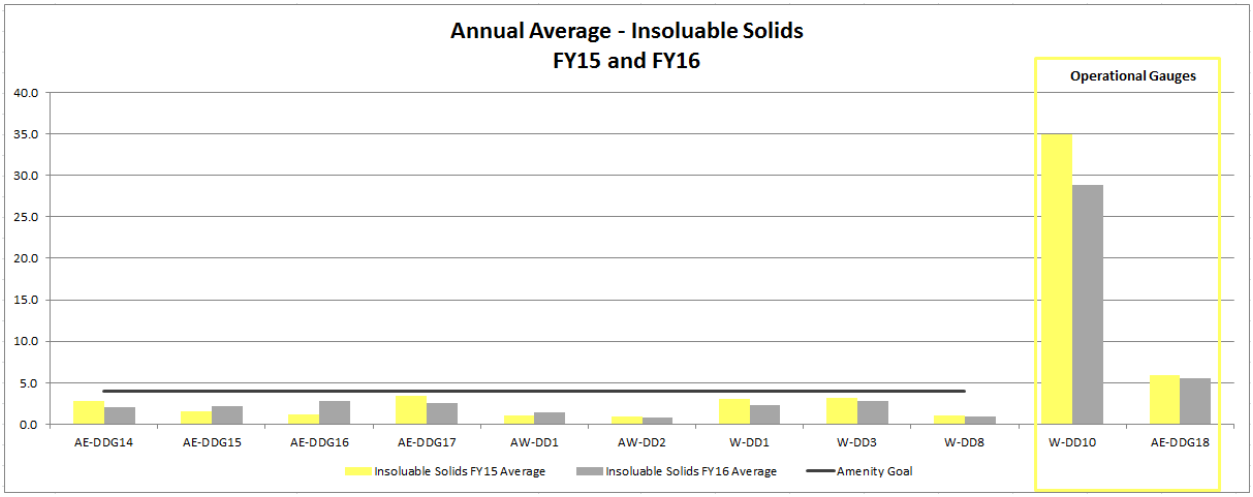


Figure 5: Comparison between FY15 and FY16 annual averages for insoluble solids across the BSO.

The long term criteria (amenity goal) applies to particulate emissions on any residence on privately owned land – W-DD10 and AE-DDG18 are operational gauges located within the mine site (i.e. operational land), they provide an indication of effectiveness of the sites immediate dust control measures.

Real-time Monitoring

As described in the BSO AQMP, if the optical photometer at Appin East (Central) (AE-PF3) indicates dust levels greater than 80% of the Air Quality Criteria (refer to Schedule 4, condition 9 of the BSO project approval) additional monitoring will be undertaken using the HVAS (AE-HV1) in order to assess compliance. At several times during FY16 the apparent PM10 dust levels were measured above the 80% criteria. Where this occurred it was due to regional air quality problems associated with bush fires and hazard reduction burning. HVAS samples were taken following these and they confirmed the non-operational nature of the exceedances. These were also reported in the 14 day reports (Figure 6). Currently, the optical photometers are unable to determine the difference between dust, rain and fog. High results are often the result of dense fog in the Appin area. A heated inlet was installed on the optical photometer AE-PF3 to reduce the influence of water vapour in the air.

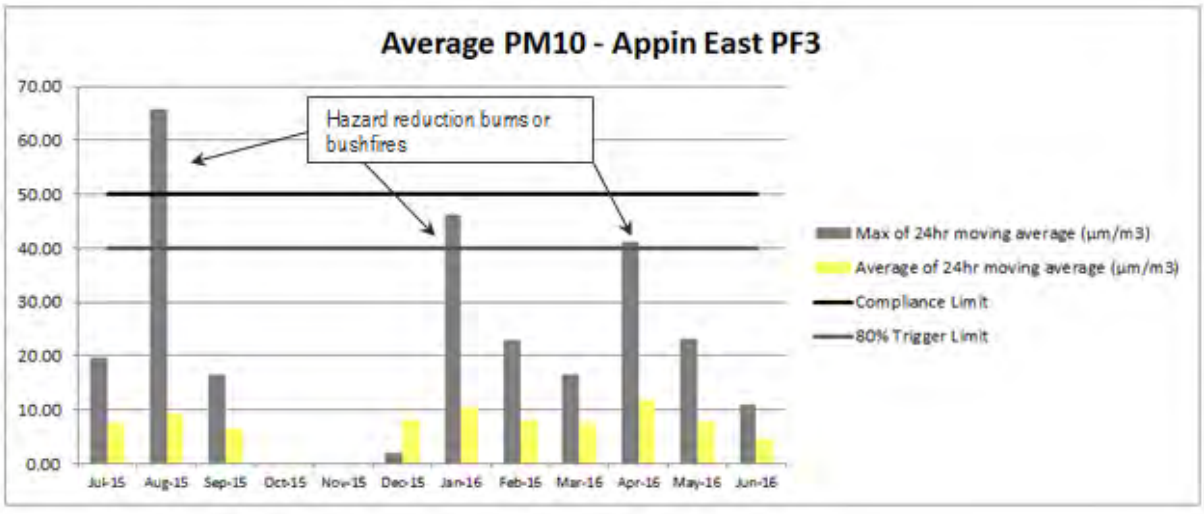


Figure 6: PM10 average 24 hour levels and maximum 24 hour levels at Appin East (Central).

6.2. EROSION AND SEDIMENT

Environmental Management

Most activities at the Appin East (Central), West and West Cliff pit top sites are undertaken on relatively flat areas. In addition, high activity areas are sealed. There are minimal exposed earthen areas at both sites. Internal unsealed roads are maintained to prevent dust, primarily through dust suppression sprays and water carts. Sediment fences are installed where required to filter sediment from drainage / seepage. Sediment is controlled by a series of dams and water treatment facilities at both sites. Water discharged is monitored for suspended solids.

Areas that have the potential to be contaminated by the surface operations at the Appin West Pit Top are contained within the catchment of the Surface Water Dams which are designed to capture and treat a 1:10 year, 72 hour rainfall event. The Surface Water Dam contains a spillway designed for a 1:1000 year rainfall event to maintain the engineering integrity of the structure and reduce the risk of erosion and sediment release. Prior to the release of surface water from the Surface Water Dam (via LDP 23), water passes through a filter unit which is designed to remove suspended solids, oil and grease.

The potential for erosion at the emplacement area is managed in accordance with the West Cliff (Appin North) Coal Wash Emplacement Area Management Plan. The following activities are undertaken to minimise the likelihood of erosion within the emplacement area:

- Compaction of emplaced material;
- Profiling of finished areas to designed gradients; and
- Revegetation of emplaced area.

Sediment is controlled by a series of sedimentation ponds, which have a combined capacity in excess of 200 ML. Treatment of the water is undertaken at a number of locations across the site prior to release to BCD to meet compliance with EPL limits.

The water management system is regularly inspected by the site environmental representative to ensure the system is operating as efficiently as possible.

Environmental Performance

Routine water quality monitoring of Total Suspended Solids (TSS) across the BSO has not identified any issues associated with erosion and sedimentation. The Appin East (Central) and West and West Cliff (Appin North) sites are operating within the licence limits for TSS.

6.3. SURFACE WATER

Environmental Management

Surface water management across the BSOP is undertaken in accordance with EPL 2504 and the approved BSO Surface Water Management Plan. The Surface Water Management Plan (SWMP) details the control measures, compliance procedures, monitoring programs, evaluation protocols, notification and communication processes for surface water management for the BSO. This plan has been prepared to satisfy Schedule 4, Condition 16 of the BSO approval.

The objectives of the SWMP are to:

- Provide a water balance for the project including sources, usage and discharge quality;
- Outline the process to reduce the impacts on biota from the Brennans Creek dam discharge;
- Establish responsibilities for the surface water management at the BSO operations;

- Comply with all relevant regulatory requirements, Environmental Protection Licence 2504 and South32 policies and standards for water management;
- Describe the water management systems including measures to comply with discharge limits and minimise potable water usage;
- Outline the framework for water monitoring, auditing and reporting; and
- Specify investigation and communication processes in response to water related issues and complaints.

For specific surface water management strategies and controls, please refer to the SWMP found at:

http://www.south32.net/our-operations/australia/illawarra-coal/regulatory-document

Environmental Performance

Results of the surface water monitoring are reported online every 14 days as per the requirements of Section 66 (6) of the POEO Act and Schedule 6, Condition 11 of the BSO Project Approval; and on an annual basis to the OEH via the EPA Annual Return (Appendix B – 2015/16 EPA Annual Return). The online report is accessible via the following link:

http://www.south32.net/our-operations/australia/illawarra-coal/regulatory-document

A summary of results from the BSO monitoring program is included in the following sections.

Water Quality

All but three of the eleven monitoring sites across the BSO achieved compliance with the EPL2504 limits during the reporting period (refer to Table 11). Sites where an exceedance of the EPL has occurred are discussed in more detail below.

Table 11: Summary of Compliance with EPL Water Quality Limits Across BSO

Monitoring Site	EPL Compliant (Y/N)	Comments
Point 4	No	Oil and Grease sample result was above the EPL 100 percentile limit. The exact cause of the elevated level is unknown, though potentially due to contamination of the sampling bottle or cross-contamination at the Laboratory.
Point 10	Yes	---
Point 11	Yes	---
Point 12	Yes	---
Point 18	Yes	---
Point 19	Yes	---
Point 20	Yes	---
Point 22	No	Oil and Grease sample result above the EPL 100 Percentile limit. There was a problem with sewage treatment sludge between 14 August and 27 August, although no oil and grease was visible. Subsequent samples in Sept were below the licence limit.
Point 23	Yes	---
Point 24	No	Oil and Grease sample result over the EPL 100 Percentile limit. The exact cause of the elevated level is unknown, though potentially due to contamination

		of the sampling bottle or cross-contamination at the Laboratory.
Point 36	Yes	-

Water Discharge

There have been no instances where discharge volume exceeded the EPL limits for discharge (see Table 12).

Table 12: Summary of Compliance with EPL Discharge Volume Limits Across BSO

Monitoring Site	EPL Compliant (Y/N)	Comments
Point 4	Yes	---
Point 10	Yes	---
Point 13	Yes	---
Point 18	Yes	---
Point 19	Yes	---
Point 20	Yes	---
Point 22	Yes	---
Point 24	Yes	---

Ecotoxicity

In accordance with EPL 2504 Condition M2.4, Illawarra Coal conducted acute and chronic (sub-lethal) toxicity testing of the discharges from Point 10. The program commenced in June 2013. A summary of the results from the four FY16 sampling events is provided in Table 13.

Table 13: Summary of Ecotox Monitoring at Point 10

Test and Spp	Mine Water Concentration where there was No Observable Impact (NOEC) over a Full or Partial Life Cycle.			
	Jul-15	Oct-15	Jan-16	Apr-16
Partial life-cycle toxicity test using the freshwater cladoceran Ceriodaphnia dubia	25%	50%	100%	100%
48hr Acute Toxicity Test using the freshwater cladoceran Ceriodaphnia dubia	100%	100%	100%	100%
10 day Acute Survival Test using the freshwater shrimp Paratya australiensis	50%	50%	100%	100%
96 hour fish imbalance test - Melanotaenia duboulayi	100%	100%	100%	50%
7-day Growth Inhibition of the freshwater aquatic duckweed Lemna disperma	12.1%	6.1%	96.8%	48.4%
72-hour microalgal growth inhibition test - Selenastrum capricornutum (green alga)	<6.3%	25%	<6.3%	6.3%

Pollution Reduction Programs

PRP19

PRP 19 (condition U2.1) aims to protect and / or restore the environmental values of the receiving waters affected by the discharge of waters from Brennans Creek Dam (BCD) into the Georges River. Stage 1 of the project was completed in December 2012 and involved the transfer of mine water from underground directly to the West Cliff (Appin North) Washery to be used as process water. Stage 2 of the project involves carrying out a program of works to achieve specified discharge water quality. Stage 2 requires the licensee to provide six monthly progress reports (30 June and 30 December) until the completion of the project. Progress as at the end of the reporting period is as follows:

- Commenced coagulant/flocculant trial to reduce aluminium concentrations within the treatment ponds, Brennans Creek Dam and discharge waters.
- Commenced expansion of Appin West Water Filtration Plant to increase storage capacity and processing capacity of mine water.
- Modification of the West Cliff (Appin North) Washery water management system to create a 'semi closed loop' to reduce diversion of washery waters into BCD.
- Regular meetings with the community and environmental groups and the EPA to discuss monitoring results and plan suitable options to address the requirements of PRP19.
- Completion of year 1 & 2 base-line aquatic health monitoring (PRP20).
- Six monthly progress reports have been submitted to the EPA as per the requirements of the PRP.

PRP20

A study was developed to meet the aquatic health monitoring requirements of EPL2504 Condition U3 - PRP 20 Aquatic Health Monitoring Plan (see below).

1) Prepare Aquatic Health Monitoring Program Plan

The licensee must provide an aquatic health monitoring program plan to the EPA for review and approval. The program must require the monitoring and assessment of the aquatic health of Brennans Creek and the Upper Georges River between 1 September and 30 November (monitoring period) in the years 2013, 2015, 2017 and 2019.

The monitoring program must include, but is not limited to, chemical analysis and in-stream biota assessment, including representative macroinvertebrate, algal and vertebrate species. The monitoring program must be carried out at five or more locations including discharge point 10, discharge point 11, discharge point 12 and the Upper Georges River to the confluence with O'Hares Creek.

The aim of the study is to monitor the changes to biota in-stream and within the sediment within the Upper Georges River as Water Projects required by PRP 19 are commissioned.

The aim will be achieved by:

- Comparing the Brennans Ck/Georges River site with reference sites
- Estimate changes over time in the composition and abundance of in-stream and sediment biota; and
- Assessing the downstream gradient changes in composition and abundance of in-stream and sediment biota

We predict that the abundance and composition of aquatic biota will become more similar to the reference sites as Water Projects required by PRP 19 are commissioned.

The Program includes the following:

- Quantitative sampling of macroinvertebrates
- Ecological assessment processes using DNA extracted from sediment samples;
- In-stream water quality testing; and
- Laboratory water testing.

The study area is located within the Upper Georges River Catchment, commencing at the headwaters of the Georges River and runs to the confluence with O'Hares Creek. Several sites are located in pool habitats downstream of Licence discharge point 10. Three reference sites are also sampled (upstream Georges River).

The first years (Year 1 baseline) monitoring was completed in November 2013. The latest round of monitoring (Year 2 baseline) was completed spring 2015. The results were submitted to the EPA in April 2016 as required. The reports are available on the South32 regulatory webpage http://www.south32.net/our-operations/australia/illawarra-coal/regulatory-document.

IC holds regular meetings with the EPA, community and environmental groups to discuss monitoring results from PRP20 and to plan suitable options to address the requirements of PRP19. Since the establishment of these meetings, a number of improvements have been made to the PRP20 monitoring programs and IC has incorporated feedback from the Group into the various PRP19 projects. The next meeting is planned for September 2016 to discuss environmental flows and water quality limits.

The next round of monitoring for PRP20 will occur in spring 2016.

6.4. GROUNDWATER

No groundwater pollution issues were associated with the BSOP during this reporting period.

At West Cliff (Appin North), water make resulting from strata water inflow is collected in pits and low points in the underground workings where it is mixed with water delivered underground from surface storage. This strata water is brought to the surface either as moisture contained within the coal or as surplus underground water which is pumped to the surface. Once on the surface, the water is piped to the concrete settling tanks where it is used as the main supply for the WCCPP. There were no incidents of ground water pollution within the report period.

At Appin, mine water is pumped from the underground working to the surface for treatment in the Appin West WTP from where it is either fed back underground for use or blended with mine water and discharged via LDP24.

6.5. CONTAMINATED POLLUTED LAND

Environmental Management

Appin

During the 2010/11 reporting period, Illawarra Coal investigated a small area of the Appin East (Central) site that had formerly been used as a fuel dispensing station which comprised two bowsers, a bunded above ground diesel tank, and a bunded refuelling pad. The decommissioned fuelling area was being excavated for the purpose of road construction to upgrade coal loading facilities at the site.

Preliminary investigations found the decommissioned fuelling area contained elevated concentrations of TPH C10-C36. In response to this finding, Illawarra Coal endeavoured to remove the majority of contaminated material from the decommissioned fuelling area to reduce environmental and health risks and ensure the site is suitable for continued industrial land use.

During the excavation and grading works, three previously unknown underground diesel storage tank pits (including a total of four UST's) were discovered. Leakage of diesel was evident in all three UST pits, so after the tanks were removed from site, 0.5-1.0m of soil was excavated from the walls and floor of each tank pit excavation.

Validation sampling of the floor of the excavated area continued to show elevated concentrations of Total Petroleum Hydrocarbons but concentrations of aliphatic and aromatic hydrocarbon compounds were below the NEPC (1999) guidelines for human health. The consultant's validation report indicated that the land remaining in the investigation area and around the UST excavations is suitable for continued industrial land use based on application of the NEPC (1999) guidelines and that the remaining in-situ contamination is not perceived to compromise the ongoing use of the site for industrial purposes. A quarterly monitoring program was established in 2011, with sampling conducted at four locations – T1, P1, P2 and P3. T1 is used to monitor for potential contamination from the old Appin Tip which is located upstream of the site (Figure 7).

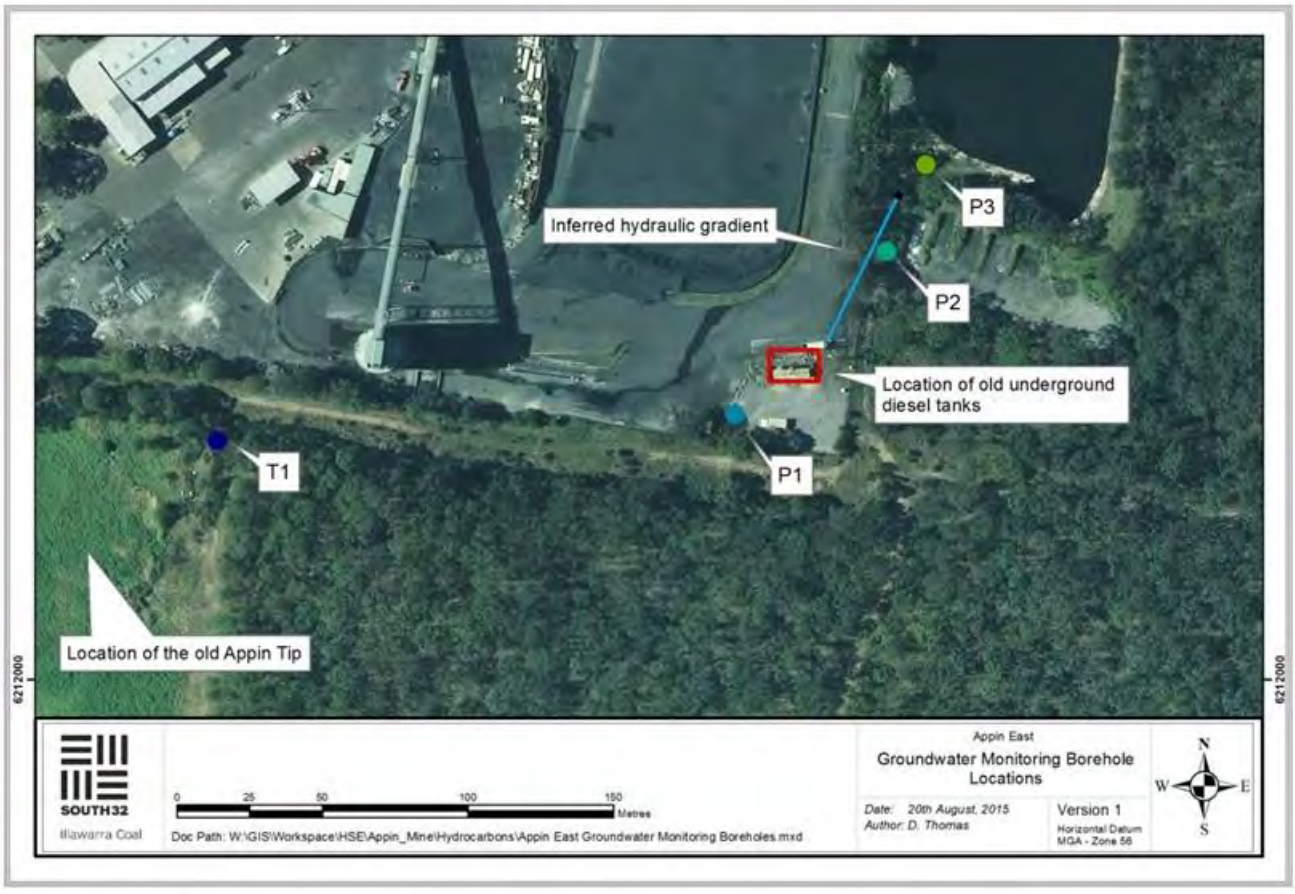


Figure 7: Groundwater Monitoring Bores locations at Appin East (Central).

West Cliff (Appin North)

During the 2009/10 reporting period, both West Cliff (Appin North) Colliery and West Cliff (Appin North) CPP underwent 'Preliminary Contamination Assessments' were undertaken to review site activities and history, a site inspection to look for indicators of contamination followed by a Risk Assessment conducted with relevant site staff.

The site inspection identified a small groundwater seep which was discharging into one of the site dirty water catchment ponds (i.e. Pond P3). The lab analysis of the seep confirmed that the seep contained traces of hydrocarbons and therefore triggered the reporting requirements under Section 60 of the Contaminated Land Management Act 1997 (CLM Act).

As part of the notification, Illawarra Coal proposed to undertake a Comprehensive Contamination Assessment to determine the level and extent of contamination (both groundwater and soil) prior to determining an appropriate management strategy. This approach was endorsed by DECCW (now EPA) on the 11th May 2010.

The Comprehensive Contamination Site Assessment was completed by an environmental consultant during the 2010/11 reporting period. The assessment involved drilling of nine boreholes (BH1 to BH9), screening of 39 soil samples and laboratory analysis of 15 soil samples. Two groundwater bores (BH8 and BH9) were also installed as part of the investigation.

The analysis of the results suggested that the majority of the investigation area appeared to be free of contamination with only four of the samples indicating relatively low levels of contamination, three of which were located within 2.5 metres of a recently decommissioned and removed UPSS. The concentrations were relatively low in the context of an industrial site and analysis indicates the concentrations were likely to be well below NEPM health investigation guidelines for the industrial land use. In addition, a preliminary assessment of the soils waste classification suggested that the soil is likely to be classified as general solid waste. Ongoing monitoring of BH8 has been carried out during the reporting period.

Environmental Performance

Appin

Since the first round of monitoring, all samples across all sites have been uncontaminated with respect to BTEX and TPH.

During the reporting period all boreholes showed below or close to lowest observable limit for TPH (50 µg/L). The small rise in TPH observed at T1 in Jan 2016 is not attributed to site – T1 is used to monitor for potential contamination from the old Appin Tip which is located upstream of the site. The result was below observable limit for the most recent sample.

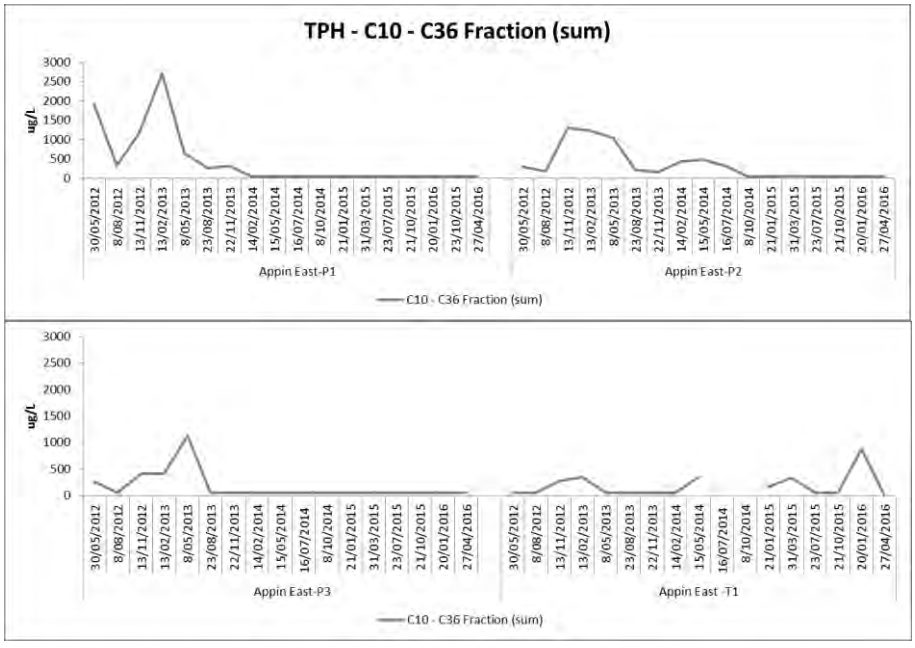


Figure 8: Total Petroleum Hydrocarbons (C10 – C36 Fraction (Sum)) since monitoring began in 2012 at Appin East (Central).

West Cliff (Appin North)

During the reporting period, all samples from BH8 were uncontaminated with respect to BTEX and TPH.

Since the first sampling campaign, TPH concentrations had generally trended downwards in BH8. TPH concentrations had ranged between 2050 µg/L in Feb 2012 down to 260 µg/L in August 2012. The carbon chain range for BH8 are between C10 – C28 indicating that diesel is a potential source of contamination at this location. This is consistent with data reported in the validation report which was submitted to the EPA in August 2010 which indicated there was a small hot spot of contamination remaining.

During the reporting period TPH was below the observable limit.

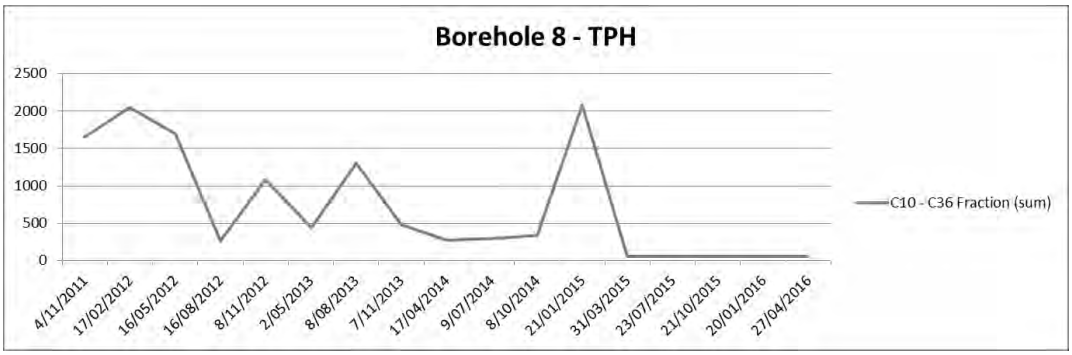


Figure 9: Total Petroleum Hydrocarbons (C10 – C36 Fraction (Sum) µg/L) since monitoring began in 2012 in BH8 at West Cliff (Appin North).

6.6. WASTE

General Waste

General waste is segregated on all sites to maximise reuse and recycling opportunities in accordance with the BSO Waste Management Plan. The waste streams applicable to the BSO are specified in the table below.

Table 14: The main waste streams for the BSO.

Waste Stream	Treatment
Timber	Recycled off site
Cardboard and paper	Recycled off site
Printer Cartridges	Recycled off site
Oil	Recycled off site
Oily waters	Recycled or disposed off-site
Steel and Scrap Metal	Recycled off site
Sewage effluent (treated)	West Cliff (Appin North) – Treatment and irrigation on site. Appin West – Treatment and irrigation onsite Appin East (Central) – Disposed via town sewerage system
Industrial filters	Off-site treatment and disposal
Bathhouse water	West Cliff (Appin North) - Spray irrigated to land on site Appin West - Spray irrigated to land on site Appin East (Central) – Transported to licensed sewage treatment facility for first part of reporting period. Connected to town sewerage system for

	later part of reporting period.
Particulate filter	Off-site treatment and disposal
Hazardous waste	Off-site treatment and disposal
General Waste	Landfill

Solid waste volumes generated at the BSO (including the Appin West, Appin East (Central) and West Cliff (Appin North) sites) for the reporting period are provided in Table 15.

Table 15: Waste Volumes – BSO

	General Waste	Industrial Waste (Filters)	Timber	Metal	Cardboard	Commingle
Quantity (Tonnes) FY15	1146	381	234	1349	30	17
Quantity (Tonnes) FY16	1323	380	225	1344	20	17

Approximately 11% more waste was disposed as landfill for the reporting period when compared to the previous financial year.

Coal Wash

Coal wash is a by-product of processing ROM coal. During the reporting period, a total of 1.6 million tonnes of coal wash (includes Dendrobium, Appin and West Cliff (Appin North)) was emplaced at the West Cliff (Appin North) Emplacement Area. Illawarra Coal received approval to expand the West Cliff (Appin North) Emplacement Area (i.e. Stage 3) from the DoP on the 20 December 2007. The Stage 3 Emplacement Area provides an additional 33.5 million tonnes of coal wash emplacement (refer to table below) with an expected emplacement life of 10 to 15 years (based on projected coal wash volumes).

Illawarra Coal received approval for Stage 4 of the West Cliff (Appin North) Emplacement Area on the 22nd December 2011. The Stage 4 Emplacement Area will provide an additional 59.4 million tonnes of coal wash emplacement (refer to table below) with an expected life to 2041.

Table 16 outlines the capacity and status of each of the West Cliff (Appin North) coal wash emplacement areas.

Table 16: West Cliff (Appin North) Emplacement Area – Capacity and Status.

Emplacement Stage	Estimated Capacity	Emplacement Status
1	4.6	Complete
2	20.8	Current
3	33.5	Current
4	59.4	Not Yet Commenced

Coal Wash Research

During FY16, Illawarra Coal diverted just under 1Mt of coal wash for beneficial uses in the local region (i.e. as an engineered fill, and for the development of arterial and agricultural roads), with over 2Mt diverted since 2009. Illawarra Coal continues to research, develop and implement alternative uses for coal wash and hence minimise the volume emplaced at the West Cliff (Appin North) site.

Illawarra Coal is a member of 'Sustainability Advantage', a business support service. One of the projects from the 'Sustainability Advantage' is a road base mixture which utilises coal wash with other recycled

materials such as fly ash to produce a material suitable for a variety of applications. In 2014 this project was awarded a Green Globe from the NSW Government in recognition of its success in sustainable Innovation.

In late 2014 the RMS published a specification of this material based on the success in trials of this product, and local councils have undertaken trials of this product in their respective areas. Wollongong Council is now actively using this product in a new residential development, and the RMS are looking to use this product as part of major infrastructure projects in the local area.

Following on from the success of these trials, Illawarra Coal has aligned itself with three universities (University of Wollongong, University of Sydney and University of Newcastle) and 4 other industry partners (RMS, Douglas Partners, Infratech and Stabilco) and has been successful in securing an ARC-Linkage Project grant of $590k to conduct research into the long term performance of this material in roads and railways. The project will kick off in FY17, and will take 3 years to complete.

Other sustainable projects that look to incorporate coal wash which have yielded positive results also include cement making and brick making.

Underground Coal Wash Emplacement

Illawarra Coal submitted a revised Underground Coal Wash Emplacement Trial to the Department in 2013. The revised Plan proposed to defer the trial for 5 years for the following reasons:

- Illawarra Coal's focus on diverting material from surface emplacement via alternative beneficial uses continues to provide good outcomes;
- The declaration of Dharawal National Park has eliminated a significant area of potentially suitable roadways for underground coalwash emplacement; and
- The trial replicates what has been demonstrated by another Southern District Colliery.

The key aspects of the Plan remained valid during the reporting period and detailed reports and presentations will be made available at the completion of major research milestones.

Sewage

During the reporting period, ongoing monitoring and inspections were conducted on the two BSO sewage treatment plants (Appin West and West Cliff (Appin North)). Appin East (Central) is connected to town sewage.

There is a Smith and Loveless Sewage Treatment Plant (STP) on the Appin West and West Cliff (Appin North) sites that discharge into maturation ponds. The treated effluent is irrigated on site via LDP 22 (Appin West) and LDP 4 (West Cliff (Appin North)). During FY16 the treatment capacity of the Appin West system was increased (additional aeration installed) to cater for increased manning at Appin West. A waste water maintenance contractor is periodically used to assist with the operational aspects of the Appin and West Cliff (Appin North) Sewerage treatment systems to minimise the likelihood of any issues occurring.

Monitoring of the STP effluent at both sites is undertaken on a monthly basis in accordance with conditions contained with EPL 2504. Results of the monitoring are reported on an annual basis to the EPA via the EPA Annual Return and are made available to the public via the web based environmental monitoring report which is issued every 14 days.

Appin WAC Disposal

Weak Acid Cation Regenerate (WAC), a waste stream from the Appin water treatment plant, is transported offsite to a licensed Waste Management Facility. The total volume of WAC transported off-site during the reporting period was 3.6 ML, a decrease of 0.5 ML when compared to the previous reporting period.

Appin Water Treatment Plant Biological Sludge

The Appin backwash treatment plant was commissioned in April 2009. One of the by-products of the Backwash Treatment process is an organic sludge. The total weight of sludge reused as a soil conditioner offsite at the Emplacement Operations during the reporting period was approximately 360 tonnes.

6.7. THREATENED FLORA AND FAUNA

Environmental Management

Threatened Flora and Fauna communities at the BSO are managed in accordance with the following approved plans:

- West Cliff (Appin North) Coal Wash Emplacement Area Management Plan;
- Broad-headed Snake Management Plan;
- Southern Brown Bandicoot Management Plan;
- Persoonia hirsuta Offset Management Plan;
- Ventilation Shaft No.6 Biodiversity Management Plan;
- Sandstone Shale Transition Forest Offset Management Plan; and
- Surface and Groundwater Quality Monitoring and Adaptive Management Plan for Water Sensitive EPBC Listed Species.

These plans include the management and mitigation measures for threatened species or habitats that occur on our sites and are available on the South 32 website:

http://www.south32.net/our-operations/australia/illawarra-coal/regulatory-document

The *Persoonia hirsuta* is listed as Endangered under both the NSW Threatened Species Conservation Act and Commonwealth EPBC. A substantial population of the *Persoonia hirsuta* is known to exist on the West Cliff (Appin North) Colliery Lease. A number of the *Persoonia hirsuta* are located within operational areas such as high voltage transmission lines on site.

Acacia bynoeana is listed as Threatened under the NSW Threatened Species Conservation Act and Vulnerable under the Commonwealth EPBC. The species has previously been recorded along existing roads, tracks and disturbed areas at West Cliff (Appin North).

Pultenaea aristata is listed as Vulnerable under the NSW Threatened Species Conservation Act and the Commonwealth EPBC. The species has been recorded in areas of impeded drainage in woodland adjoining the main access road and in the vicinity of the southern extent of Stage 3 Emplacement Area. 41 *P. aristata* have been identified within the rehabilitating emplacement area (See Appendix A: Annual Rehabilitation Report).

Flora and Fauna aspects associated with mine subsidence are detailed in section 6.15.

Environmental Performance

Broad-headed Snake and Southern Brown Bandicoot

There has been one instance that required the implementation of mitigation measures for Broad-headed Snakes (as outlined in the approved management plan). On the 5th April, 2016, an individual Broad-headed Snake was located during a pre-clearing inspection in the Stage 3 emplacement area.

The snake was approximately 40 cm long and showed no signs of injury, parasites or other ill-health. The Snake was captured and relocated in accordance with the Broad-headed Snake Management Plan.

Figure 10: Female Broad-headed Snake captured and relocated during a pre-clearing survey in April 2016.

There were no instances that required implementation of mitigation measures for the Southern Brown Bandicoot.

Persoonia hirsuta Offset Monitoring

Overview

During the reporting period, Illawarra Coal conducted its third round of annual condition monitoring of the *Persoonia hirsuta* population at West Cliff (Appin North). The monitoring was undertaken in accordance with the approved *P. hirsuta* Offset Management Plan, which complies with EPBC Approval Condition 2. The monitoring was completed over five days in November and December 2015 during the peak flowering period for the species.

Results

Offset Population

The total count of live plants in spring 2015 was 29; 24 plants have died since baseline (2012); 1 new plant was identified in 2015.

West Cliff (Appin North) Other Areas

A further 32 individuals are being monitored within the surrounding West Cliff (Appin North) lease, 10 of which were recorded in 2012; five in 2013, 13 in 2014 and four in 2015. This includes one plant in the Stage 2 emplacement rehabilitation (Identified in 2014), another within the future Stage 4 boundary, 13 plants on the Brennans Creek Dam access road (and in bushland to the north), and 17 along the south-west boundary of the Appin Road easement.

Total Site Count

The total count for *P.hirsuta* plants at West Cliff (Appin North) in spring 2015 was 61, including 22 plants that have been identified post baseline. Excluding these, there has been a decrease of 24 plants when compared to the 2012 baseline population of 63.

Little has changed since previous monitoring years. The Offset still maintains at a good capacity to regenerate, a high level of native plant species richness, a low level of exotic plant cover and all structural layers are intact (canopy, mid-storey, shrubs and ground-cover).

Overall, the vegetation remains in good condition. The overall health of the core population of *P. hirsuta* is declining as the plants are reaching the end of their natural lifecycle.

Persoonia hirsuta Research

In accordance with EPBC 2010/5350 Condition 3, Illawarra Coal is undertaking targeted research on including:

- Habitat and demography
- Population genetics;
- Seed biology, germination and recruitment and propagation, and
- pollination

The program commenced in 2013; the University of Wollongong (UOW) and Mt Annan Royal Botanic Gardens (RBG) have been engaged to conduct the research. The 'targeted' research by UOW consists of a series of honours projects.

Mt Annan RBG is undertaking trial propagation using cuttings collected from the Appin North population and this is an ongoing project. To date, one P. hirsuta has been successfully propagated.

In addition, Mt Annan RBG (in collaboration with Illawarra Coal and Centennial Coal) has been granted ACARP funding to conduct research on seed germination biology and alternative ex situ storage of Persoonia germplasm for restoration. This commenced in February 2015 and will address two main questions: 1) how to effectively propagate Persoonia species (both rare and common) for mine rehabilitation work; and, 2) what are the most appropriate ex situ conservation options to ensure restoration success.

The research will be completed in 2017, at which time Illawarra Coal will compile the research and make available to the various stakeholders and our website in accordance with Condition 3 (e) & (f).

Persoonia Ecological Burn

In April 2016, IC engaged the NSW Rural Fire Service to conduct an ecological burn in the West Cliff (Appin North) *Persoonia* Offset. The aim of the burn is to promote germination of *P. hirsuta* and increase the density of the species within the area. It is known that fruits of *Persoonia* maintain seeds in a dormant state, which is hard to break artificially and is not well, understood (Myerscough et al. 2000). The general consensus is that the species requires physiological disturbance to break dormancy. The exact germination mechanisms are not yet known; however, it is suspected the combination of heat and smoke from a fire would be a trigger (Auld and Ooi 2008). This is generally supported by observations from other known populations that have been subject to wildfire in the past two years (Alison Haynes Thesis 2015; David Gregory *Pers. Obs.*), and other *Persoonia* species and Proteaceae in general. The Offset has not experienced a fire for at least 25 years.

The burn site will be monitored over the coming year to identify new seedlings.

Figure 11: *Persoonia* ecological burn – April 2016.

6.8. WEEDS

Environmental Management and Performance

Appin

Environmental inspections (which include weed identification) are undertaken at the Appin East (Central) and Appin West sites. When noxious weeds are identified they are removed and treated as per the approved Waste Management Plan. Maps outlining the weed growth areas are provided to the grounds maintenance personnel to assist with identifying the target locations. During the reporting period active weed management included:

- Regular spaying of weed zones by licensed contractors;
- Regular audits of the effectiveness of weed management activities

West Cliff (Appin North)

Ongoing grounds maintenance is undertaken by a contractor who has a regular schedule of work. The annual emplacement rehabilitation monitoring program includes the identification and proposed management strategies to control weed growth within the emplacement areas. Focus areas for weed control are determined through this program. Records of areas targeted are maintained for future reference. Targeted weed control within the emplacement area was undertaken by a licenced contractor during the year which included weed spraying and slashing of perennial grasses.

6.9. BLASTING

No surface blasting activities are undertaken on site. Minor blasting activities underground are undertaken using approved management plans.

6.10. OPERATIONAL NOISE

Environmental Management

Noise across the BSOP is managed in accordance with the approved BSO Noise Management Plan. The Plan was prepared to satisfy Schedule 4, Condition 5 of the BSO approval and details the relevant noise criteria, compliance procedures and controls relating to the mining operations.

The objectives of this plan are to:

- Provide the frame work for the responsible management of noise emissions associated with the project;
- Describe the control measures for management of noise emissions;
- Prevent adverse noise impacts on the amenity of local communities and environment;
- Describe compliance criteria for noise for the project;
- Describe compliance criteria exceedance assessment protocols;
- Describe the noise monitoring program;
- Comply with the relevant requirements of Environment Protection Licence (EPL) No. 2504 and the BSO Project approval;
- Describe measures for the reduction of noise emissions; and

- Comply with South32 and other relevant standards and requirements.

A copy of the Plan is available on the South32 website:

http://www.south32.net/our-operations/australia/illawarra-coal/regulatory-document

Monitoring Program

A noise monitoring program has been developed to comply with Condition 5(f) of Schedule 4 of the Project Approval.

The objectives of the noise monitoring program are to:

- Measure noise levels experienced by nearby residential receivers;
- Assess the effectiveness of the existing noise controls;
- Measure project related noise levels;
- Detect any adverse developments in Project noise;
- Measure Residential Background Level (RBL) noise; and
- Acquire sufficient and reliable data to inform the assessment of compliance with noise criteria

Assessment criteria have been established for each monitoring location, as outlined in Table 17. The criteria enable an assessment of compliance to be made against the noise levels outlined in the Project Approval. The site specific assessment criteria were developed using the following methodology:

- Adoption of the most stringent noise levels as outlined in the Development Consent noise criteria; and
- Where relevant, the noise levels were adjusted (to take into account monitoring location verse receivers) using the noise contours from the BSO Noise Impact Assessment.

Table 17: Noise Survey Points.

Survey Point ID	Type	Receivers	Assessment Criteria		Locality	Function
			$LA_{eq\,(15\,min)}$	$LA_{1\,(1\,min)}$		
AE-NS4	Real-time and attended	Appin township	43 (day, evening and night)	52 (night)	Located in paddock between Illawarra and Toggarai St North of Pit Top behind receiver 137	Noise from AE
AE-NS5	Attended	Appin No.1 and No.2 receivers	40 (day, evening and night)	50 (night)	Northampton Dale Road between the No.2 Shaft Site and power plant project and the nearest residential receivers in the South to East quadrant from site.	Noise levels between Shaft Site and the nearest residential receivers to the SE
AW-NS5	Real-time and attended	All other Appin West receivers	39 (day and evening)	53 (night)	Between nearest residential receivers on Douglas Park Drive and the Appin West Pit Top	Noise level at AW property boundary; Noise levels between AW and nearest

Table 17: Noise Survey Points.						
			35 (night)			residential receivers on Douglas Park Drive
AW-NS4	Attended	Appin West receivers South-west of Appin West; and Appin West receivers near Hume Highway	39 (day and evening) 35 (night)	49 (night)	Ashwood Road, South-west of Appin West Pit Top	Noise level for Appin West Receivers South-west of Appin West; and Appin West Receivers near Hume Highway
AW-NS3	Attended	Appin No.3 receivers	41 (day, evening and night)	49 (night)	Appin No.3 Shaft site at end of Brookes Pt Road	Noise level at Brookes Pt Road and nearest residential receivers to the East of the shaft site
W-NS1	Attended	N/A – Baseline data for West Cliff (Appin North) only	N/A	N/A	West Cliff (Appin North) Brennans Creek Dam	Noise level between the West Cliff (Appin North) emplacement area and the nearest residential receivers to the North of site

The program consists of continuous, real-time noise monitoring and attended monitoring using handheld portable monitors. The attended monitoring is undertaken at the nominated monitoring locations to confirm compliance.

Environmental Performance

Quarterly attended and real-time monitoring was conducted in accordance with the approved management plan for the reporting period. Results of the monitoring are reported online. The online report is accessible via the following link:

http://www.south32.net/our-operations/australia/illawarra-coal/regulatory-document

The assessed noise levels generated from the Bulli Seam Operations were below the Day, Evening and Night assessment criteria in Table 17.

During the reporting period, a noise wall was constructed at the Vent Shaft No.6 site. The wall is constructed of coal wash and has been topsoiled and vegetated.

6.11. VISUAL, STRAY LIGHT

The Appin West Mine Site is not directly visible by residential receivers. Lighting located on the Man and Materials Winder is partially visible by some residences at Wilton, but has not been raised by the community as an issue.

At Appin East (Central), operations are not directly visible by residential receivers. Lighting located at the top of the coal storage bins is partially visible by some residences but has not been raised by the community as an issue.

Due to the relatively remote locality of West Cliff (Appin North) Colliery there are no significant issues in regard to lighting pollution.

There were no lighting impacts from the construction activities undertaken during the reporting period.

Emissions of stray light continued to be assessed quarterly in conjunction with other monitoring outside of daylight hours.

Aesthetics of Mine Safety Gas Drainage activities are addressed by:

- Shielding wells from residences as practicable. This included utilising natural topography and vegetation to screen operations and optimising the position of pad infrastructure;
- Where possible infrastructure is green coloured, or housed in a green coloured compound;
- Green coloured noise barriers are installed at the perimeter of sites within sight of residences; and
- Revegetation of exposed areas as soon as practicable.

To minimise the visual disturbance from the Vent Shaft No.6 site, exposed areas are revegetated progressively as final landform is achieved. The most significant feature is the earthen noise barrier that is was constructed using coal wash. This site has been revegetated.

6.12. ABORIGINAL HERITAGE AND NATURAL HERITAGE

Aboriginal and natural heritage at West Cliff (Appin North) is managed in accordance with the approved West Cliff (Appin North) Coal Wash Emplacement Area Management Plan. This Plan outlines the management/mitigation measures relating specifically to each heritage site located within or in close proximity to the West Cliff (Appin North) Coal Wash Emplacement. A copy of the Plan is available at

http://www.south32.net/our-operations/australia/illawarra-coal/regulatory-document

During the reporting period, Site BC2 was buried by the emplacement operations. Prior to burial, the following management actions were completed:

1. Detailed recording – including scale photographic recording of the art and the sandstone overhang (art recoding will be undertaken using methods that do not involve touching the art surface).
2. Facilitating the agreed Aboriginal Community Enhancement Program with the Tharawal LALC which included funding for: 3D imaging and recording of the landscape; research and sponsorship; and training and employment.
3. Excavation – The archaeological deposits at BC2 have been entirely salvage excavated as per the Preliminary Research Permit #2908.
4. Protection of site using geo-textile and clean sand fill prior to emplacement

The equipment and labour to prepare and backfill the shelter was provided by South Coast Equipment (SCE) together with a representative from the Cubbitch Barta Native Title Claimants Aboriginal Corporate who was invited by the Company to supervise the work. The procedure to encapsulate the sites commenced when the level of coalwash in the Emplacement Area reached the shelter floor. The work proceeded, as follows:

1. A high coalwash embankment is formed in front of the shelter.
2. The floor, walls and roof of the shelter and the inside face of the embankment are lined with geofabric sheeting.

3. Layers of sand are progressively placed in the lined shelter and consolidated to ensure the void is completely filled.

4. This procedure continues until the sand fill reaches the top of the shelter outcrop.

5. At the top of the shelter outcrop the geofabric sheeting is wrapped over to entirely encapsulate the sand fill. Dig Alert Tape is laid over the shelter to mark the location.

6. When sand filling is complete coalwash deposition can proceed to cover the shelter. Coalwash placed over the shelter is carefully compacted up to 1m above the shelter outcrop.

7. A permanent marker is installed above the shelter when the Emplacement reaches the finished level.

8. The location of the sites is recorded on Mine Plans.

The location of all heritage sites at West Cliff (Appin North) is outlined in Plan 13.

Aboriginal and natural heritage aspects associated with subsidence from the underground mining activities are detailed in section 6.15 of this report.

6.13. SPONTANEOUS COMBUSTION

No incidence of spontaneous combustion occurred within this reporting period.

Bulli seam coal has a very low propensity to spontaneous combustion. Sampling programs (at Appin and West Cliff (Appin North)) are in place to detect any changes in coal quality that could potentially lead to spontaneous combustion occurring in coal stockpiles or refuse emplacements.

Routine and Statutory Inspections are used to identify any heating or spontaneous combustion events. In addition, a real time CO monitoring system exits, and all mine officials carry CO handheld monitors.

6.14. BUSHFIRE

The risk of bushfire at Appin West, Appin East (Central) and West Cliff (Appin North) is managed by a combination of preventative and ready response activities. Bushfire management on both sites is achieved through the formation of a “fire break” around the site perimeters fence-line and the establishment of an extensive firefighting water pipeline around the sites (with booster pump facilities).

Appropriate site personnel are trained in emergency response and firefighting and have a large supply of readily available firefighting equipment on the sites.

6.15. MINE SUBSIDENCE

Approvals

Appin Area 7 Longwalls 705 – 710

The Subsidence Management Plan (SMP) for Appin Area 7 Longwalls 705 to 710 was approved by the Department of Trade, Investment, Regional Infrastructure and Services (DTIRIS), now the Department of Industry: Resources and Energy (DRE) on the 28th February 2012 (for Longwalls 705 and 706) and 28th of September 2012 (for Longwalls 707 to 710). The Longwalls 705 to 710 SMP is supported by a number of management plans addressing social, cultural, environmental and infrastructure aspects of the mining area.

Illawarra Coal applied to the DRE to vary the SMP Approval for Longwalls 707 to 710 on the 5th May 2016 to split Longwalls 707 and 708 into Longwall 707 A&B and Longwall 708 A&B. DRE approved the variation on the 9th July 2016.

During the reporting period, Appin Mine continued extracting coal from Longwalls 706 and 707. As of 30th June 2016, Longwall 707 had extracted 855m, with 2472m remaining.

Appin Area 9 Longwalls 901 - 904

The Extraction Plan (EP) for Appin Area 9 Longwalls 901 - 904 was approved by the DPE on the 10th of September 2014. The Longwalls 901 – 904 EP is supported by a number of management plans addressing social, cultural, environmental and infrastructure aspects of the mining area.

Illawarra Coal applied to the DPE to vary the EP Approval for Longwalls 901 - 904 on the 24th of March 2015 to shorten the commencing end of Longwall 901 by 418m. DRE approved the variation on the 29th of April 2015.

Illawarra Coal applied to the DPE to vary the EP Approval for Longwalls 901 - 904 on the 24th of March 2015 to shorten the commencing end of Longwall 901 by 418m. DRE approved the variation on the 29th of April 2015.

Longwall 901 commenced extraction on the 23rd of January 2016 and as of the 25th of June 2016 had extracted 868m, with 1153m remaining.

West Cliff (Appin North) Area 5 Longwalls 37 – 38

The West Cliff (Appin North) Area 5 Extraction Plan (EP) for Longwalls 37 and 38 was approved by the Department of Planning and Infrastructure - DoPI (now the Department of Planning and Environment – DPE) on the 24th March 2014. SMP approval was granted by the Department of Trade and Investment (T&I) on 28th March 2014. The EP is supported by a number of management plans addressing cultural, environmental and infrastructure aspects of the mining area.

A variation to reduce the length of Longwall 37 by 223m at the commencing end was approved on the 6th June 2014 (by DoPI and T&I). Illawarra Coal applied to the DPE to vary the SMP Approval for Longwall 38 on the 1st of September 2014, to reduce the length of the longwall by 59m at the commencing end. DPE approved the variation on the 14th October 2014.

Longwall 38 commenced extraction on the 3rd of February 2015 and was completed on the 1st of February 2016.

Appin Area 7 and 9 Monitoring and Management Programs

The surface features in the vicinity of mining during the reporting period include:

- The Nepean River and associated tributaries;
- Harris Creek and associated tributaries;
- Cliffs, rocky outcrops and steep slopes;
- Aboriginal and European heritage; and
- Buildings and infrastructure.

Monitoring activities within the SMP area includes:

- Water flow, pool water levels and water quality monitoring;
- Photographic and observational monitoring to identify mining-induced fractures, strata gas releases, iron staining and rock falls;
- Aquatic ecology monitoring;

- Aboriginal and European heritage items; and
- Built features.

The results of these monitoring programs are provided below.

Landscape Features

During the reporting period monitoring of environmental features was carried out in accordance with the Appin Longwall 705 to 710 SMP and Longwall 901 to 904 EP. Monitoring was conducted within the zone of influence during baseline, mining and post-mining periods (where applicable).

One zone of gas release, AA7_LW706_001, was activated during the extraction of Longwall 706. It was first observed on the 13th of August 2014 and consisted of four releases in two 2m x 1m areas. When initially observed it was located approximately 3800m south-west of the nearest point of Longwall 706. Due to this distance it is most likely that it is a reactivation of a gas release from previously mined Longwall 16 which was extracted between October 1998 and August 1999 and is the closest longwall to this impact. AA7_LW706_001 was last observed to be active on the 7th of January 2016.

Eighteen gas release zones have been observed in the Nepean River and tributaries as a result of Longwall 901 extraction. Gas releases are reducing as Longwall 901 is extracted further away from the river and at the end of the reporting period fifteen of the releases were still active with three inactive.

For all observed impacts, the appropriate TARP's were applied, actions implemented and key stakeholders notified as required by the approved SMP and EP.

Impacts associated with Longwalls 706 and 901 are summarised in Table 18.

Table 18: Predicted vs Observed Impacts for Landscape Features for Appin Area 7.

Aspect	Predicted Impacts	Observed Impacts
Nepean River water levels	Unlikely for any significant change in water level along the Nepean River	No impacts observed
Surface waters in the mining areas	Potential for surface water diversion directly above or adjacent the mining area	No impacts observed
Gas releases	Likely that gas emissions could occur in the Nepean River	Gas releases identified
Iron staining	Minor iron flocs are expected to occur in the Nepean River. No change in water quality is predicted	No impacts observed
Fracturing	Minor fracturing may occur in the bed of the Nepean River	No impacts observed
Creeks	Possible for localised increase in ponding, flooding or scouring	No impacts observed
Cliffs	Possible minor isolated rock falls. Unlikely that any large cliff instabilities would occur	No impacts observed
Steep Slopes	Unlikely that there would be any significant impacts to steep slopes	No impacts observed

Surface Water

Inspections carried out by the IC Environmental Field Team include monitoring for iron staining and gas releases in the river and tributaries. No areas of iron staining were identified during the reporting period.

Data for pH, Electrical Conductivity, Dissolved Oxygen, Total Iron and Total Manganese are compared at sites upriver and downriver of mining in order to identify any significant water quality change. TARP limits have been established for water quality adjacent to the mining and downriver at monitoring sites.

No TARP trigger levels have been identified to date for Longwall 706 or Longwall 901. Table 19 provides a summary of the predicted and observed impacts for surface waters during the reporting period.

Table 19: Predicted vs Observed Impacts for Surface Water for Appin Area 7.

Aspect	Predicted Impacts	Observed Impacts
Nepean River	Unlikely for any significant change in water level along the Nepean River	No mining-induced water level change has been observed – natural fluctuations with rainfall and WaterNSW dam releases
	Potential for surface water flow diversion is very low	No surface water flow diversion has been observed
	Strata gas emissions into the river likely, with some associated reduction in dissolved oxygen possible	Gas zones observed in the Nepean River and the tributary Allens Creek. No associated reduction in dissolved oxygen has been observed
	Low likelihood of ferruginous springs. Significant impacts on Nepean River pH, iron and dissolved oxygen not predicted	No new iron staining or seeps resulting identified
Harris River	Mine subsidence induced ferruginous springs possible, with potential impacts on water quality	No subsidence induced fracturing or iron staining observed in Harris Creek

Groundwater

Piezometer and bore monitoring data has been used to determine pre-mining groundwater levels and quality. Monitoring undertaken includes deep groundwater (e.g. Bulgo Sandstone and coal seams) and the Hawkesbury Sandstone (shallow groundwater). Targeted monitoring to a depth of approximately 10 m below the level of the Nepean River has been established to determine if there are any changes to groundwater contributions to base flow of the river resulting from mining.

Bore EAW5 [S1913] is located approximately 2.2 km north to northwest of Longwall 706. As mining has progressed water head has declined linearly at EAW5 in the Hawkesbury Sandstone and there is a clear difference in the behaviour of groundwater pressures above and below the Bald Hill Claystone.

This is evidence of the contiguous nature of the claystone across the general Appin mining area and evidence of the pre-mining separation between shallow and deep aquifer heads.

The EAW5 water levels were essentially unaffected by Longwall 706 extraction, outside of a gradual water level decline in the Bulli Seam, Scarborough Sandstone (505mbgl), Bulgo Sandstone (274mbgl) and a rise in the Hawkesbury Sandstone at 65mbgl.

EAW7 (S1936) is located over Longwall 706. A decline of approximately 30m was observed in the Scarborough Sandstone, which was a clear mining effect of Longwall 705. No groundwater level reduction TARP triggers were exceeded during extraction of Longwall 706 and no changes outside of predictions for the monitoring bores occurred.

No adverse effects on groundwater supply, well yield or bore serviceability have been monitored or reported during and following extraction of Longwall 706.

No well yield TARP triggers were exceeded during or following the extraction of Longwall 706. Gas seepage has occurred in one private borehole and this has adversely impacted supply from the bore as a result of mining and is a Level 3 trigger. An alternative water supply has been provided to the landholder.

Aquatic Ecology

Within the Appin Areas 7 and 9 mining domain, significant aquatic habitat is limited to the Nepean River and its tributaries. Four species of aquatic macrophytes and five species of native fish were identified in the EIS and SMP studies. No threatened fish or invertebrate species were identified.

The area is potentially within the range of two threatened species (Macquarie Perch and Sydney Hawk Dragonfly) listed under the Threatened Species Conservation Act.

Mine subsidence can result in fracturing and a net vertical uplift of the river bed, resulting in reductions in water depth. It was predicted that these effects could impact flow, connectivity and water quality and could also reduce availability of aquatic habitat. The Nepean River within the mining areas is generally a deep, continuous slow-flowing pool created by the damming effect of Douglas Park and Menangle Weirs. This would minimise the potential impacts on aquatic ecology resulting from reduced water flow and / or depth caused by any fracturing or net uplift of the river bed. Any impacts on water flow would be expected to be minimal due to the flooded nature of the river system.

The latest round of aquatic ecology monitoring was undertaken in November 2015, as part of the ongoing aquatic ecology monitoring programme. The assessment focussed on the effects of extraction on aquatic habitats and biota in relevent sections of the Nepean River, comparing results from surveys undertaken since 2002 (CEL, 2013).

There were no observed impacts to indicators of aquatic ecology (number of taxa and biotic indices derived from macroinvertebrate sampling) that could be attributed to mining. Differences in the number of taxa between Impact and Control Reaches prior to extraction, and between Control Reaches after extraction of Longwall 706, were not related to mining. Likewise, an increase in the OE50 Taxa Score (a biotic index of aquatic habitat and water quality) at the Impact Reach and a decrease at a Control Reach following the commencement of extraction of Longwall 706 was also unrelated to mining.

Rather, such changes, and other statistically significant differences in various indicators were attributed to natural variation.

Similarly, there was no evidence of any changes to fish and aquatic macrophytes attributable to mining. The fish assemblage sampled in the Nepean River following the commencement of extraction was comparable with that sampled prior to extraction and no fish kills or any other observations that may suggest an impact due to mining have been observed.

Table 20 provides a summary of predicted and observed impacts on aquatic ecology for the reporting period.

Table 20: Predicted vs Observed Impacts for Aquatic Ecology for Appin Area 7.

Aspect	Predicted Impacts	Observed Impacts
Aquatic Ecology	Exposure of wetted substrata in some limited shallow areas of the river, potentially arising due to minor reductions in water depth caused by net uplift of the river bed	No reported change in water level apart from the normal fluctuations associated with rainfall and Sydney Catchment Authority releases. No exposed wetted substrata observed
	Potential water loss or reduced flow due to fracturing of the river bed. However, this was not expected to result in significant water loss or reduced flow due to the flooded nature of this reach	No fracturing observed in the Nepean River and no water loss observed
	Components of aquatic ecology such as flow characteristics, connectivity and water quality should not be impacted by any predicted subsidence	No reported surface water flow diversions, impacts on water quality or connectivity of aquatic plant components

	Alterations to the composition of macrophyte beds due to small reductions in water depth. However, this is not expected to have a significant impact on the overall habitat in the survey area	No alterations to the composition of macrophyte beds observed. No mining induced dieback has been observed
	Possible that gas emissions may have impacts on water quality	No evidence of significant impacts on water quality due to gas releases
	Potential impacts on fish and macroinvertebrates due to mine subsidence are considered unlikely	No evidence of mining induced impact on either fish or macroinvertebrates

Terrestrial Ecology

Assessments of significance have been completed for an endangered community and threatened flora and fauna species in the mining area. The assessment focused on flora and fauna that could potentially be impacted by subsidence. The following aspects were assessed:

- Native vegetation communities;
- Threatened flora; and
- Threatened fauna and fauna habitat.

Plant communities, fauna habitats, threatened species, populations and ecological communities have not been significantly impacted by subsidence during the reporting period as outlined in Table 21 below.

Table 21: Predicted vs Observed Impacts for Terrestrial Ecology for Appin Area 7.

Aspect	Predicted Impacts	Observed Impacts
Vegetation communities and fauna habitat	Minor impacts to riparian habitats on the Nepean River through changes in water levels, desiccation, gas release and minor fracturing	No impacts observed
	Minor impacts to vegetation due to rock falls, an increase in ponding, flooding or cracking to drainage lines and creeks	No impacts observed
Threatened flora	Unlikely that any threatened flora would be significantly impacted	No impacts observed
Threatened fauna	Unlikely that threatened fauna or habitats will be significantly impacted	No impacts observed

Cultural Heritage

European Heritage

No historical sites are located above the mining area.

Aboriginal Heritage

Based on the subsidence predictions provided by MSEC (2008) for Longwalls 705 to 710, it is unlikely that there will be impacts to the archaeological sites resulting from the extraction of the longwalls (Biosis, 2008).

Bradcorp 1 is an Aboriginal site located over 500m south-west of the commencing (western) end of Longwall 901. The site is outside the area predicted to experience subsidence, tilts, curvatures or strains (MSEC 2012).

Surface Infrastructure

Surface infrastructure located within or near the mining areas includes the following:

- Optical fibre cables (Telstra, Optus, NextGen and Powertel);
- Main Southern Railway and associated infrastructure;
- HW2 Hume Highway and associated infrastructure;
- Local roads and drainage culverts;
- Low voltage power lines;
- Copper telecommunications cables;
- Building structures, pools, water tanks and farm dams;
- Groundwater bores;
- Heritage structures;
- The Nepean Twin Bridges at Douglas Park;
- Pumps in the Nepean River;
- The Upper Canal, Cataract Tunnel and associated infrastructure; and
- Survey Control Marks.

A summary of the observed impacts during reporting period is provided in Table 22.

Table 22: Predicted vs Observed Impacts for Surface Infrastructure for Appin Area 7.

Aspect	Predicted Impacts	Observed Impacts
Local Road	Minor cracking and localised heaving of the road surface in some locations above the longwall	Cracking observed to pavement on Menangle Road more than 400 m from mining. Cracks are not considered to be due to mine subsidence.
HW2 Hume Highway	No impacts on the safety or serviceability of the highway after the implementation of the management strategies	No adverse impacts to safety or serviceability. Humps formed on both carriageways and these were remediated by re-shaping of the pavement surface as part of Management Plan responses.
Main Southern Railway	No impacts on the safety or serviceability of the railway after the implementation of the management strategies	Changes in track geometry recorded and remediated in accordance with the established Management Plan. No adverse impacts to safety and serviceability
Douglas Park Twin Bridges	Impacts unlikely after the implementation of the TARP	No reported impacts
Moreton Park Road Bridge (south)	Impacts unlikely after the detailed investigation, analysis and implementation	No reported impacts

Table 22: Predicted vs Observed Impacts for Surface Infrastructure for Appin Area 7.		
Aspect	**Predicted Impacts**	**Observed Impacts**
	of the TARP	
Low voltage power lines	Impacts unlikely, but minor mitigation measures may be required	No reported impacts
Copper telecommunications cables	Impacts unlikely	No reported impacts
Optical fibre cables	Impacts unlikely with the implementation of the management strategies including OTDR monitoring and mitigation	Small levels of signal loss measured
Building structures	Typically Category A Tilt Impacts, with 1 x Category B Tilt Impact. Typically Category 0 Strain Impacts, With 6 x Category 1 Strain Impacts, 4 x Category 2 Strain Impacts	To date, one claim made to MSB for impacts to house and one claim in the process of being made, due to the extraction of Longwall 706
Pools	In ground pools could be more susceptible to ground strains	One impact reported (claim included with house impact mentioned above)
Water tanks	Impacts unlikely	No reported impacts
Farm dams	Potential for minor cracking or leakage	One claim to the MSB for impacts to a dam
Heritage structures	Impacts unlikely	No reported impacts
Groundwater bores	Potential for blockage or reduction in the capacity of the groundwater bores	One private bore impact
Pumps in the Nepean River	Impacts unlikely	No reported impacts
The Upper Canal, Cataract Tunnel and associated infrastructure	Impacts unlikely	No reported impacts
Survey control marks	Small far-field horizontal movements which could require re-establishment	Small far-field horizontal movements

West Cliff (Appin North) Monitoring and Management Programs

The surface features in the vicinity of mining during the reporting period include:

- The Georges River and associated tributaries;
- Rocky outcrops and steep slopes;
- Local roads;
- An aero-club airfield;
- Aboriginal and European heritage; and
- Buildings and infrastructure.
- Monitoring activities include:
- Water flow, pool water levels and water quality monitoring;
- Photographic and observational monitoring to identify mining-induced fractures, strata gas releases, iron staining and rock falls;
- Aquatic ecology monitoring;
- Aboriginal and European heritage items; and

- Buildings and infrastructure.

Landscape Features

Monitoring of natural features above and adjacent to Longwall 38 includes regular inspections of the Georges River as well as riparian features and cliffs.

Pool water levels, flows, water quality, photographic and observational monitoring are undertaken to identify any mining-induced impacts such as fractures, strata gas releases, iron staining or rock falls from cliffs, steep slopes or rock outcrops. Table 23 summarises predicted and observed impacts from Longwall 38.

Table 23: Predicted vs Observed Impacts for Landscape Features for West Cliff (Appin North) Area 5.

Aspect	Predicted Impacts	Observed Impacts
Georges River and tributaries	Negligible environmental consequences including: negligible diversion of flows or changes in the natural drainage behaviour of pools; negligible gas releases and iron staining; and negligible increase in water cloudiness. over at least 80% of the stream length subject to vertical subsidence >20mm. No subsidence impact or environmental consequence greater than minor.	Multiple fractures and dislodged rocks on GR_Rockbar 49. Fractures range from 1.3m to 10m long. Flow diversion evident. Rock fracture up to 4m long in GR104. Fracturing and extension of bedding plane in Rockbar 6A of GR108 approx. 1.4m long. Fracturing and uplift in Channel 2 of GR108. Maximum fracture approx. 10m long. Fracturing and uplift downstream of GR108_Pool. Largest fracture approx. 1.2m long. No flow diversion. Minor iron staining. Fracturing to boulders and base of GR110. Fractures up 2.1m long. Loss of surface flow. Fractures to Rock Outcrop adjacent to GR110. Largest fracture is approx. 2.1m long. 20m section of iron staining downstream of GR_Pool 49.
Cliffs	Cliffs of "special significance": Negligible impact (that is occasional rock falls displacement or dislodgement of boulders or slabs, or fracturing, that in total do not impact more than 0. 5% of the total face area of such cliffs) within any longwall mining domain. Other cliffs: Minor impacts (that is occasional rock falls, displacement or dislodgement of boulders or slabs, or fracturing, that in total do not impact more than 3% of the total face area of such cliffs within any longwall mining domain)	No impacts observed
Access Track	Minor impacts	Two areas of soil cracking across fire trails. Approx. 3m long. No impact to access.

Surface Water

The monitoring program provides a basis for the comparison of flow, pool level and water quality in the area before, during and after mining as outlined in the West Cliff (Appin North) Colliery Area 5 Longwalls 37 to 38 EP.

The pH, DO, ORP and salinity in the Georges River and tributary sites maintained a similar variability, with no significant change to the baseline range, along with no significant change in trend or extended adverse changes being observed as a result of extraction of Longwall 38. No TARP trigger levels were attained for pH due to extraction of Longwall 38.

During the extraction of Longwall 38, a 20m section of iron staining was observed in the Georges River downstream of GR_Pool 49. Minor iron staining was noted at impacts WCA5_LW38_002, as well as WCA5_LW38_005 in tributary GR108.

The levels of Mn, Ni and Zn in Georges River maintained similar pre Longwall 38 variability, with no significant change to the observed ranges as a result of extraction of Longwall 38.

Fracturing was identified in the Georges River at GR_Rockbar_49. The largest fracture at this site is 10m long and 0.04m wide. Flow diversion was observed and the impact is a Level 2 Trigger under the TARPs.

During monitoring for Longwall 38, below baseline levels were reported for Georges River pools; GR_Pool 60, GR_Pool 59, GR_Pool 58, GR_Pool 57, GR_Pool 56, GR_Pool 54 and GR_Pool 44. These pools have been reported during the extraction of previous longwalls and have been attributed to Longwall 35 impacts. During significant rainfall events and increased mitigatory flow from Brennans Creek Dam these pools continue to show water levels similar to baseline. However, these water levels decrease during periods of low rainfall and reduced releases from Brennans Creek Dam.

Remediation options for impacted sections of the Georges River as a result of Longwalls 32 to 38 will be addressed in the Georges River Remediation Plan (in draft).

A summary of the observed surface water impacts for Longwall 38 is provided in Table 24.

Table 24: Predicted vs Observed Impacts for Surface Water for West Cliff (Appin North) Area 5.

Aspect	Predicted Impacts	Observed Impacts
Georges River	Negligible environmental consequences including: negligible diversion of flows or changes in the natural drainage behaviour of pools; negligible gas releases and iron staining; and Negligible increase in water cloudiness. Over at least 80% of the stream length subject to vertical subsidence >20mm. No subsidence impact or environmental consequence greater than minor.	Based on analysis of the long-term water quality records for designated upstream and downstream sites of Longwall 38, no significant water quality impacts were observed or measured within the Georges River. Fracturing and diversion of flow with lower pool levels. Pool water levels respond to increased releases from Brennans Creek Dam.

Groundwater

No adverse interconnection of aquifers and aquitards has been observed within 20m of the plateau surface and no increased rate of groundwater recharge into the plateau has been observed as a result of Longwall 38.

No TARP trigger levels related to aquifer or aquitard interconnection or changes in recharge have been observed as a result of Longwall 38.

Water levels in Piezometers GR27, GR28, GR70 and WC54 have not been affected by subsidence up to the end of extraction of Longwall 38, although GR28 was affected by an approximately 6m drop associated with subsidence in August 2011.

The water level in WC95 fell by approximately 9m between the end of March and late May 2015 and then recovered by approximately 4m up to mid-January 2016.

A Level 1 TARP was triggered by the 9m reduction in water level in piezometer WC95 as the fall was between 5 and 7.5 m greater than the predicted reduction in Hawkesbury Sandstone related depressurisation over a minimum two month period.

The landowner at Lot 10, DP3221 reported an adverse effect on groundwater pumping supply and iron levels from bore GW72454 in mid-November 2015. The landowner at Lot 81, DP622780 reported an adverse effect on groundwater supply from bore K10bh01 in March 2016 in that it had not been performing as usual for several months. Alternative water supply has been provided where appropriate.

There were no bore water quality TARP triggers during or after the extraction of Longwall 38.

No increased groundwater inflow to the West Cliff (Appin North) mine workings following extraction of Longwall 38 has occurred and no TARP trigger levels have been reached or exceeded.

Aquatic Ecology

The latest round of aquatic ecology monitoring was undertaken in November 2015. The monitoring program focuses on three main indicators:

- Aquatic habitat, including fish habitat, aquatic macrophytes and riparian vegetation;
- Aquatic macroinvertebrates sampled in accordance with the Australian River Assessment System (AUSRIVAS); and
- Fish sampled using backpack electrofishing.

The results of the November 2015 survey were compared with those obtained in May 2002, March 2005, November 2007, September 2008, May 2010, May 2012, December 2012, November 2013 and December 2014.

Data collected during December 2014 and November 2015 suggested that impacts to indicators of aquatic ecology in some sections of the river, previously observed in November 2013 following mining impacts in the Georges River due to extraction of Longwall 35, have recovered to some degree. Recovery is almost certainly a result of the restoration (at least temporarily) of pool water levels and flow in affected areas of the Georges River attributed to the additional releases of water from Brennans Creek Dam which were implemented as an ameliorative measure following extraction of Longwall 35.

There is no evidence to suggest the extraction of Longwalls 36 to 38 has had any impact on aquatic ecology. This finding is not surprising considering that minor physical impacts and no significant impacts to water quality have resulted from extraction of these longwalls.

A summary of predicted and observed impacts on aquatic ecology is provided in Table 25.

Table 25: Predicted vs Observed Impacts for Aquatic Ecology for West Cliff (Appin North) Area 5.

Aspect	Predicted Impacts	Observed Impacts
Aquatic Ecology	Threatened species, threatened populations, or	Mining impacts in the Georges River due to extraction of

	endangered ecological communities: - negligible environmental consequences	Longwall 35, have recovered to some degree. There is no evidence to suggest the extraction of Longwalls 36 to 38 has had any impact on aquatic ecology.

Terrestrial Ecology

A baseline Terrestrial Flora and Fauna Assessment (Flora Search, 2009; Biosphere, 2009) was undertaken in support of the Bulli Seam Operations Environmental Assessment, the Study Area for these assessments included the Longwalls 37 and 38 Study Area. Supplementary field surveys for terrestrial biodiversity were undertaken by Niche (2013), for the purposes of the Longwall 37 and 38 EP.

Subsidence effects are unlikely to have a significant impact on any threatened flora or fauna species (Niche, 2013). However, impacts may lead to the alteration of habitat and the alteration of the natural flow regimes of rivers, stream, floodplains and wetlands following longwall mining (Niche, 2013).

Visual inspections of vegetation communities within the Longwalls 37 and 38 Study Area are undertaken as a part of routine landscape and water monitoring programs. Monitoring focuses on detecting significant changes to vegetation communities and fauna habitat present within the Longwalls 37 and 38 Study Area.

No impacts were observed to the vegetation within the study area during inspections undertaken throughout the Longwall 38 extraction period. Table 26 summarises the predicted and observed impacts for the reporting period.

Table 26: Predicted vs Observed Impacts for Terrestrial Ecology for West Cliff (Appin North) Area 5.

Aspect	Predicted Impacts	Observed Impacts
Ecology	Threatened species, threatened populations, or endangered ecological communities: - negligible environmental consequences	No impacts observed.

Cultural Heritage

European Heritage

No historical site is located above Longwall 38.

Aboriginal Heritage

There were no new impacts identified as a result of Longwall 38 extraction. Impacts have previously been noted to Aboriginal shelter sites Georges River No. 2 (AHIMS # 52-2-2243) and Georges River No. 3 (52-2-2243). These impacts were a result of subsidence movements from Longwall 35 (Niche 2013) and Longwall 36 (Niche 2014) and have not been further impacted by the extraction of Longwall 38.

A summary of the inspection on archaeological sites from the extraction of Longwalls 37 is outlined in Table 27 below.

Table 27: Summary of Site Visits to the Aboriginal Heritage Sites in Proximity to Longwall 37.

AHMS Site Number	Site Name	Results of Inspection
52-2-2243	Georges River 2	Impacts to this shelter had been noted in Niche (2014). Observations found that impacts had not worsened and remained in the same condition as described by

		Niche 2015. The art panel remains in the same condition as described in Biosis Research 2007 and Niche 2013b, 2014 and 2015 and has not been affected by the observed changes.
52-2-2244	Georges River 3	This shelter was in the same condition as described by Niche 2015. There has been no further movement of the horizontal bedding plane joints of the shelter and the cracking and exfoliation observed in relation to LW35. The site remains the same as previously described. The art panel remains in the same condition as described in Biosis Research 2007 and Niche 2013b.
52-2-2242	Georges River 4	Shelter and Art are in the same condition as described by Biosis Research 2007 and Niche Environment and Heritage 2011, 2013, 2014 and 2015.
52-2-2234	Georges River 1	This shelter is in the same condition as previously described in both Biosis Research 2007 and Niche Environment and Heritage 2011, 2013, 2013b and 2014. Natural weathering of the art panel has caused further granular loss, and a white leeching process has occurred over the infill kangaroo.
52-2-2241	Georges River 5	Shelter and art are in the same condition as described by Biosis Research 2007 and Niche Environment and Heritage 2011, 2013 and 2014.The previously reported charcoal drawings were in the same condition as described previously by Biosis 2007. The single quartz artefact was not observed in the shelters drip line during this assessment.
52-2-2235	Georges River 6	The site could not be accessed due to landholder restrictions.

Surface Infrastructure

Subsidence monitoring programmes are developed in consultation with key stakeholders and ensure that all key infrastructure and other surface features located above the extraction areas are closely monitored to assess subsidence movements and impacts.

Monitoring frequency varies in relation to the proximity of mining to the features in accordance with the agreed monitoring plans. Frequencies vary from weekly during periods when subsidence is most active, to monthly or pre and post longwall extraction for some types of infrastructure.

All survey reports are checked, reviewed and assessed by the Illawarra Coal Survey Team with additional reviews undertaken by the Illawarra Coal Subsidence Management Review Committee which meets on a monthly basis. A summary of the predicted and observed impacts for surface infrastructure is provided in Table 28 below.

A summary of the predicted and observed impacts for surface infrastructure is provided in Table 28 below.

Table 28: Summary of Assessed and Observed Impacts for Surface Infrastructure for FY16.

Surface Infrastructure	Predicted Impacts	Observed Impacts
Public Roads and tracks	Impacts unlikely, however may present as cracking and heaving which would be minor in nature.	Soil cracking in two access tracks to Georges River.
Endeavour Energy 66 kV, 11 kV	Impacts unlikely.	No reported impacts.

Table 28: Summary of Assessed and Observed Impacts for Surface Infrastructure for FY16.		
Surface Infrastructure	**Predicted Impacts**	**Observed Impacts**
and low voltage power lines		
Telstra Copper Cables	Impacts unlikely.	No reported impacts.
Rural Building Structures	Minor impacts that could be remediated using normal building techniques. Structures would remain safe and serviceable	One impact reported where the concrete slab in a shed had dropped
Tanks	Impacts unlikely.	No reported impacts.
Farm Dams	Potential for some minor cracking or leakage in farm dams.	Leaking in one dam reported.
Houses	Generally slight to minor impacts anticipated, but possible major impacts due to irregular movements.	Cracking to one house reported
Pools	Tilt could be visible along waterline and inground pools could be more susceptible to strain impacts.	Cracking in one pool reported
Fences	Possible that some fences could experience slight impacts.	No reported impacts.
Survey control marks	Small far-field horizontal movements which could require re-establishment.	Small far-field horizontal movements.

Environmental Research Program

During the reporting period Illawarra Coal undertook research into an improved understanding and prediction of subsidence impacts. Understanding strata conditions and properties contributes significantly to the prediction of subsidence impacts. Testing of overburden strata (core and in situ) has been completed during the exploration program to further define the mechanical, hydrogeological and geochemical properties of rock strata. This work has been undertaken in the Area 7 and 9 mining domains.

A regional network of pore pressure monitoring bores with vertical arrays of transducers has been installed to assess and quantify the height and impacts of subsurface fracturing. This network was further developed during the reporting period as part of the exploration program.

Analysis of the available groundwater level data from shallow and deep groundwater systems indicates that mining is not having an unexpectedly strong influence on groundwater levels in the deep groundwater systems, e.g. the Bulli Seam and Scarborough Sandstone. These depressurisation effects are in areas and horizons where there is very little productive groundwater resource or extraction for anthropogenic purposes. Furthermore, and more importantly for environmental and anthropogenic groundwater users, the data shows that the mining impact on groundwater levels in the Bulgo Sandstone and the shallow Hawkesbury Sandstone is in line with predictions and the approved BSO environmental approvals.

Drawdowns of up to 10 metres are observed in the Hawkesbury Sandstone, however these mining influences are temporary, and water levels generally recover within months of longwalls being completed. Based on the analysis of heads around the Nepean River piezometers, gradients toward the river were preserved, which maintains base flows to the rivers.

Comparison of the predicted groundwater levels and drawdowns from the EA Groundwater Assessment (Heritage Computing, 2010) with observed data for the reporting period suggests that the model is a useful tool for groundwater assessment. The match between modelled and observed water levels is generally good to fair.

Illawarra Coal implements targeted research to improve the understanding and prediction of environmental consequences on significant natural features resulting from subsidence impacts. The research is directed at improving the prediction, assessment, remediation and/or avoidance of subsidence impacts and environmental consequences on significant natural features.

During the reporting period Illawarra Coal continued to develop the Swamp Rehabilitation Research Plan (SRRP) in consultation with the Department of Planning and Environment. The objectives of the SRRP are to:

- Investigate methods to rehabilitate swamps subject to subsidence impacts and environmental consequences;
- Establish a field trial (for a 5 year duration or longer) for rehabilitation techniques at a swamp or swamps that have been impacted by subsidence; and
- Include a schedule for subsequent trials, development of work plans and ongoing reporting.

Detailed monitoring programs have been implemented to provide a basis for the design and implementation of any swamp mitigation or remediation required. Swamp rehabilitation options have been developed from rehabilitation programs in the Georges River and from swamp rehabilitation techniques used for non-mining related impacts in the Blue Mountains and other areas. Research programs and projects undertaken by Illawarra Coal will develop further understanding of the factors which influence swamp health and function, if and how swamps have been changed due to mining and what rehabilitation methods may be required for swamp restoration.

Remediation works were undertaken from 2002 – 2005 to reduce impacts to the Georges River at Pools 8, 9, 14, 15 and 16, Marhnyes Hole and Jutts Crossing. These previous mitigation works demonstrate that remediation of mining induced subsidence impacts can be achieved within acceptable environmental limits. The following grouting techniques have previously been implemented:

- hand mortaring;
- pattern grouting; and
- deep angled hole grouting.

The works have proven successful, with flows and water levels during low flow conditions being restored in areas where rehabilitation has been completed. Further rehabilitation is proposed for the Georges River where impacts occurred from Longwalls 35 and 38. The plan has been developed in consultation with key Government stakeholders. As part of these works Illawarra Coal will undertake research into the implementation and effectiveness of the rehabilitation techniques.

Illawarra Coal submitted a revised Underground Coal Wash Emplacement Trial 13th October 2013. The revised Plan proposed to defer the trial for 5 years for the following reasons:

- The trial replicates what has been demonstrated by another Southern District Colliery
- The declaration of Dharawal National Park has eliminated a significant area of potentially suitable roadways for underground coalwash emplacement
- Illawarra Coal's focus on diverting material from surface emplacement via alternative beneficial uses continues.

Illawarra Coal supported a number of research projects relating to beneficial coalwash use during the reporting period and this has opened up significant potential for diverting coalwash from emplacement. The FY17 forecast is for 86% of coalwash from Dendrobium Mine to be diverted to beneficial uses.

6.16. HYDROCARBON CONTAMINATION

Refer to section 6.5.

6.17. METHANE VENTILATION

The in-seam gas content of the Bulli Seam in the Appin and West Cliff (Appin North) areas is in the order of 12 to 14 cubic metres of methane per tonne of in-situ coal. Both operations maintain a comprehensive underground methane drainage program which includes a network of drill holes and pipes to recover a large proportion of this gas by in-seam and cross-measure drainage. Methane drainage is necessary to provide a safe, compliant and productive underground mining environment.

Drainage gas extraction, utilisation and venting rates are reported on a monthly basis and these readings are used by Illawarra Coal for Greenhouse Gas (GHG) accounting. During this period the Appin and West Cliff (Appin North) monitoring systems, procedures and figures reported were audited (reasonable assurance) as required by statutory and internal requirements.

6.18. MINE SAFETY GAS DRAINAGE

Details of the goaf gas drainage activities, including current status of each of the established well sites, is provided in Mine Safety Gas Drainage section of this report.

At West Cliff (Appin North), no surface gas drainage activities were undertaken as underground operations ceased.

At Appin, surface gas drainage activities occur above the Appin Area 9 mining domain. Surface gas drainage activites undertaken during FY16 involved connecting the surface wells into the underground gas drainage network where the gas is utilized by the offsite EDL Power Plant. Only 8 days of flaring (July 2015) were undertaken.

Mine Methane Extraction

Appin

The methane gas extracted from the coal seam by the underground gas extraction network is directed to the surface, via the gas drainage plant, from where it is piped to the electricity generation plants and used to generate electricity. The electricity generation plants are operated by EDL. A total of 1726 $ktCO_{2e}$ was recovered and transferred (i.e. abated) to the EDL Power Plant.

West Cliff (Appin North)

The West Cliff (Appin North) Methane Drainage Extraction Plant and the gas blower station was decommissioned following the completion of Longwall mining in Area 5 in early 2016.

A total of 852 ktCO2e was recovered and transferred (i.e. abated) to the EDL Power Plant which equates to a 59% increase when compared to the previous reporting period.

Mine Ventilation Fans

Appin

During the reporting period, approximately 1735 ktCO2e was emitted to atmosphere from the Appin Mine Ventilation System, up 33% when compared to FY15. The average CH4 concentration was 0.69% (similar to FY15) and the average CO2 concentration was 0.32% (similar to FY15).

West Cliff (Appin North)

During the reporting period, approximately 852 ktCO2e was emitted to atmosphere from the West Cliff (Appin North) Mine Ventilation System, a 10% increase from FY15. The average CH4 concentration was 0.53% (Drop of 0.06% from FY154) and the average CO2 concentration was 0.26% 0.34% (drop of 0.08% from FY15).

WestVAMP

The WestVAMP project was designed to consume low purity methane in air mix (mine vent air) to produce electricity. The project was completed during the 2007/08 reporting period. The plant is scaled to utilise approximately 20% of the available mine vent air with a generation capacity of 6MWh. WestVAMP consumed 8,497,826m3 of coal mine waste gas during the reporting period (CMWG). The WestVAMP power generator produced 21,265 MWh (net) of electricity which was wholly utilised by the West Cliff (Appin North) Colliery. This is a large decrease when compared to the previous periods' abatement and generation performance as the WestVAMP facility was shut down for decommissioning during the reporting period. The project has been a significant Greenhouse Gas reduction initiative, which complements the reductions presently achieved by the Appin and Tower Power Plant Projects.

6.19. HAZARDOUS MATERIAL MANAGEMENT

Storage

Oils are stored in purpose built facilities with appropriate bunding and firefighting provision. A licensed contractor is engaged to remove and recycle and/or dispose of used oil and grease products through appropriately licensed facilities.

Diesel fuel is brought to the Appin East (Central), Appin West and West Cliff (Appin North) sites by road tanker and stored in above ground bunded tanks from where it is transferred to diesel pods for underground use or direct to machinery.

The chlorine dioxide dosing plant at Brennans Creek Dam is still in use. This includes storage of approximately 5000 L of Sodium Hypochlorite and 5000 L of Hydrochloric Acid.

All explosives / detonators for the Appin operations are currently stored at the explosives storage facility located at the Appin West and Appin East (Central) mine site. Storage facility information is provided below.

Table 29: Explosives and Detonator Storage - Appin

Site	Type	Capacity
Appin East (Central)	1.1D Explosive type E	300 kg
	1.1D Explosive type A	250 kg
	1.1B Detonators	5000 detonators
Appin West	1.1D Explosive	2000 kg
	1.1B Detonators	5000 detonators

Details of the bulk chemical storage locations associated with the Appin operation are provided in the tables below.

Table 30: Summary of Dangerous Goods Storage on the Appin West Site.

Depot	Class	Type of Storage	Product Name	Maximum Volume (L)	Normal Storage (L)
2	8	Above Ground Tank	Hydrochloric acid	12,000	12,000
3	C1	Above Ground Tank	Diesel	42,200	40,000
4	8	Above Ground Tank	Sodium Chlorite	3,000	2,700
5	8	Above Ground Tank	Hydrochloric Acid	3,000	2,700

Table 31: Summary of Dangerous Goods Storage on the Appin East (Central) Site.

Depot	Class	Type of Storage	Product Name	Maximum Volume (L)	Normal Storage (L)
2	C1	Above Ground Tank	Diesel	36,600	36,000
3	8	Above Ground Storage	Ferric Chloride	3000	3000
4	8	Above Ground Storage	Sodium Hypochlorite	3000	3000

There is one monitoring gauge (moisture scanner) at the Appin East (Central) Surface Elevator Belt that contains low emission radioactive isotopes. This gauge is licensed and maintained as per the legal requirements. The gauge is housed in an appropriate container and is inspected and tested in accordance with legislative requirements.

There are several monitoring gauges (moisture scanners) in the WCCPP that contain low emission radioactive isotopes and these gauges are licensed and maintained as per legal requirements. All gauges are housed in appropriate containers and are inspected and tested in accordance with legislative requirements.

6.20. NORTH CLIFF

The North Cliff Mine Site and access road is located between O'Hares Creek and Stokes Creek. The majority of the site is gently sloping in a northerly direction towards O'Hares Creek. The mine site covers an area of approximately 10.3 hectares of which approximately 6.5 hectares is undisturbed by mining activities. The North Cliff site is shown in Plan 10.

Access to the site is along 10B and 10C Fire Trails from an intersection on the Bulli/Appin Road, 6 km northwest of Bulli Pass. The 4.5 km long access road is included in the mine site Coal Lease CCL724.

Land Ownership and Approvals

The North Cliff Mine Site and access road is subject to CCL724, which includes the surface and land below to an unlimited depth over the mine site and to a depth of 15m over the access road. Consent to establish the mine was granted in 1981 by the Minister for Planning and Environment under Section 101 of the Environment Planning and Assessment Act 1979 and subsequently amended under Section 102 of the Act.

History

Mining operations commenced at the site in 1983, with mining operations restricted to a single unit Continuous Miner. The ROM product was brought to the surface through the No.4 shaft and into a 400 t surge bin, from which the product was loaded into trucks and transported to West Cliff (Appin North) Colliery for processing.

Mining operations ceased at North Cliff in 1990 at which time all underground equipment was removed from the site. The two shafts were temporarily sealed with concrete caps with additional security fencing and associated signage installed to prevent unauthorised access. A number of the buildings and associated structures, and various other pieces of equipment were also removed from site. Periodic inspections are undertaken by the Site Environmental Representative.

Remaining Infrastructure

As specified above, most of the infrastructure that was located on the North Cliff site was removed following closure of the mine in 1990. The major structures remaining on the site include:

- No.3 shaft head frame;
- No.4 shaft head frame; and
- Sub-station base slabs.

There are also various items of redundant equipment on the site, however these are not posing an environmental or safety hazard. There has been no equipment removed from site during the reporting period.

Site Security

The North Cliff Site is enclosed with a 1.8 metre high fence with two locked entry gates. The site security fencing is inspected on a regular basis.

Site Rehabilitation

An area on the site between the two shafts was used for the disposal of spoil excavated from the sinking on the shafts. The spoil heap, which covers an area of approximately 3.5 ha and containing 55,000 m^3 of loosely tipped shale and sandstone, has been graded, shaped and regenerated with local vegetation species.

The West Cliff (Appin North) Conceptual Closure Plan details the remaining site specific closure works to be undertaken at this site. A summary is provided below:

- Remove infrastructure;
- Fill and seal No. 3 and No. 4 shafts in accordance with DTI requirements;
- Demolish and remove all concrete slabs and bitumen surfaces including hardstand areas;
- Remediate any contaminated soil by removal, encapsulation or land farming on site;
- Backfill lagoon with wall material and clean material;
- Topsoil bare or stripped areas, where appropriate;
- Re-profile site as per the final landform design to reduce the slope lengths by constructing contour banks and armouring channels to prevent erosion;
- Revegetate as per the final revegetation/landscape plan utilising local species. Rip and seed to stabilise the bare soil using an appropriate method (such as hydro-seeding/hydro-mulching); and
- Develop ongoing maintenance management plans.

Post Closure works will include:

- Monitor frequently until vegetation establishment, and then on a minimum 12 monthly basis for at least 5 years after works have been completed (or site sold); and

- Carry out weed control and replanting/reseeding as necessary.

Water Management

Surface drainage is mainly carried in open channels to the site pond located at the northwest corner of the site. The pond is a permeable structure that filters the water that passes through the wall. Water that overflows the dam in wet weather events or passes through the wall flows through open sedge-land before entering an unnamed creek and into O'Hares Creek. There is no environmental impact associated with these discharge events on the receiving environment. No issues were identified with the site drainage system during the reporting period. No hydrocarbons or chemicals are stored at the Site.

Air Quality

The generation of windblown dust from the North Cliff Mine Site is unlikely to cause any adverse impacts on air quality on the community due to the isolated location of the site. A large proportion of the disturbed areas are largely compacted hence further reducing the likelihood of generating significant emissions of wind blow dust.

Noxious Weeds

The site management measures to monitor and control the growth of noxious weeds on the mine site include the use of a weed control specialist to inspect the mine site periodically. No issues were identified during the reporting period.

Archaeological Sites

Archaeological surveys were carried out in 1977 and 1983. The studies identified one aboriginal site, a single axe groove on an exposed rock shelf; located within the fenced mine site area. No damage occurred to these sites during the development or operation of the mine. No damage was identified at this site during the reporting period.

Environmental Inspections

Four environmental inspections of the North Cliff site were completed during the reporting period. The quarterly inspections cover the following aspects:

- Site Security and Safety;

- Surface Drainage;

- Erosion;

- Weed Management;

- Archaeological Sites;

- Dust; and

- Hydrocarbon Management.

6.21. PUBLIC SAFETY

No incidents involving the general public occurred during the reporting period. Safety risks associated with the site activities are addressed and controlled by the mechanisms listed in Table 32.

Table 32: Site Safety Risks and Control Mechanisms	
Potential Safety Risk	**Control Mechanism**
External persons attending site	Site reception office – sign in/out procedure in place for visitors. Site inductions / awareness sessions for persons undertaking activities on site. Company representative accompanies visits to the North Cliff site.
General vehicle traffic	Designated and sign posted roads and rules. Periodic speed monitoring along Wedderburn Road. Key locked gates to site (North Cliff).
Public roadway conditions	Routine daily inspections of public roads for evidence of coal spilled from trucks. Use of road sweepers to clean roads as required Coal Trucks - Loads covered before travelling on public roads. All truck leaving the West Cliff (Appin North) site must pass through the truck wash located to the east of the clean coal bins.
Exposure to hazardous chemicals	Designated storage facilities and signage. Chemalert system in place. Rules and procedures in place for bringing chemicals into site.
Personnel Health and Hygiene	Surveillance / monitoring program in place for noise, reparable dust, hazardous materials exposure. PPE requirements enforced and periodically audited. Hazardous areas are delineated with warning signs and notices.
Radiation apparatus	Certified and registered installations – annual inspections by certifying officer. Licences in place for all radiation apparatus.
Heavy vehicle movements on site	Reversing alarms. South32 Fatal Risk standards. Authorised / licensed operators.
Working at heights	Standards and procedures for working at height activities.
Confined Spaces	Standards and procedures for working in confined spaces.
Explosive atmospheres	Explosion protected and intrinsically safe equipment – monitoring of the underground environment.
Fire	Firefighting infrastructure in place to protect persons and property.
Potential at risk activities	Formal risk assessment / task analysis process in place to assess risks and ensure sufficient controls are in place prior to the work/activity commencing.
Surface and underground vehicles	Vehicle standards in place - rotating beacons / seat belts / roll bar protection where relevant. Light vehicle policy for surface vehicles.

7. WATER MANAGEMENT

7.1. WATER SUPPLY AND USE

Appin West

Mine water is processed at the Appin West Water Treatment Plant (WTP) to produce treated water. This treated water is supplied to the Appin Mine underground mining operations. Any shortfall in underground supply is made up using potable water provided by Sydney Water. Potable water is used for site administration buildings, workshops, the bathhouse and as a back-up for underground operations.

Water Treatment Plant Improvements

The continual process improvements at the Appin West WTP has allowed for increased throughput and operational uptime of the Water Filtration Plant (WFP) compared to last FY.

Trials of a *pre-treatment* system (before Reverse Osmosis RO) and membrane technologies during the reporting period have informed the final concept design for planned future expansion. The upgrading of the WFP to cater for the increased processing demand is presently under way with commissioning expected to be completed FY17. Key drivers for this upgrade include minimising dependency on Sydney Water, environmental compliance and an increase in demand for underground water requirements with the Area 9 mining domain.

The staged upgrade process entails project components of pre-treatment, integrated membrane system and bulk storage and blending. The newly constructed plant is expected to cater a throughput capacity of 4.7 ML/day with an additional 2.0 ML of surface storage. The overall upgrade is expected to be completed within FY17.

Appin East (Central)

Potable water is supplied by Sydney Water to the Appin East (Central) mine site via a 600 kL surface tank. This tank provides potable water for the Bathhouse, workshops, administration buildings, Appin No.2 shaft area, Energy Development Limited Appin East (Central) Power Plant and nearby mine-owned cottages.

During this reporting period Appin East (Central) underground has been operated on recycled mine water (supplied underground from Appin West WFP) and Sydney water supplies from Appin East (Central) Pit Top tanks. Surface water runoff from rainfall is captured in the main surface dam and is used as supply for the truck washing facilities, dust suppression on haulage roads and stockpiles and dirty equipment hose down. Potable water was also being supplied to the West Cliff (Appin North) underground operations (mining ceased in Feb 2016) and the WestVAMP project (now redundant) from the Appin East (Central) Site. In addition, a pipeline was installed to temporarily dilute discharge from Brennans Ck Dam to reduce salinity levels in-line with the EPL. This pipeline will be used as future water supply to the West Cliff (Appin North) Washery during drought as projects under PRP19 are completed (Section 0).

Table 33 provides an overview of the potable water usage associated with the Appin operations for the reporting period.

Table 33: Potable Water Usage for the Appin Operations

Area	Usage FY15 (ML)	Usage FY16 (ML)	Variance	Comments
Appin East (Central) & West	190	480	+290	Increase due to water being pumped across to the West Cliff (Appin North) Washery site to reduce salinity levels

An estimate of the volume of clean and dirty water stored on site at the end of the reporting period is provided in Table 34.

Table 34: Stored Water - Appin			
Water Type	**Volumes Held (m3)**		
	Start of Reporting Period	**At End of Reporting Period**	**Storage Capacity**
Clean water	2.8	2.8	2.8
Dirty water	30	30	33.3
Controlled discharge water (salinity trading schemes)	2.4	2.4	2.4
Contaminated water	N/A	N/A	N/A

West Cliff (Appin North)

West Cliff (Appin North) Colliery Site is primarily reliant on recycled water. Some potable water is trucked to site and stored in a surface tank for use in the bathhouse and office facilities. Potable water was pumped from Appin East (Central) for use in WestVAMP (now redundant) and the longwall until operations were ceased in Feb 2016. Recycled water is sourced from Brennans Creek Dam (BCD) from where it is pumped, following chlorination treatment, for use in the following areas:

- West Cliff (Appin North) Underground operations;
- West Cliff (Appin North) Coal Preparation Plant and associated infrastructure; and
- West Cliff Pit Top (Appin North).

Annual recycled water usage from BCD for the West Cliff (Appin North) operations for this reporting period was approximately 718 ML. Approximately 70% of this water was utilised on the surface for CPP and associated infrastructure and the West Cliff (Appin North Site) with the remaining 30% utilised underground for mining related activities. This was significantly less than the previous reporting period due to longwall operations in Area 5 concluding in Feb 2016 and the increased use of recycled water at the Washery (see below).

A total of 107 ML of potable water was consumed during the reporting period which is significantly less than the previous year due to longwall operations in Area 5 concluding in Feb 2016.

A summary of the water usage for the reporting period, compared to the previous reporting period, is provided in Table 35.

In June 2015 initial works to increase the amount of recirculated water used at the West Cliff (Appin North) Coal Preparation Plant were undertaken. These works reduce the volume of Washery waste water flowing to Brennans Creek Dam and decrease the volume of Brennans Creek Dam water required in the Washery. The works utilise existing infrastructure (no new construction footprint required). Further details are outlined in section 6.3 of this report (PRP19). The project is due to be completed during the next reporting period and will be reported in the FY17 AEMR.

Table 35: Water Usage Comparison			
Type	**Usage FY15 (ML)**	**Usage FY16 (ML)**	**Comment**
Sydney Water	209	107	WC Longwall operations ceased Feb 2016
Recycled (BCD) Water	2099	718	WC Longwall operations ceased Feb 2016

An estimate of the volume of clean and dirty water stored on site at the end of the reporting period is provided in the table below.

Table 36: Stored Water – West Cliff (Appin North)			
Water Type	**Volumes Held (m3)**		
	Start of Reporting Period	**At End of Reporting Period**	**Storage Capacity**
Clean water	307	307	307
Dirty water	200	200	237
Controlled discharge water (salinity trading schemes)	N/A	N/A	N/A
Contaminated water	N/A	N/A	N/A

Appin Ventilation No.6 Shaft Site

During the reporting period water was extracted from the Nepean River and used on site for operational purposes. The water is extracted under the Surface Water License No. 10WA117285, issued by NSW Office of Water (NOW) on the 15 November 2011. The Licence allows up to 53 ML to be diverted - Comprising of 40 ML for mining use and 13 ML for industrial use in any one year commencing 1 July. Approximately 5.5 ML was extracted during the reporting period for mining use.

7.2. SURFACE WATER

Surface water management at the BSO is undertaken in accordance with EPL 2504 and the approved BSO Water Management Plan. Specifics of the site water management systems are provided in the BSO Water Management Plan which is available on the South32 regulatory information website.

Appin West

The filter modules at Point 23 have undergone routine maintenance, including replacement of the filters and screens. No additional works have been undertaken at the site. The active oil separator (spin separator) underwent a major service, and the passive separator (baffle plate system) also underwent routine maintenance.

Appin East (Central)

The silt trap associated with the main dam has undergone standard maintenance and the dynasand and first flush systems have undergone standard maintenance.

West Cliff (Appin North)

The seep that was identified in the reclaim pond at Brennans Creek Dam in March 2010 continues to be monitored on a regular basis with results including flow measurements, piezometer readings and visual inspections, reported through to the consultant geotechnical engineer periodically. There has been no change to the characteristics (i.e. volume, clarity etc.) of the seep for the reporting period. A new V notch and concrete bund has been installed around the seeps to improve accuracy of monitoring.

Surveillance reports are prepared every 5 years by the consultant geotechnical engineer. The latest report was submitted to the Dam Safety Committee in August 2011. The next surveillance report is due in 2016. Intermediate inspections are being conducted regularly by Illawarra Coal.

Surface run-off associated with the emplacement area, operates in accordance with the approved Coal Wash Emplacement Area Management Plan which is available on the South32 website.

Appin Ventilation No.6 Shaft Site

During the reporting period surface runoff was captured on site and treated with flocculent in surface dams prior to discharge into Harris Creek via LDP 36.

7.3. GROUNDWATER MANAGEMENT

Appin

During the reporting period excess groundwater from the Appin operations was pumped to the surface at Appin West for treatment via the Appin West WTP. The treated water is re-used underground and/or discharged via LDP24. Discharge volumes at LDP24 are made available to the public via the web based environmental monitoring report which is issued every 14 days.

West Cliff (Appin North)

Water for underground use is delivered from BCD to the underground operations via a gravity fed pipeline. Groundwater and surplus mine water is collected in pits and pumped to the surface for use in the West Cliff (Appin North) CPP. During the reporting period approximately 230 ML of water was delivered underground with approximately 600 ML of surplus underground water pumped to the surface for use in the CPP or treated and release to BCD.

7.4. RAINFALL

Figure 12 below displays the annual rainfall for the region since FY11 at Menangle, NSW.

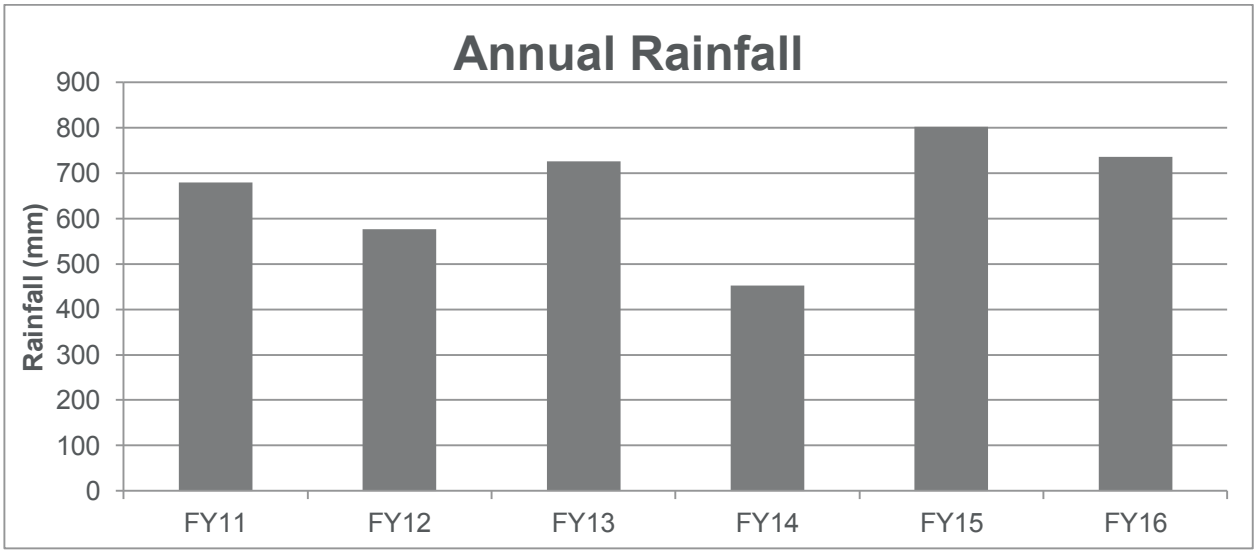


Figure 12: Annual rainfall – Menangle (BOM site #68216)

8. REHABILITATION

8.1. REHABILITATION FOR THE REPORTING PERIOD

Buildings

The Appin West bulk coal winder building was modified for the installation of new gas drainage infrastructure (see photos below).

Figure 13: Demolition of the bulk coal winder building

Modifications were made to the Vent Shaft No. 3 fan and fan housing, converting the shaft from upcast to downcast following the commissioning of Vent Shaft No 6.

Rehabilitation of Disturbed Land

Progressive rehabilitation of the West Cliff (Appin North) Emplacement has been undertaken during the reporting period in accordance with the approved West Cliff (Appin North) Coal Wash Emplacement Area Management Plan. Refer to Appendix A: Annual Rehabilitation Report for further detail of the success of the rehabilitation of the Emplacement area. Plan 12 – Land Preparation Planoutlines the rehabilitation undertaken over the reporting period.

Figure 14: Stage 2 emplacement rehabilitation after two years showing dense cover of shrubs and high native species diversity.

Exploration activities are undertaken on an ongoing basis following completion of associated activities.

The rehabilitation summary is provided in Table 37.

8.2. REHABILITATION TRIALS AND RESEARCH

No rehabilitation trials were conducted during the reporting period.

8.3. FURTHER DEVELOPMENT OF THE FINAL REHABILITATION PLAN

The BSO Mining Operations Plan (also known as the Rehabilitation Management Plan) addresses the rehabilitation requirements and objectives for all domains associated with the Appin and West Cliff (Appin North) combined BSO. The MOP outlines a range of post land use options that are potentially available for the BSO sites upon completion of operations. The future final land use objectives are yet to be decided upon and agreed due to timing of the eventual closure of BSO related sites. There has been no further development of this plan.

The Rehabilitation Cost Estimate (RCE) for the BSO was reviewed during FY16 and is attached as Appendix F to this document.

Table 37: Rehabilitation Status.

Location	Area Affected/Rehabilitation (ha)		
	Previous Report (FY15)	This Report (FY16)	Forecast (FY17)
A Total Mine Footprint	46580	46580	46580
B Total Active Disturbance	92	146	146
C Land Being Prepared for Rehabilitation	6	6	5
D Land Under Active Rehabilitation	55	61	65
E Completed Rehabilitation	0	0	0

9. COMMUNITY

At the completion of this reporting period the Appin and West Cliff (Appin North) Mines employed 709 full time employees. In addition 400 full time contractors were working across the operations.

The closest township to the Appin West surface operations is the village of Douglas Park, which is located approximately 4 km to the north west of the surface operations. The current underground mining operation (i.e. Area 7) is located on the outskirts of the Douglas Park village.

The closest township to the West Cliff (Appin North) surface operations is the village of Appin, which is located approximately 4 km to the north west of the operations. The current underground mining operations (i.e. Longwall 38) are located approximately 5 km to the north of Appin.

Appin East (Central) Pit Top is located on the outskirts of Appin.

9.1. ENVIRONMENTAL COMPLAINTS

During this reporting period 17 complaints were received in relation to BSO operations (including Pit Tops, Mine Safety Gas Drainage projects, and exploration work). Details of the complaints received and the actions taken are provided in Appendix C: FY2016 Complaints. A summary of all complaints received across the BSO is included in refer to Figure 15.

All complaints received are recorded in the South32 information management system in accordance with the Environmental Protection Licence and Development Consent conditions. The Illawarra Coal Community Call Line is a 24 hour, 7 day per week call centre for enquiries and complaints. A Company representative responds to the contact and liaises with operational personnel to attend to any issue(s) of concern within a reasonable timeframe.

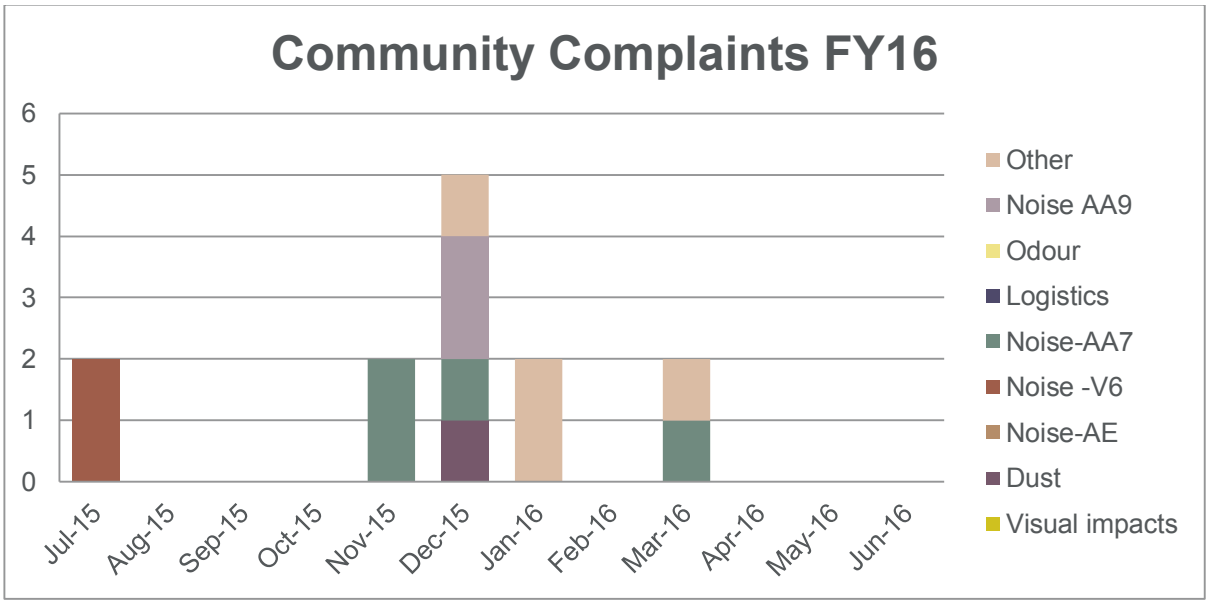


Figure 15: Summary of complaints for FY16.

9.2. COMMUNITY LIAISON

Community consultation is undertaken on an Illawarra Coal group basis, with support of operational and functional team members. Community liaison is managed as per the Illawarra Coal Stakeholder Engagement Management Plan. The plan, which was reviewed during the reporting period, identifies key stakeholders and appropriate communication and consultation processes.

Key regional stakeholders include:

- Communities surrounding the Appin and West Cliff (Appin North) operations;
- Local government;
- State government agencies and authorities including DTIRIS, OEH, SCA, and MSB;
- Employees and contractors;
- Local and regional business groups;
- Community and Environmental groups;
- The indigenous community – Tharawal Aboriginal Land Council and others;
- Local schools and volunteer groups; and
- The broader regional community.

Community information is provided in accordance with the Illawarra Coal Stakeholder Engagement Management Plan. The mechanisms utilised include:

- Community newsletters and information sheets via letter box drops;
- Door knocks;
- Media releases and other media activities;
- Community notice boards;
- Community perception surveys and
- The 'Regulatory Information' webpage on the South32 website;
- Stakeholder group presentations and information sessions; and
- Community Information days.

Illawarra Coal directly manages the following stakeholder committees and working groups:

- Illawarra Coal Community Consultative Committee;
- Douglas Park Advisory Panel; and
- Illawarra Coal Community Partnerships Program Board.

Illawarra Coal is also represented at other stakeholder committees in the area of the Bulli Seam Operations, including the Appin Chamber of Commerce.

Table 38 provides a summary of the information presented to the Illawarra Coal Community Consultative Committee during the reporting period.

Table 38: Summary of Information Presented to the Illawarra Coal Community Consultative Committee during the Reporting Period.

Month	Presentation
July 2015	Discussed the following: Illawarra Coal update on mining operations. Impacts to Georges river

Table 38: Summary of Information Presented to the Illawarra Coal Community Consultative Committee during the Reporting Period.	
Month	Presentation
	from Longwall 38. Property inspection for Area 9 and Area 7. Damage to boreholes and community complaints to date.
September 2015	Discussed the following: Illawarra Coal update on mining operations. Impacts to George's river from Longwall 38. Property inspection for Area 9 and Area 7. Damage to private property. Vent Shaft 6 update. Mine Safety Gas Management and community complaints to date.
November 2015	Discussed the following: Illawarra Coal update on mining operations. Impacts to George's river from Longwall 38. Mine Safety Gas Management and community complaints to date. Community investment.
February 2016	Discussed the following: Illawarra Coal update on mining operations. Impacts to George's river. Property inspection for Area 9 and Area 7. Damage to private property. Vent Shaft 6 update. Mine Safety Gas Management and community complaints to date. Community investment.
March 2016	Discussed the following: Illawarra Coal update on mining operations. Impacts to George's river from Longwall 38. Impacts to Nepean River (gas bubbling) Property inspection for Area 9 and Area 7. Damage to private property. Vent Shaft 6 update. Mine Safety Gas Management and community complaints to date. Community investment.
ay 2016	Discussed the following: Illawarra Coal update on mining operations. Impacts to George's river from Longwall 38. Impacts to Nepean River (gas bubbling) Property inspection for Area 9 and Area 7. Damage to private property. Vent Shaft 6 update. Mine Safety Gas Management and community complaints to date. Community investment.

The minutes of community meetings are made available to the public primarily in two ways: placed (as 'draft') on the South32 "Regulatory Information" webpage; and distributed via email to a stakeholder notification list (meeting minutes are emailed directly to persons who have expressed an interest to receive a copy).

9.3. DOUGLAS PARK ADVISORY PANEL

A purpose-formed community representative group, the Douglas Park Advisory Panel, was established by Illawarra Coal in April 2010 to provide input to the preparation of the Ventilation Shaft No. 6 Environmental Assessment. Since approval and commencement of construction, meetings have continued with other local issues discussed including Mine Safety Gas Drainage. The Douglas Park Advisory Panel operates under agreed Terms of Reference and is facilitated by Illawarra Coal. The Panel comprises 10 representatives of the Douglas Park Township.

The table below provides a summary of the information presented to the Douglas Park Advisory Panel during the reporting period.

Table 39: Douglas Park Advisory Panel Meetings – 2015/16.	
Month	**Presentation**
August 2015	Discussed the following: Ventilation 6 update, Update on Illawarra coal mining operations, rail mitigation work, property inspections, Built Feature Management plans, Mine Safety Gas Management update and community investment.
October 2015	Discussed the following: Ventilation 6 update, Update on Illawarra coal mining operations, rail

	mitigation work, property inspections, Built Feature Management plans, Mine Safety Gas Management update and community investment.
December 2015	Discussed the following: Ventilation 6 update, Update on Illawarra coal mining operations, rail mitigation work, property inspections, Built Feature Management plans, Mine Safety Gas Management update and community investment.
February 2016	Discussed the following: Ventilation 6 update, Update on Illawarra coal mining operations, rail mitigation work, property inspections, Environmental impacts (gas bubbling), Built Feature Management plans, Mine Safety Gas Management update and community investment.
April 2016	Discussed the following: Ventilation 6 update, Update on Illawarra coal mining operations, Environmental impacts, rail mitigation work, property inspections, Built Feature Management plans, Mine Safety Gas Management update and community investment.

During the reporting period, members of the Douglas Park Advisory Panel were also kept informed of operational matters relating to Douglas Park through email updates.

9.4. COMMUNITY PARTNERSHIPS PROGRAM

Illawarra Coal has an overriding commitment to supporting the communities in which we operate. As part of this commitment, the Company established the Illawarra Coal Community Partnerships Program (CPP) to provide support for community projects and initiatives in the regions surrounding the Bulli Seam operations.

Since being established in 2004, the program has provided support to a range of community groups and not-for-profit organisations.

The CPP is funded by three cents per saleable tonne of coal from Illawarra Coal's Bulli Seam operations. The program is administered by a board of community and Illawarra Coal representatives, which ensures community-based decision making on the allocation of funds.

During the past 12 months the Board has committed over $100,000 for community projects in the local Wollondilly area.

Some local not-for-profit groups to benefit from program funding in 2015/16 included:

- Lifeline Macarthur (Telephone Crisis Support Training Course)
- Our Lady Help of Christians Parish School P&C Association – Playground Upgrade
- Douglas Park Reserve Sportsground and Community Management Committee – Douglas Park Reserve Terrace
- Douglas Park Netball Club – Storage facilities
- Wilton Reserve and Community Hall Committee (WRCHC) – Community Centre Hall Extension
- Campbelltown Uniting Care (Focus on New Families Program in Appin, Wilton and Douglas Park)

The CPP Board continued its support for Life Education with funding to Appin, Douglas Park and Wilton Public Schools to enable children to visit the Life Education mobile learning centre. Life Education aims to empower the young to make the best choices for a safe life, through leading drug and health education programs. Illawarra Coal has supported Life Education in the Wollondilly area since 2008.

9.5. CAMP QUALITY CONVOY

For the eleventh consecutive year, Illawarra Coal has helped raise money for children with cancer and launch another successful i98FM Camp Quality Convoy for Kids. Held in November 2015, West Cliff's access road became the muster ground and starting point for the Convoy and the mine's external truck movements were stopped for approximately five hours to avoid heavy traffic travelling in opposite directions on the mine access road. More than 800 trucks and 1,000 motorbikes participated in the Convoy which is organised by local radio station i98FM, to raise funds for Camp Quality Illawarra, which helps provide access to a variety of activities and resources to help brighten the lives of kids living with cancer and their families in the local regions.

Over $1.7 million was raised during the 2015 Convoy, with over $6 million raised since the inaugural event in 2005.

9.6. COMPLAINTS/ENQUIRIES MANAGEMENT

Illawarra Coal maintains a 24 hour Community Call Line (freecall 1800 102 210) and a general email address ICEnquiries@South32.net. These avenues are promoted as the primary point of contact throughout Illawarra Coal's suite of communications for persons who seek to lodge a complaint or make a general enquiry.

Complaints and enquiries are recorded in an internal event reporting system, and processes in place ensure the complaint / enquiry is responded to and actioned. Complaints, and its resolution, are reported on the South32 website each month in the Community Complaints Report.

All complaints recorded during the reporting period are attached as Appendix C: FY2016 Complaints.

10. INDEPENDENT AUDIT

The Illawarra Coal Environmental Management System was certified to the International Standard ISO14001 in May 2003.

The Appin East (Central) and West sites, West Cliff (Appin North) Colliery and the West Cliff (Appin North) CPP are included in Illawarra Coal's schedule of certified ISO 14001:2004 sites. Each of these operational sites, as well as the Emplacement Area has been regularly audited for compliance against this Standard.

KPMG undertook a reasonable assurance audit for NGER (National Greenhouse and Energy Reporting) for the reporting period.

The audits/management reviews undertaken during the reporting period are provided in Table 40.

Table 40: Environmental Audits Undertaken During reporting Period

Date	Type	Internal	External	Comments
Dec 2015	Annual ISO14001		x	Recertified
Ongoing	Management plan governance checks (Internal EMS audits)	x		

The auditing process requires demonstration of adequacy of systems to manage environmental aspects and impacts related to site activities. The systems audited include legal compliance, document control, records, corrective action, monitoring and control, training and management of risks.

An Independent Environmental Audit of the BSO is undertaken every three years. The next Audit is planned for late 2016.

11. INCIDENTS AND NON-COMPLIANCES DURING THE REPORTING PERIOD

There were no reportable incidents during the reporting period.

Please refer to the following reports for compliance information:

Appendix B: 2015/16 EPA Annual Return for details of non-compliances against EPL2504.

Appendix D: BSO EPBC Approval 2010/5350 Compliance Report; and

Appendix E: BSO Consent Compliance Report and Summary of Non-compliances

12. ACTIVITIES TO BE COMPLETED IN THE NEXT REPORTING PERIOD

12.1. MINE OPERATIONS

During the next reporting period underground operations will continue in Area 7 and Area 9.

12.2. PROJECTS

The Appin West Water Filtration Plant will continue to be upgraded with expected completion mid - late 2017.

12.3. ENVIRONMENTAL MANAGEMENT

The next reporting period will have the following activities:

- Completion of the Appin West Water Filtration Plant upgrade (as stated above);
- Completion of PRP19 improvement projects (refer to section 17.3 of this report)
- Post-fire monitoring for Persoonia hirsuta seedlings in the Offset area at West Cliff (Appin North)
- Completion of 5 year Persoonia hirsuta Research Program; and
- An Independent Environmental Audit for the BSO.

13. REFERENCES

Illawarra Coal, Bulli Seam Operations Air Quality and Greenhouse Gas Management Plan

Illawarra Coal, Bulli Seam Operations Environmental Management Strategy

Illawarra Coal, BSO Mining Operations Plan – October 2012 – September 2019

Illawarra Coal, West Cliff Stockpile and Slope Stability Management Plan.

Illawarra Coal, BSO Water Management Plan.

Illawarra Coal, West Cliff Coal Wash Emplacement Area Management Plan.

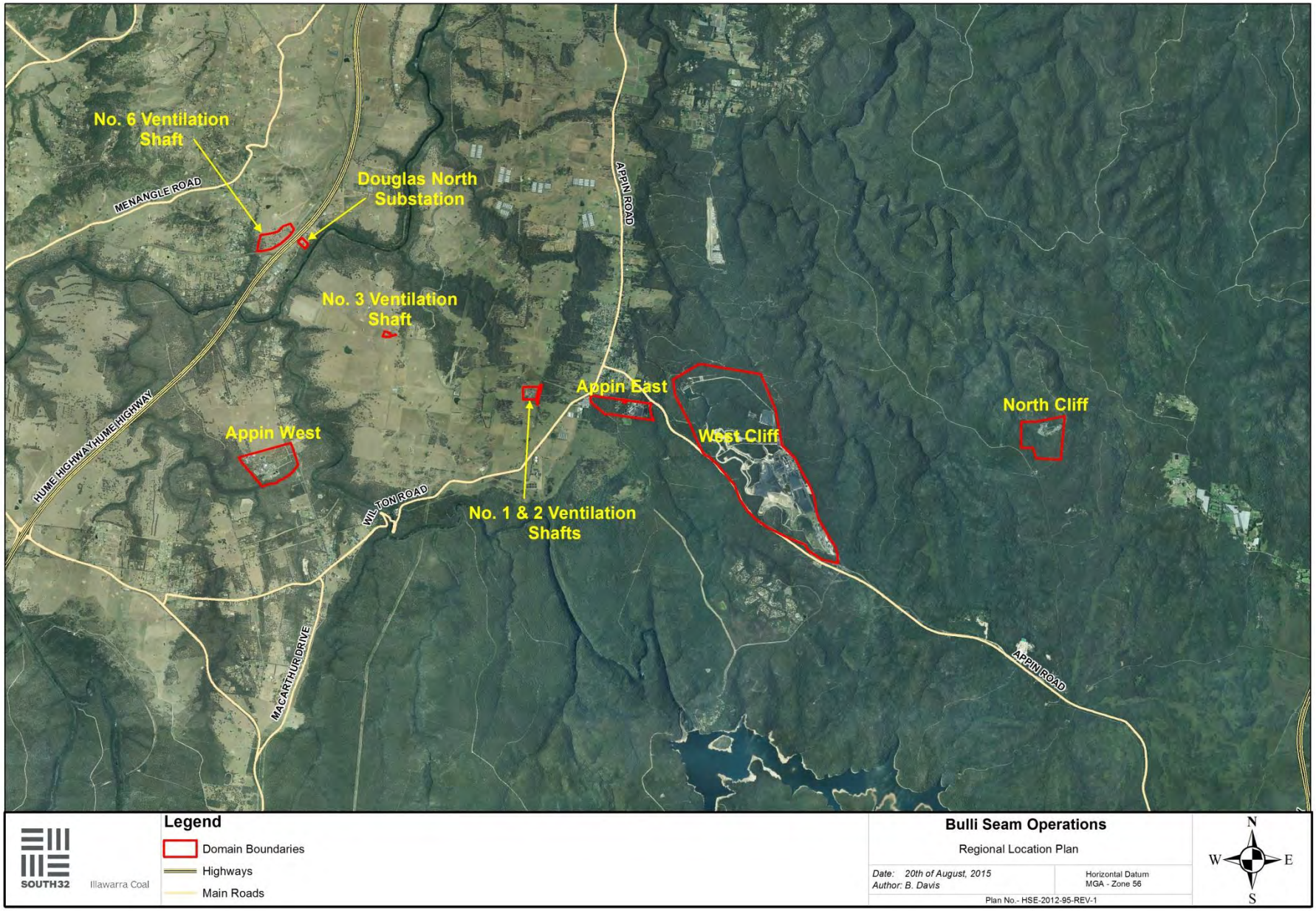
Illawarra Coal, BSO Waste Management Plan.

NSW Department of Planning & Environment (2015). Annual Review Guideline, Post approval requirements for State Significant Developments, October 2015.

NSW EPA (2016), Environment Protection Licence No.2504.

14. PLANS

PLAN 1 - REGIONAL LOCATION PLAN


No. 6 Ventilation Shaft
Douglas North Substation
No. 3 Ventilation Shaft
Appin East
North Cliff
West Cliff
Appin West
No. 1 & 2 Ventilation Shafts
MENANGLE ROAD
APPIN ROAD
HUME HIGHWAY
HUME HIGHWAY
WILTON ROAD
MACARTHUR DRIVE
APPIN ROAD
Legend
Domain Boundaries
Highways
Main Roads
SOUTH32
Illawarra Coal
Bulli Seam Operations
Regional Location Plan
Date: 20th of August, 2015
Author: B. Davis
Horizontal Datum
MGA - Zone 56
Plan No.- HSE-2012-95-REV-1
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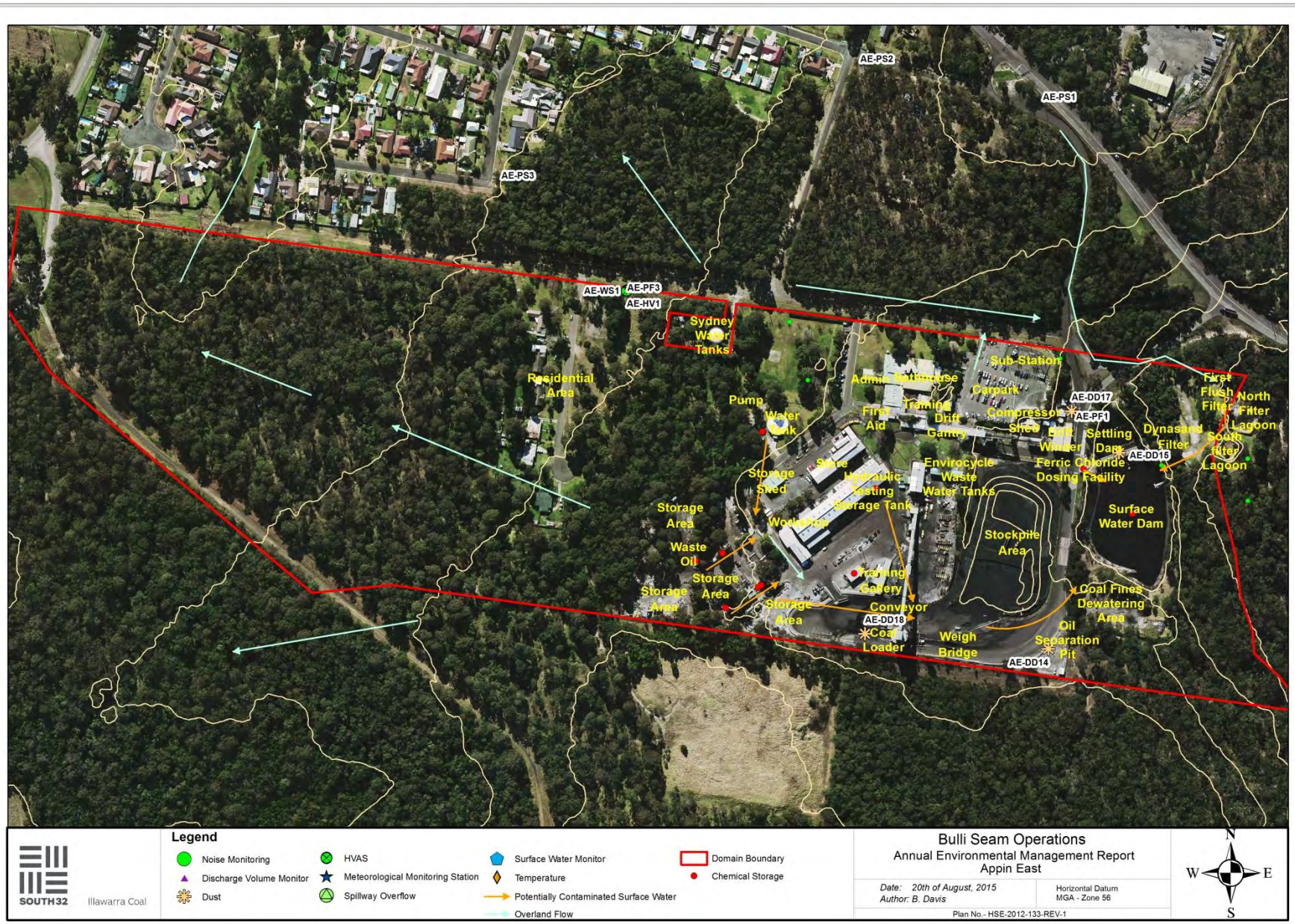
PLAN 2 - APPIN EAST (CENTRAL) MINE SITE


AE-PS2
AE-PS1
AE-PS3
AE-WS1
AE-PF3
AE-HV1
Sydney Water Tanks
Residential Area
Sub-Station
Admin Bathhouse
Carpark
Pump
Water Tank
Training
First Aid
Drift
Gantry
Compressor Shed
AE-DD17
AE-PF1
Bulk Water
Settling Dam
Dynasand Filter
AE-DD15
First Flush Filter
North Filter Lagoon
South filter Lagoon
Ferric Chloride Dosing Facility
Envirocycle Waste Water Tanks
Store
Hydraulic Testing Storage Tank
Storage Shed
Workshop
Storage Area
Surface Water Dam
Stockpile Area
Waste Oil
Storage Area
Storage Area
Storage Area
Training Gallery
Conveyor
AE-DD18
Coal Loader
Weigh Bridge
Coal Fines Dewatering Area
Oil Separation Pit
AE-DD14
Legend
Noise Monitoring
Discharge Volume Monitor
Dust
HVAS
Meteorological Monitoring Station
Spillway Overflow
Surface Water Monitor
Temperature
Potentially Contaminated Surface Water
Overland Flow
Domain Boundary
Chemical Storage
SOUTH32
Illawarra Coal
Bulli Seam Operations
Annual Environmental Management Report
Appin East
Date: 20th of August, 2015
Author: B. Davis
Horizontal Datum
MGA - Zone 56
Plan No.- HSE-2012-133-REV-1
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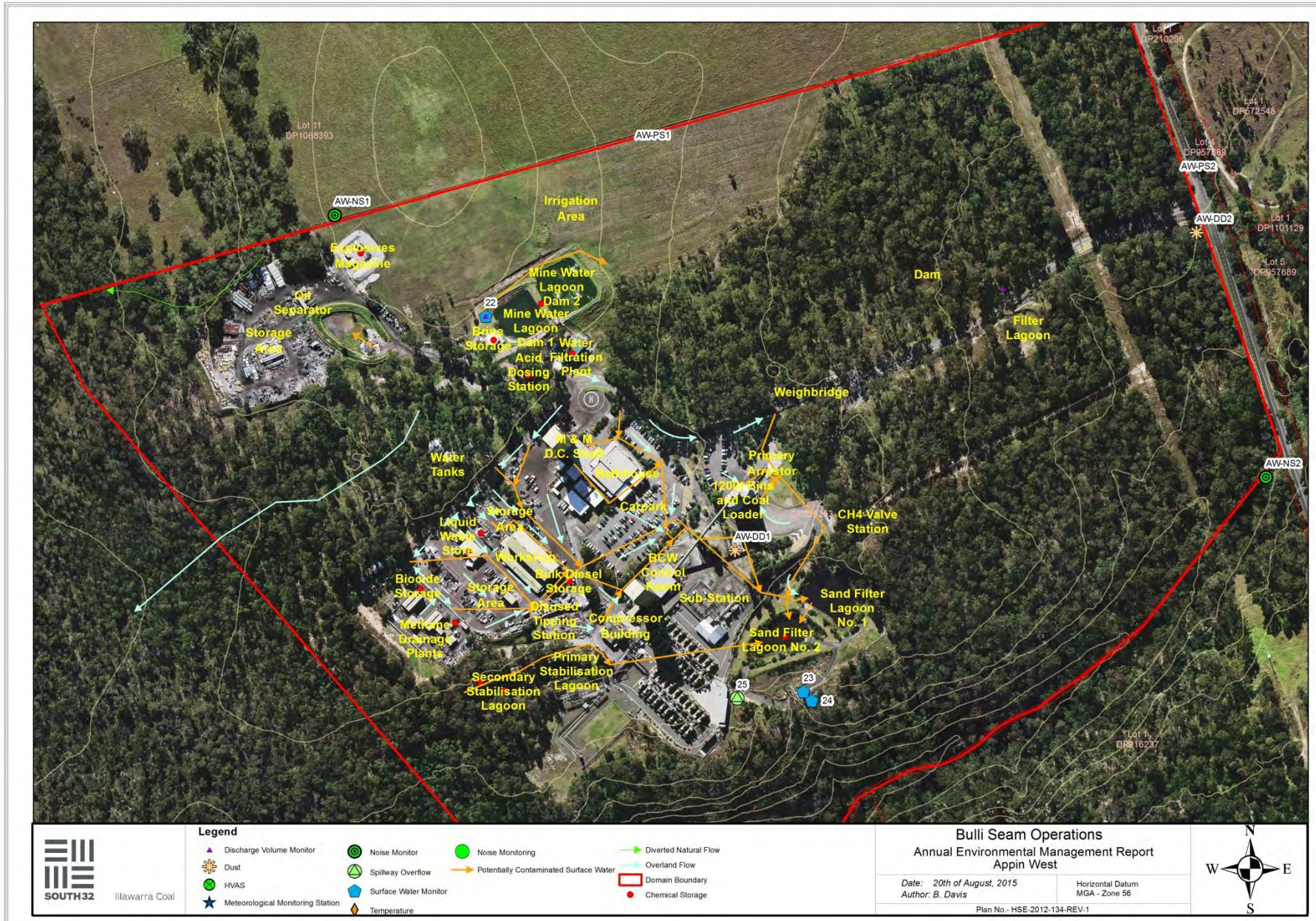
PLAN 3 – APPIN WEST MINE SITE


Lot 11 DP1088393
AW-PS1
AW-NS1
Irrigation Area
Explosives Magazine
Oil Separator
Storage Area
Mine Water Lagoon Dam 2
Mine Water Lagoon Dam 1
Brine Storage
Water Acid Dosing Station
Filtration Plant
Dam
Filter Lagoon
Weighbridge
M & M D.C. Store
Warehouses
Water Tanks
Primary Arrestor
12000 Bins and Coal Loader
Carpark
CH4 Valve Station
AW-DD1
Liquid Waste Store
Workshop
Bulk Diesel Storage
BCW Control Room
Sub-Station
Biocide Storage
Storage Area
Drained Tipping Station
Compressor Building
Sand Filter Lagoon No. 1
Sand Filter Lagoon No. 2
Methane Drainage Plants
Primary Stabilisation Lagoon
Secondary Stabilisation Lagoon
AW-PS2
AW-DD2
AW-NS2
Lot 1 DP210206
Lot 1 DP672548
Lot 4 DP957689
Lot 1 DP1101129
Lot 5 DP957689
Lot 1 DP816237
22
23
24
25
Legend
Discharge Volume Monitor
Dust
HVAS
Meteorological Monitoring Station
Noise Monitor
Spillway Overflow
Surface Water Monitor
Temperature
Noise Monitoring
Potentially Contaminated Surface Water
Diverted Natural Flow
Overland Flow
Domain Boundary
Chemical Storage
SOUTH32
Illawarra Coal
Bulli Seam Operations
Annual Environmental Management Report
Appin West
Date: 20th of August, 2015
Author: B. Davis
Horizontal Datum
MGA - Zone 56
Plan No.- HSE-2012-134-REV-1
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S

PLAN 4 – NO.1 & NO.2 SHAFT SITE


Switch Yard
66kV to 6.6kV Switch Yard
Carpark
Upcast Ventillation Shaft
Downcast Mine Ventillation Shaft
CH4 Drainage Pipe
Switch and Cable Room
Workshop Store Room
CH4 Drainage Surface Exhauster House
Site Runoff Collection Ponds
OUSEDALE CK
Lot 31 DP864032
Lot 1 DP249286
Lot 3 DP249286
0
50
100
200
300
400
Metres
Legend
Cadastral Parcels
Crown Land
Domain Boundary
Creeks
Bull Seam 5m Contours
SOUTH32
Illawarra Coal
Responsible Officer
Job Title
Date
Bulli Seam Operations
Annual Environmental Management Report
Domain 6 - Appin No. 1 & No. 2 Shafts
Date: 20th of August, 2015
Author: B. Davis
Horizontal Datum
MGA - Zone 56
Plan No.- HSE-2012-136-REV-1
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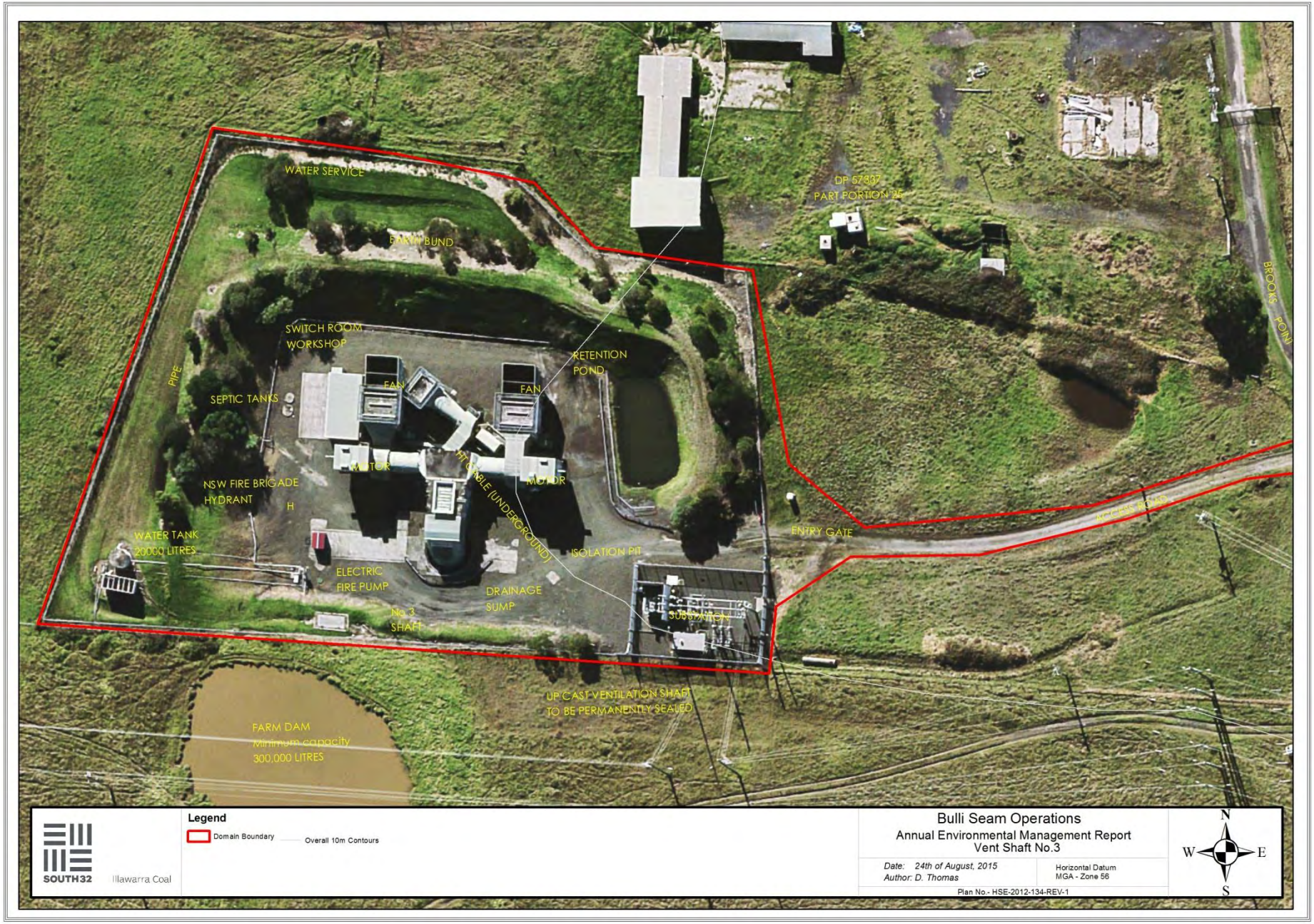
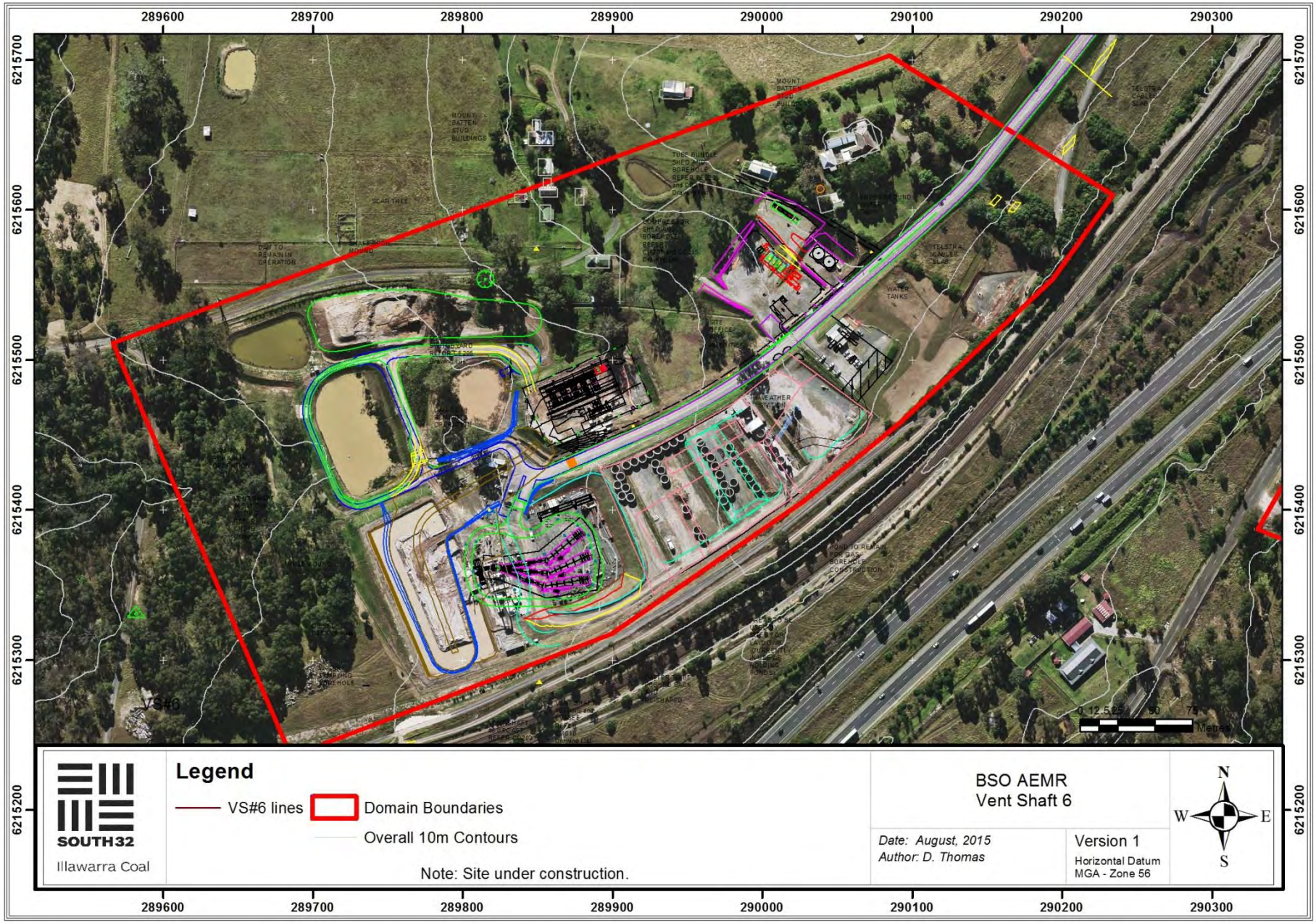
PLAN 5 – NO.3 SHAFT SITE


WATER SERVICE
EARTH BUND
DP 57837
PART PORTION 25
BROOKS POINT
SWITCH ROOM
WORKSHOP
RETENTION
POND
PIPE
SEPTIC TANKS
FAN
FAN
MOTOR
MOTOR
PIT CABLE (UNDERGROUND)
NSW FIRE BRIGADE
HYDRANT
H
WATER TANK
20000 LITRES
ELECTRIC
FIRE PUMP
No. 3
SHAFT
DRAINAGE
SUMP
ISOLATION PIT
SUBSTATION
ENTRY GATE
MYLES ROAD
UP CAST VENTILATION SHAFT
TO BE PERMANENTLY SEALED
FARM DAM
Minimum capacity
300,000 LITRES
Legend
Domain Boundary
Overall 10m Contours
SOUTH32
Illawarra Coal
Bulli Seam Operations
Annual Environmental Management Report
Vent Shaft No.3
Date: 24th of August, 2015
Author: D. Thomas
Horizontal Datum
MGA - Zone 56
Plan No.- HSE-2012-134-REV-1
N
W
E
S

PLAN 6 – NO.6 SHAFT SITE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6215500
6215400
6215300
6215200
VS#6
0 12.5 25 50 75
Metres
Legend
VS#6 lines
Domain Boundaries
Overall 10m Contours
Note: Site under construction.
SOUTH32
Illawarra Coal
BSO AEMR
Vent Shaft 6
Date: August, 2015
Author: D. Thomas
Version 1
Horizontal Datum
MGA - Zone 56
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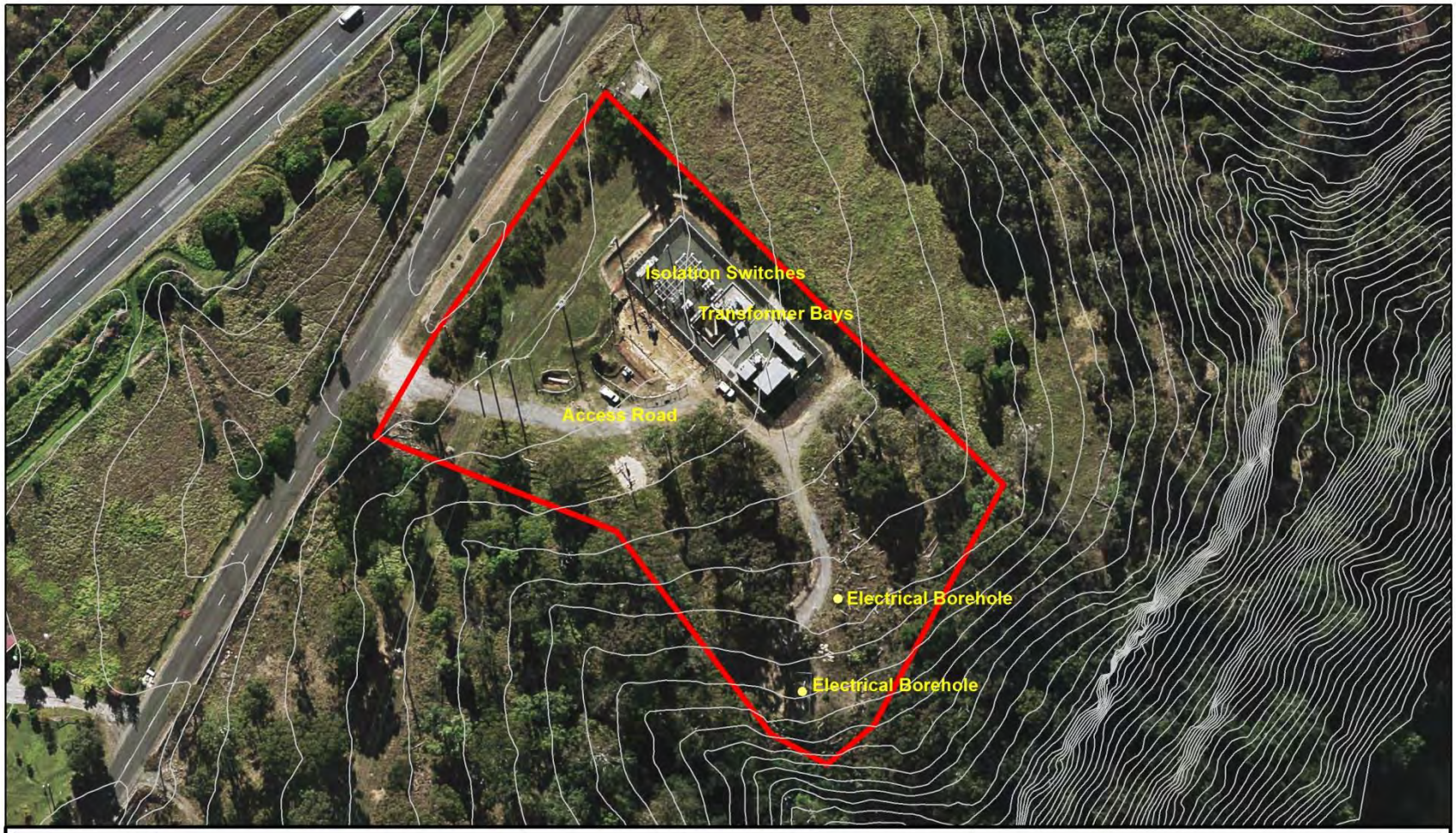
PLAN 7 – DOUGLAS NORTH SUBSTATION



SOUTH32
Illawarra Coal

Legend

1m Contours

Domain Boundary

0 10 20 40 60 80 Meters

Douglas North Substation

Date: 20th of August, 2015
Author: B. Davis

Version 1
Horizontal Datum
MGA - Zone 56

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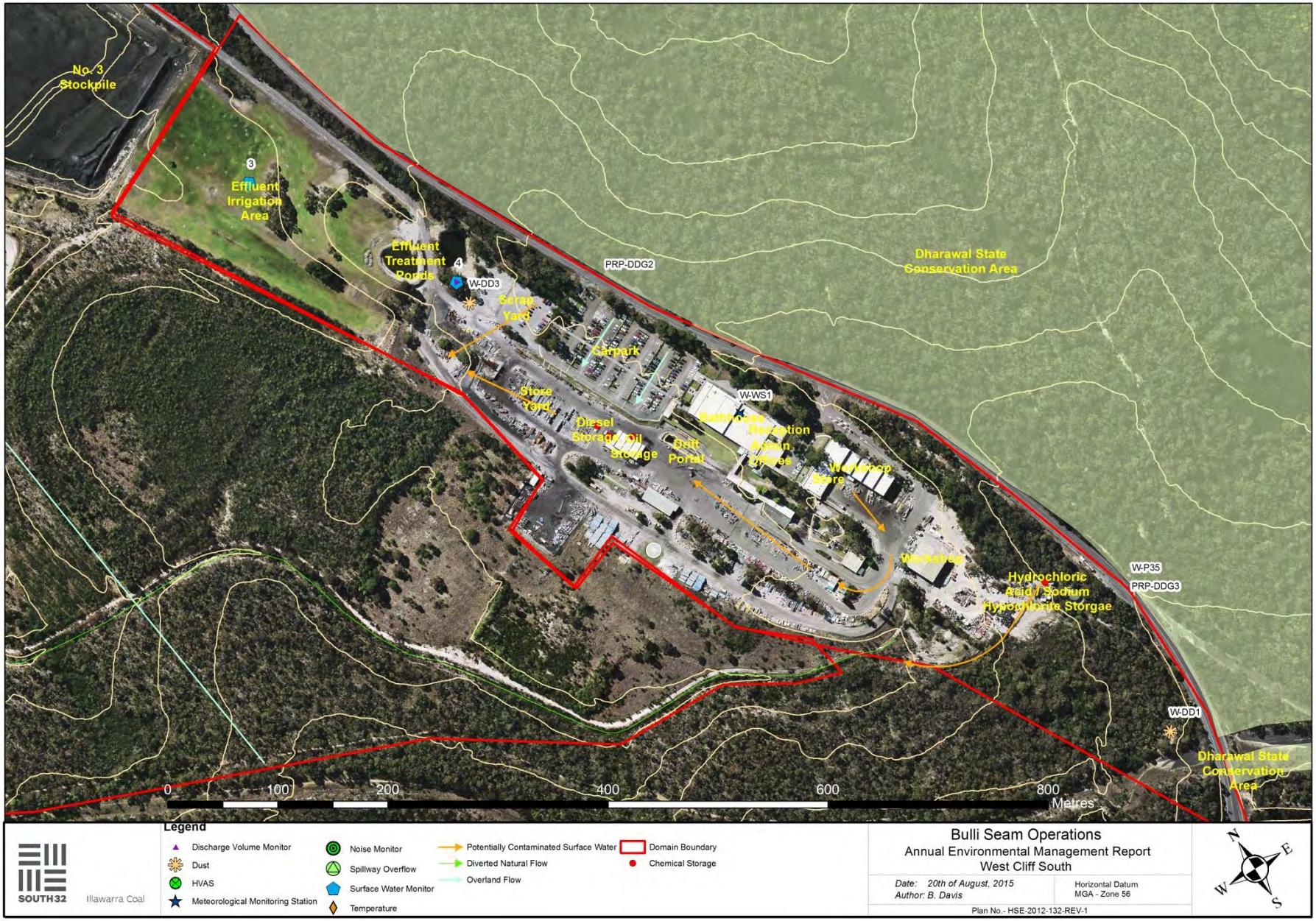
HSE-2014-139-Rev 1

PLAN 8 – WEST CLIFF SOUTH SITE


No. 3 Stockpile
3
Effluent Irrigation Area
Effluent Treatment Ponds
4
W-DD3
Scrap Yard
PRP-DDG2
Dharawal State Conservation Area
Carpark
Store Yard
W-WS1
Diesel Storage
Oil Storage
Drift Portal
Bathhouse
Reception
Admin Offices
Workshop Store
Workshop
Hydrochloric Acid / Sodium Hypochlorite Storgae
W-P35
PRP-DDG3
W-DD1
Dharawal State Conservation Area
0
100
200
400
600
800
Metres
Legend
Discharge Volume Monitor
Dust
HVAS
Meteorological Monitoring Station
Noise Monitor
Spillway Overflow
Surface Water Monitor
Temperature
Potentially Contaminated Surface Water
Diverted Natural Flow
Overland Flow
Domain Boundary
Chemical Storage
SOUTH32
Illawarra Coal
Bulli Seam Operations
Annual Environmental Management Report
West Cliff South
Date: 20th of August, 2015
Author: B. Davis
Horizontal Datum
MGA - Zone 56
Plan No.- HSE-2012-132-REV-1
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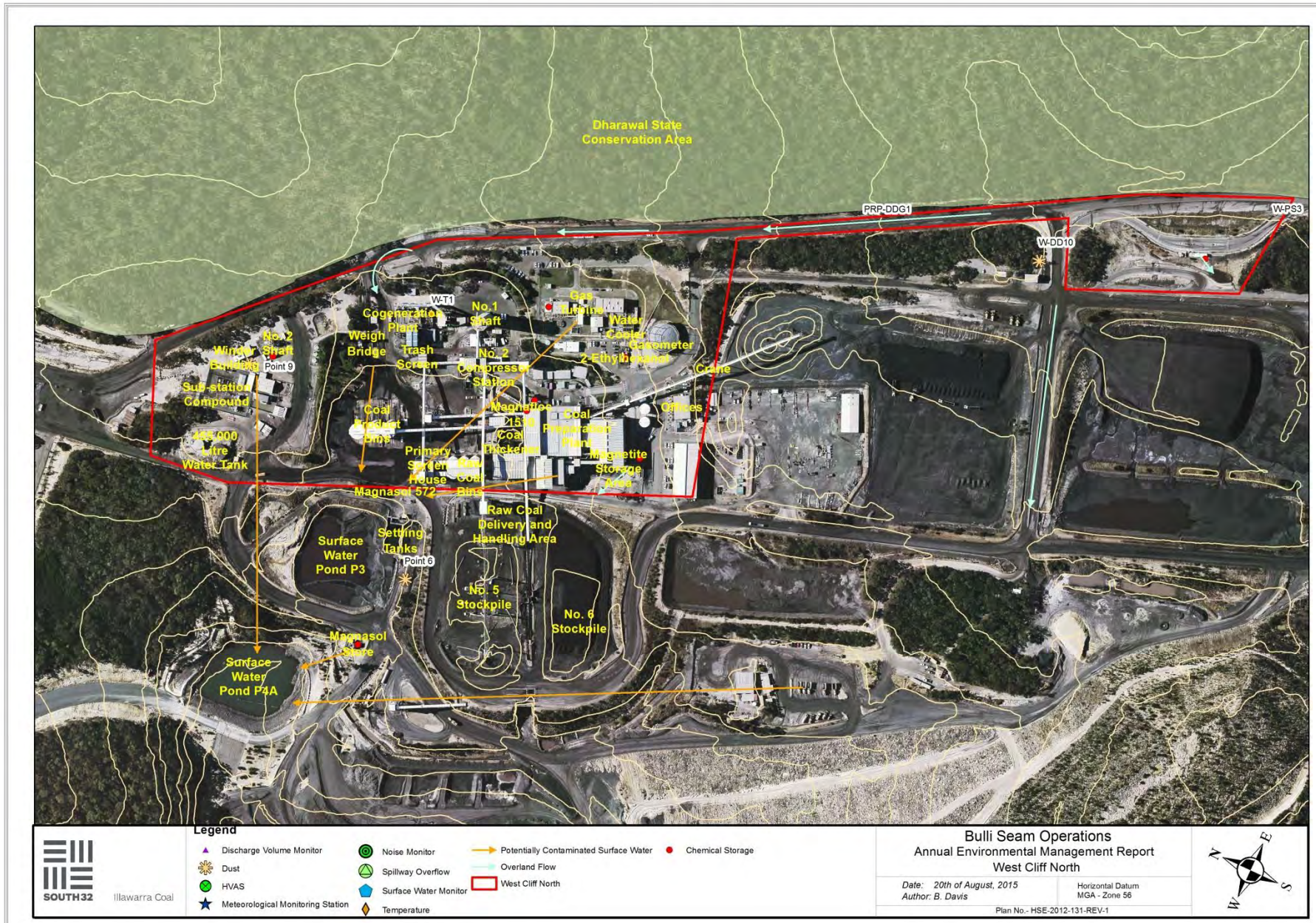
PLAN 9 – WEST CLIFF NORTH SIDE


Dharawal State Conservation Area
PRP-DDG1
W-PS3
W-DD10
W-T1
Cogeneration Plant
No.1 Shaft
Gas Turbine
Water Cooler
Calorimeter
2-Ethylhexanol
No. 2 Winder Building
Point 9
Weigh Bridge
Trash Screen
No. 2 Compressor Station
Crane
Offices
Sub-station Compound
Coal Product Bins
Magnetics
15 m Coal Thickener
Coal Preparation Plant
Magnetite Storage Area
485 000 Litre Water Tank
Primary Screen House
Raw Coal Bins
Magnasol 572
Raw Coal Delivery and Handling Area
Surface Water Pond P3
Settling Tanks
Point 6
No. 5 Stockpile
No. 6 Stockpile
Magnasol Store
Surface Water Pond P4A
Legend
Discharge Volume Monitor
Dust
HVAS
Meteorological Monitoring Station
Noise Monitor
Spillway Overflow
Surface Water Monitor
Temperature
Potentially Contaminated Surface Water
Overland Flow
West Cliff North
Chemical Storage
SOUTH32
Illawarra Coal
Bulli Seam Operations
Annual Environmental Management Report
West Cliff North
Date: 20th of August, 2015
Author: B. Davis
Horizontal Datum
MGA - Zone 56
Plan No.- HSE-2012-131-REV-1
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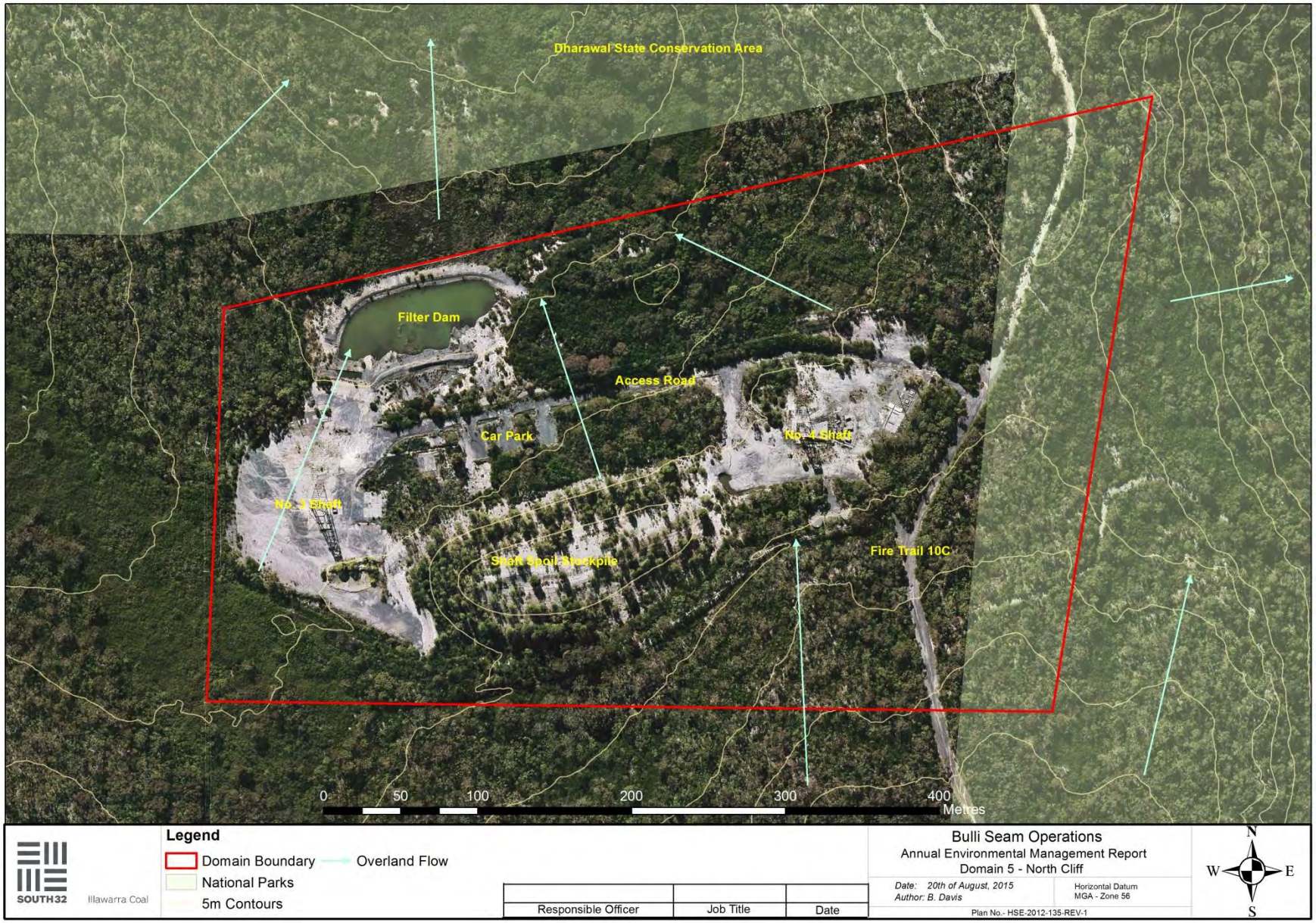
PLAN 10 – NORTH CLIFF SITE


Dharawal State Conservation Area
Filter Dam
Access Road
Car Park
No. 4 Shaft
No. 3 Shaft
Shaft Spoil Stockpile
Fire Trail 10C
0
50
100
200
300
400
Metres
Legend
Domain Boundary
Overland Flow
National Parks
5m Contours
SOUTH32
Illawarra Coal
Responsible Officer
Job Title
Date
Bulli Seam Operations
Annual Environmental Management Report
Domain 5 - North Cliff
Date: 20th of August, 2015
Author: B. Davis
Horizontal Datum
MGA - Zone 56
Plan No.- HSE-2012-135-REV-1
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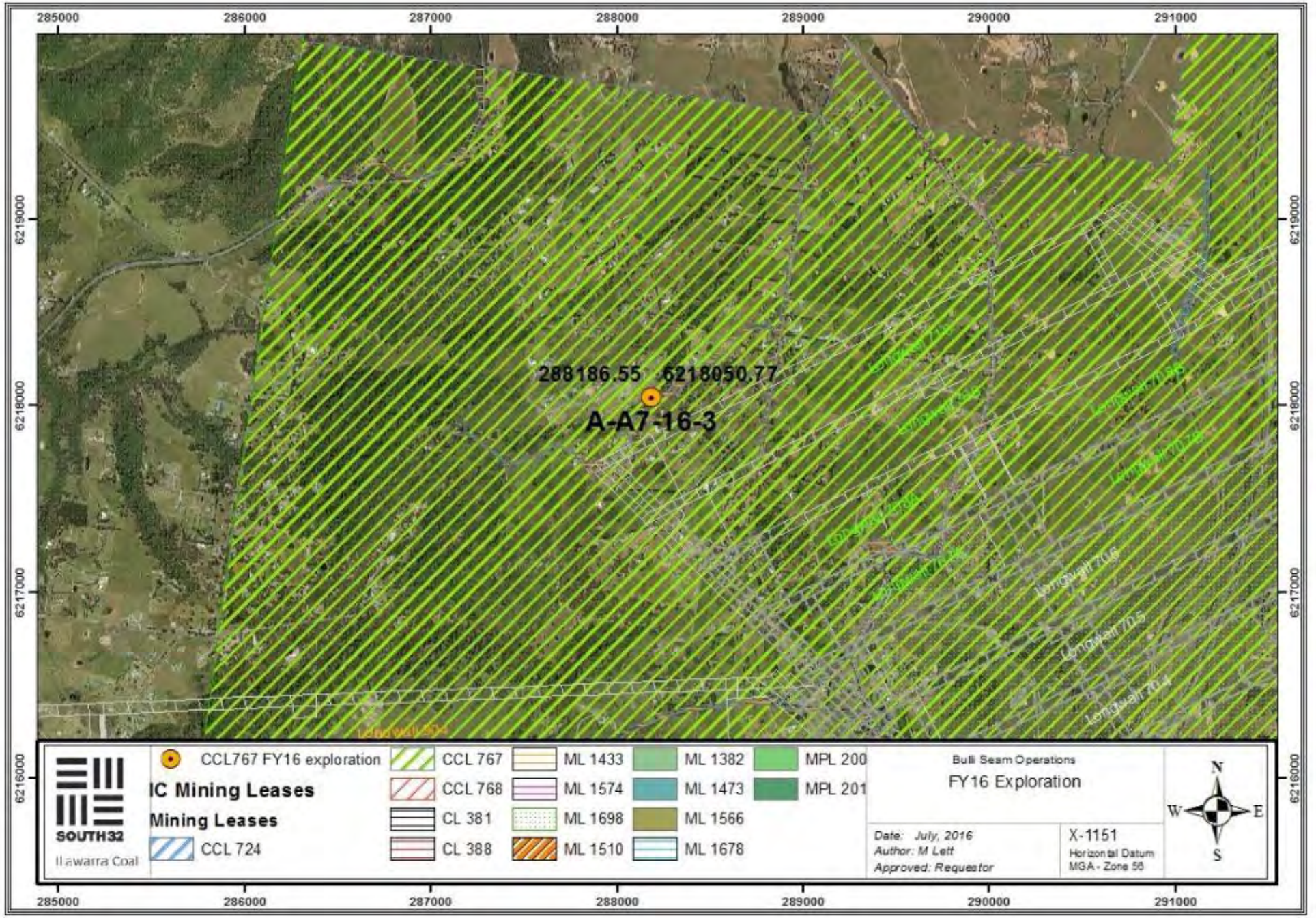
PLAN 11 – EXPLORATION FOR THE PERIOD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A-A7-16-3
Longwall 706
Longwall 705
Longwall 704
CCL767 FY16 exploration
IC Mining Leases
Mining Leases
CCL 724
CCL 767
CCL 768
CL 381
CL 388
ML 1433
ML 1574
ML 1698
ML 1510
ML 1382
ML 1473
ML 1566
ML 1678
MPL 200
MPL 201
SOUTH32
Illawarra Coal
Bulli Seam Operations
FY16 Exploration
Date: July, 2016
Author: M Lett
Approved: Requestor
X-1151
Horizontal Datum
MGA - Zone 56
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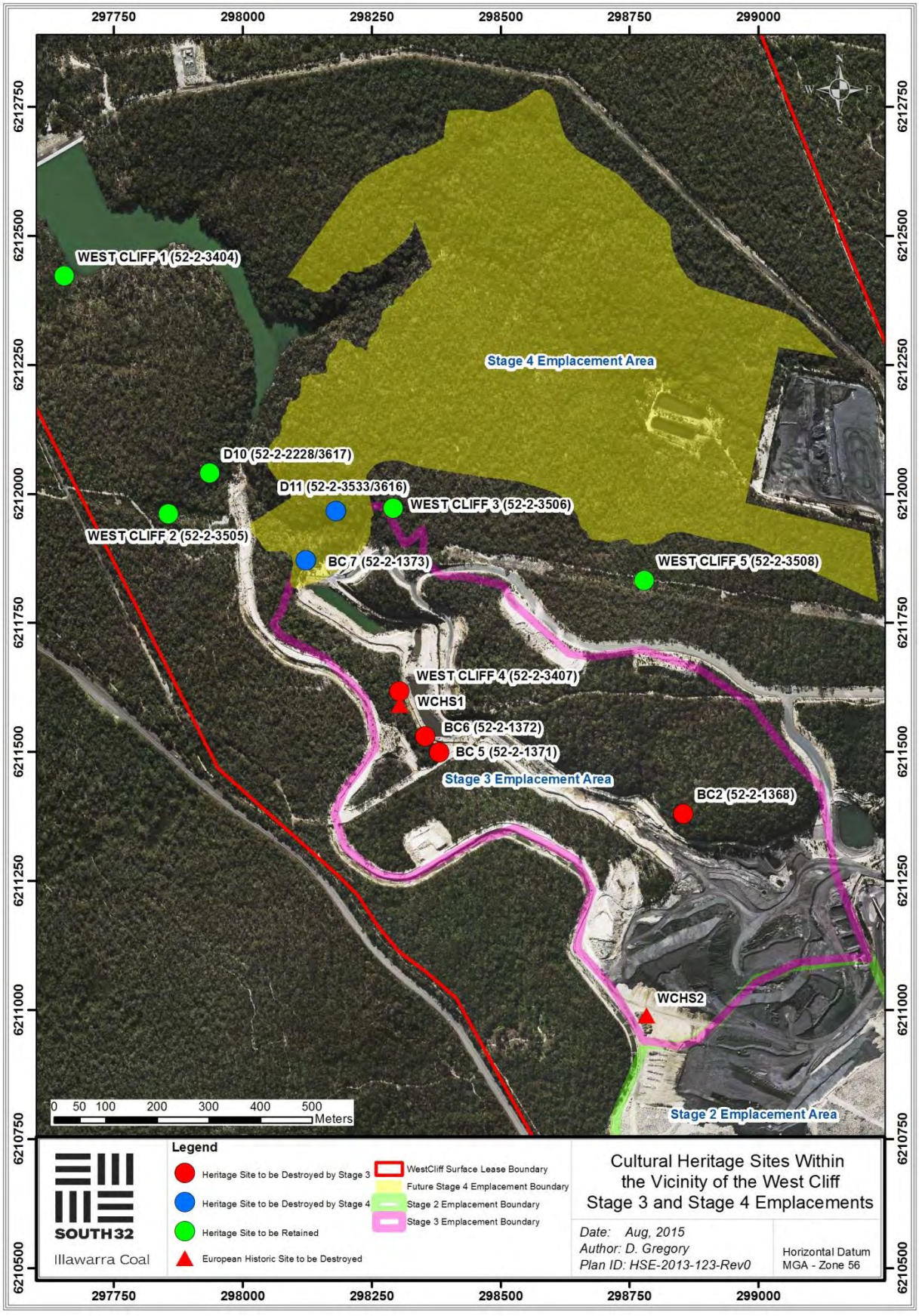
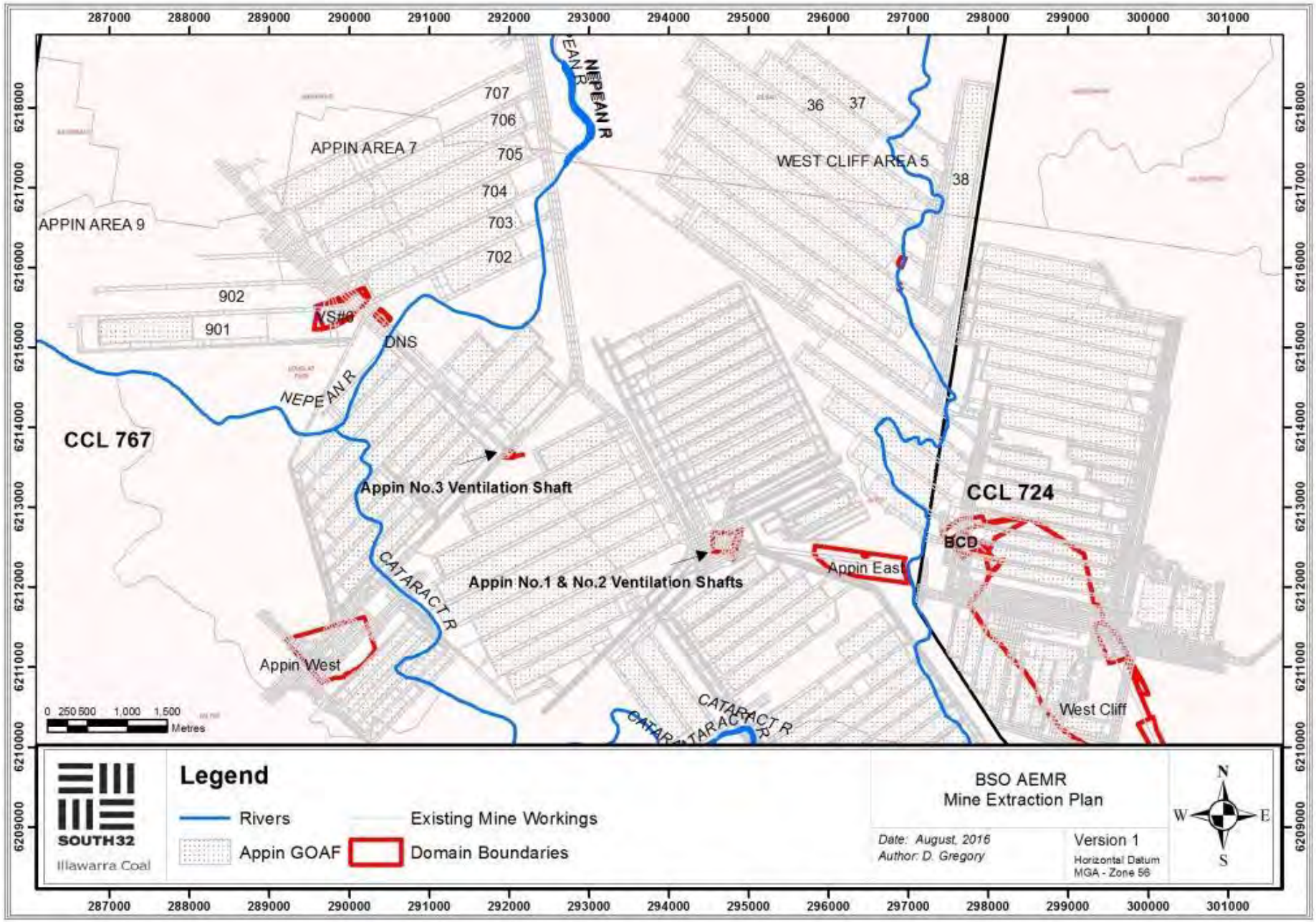
PLAN 12 – LAND PREPARATION PLAN

PLAN 13 – WEST CLIFF EMPLACEMENT CULTURAL HERITAGE SITES



PLAN 14 – MINE EXTRACTION PLAN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6217000
6216000
6215000
6214000
6213000
6212000
6211000
6210000
6209000
APPIN AREA 7
APPIN AREA 9
WEST CLIFF AREA 5
707
706
705
704
703
702
36
37
38
902
901
VS#9
DNS
NEPEAN R
CCL 767
CCL 724
Appin No.3 Ventilation Shaft
Appin No.1 & No.2 Ventilation Shafts
CATARACT R
Appin East
BCD
Appin West
West Cliff
0 250 500 1,000 1,500
Metres
SOUTH32
Illawarra Coal
Legend
Rivers
Existing Mine Workings
Appin GOAF
Domain Boundaries
BSO AEMR
Mine Extraction Plan
Date: August, 2016
Author: D. Gregory
Version 1
Horizontal Datum
MGA - Zone 56
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APPENDICES

APPENDIX A: ANNUAL REHABILITATION REPORT

MONITORING REPORT - EMPLACEMENT REHABILITATION YEAR 5

Illawarra Coal, February 2015

Contents

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Requirement for Monitoring 2
Purpose of this report 3
Survey Design 4
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Key Performance Criteria 4
Methods 4
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Biometric Vegetation Assessment 7
Photo-Point monitoring 12
Threatened Plant Random Meander 12
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Conclusion 13

INTRODUCTION

REQUIREMENT FOR MONITORING

Stage 3 Consent

The development consent for the Stage 3 Emplacement at West Cliff Colliery Emplacement required Illawarra Coal (IC) to implement a formal monitoring program for all past, present and future emplacement rehabilitation activity on the site. The Stage 3 consent was replaced by the Bulli Seam Operations (BSO) Part 3A and EPBC Act approvals in 2011.

BSO Part 3A and EPBC Act Approvals

IC received Project Approval for current and proposed operations within the BSO for the next 30 years from the:

- NSW Department of Planning and Environment (DOPE) under the *Environmental Planning and Assessment Act* 1979 in December 2011; and
- Department of the Environment (DOTE) under the Environment Protection and Biodiversity Conservation Act 1999 in May 2012.

Both contain conditions relating to the emplacement operations as summarised below:

Table 1: Condition requirements of the EPBC and Part 3a approvals relating to emplacement rehabilitation

BSO Project Approval Condition 17	EPBC Project Approval Clause 6:
The Proponent shall prepare and implement a West Cliff Emplacement Area Management Plan for the project to the satisfaction of the Director-General. This plan must be prepared in consultation with OEH and be submitted to the Director-General for approval by the end of June 2013.This plan must include: a) detailed design plans which include options for reducing, avoiding and/or managing impacts on Aboriginal heritage sites in and adjacent to the south-western fringe of the proposed Stage 4 footprint (including sites: 52-2-2228/3617, 52-2-1373, 52-2-3533/3613 and 52-2-3506 (b) management strategies to ensure no impacts to Aboriginal heritage site 52-2-3505 other than negligible impacts, including consideration of potential staged development of the emplacement and/or buffer areas; (c) management strategies for the protection and conservation of *Persoonia hirsuta*; (d) management strategies for the protection and conservation of the Broad-headed Snake and the Southern Brown Bandicoot; (e) a comprehensive groundwater monitoring program for the Brennans Creek valley, including the area of the emplacement; (f) provide for progressive rehabilitation of the emplacement area, including through: - maximising opportunities for natural regeneration; - maximising retention of suitable habitat species; - appropriate weed and pest control strategies; and - planting only endemic species in habitat mixes appropriate for soil, slope and aspect.	The person taking the action must provide a Coal Wash Emplacement Staging and Rehabilitation Plan (the Staging Plan) for the stage 4 coal wash emplacement area to the Minister for approval. Clearing of vegetation for stage 4 coal wash area must not occur until the Staging Plan has been approved by the Minister. The Staging Plan must include, but not be limited to: Measures to limit the clearing of native vegetation to no more than 60 hectares; Provision for the progressive staging of coal wash emplacement to ensure at all times a minimum 100 m wide habitat corridor is maintained linking the Persoonia hirsuta core population with habitat adjacent to the Stage 4 coal wash emplacement area; Measures to ensure that, if the corridor is to include land previously used as emplacement areas (either in whole or part), native re-vegetation is established to the extent that it facilitates the movement of pollination vectors for *Persoonia hirsuta*; Staging of emplacement from east to west; Provision for progressive rehabilitation of the emplacement area, including through: Staged clearing of native vegetation within the stage 4 coal wash emplacement area; Maximising opportunities for natural regeneration, including through salvage, storage and re-use of site top soil and maximising the retention time of suitable habitat species within the stage 4 coal wash emplacement area adjacent to active emplacement areas to assist re-colonisation of native species to rehabilitated areas; Key performance objectives for site rehabilitation, including indicative timelines, performance measures, management actions and responsibilities and accountabilities; Planting only endemic species in habitat mixes appropriate for the local surrounding environment, soil, slope and aspect, in accordance with relevant published guidelines; and Appropriate weed and pest control strategies. Monitoring and rehabilitation actions including but not limited to, measures to assess the success of management actions, natural regeneration and revegetation. The reporting of monitoring results must be submitted to the department within 30 days of every 12 month anniversary of the implementation date of the Staging Plan; and Unless otherwise agreed to in writing by the Minister, the Staging Plan must be implemented and remain implemented for a minimum period of 10 years at which point a revised plan taking into account the monitoring referred to above must be submitted to and approved by the Minister.

Emplacement Management Plan
The BSO Emplacement Area Management Plan was approved on 25th July 2014 by DOPE.

The rehabilitation monitoring commitments outlined in this plan are as follows:

Table 2: Monitoring requirements from the Coal Wash Emplacement Area Management Plan

Type	Who	Frequency	Aspects monitoring	Output
Quarterly Inspection	Site Environmental Representative	Quarterly	Photographic records at pre-determined sites located within the rehabilitated area of the emplacement.	Report (internal) and photographic database. Results summarised in the BSO AEMR.
Annual Inspection	Qualified ecologists or suitably trained site environmental representative	Annual	Fixed photo points throughout the emplacement. Quadrat monitoring in rehabilitation and surrounding areas Random meander transects (every two years) in rehabilitated areas Materials Characterisation (as required)	Report (internal) Outcomes from monitoring summarised in the BSO AEMR Report appended to the BSO AEMR.

PURPOSE OF THIS REPORT

The purpose of this report is to provide the results of the spring 2015 survey for the emplacement rehabilitation works.

SURVEY DESIGN

AIM

To measure, over time, the success of the rehabilitation of the Emplacement Area, particularly the regeneration of natural vegetation and placement of specific habitat features including rocks and logs.

This will be achieved through monitoring of biometric attributes, fixed photo points and threatened plant meander surveys as well as measuring the presence/absence of fauna within the various rehabilitation sites of varying age.

KEY PERFORMANCE CRITERIA

The monitoring program is designed to monitor the success of the following criteria:

1. Adequate regeneration of translocated communities: Exposed Sandstone Scribbly Gum Woodland (ESSW) and Sandstone Gully Peppermint Forest (SGPF). Regeneration to reflect the composition and structure of the two communities.

    i. Biometric attributes within local benchmarks

    ii. no more than 20 percent weed cover in translocated compartments;

2. The degree to which fauna (native) use the rehabilitated emplacement including constructed habitats and nest boxes.

METHODS

Biometric Vegetation Assessment
This assessment utilises the BioBanking Assessment Methodology as outlined in the *BioBanking Assessment Methodology and Credit Calculator Operational Manual* (OEH 2014). This methodology is used as it is a ready-made vegetation condition assessment, incorporating parameters (known as 'site attributes') that reflect changes in condition over time against benchmarks. Furthermore, the methodology allows for the calculation of local benchmark data, thereby providing a more accurate picture of the condition of the suitable vegetation types locally. In summary, the system is a vegetation condition assessment predicated on the basis of a comparison of site attributes against benchmarks for those attributes within the relevant vegetation types. Local benchmark data can be collected to reflect local conditions.

Vegetation plots (50 x 20 metres) were established within each of the monitoring zones and data for the following site attributes was collected:

- Native Plant Species Richness;
- Native Overstorey Cover;
- Native Midstorey Cover;
- Native Groundcover (Grasses);
- Native Groundcover (Shrubs);
- Native Groundcover (Other);
- Exotic Plant Cover;
- Total Length of Fallen Logs.

Control Sites
Six locations were chosen as control sites (Plan A: Monitoring plot locations). Monitoring the controls sites will:

Allow the measurement of the success of soil translocation within the Emplacement through the comparison of a range of site condition attributes with local benchmark conditions;

- Provide long term data regarding the condition of local vegetation types and the targets for rehabilitation; and

- Account for any stochastic variability within the local ecosystems (e.g., bushfire, climate, etc.) and allow for the consideration of such variability in relation to the outcomes on the site.

The six locations chosen as control sites were stratified evenly (three of each) between the two locally dominant vegetation types; ESSW and SGPF.

Monitoring Sites
Stratification of the monitoring sites, within the Emplacement, occurred according to their treatment histories, age and the respective areas they occupied in hectares. Accordingly, 11 monitoring sites were chosen across three different treatment types in 2011. This has been expanded to 15 plots across four separate treatments in 2014 (Plan A: Monitoring plot locations & Plan B: Emplacement Plot Locations). Monitoring sites are listed in Table 3: Monitoring site locations

Table 3: Monitoring site locations

SiteSite	Easting	Northing	Emplacment Stage
a1-228	299842	6210193	1
a1-230	299758	6210171	
a1-232	299857	6210092	
a2a-237	299578	6210253	2a
a2a-239	299649	6210350	
a2a-240	299509	6210386	
a2b-241	299515	6210493	2b
a2b-242	299322	6210565	
a2b-243	299136	6210510	
a2b-244	299093	6210408	
a2b-245	299388	6210627	
a2c-042	299259	6210803	2c
a2c-043	299223	6210746	
a2d-001	298798	6210768	2d
a2d-002	298848	6210678	

Local Benchmarks
Local benchmark data was collected at six control sites. The BioBanking Local Benchmark Calculator is then used to calculate the benchmark levels and the range of values for each of the collected attributes. The control sites were nominated on the basis of Revised Biometric Vegetation Types (RBVTs as defined by OEH in the Biometric Vegetation Types Database) as either the Red Bloodwood – Scribbly-Gum Heathy Woodland RBVT or the Sydney peppermint – Smooth-Barked Apple – Red Bloodwood Shrubby Open Forest RBVT of the Sydney Metropolitan Catchment Management Authority (CMA). It was considered that the Emplacement was likely to regenerate to a state that was an artificial combination of both of these RBVTs and therefore no attempt has been made to stratify the survey on the basis of these types.

Table 2 below shows the local benchmark values for each of the biometric attributes utilising data from the control sites collected in 2010, 2012 and 2014. Data from these years was used as the Local Benchmark. The data was entered into the Local Benchmark Calculator. The calculator only allows entry of up to 20 plots and, as 30 control sites exist (five years of six plots), only data from three years could be used (i.e., 18 plots). An average of the data from these two monitoring season was utilised in this report.

Table 4: Local benchmarks

Attribute	Benchmarks (2014)	
	Lower	Upper
Native Plant Species	-	>= 49
Native Overstorey Cover	5.0	22.3
Native Midstorey Cover	1.2	21.2
Native Ground Cover (Grasses)	0.0	39.0
Native Ground Cover (Shrubs)	14.8	72.0
Native Ground Cover (Other)	13.4	62.6
Number of Trees with Hollows*	-	>= 2
Total Length of Fallen Logs	-	>= 26

** Included here for completeness only. As discussed above, trees with hollows are unlikely to develop within the life of the project.*

Photo Point Vegetation Monitoring
Permanent photographic points have been established at each of the biometric vegetation plots.

Threatened Plant Random Meander
A random meander for threatened plants (Cropper 1993) is conducted through the Emplacement. This method is the most appropriate and accurate for the purposes of the monitoring survey. Two people, approximately 10 metres apart, traverse the Emplacement. Targeted species included those known to exist locally (some within the West Cliff Colliery surface lease-area) and include; Acacia bynoeana, Epacris purpurascens var. purpurascens, Grevillea parviflora ssp. parviflora, Melaleuca deanei, Persoonia hirsuta, Persoonia nutans and Pultenaea aristata.

Fauna Using Camera Traps
Camera traps are becoming the preferred survey method over traditional cage traps or hair tubes as they are more efficient and less labor intensive, and non-invasive. The method is well documented for monitoring small to medium sized mammals. Some useful resources are Eyre et al (2012) and Meek et al. (2012).

Camera traps will be deployed to the rehabilitating areas, using a **passive** survey approach (i.e. non baited). The sites will target specific habitat features i.e. logs, log hollows and rock crevases/overhangs to determine occupation – As a general rule, minimum 1 trap per rehabilitation compartment. Refer to Figure 3 for current trap locations.

Camera will be Infra-red type. Cameras should be placed to aim the lens at the core body zone of the animal. The camera should be placed approx. 20-30cm above the ground and distance from the feature should be no more than 2-3m (Meek *et al.* 2012).

A measurement of scale should be placed in the background (30cm ruler, steel pole or other aid).

The recommended minimum deployment time is 12 nights (Meek et al. 2012 and Paull et al. 2011).

Timing
Biometric assessments are required annually, starting at 1 year after translocation.

Surveys at control sites only required once every three years and the benchmarks as presented in this report remain so for the ensuing three year period.

Photo point monitoring is required annually and done in conjunction with the above.

Meanders for threatened plants are undertaken every three years.

Fauna monitoring using camera traps is required annually, starting 5 years after translocation or as deemed appropriate depending on the maturity of the revegetation.

Criteria can be measured most easily in spring by noting flowering, seed production, seedling growth and establishment.

RESULTS AND DISCUSSION

BIOMETRIC VEGETATION ASSESSMENT

Native Plant Species Richness

The local benchmark for Native Plant Species Richness is >= 49 species per plot.

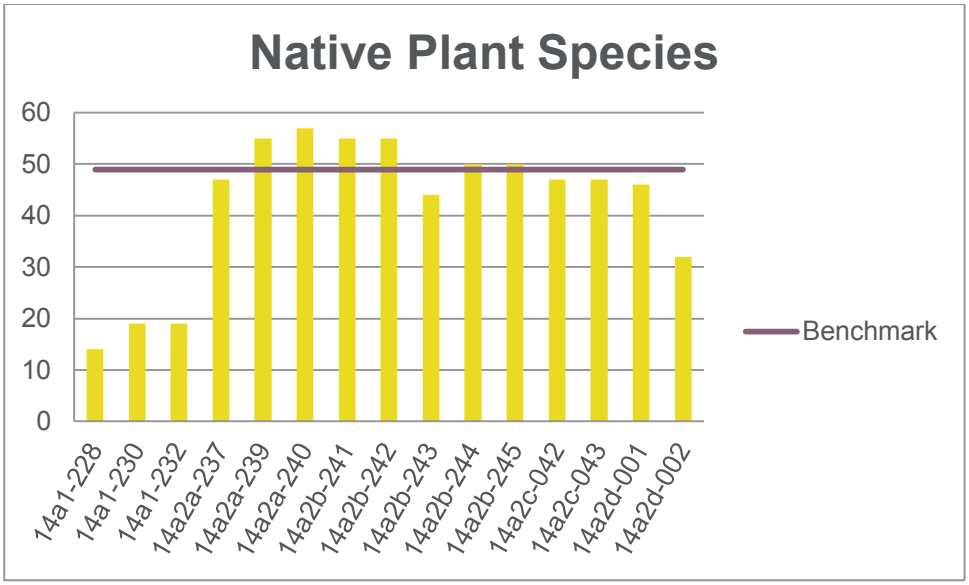

Figure 1 Number of native plant species at the monitoring plots for rehabilitation areas 1, 2a, 2b, 2c and 2d for 2015.

The plots in Area 1 had low species richness in comparison to benchmark; however this was also the case in previous years (2011 to 2014) and is a stable result. This is due to the differing nature of the methodology used in comparison to stage 2 i.e. Stage 1 has shallower topsoil and planted with tube stock (Predominantly Acacia's and Eucalypts).

The plots in Area 2a had an average of 53 species per plot which is a decrease from the previous year's average of 64 species. Rehabilitation in this area commenced in 2007 and it is expected that species richness will approach benchmark certain species thrive and out compete others.

The plots in Area 2b had an average of 50 species per plot which is the same as the previous year. The average remains above benchmark.

The newly treated areas of 2c and 2d (last three years) show results approaching benchmark levels. It is expected that these species richness figures will increase at these locations as the treatments establish.

The high native species richness present in Area 2 may be a reflection of the immaturity of the translocation areas, in that it shows that no particular species has had time to establish dominance and out-compete other species. It is expected that these sites in Area 2 will see a decline in species diversity over time and approach benchmark levels as certain species thrive and out compete others for resources and space (Niche 2014).

Native Overstorey Cover

Local benchmark for Native Overstorey Cover is 5.0 – 22.3 percent foliage cover. The areas subject to rehabilitation within the study area are too immature to have recorded native overstorey as cover, despite all dominant overstorey species being recorded within the monitoring plots. All canopy species within the plots were present only as shrubs or sub-shrubs and were considered a component of the midstorey or

groundcover (shrubs < 1 metre). As a consequence, none of the sites are within the benchmark range for Native Overstorey Cover. As the translocation areas establish and mature it is expected that Native Overstorey Cover will increase and approach benchmark levels.

Native Midstorey Cover
The local benchmark for Native Midstorey Cover is 1.2 – 21.2 percent foliage cover.

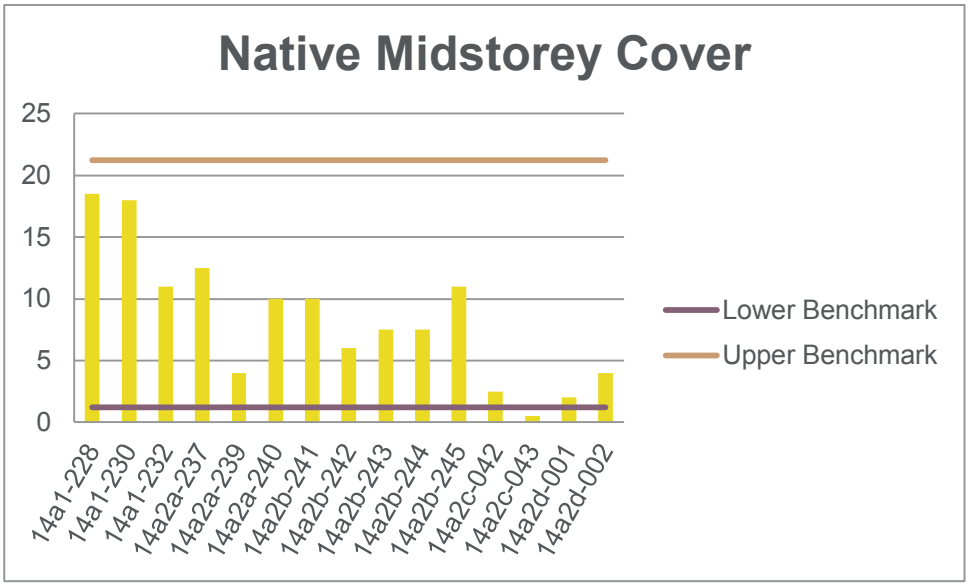

Figure 2 Native Midstorey Cover collected at the monitoring plots for rehabilitation areas 1, 2a, 2b, 2c and 2d for 2015.

All treatment areas other than one plot in A2c demonstrated within or above benchmark values for native mid-storey cover. The newer plots in A2c and A2d have demonstrated an increase in native mid-storey cover from 2014, whilst there have been some minor decreases at A1 and A2. The increases can be explained by maturity of some species whose natural life form is now above one metre (i.e., shrubs that were less than one metre in 2014 are now large shrubs or small trees over one metre). The decreases are likely natural attrition and the values are still within or above benchmark values and so are not considered significant changes. It is likely that mid-storey cover in A2c and A2d further in coming years as the rehabilitation areas mature.

Native Ground Cover (Shrubs)
The local benchmark for Native Groundcover (Shrubs), i.e., woody plants < 1 metre: 14.8 – 72.0 per cent.

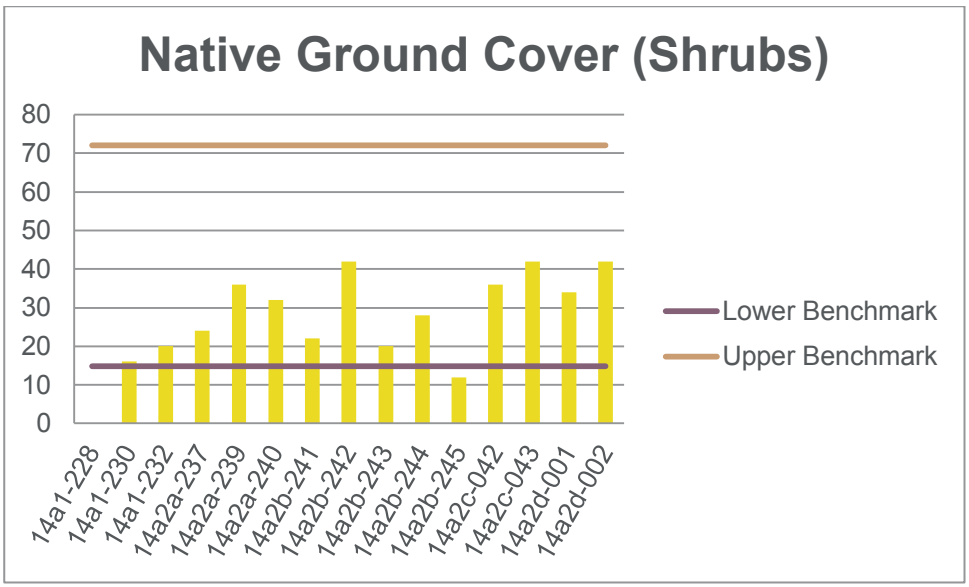

Figure 3 Native ground cover – Shrubs at the monitoring plots for rehabilitation areas 1, 2a, 2b, 2c and 2d for 2015.

All plots, other than those in A1 and also A2b-245, are clearly within the benchmark range for the attribute. The low ground cover in A1 may be as a result of the fact that the bulk of the species within this treatment are either canopy or small trees and the shrub layer has become mid-storey (i.e., greater than one metre) over time.

Native Ground Cover (Grasses)

The local benchmark for Native Groundcover (Grasses) is 0.0 – 39.0 per cent. Grass cover is naturally very low in the control sites, as Sydney Coastal Dry Sclerophyll Forests, hence the low and broad benchmark range for the attribute.

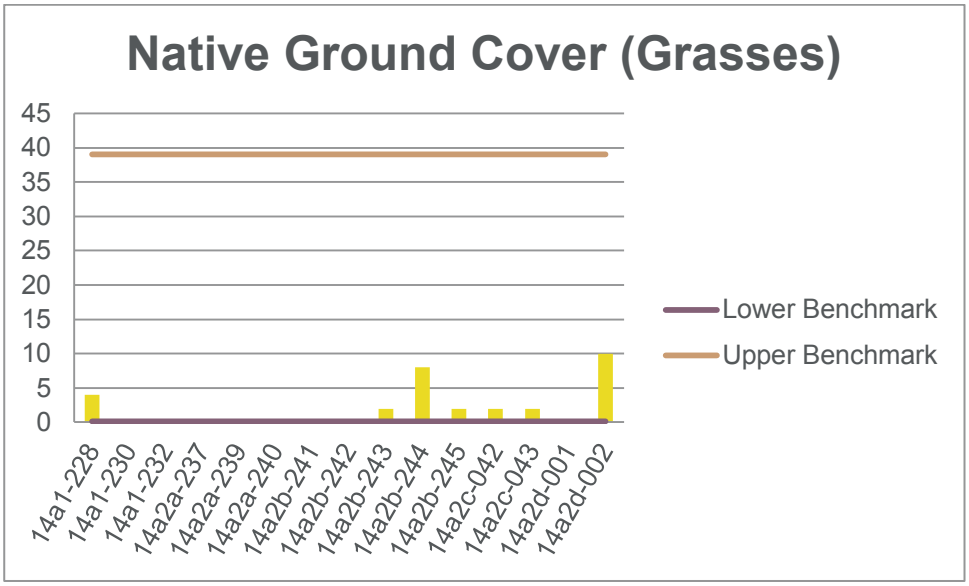

Figure 4 Native ground cover – Grasses at the monitoring plots for rehabilitation areas 1, 2a, 2b, 2c and 2d for 2015.

Given that zero (0) is the lower benchmark for Native Groundcover (Grasses), all treatments are within benchmark for this attribute. This is entirely reasonable given that the translocated soils are from Sydney Coastal Dry Sclerophyll Forests which are naturally higher in cover for herbs and forbs than grass cover. Grass cover also requires an open environment and since most of the treatments have resulted in a relatively dense mid-storey and shrub layer, native grass is difficult to establish. Percent cover of native grasses is not necessarily indicative of ecosystem health in Sydney Coastal Dry Sclerophyll Forests and the attribute is within benchmark in all treatment areas.

Native Ground cover (Other)
The local benchmark for Native Groundcover (Other), i.e., herbs and forbs other than grasses is13.4 – 62.6 per cent.

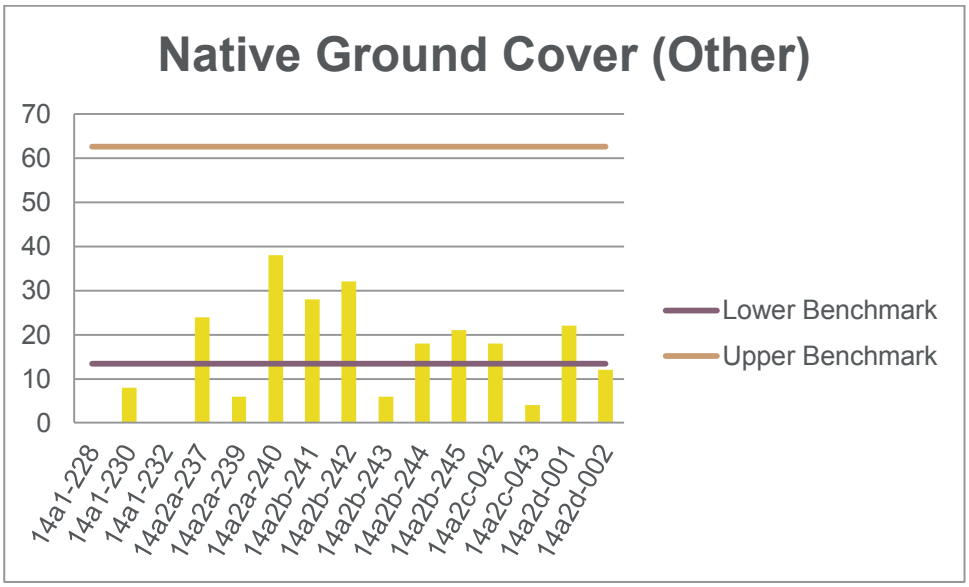

Figure 5: Native ground cover – Other at the monitoring plots for rehabilitation areas 1, 2a, 2b, 2c and 2d for 2015.

Area 1 continues to experience low levels in Native Groundcover (Other), which along with low native grass cover appears symptomatic of the treatment history and the subsequent density of the shrub and mid-storey layers. Areas 2a and 2b are largely within benchmark for Native Groundcover (Other), however significantly lower at plot site A2a-243. It is highly likely that this is a result of an increased shrub and mid-storey cover. As expected, treatment areas 2c and 2d have shown a significant increase in Native Groundcover (Other) to within or near benchmark levels in the last 12 months.

Exotic Plant Cover
There is no local benchmark for exotic plant cover. Whilst it is assumed that there would 0 – 5% exotic plant cover within the control plots, a target of <20% has been chosen for all rehabilitation areas.

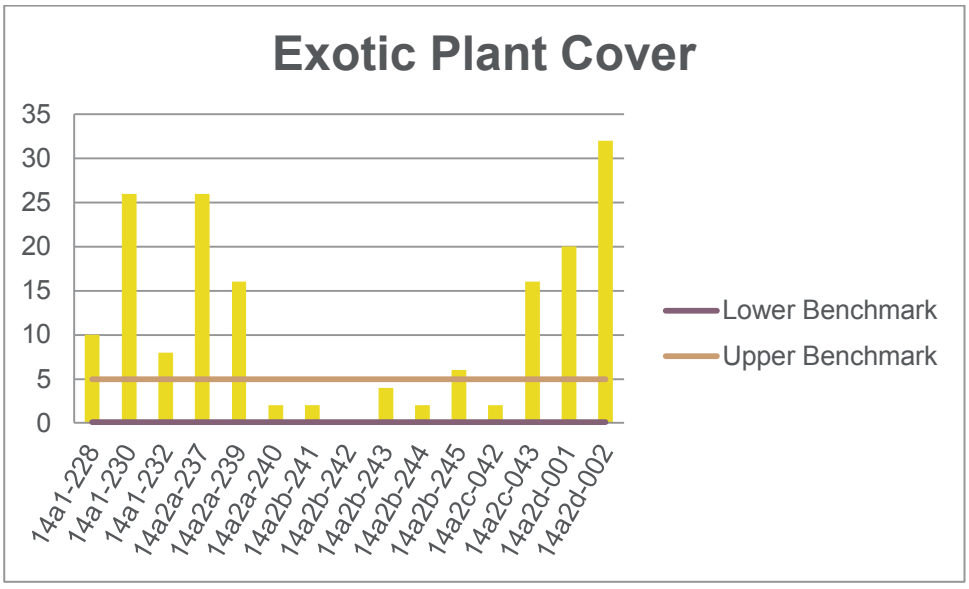

Figure 6 exotic plant cover at the monitoring plots for rehabilitation areas 1, 2a, 2b, 2c and 2d for 2015.

The majority of sites fall below the target of 20% exotic plant cover with the exception of one plot in A1a, A2a and A2d. The dominant weeds in these areas include *Eragrostis curvula* (African lovegrass), *Andropogon virginicus (*whisky grass), *Conyza bonariensis* (Fleabane), and *Hypochaeris radicata*. *Pennisetum clandestinum* (Kikuyu), *Cortaderia selloana* (Pampas grass) and *Cynodon dactylon* (common couch) are all exotic perennial grasses that have dominated localised patches within the Emplacement and also require management.

Length of Fallen logs
The local benchmark for Length of Fallen Logs is >= 26 metres within the 20 x 50 metre plot.

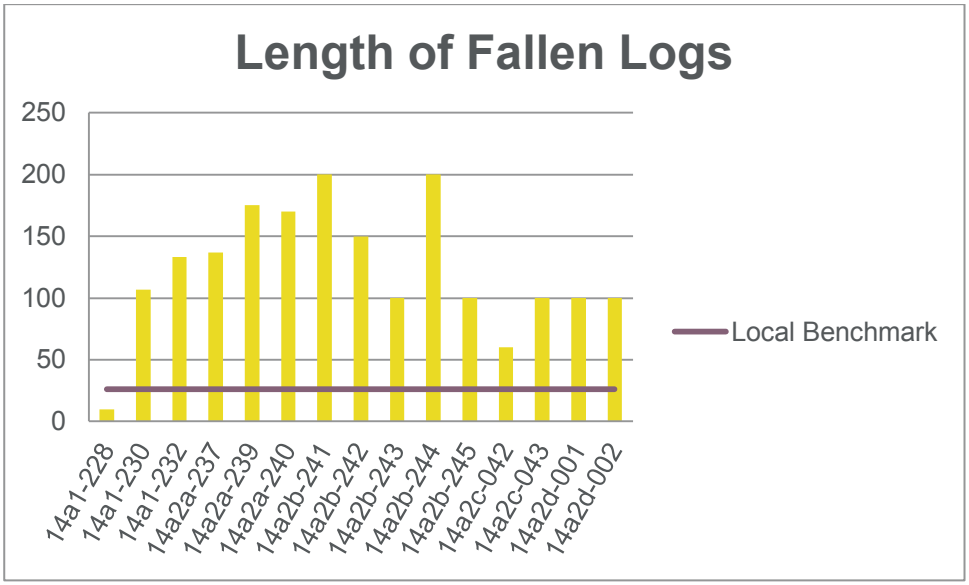

Figure 7length of fallen logs within all plots

All plots and areas have substantial log length, well above the benchmark levels. This was due to the targeted movement of this material along with the soil translocation. These figures are not expected to change dramatically over time, however the graph below serves to demonstrate that an adequate amount of logs have been moved with the translocation. Given the limitations on the amount of logs available to the Emplacement as a resource, the current on-site strategy for log placement has been substantially reduced and will still meet benchmark levels.

Biobanking Scores
Biobanking scores are calculated every 3 years. The last calculation was undertaken in 2014.

At the time Six BioBanking scenarios were run through the BioBanking Credit Calculator (2014 on-line version) using the data collected from the monitoring sites from 2011 and 2014. These scenarios were comprised of one scenario for each of the treatment areas assuming that the sites would regenerate to either the Red Bloodwood – Scribbly-Gum Heathy Woodland BVT (ME014) or the Sydney peppermint – Smooth-Barked Apple – Red Bloodwood Shrubby Open Forest BVT (ME029). The scenarios were run only as an indication of the ecosystem credits generated by the current management regime. Species credits were not included in the calculations. The ecosystem credits generated are used here only as an index and are not for the purposes of creating a BioBank Site.

Ecosystem credit calculations for each of the three main treatment areas, for which BioMetric attribute data exists in both 2011 and 2014 are shown in Table 5. Due to the limitations of the BCC, the scenarios presented in Table 3 assume that the treatment areas will regenerate to either ME014 (Bloodwood – Scribbly) or ME029 (Peppermint – Apple). Table 5 shows that an increase in ecosystem credits has occurred within each of the treatment areas, thus indicating stable if not improved condition overall. The only exception to this overall improvement is Area 2b assuming regeneration to ME014 (Bloodwood – Scribbly), which decreases from 77 to 68 credits. As an increase in ecosystem credits is shown for Area 2b assuming regeneration to ME029 (Peppermint – Apple), from 63 to 66 credits, the formerly mentioned decrease is

likely a result of differences in benchmarks between ME014 (Bloodwood – Scribbly) and ME029 (Peppermint – Apple). The decrease will be monitored in future BCC scenarios – The next calculation will be in 2017.

Table 5 Results of biobanking credit calculations for 2011 and 2014 (From Niche 2015)

BVT Code	BVT	Treatment area	Area (ha)	Ecosystem Credits - 2011	Ecosystem Credits - 2014
ME014	Red Bloodwood – Scribbly-Gum Heathy Woodland	Area 1	9	26	46
		Area 2a	7	25	33
		Area 2b	12	77	68
ME029	Sydney peppermint – Smooth-Barked Apple – Red Bloodwood Shrubby Open Forest	Area 1	9	15	16
		Area 2a	7	25	33
		Area 2b	12	63	66

PHOTO-POINT MONITORING

Photo-point monitoring, illustrating the changes in vegetation cover at each of the monitoring sites at 2011 (previous monitoring report) and 2014, is provided in Appendix 1. In general, all treatment areas have a good cover of native vegetation as a response to translocation and/or direct-seeding.

THREATENED PLANT RANDOM MEANDER

Threatened plant meanders are undertaken every 3 years. The last meander was completed in 2014. At the time, Pultenaea aristata (12 individuals) and Persoonia hirsuta (one individual) were detected within the Emplacement during the surveys conducted in spring 2014. This is in addition to individuals recorded during the previous four monitoring events from 2010 to 2013. Pultenaea aristata is listed as vulnerable on the TSC and EPBC Acts, while Persoonia hirsuta is listed as endangered on both Acts. Pultenaea aristata has continued to have success in re-establishing to maturity within the Emplacement (refer to previous monitoring reports). The single mature individual of Persoonia hirsuta recorded in 2014 was located in Emplacement treatment area A2a, has reached maturity (flowering and fruiting) and has a stout stem with healthy foliage cover. This plant indicates that the species can germinate and survive to maturity in translocated soils. This is significant for the species locally, particularly given the focus of the BHPBIC recovery work being conducted by the University of Wollongong and the Royal Botanic Gardens (Mt Annan).

Threatened plant occurrences within the Emplacement will be regularly monitored by IC environmental staff.

FAUNA

Camera traps were deployed for 12 days across three sites in the mature rehabilitation areas (864 camera hours). Each trap targeted specific habitat features that were created during the rehabilitation process Figure 8). Site 1 is located in Stage 1 and consists of a large tree hollow. Site 2 is located in Stage 2 and consists of a small rock overhang; Site 3 is also located in Stage 2 and consists of an artificial pond.

Figure 8: Example of a camera site (Camera Trap site 1, emplacement Stage 1).

The cameras detected 5 native and 2 exotic species. The natives comprised of three mammals and one bird – A Common Wallaroo, Swamp Wallaby, Ringtail Possum, Brown Antichinus and a White-browed Scrubwren. The exotics comprised of a European Fox and a Cat.

Site 1 (Stage 1) was the most productive, with all 4 natives being detected. Site 2, detected only 1 species and site 3 the same.

Species	Site Detected	Detection Rate (number of hits/camera hours)
Common Wallaroo - *Macropus Robusta*	Site 1	0.03
Brown Antichnus - *Antichinus Stuartii*	Site 1	0.01
Common ringtail Possum – *Pseudocheirus peregrinus*	Site 1 & 2	0.002
White-browed Scrubwren - Sericornis frontalis	Site 1	0.01
Swamp Wallaby - *Wallabia bicolor*	Site 2	0.002
Eurpoean Fox – *Vulpes vulpes*	Site 1	0.002
Cat – *Felix catus*	Site 2	0.01

CONCLUSION

This report provides a description of the methodologies used and the outcomes achieved from the sixth season of monitoring the rehabilitation success in Stages 1 and 2 of the Emplacement. For the most part, the rehabilitation areas were within or above the local benchmarks for most of the biometric attributes. Treatment area 1 is in the poorest condition and fails to meet the benchmarks for most attributes even though this site was the most productive in terms of native wildlife captured by infra-red cameras. This is probably a reflection of the maturity of the vegetation in this area in comparison to Stage 2.

Weed incursion remains the key threat to the rehabilitation of the Emplacement. *Eragrostis curvula* (African Lovegrass) was observed as one of the dominant weeds throughout the monitoring program. It is likely to spread and out-crowd native plants if not treated.

Two threatened plant species, *Pultenaea aristata* and *Persoonia hirsuta,* were detected within the Emplacement during the 2014 survey and both species remain. The *Persoonia hirsuta* individual is considered a significant observation and will contribute to the understanding of the species' capacity for regeneration within the rehabilitation areas.

This is the first season to have undertaken any formal fauna monitoring. The rehabilitation is clearly being utilized by some native species and this is expected to increase further as the rehabilitation matures.

PLAN A: MONITORING PLOT LOCATIONS

PLAN B: EMPLACEMENT PLOT LOCATIONS

APPENDIX 1: PHOTO POINT MONITORING

Plate 1: Site A1_228 (left 2010, right 2015)

Plate 2: Site A1_230 (left 2010, right 2015)

Plate 3: Site A1-232 (left 2011, right 2015)

Plate 4: A2a_237 (left 2010, right 2015)

Plate 5: Site A2a_239 (left 2010, right 2015)

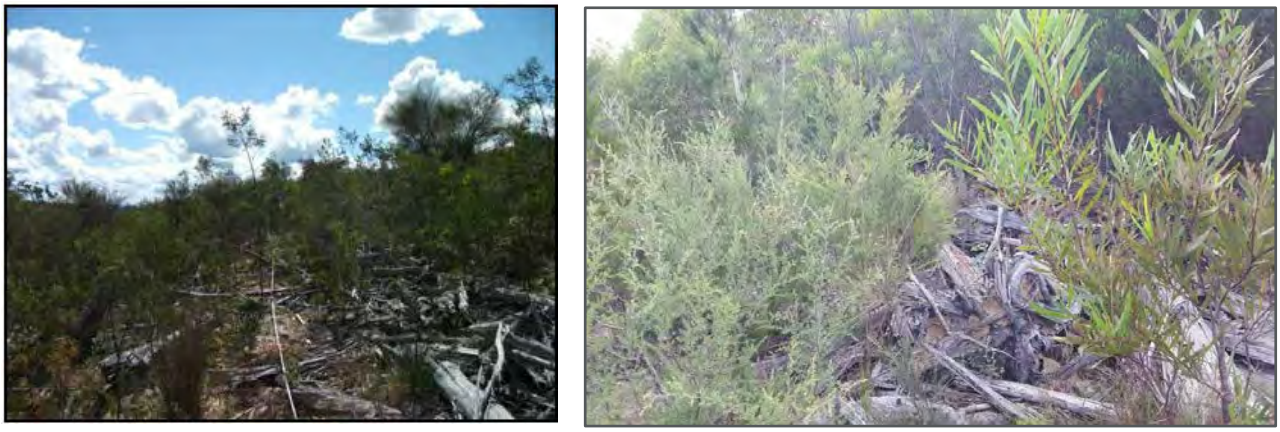

Plate 6: Site A2a_240 (left 2010, right 2015)

Plate 7: Site A2b_244 (left 2010, right 2015)

Plate 8: Site A2b_241 (left 2010, right 2015)

Plate 9: Site A2b_242 (left 2010, right 2015)

Plate 10: Site A2b_243 (left 2010, right 2015)

Plate 11: Site A2b_245 (left 2010, right 2015)

Plate 12: Site A2c-042 (left 2012, right 2015)

Plate 13: A2c-043 (left 2012, right 2015)

Plate 14: A2d-001 (2015)

Plate 15: A2d-002 (2015)

APPENDIX B: 2015/16 EPA ANNUAL RETURN

ANNUAL RETURN

LICENCE NO	**2504**
LICENCE HOLDER	ENDEAVOUR COAL PTY LIMITED
REPORTING PERIOD	01-Feb-2015 to 31-Jan-2016

If your licence has been transferred, suspended, surrendered or revoked by the EPA during this reporting period, cross out the dates above and specify the new dates to which this Annual Return relates below:

REVISED REPORTING PERIOD _____/ _____/ _____ to _____/ _____/ _____

(Note: the revised reporting period also needs to be entered in Section E)

THIS ANNUAL RETURN MUST BE RECEIVED BY THE EPA BEFORE 01-Apr-2016

Your Annual Return must be completed, including certification in Section I, and submitted to the EPA no later than 60 Days after the end of the reporting period for your licence.

Failure to submit this Annual Return within 60 days after the reporting period ends may result in:

- **the issue of a Penalty Notice for $1500 (individuals) or $3000 (corporations); OR**
- **prosecution.**

Please send your completed Annual Return by **Registered Post** to:

Regulatory and Compliance Support Unit
Environment Protection Authority
PO Box A290
SYDNEY SOUTH NSW 1232

It is an offence to supply any information in this form to the EPA that is false or misleading in a material respect, or to certify a statement that is false or misleading in a material respect.

THERE IS A MAXIMUM PENALTY OF $250,000 FOR A CORPORATION OR $120,000 FOR AN INDIVIDUAL.

Details provided in this Annual Return will be available on the EPA's Public Register in accordance with section 308 of the *Protection of the Environment Operations Act 1997.*

Annual Return

ENDEAVOUR COAL PTY LIMITED

Use the checklist below to ensure that you have completed your Annual Return correctly.

(☐ the boxes)

CHECKLIST		
☑	Section A:	All licence details are correct
☑	Section B1:	You have entered the correct number in the complaints table
☑	Section B2 – B3:	If there are tables, you have provided the required details
☑	Section C:	You have answered question **1**, and 2 if applicable
☑	Section D:	If applicable, you have completed all load calculation worksheets
☑	Section E:	You have answered question 1, 2, 3, 4, 5 and 6 if applicable
☑	Section F:	You have answered question 1, 2 and 3 if applicable
☑	Section G:	You have answered question 1 and questions 2, 3 and 4 or questions 5 through to **11** if applicable
☑	Section H:	You have answered question 1, 2, 3, 4, 5 and 6 if applicable
☑	Section I:	The Annual Return has been signed by appropriate person(s) and, if applicable, the revised reporting period entered
☑	Make a copy of the completed Annual Return and keep it with your licence records	
☐	Attach a cheque (unless you have paid separately) for the payment of the administrative fee for the next licence fee period	

Please send your completed Annual Return by **Registered Post** to:

Regulatory and Compliance Support Unit
Environment Protection Authority
PO Box A290
SYDNEY SOUTH NSW 1232

A Statement of Compliance - Licence Details

ALL licence holders must check that the licence details in Section A are correct

If there are changes to any of these details **you must advise the EPA and apply as soon as possible for a variation to your licence or for a licence transfer.**

Licence variation and transfer application forms are available on the EPA website at: http://www.epa.nsw.gov.au/licensing, or from regional offices of the EPA, or by contacting us on telephone 02 9995 5700.

If you are applying to vary or transfer your licence you must still complete this Annual Return.

A1 Licence Holder

Licence Number	2504
Licence Holder	ENDEAVOUR COAL PTY LIMITED
Trading Name *(if applicable)*	
ABN	38 099 830 476

A2 Premises to which Licence Applies (if applicable)

Common Name (if any)	3. WEST CLIFF AND NORTH CLIFF COLLIERIES
Premises	WEDDERBURN ROAD APPIN NSW 2560
Common Name (if any)	1. APPIN COLLIERY
Premises	OFF APPIN ROAD APPIN NSW 2560
Common Name (if any)	2. APPIN WEST COLLIERY
Premises	DOUGLAS PARK DRIVE DOUGLAS PARK NSW 2569

A3 Activities to which Licence Applies

Mining for Coal
Waste Disposal (application to land)
Coal Works

A4 Other Activities (if applicable)

Electricity generation
Resource Recovery

A5 Fee-Based Activity Classifications

Note that the fee based activity classification is used to calculate the administrative fee.

Fee-based activity	Activity scale	Unit of measure
Mining for coal	> 5,000,000.00	T produced
Waste disposal by application to land		annual capacity
Coal works	> 5,000,000.00	T handled

A6 Assessable Pollutants (Not Applicable)

B Monitoring and Complaints Summary

B1 Number of Pollution Complaints

Number of complaints recorded by the licensee during the reporting period. **If no complaints were received enter nil in the attached box, otherwise complete the table below.**	17

Pollution Complaint Category	Number of Complaints
Air	2
Water	0
Noise	10
Waste	0
Other	5

NOTE: 'Other' Complaints include: 1 x odour; 2 x light; 2 x personal property damage
NOTE: Above complaints data only relates to licenced facilities and activities. Excludes complaints received re: tuck movements on public roads.

B2 Concentration Monitoring Summary

For each monitoring point identified in your licence complete all the details for each pollutant listed in the tables provided below.

If concentration monitoring is **not** required by your licence, **no tables** will appear below.
Note that this does not exclude the need to conduct appropriate concentration monitoring of assessable pollutants as required by load-based licensing (if applicable).

Annual Return

ENDEAVOUR COAL PTY LIMITED

NSW EPA

Monitoring Point 4

Discharge Quality Monitoring. Volume Monitoring. - West Cliff and North Cliff Collieries., Sampling tap in settling chamber of STP.

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Biochemical oxygen demand	milligrams per litre	12	13	<2	13	43
Oil and Grease	milligrams per litre	12	13	<5	6	12
pH	pH	12	13	7.2	7.5	8.7

Discharge & Monitoring Point 10

Discharge to waters
Discharge quality monitoring
Volume monitoring - West Cliff and North Cliff Collieries., Piped Discharge outlet labelled "Point 10" on map titled "Bulli Seam Operations Point 10 Discharge Water EPL Variation" dated 12 January 2015(Doc No:HSE-2015-140-Rev0). Flowmeter location is denoted as "FM10" on the map.

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Alkalinity (as calcium carbonate)	milligrams per litre	12	15	119	702	1310
Aluminium (dissolved)	milligrams per litre	12	15	280	570	1060
Arsenic (dissolved)	micrograms per litre	12	16	4	10	15
Bicarbonate	milligrams per litre	12	15	506	756	1100
Cadmium (dissolved)	micrograms per litre	12	16	<0.1	0.1	0.2
Chemical oxygen demand	milligrams per litre	12	15	<10	19	65
Cobalt (dissolved)	micrograms per litre	12	16	2	7	16

Annual Return

ENDEAVOUR COAL PTY LIMITED

NSW EPA

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Conductivity	microsiemens per centimetre	12	15	1590	2210	3080
Copper (dissolved)	micrograms per litre	12	16	3	6	10
Lead (dissolved)	micrograms per litre	12	16	<1	2	5
Manganese (dissolved)	micrograms per litre	12	16	5	18	39
Nickel (dissolved)	micrograms per litre	12	17	72	125	205
Nitrogen (ammonia)	micrograms per litre	12	15	70	160	260
Nitrogen (total)	micrograms per litre	12	15	600	1380	2900
Oil and Grease	milligrams per litre	12	15	<5	<5	<5
Oxidised nitrogen	micrograms per litre	12	15	210	663	1760
pH	pH	12	15	8.5	8.9	9.1
Total dissolved solids	milligrams per litre	12	15	768	1242	1990
Total suspended solids	milligrams per litre	12	15	<5	8	24
Turbidity	nephelometric turbidity units	Continuous	Continuous	0	26.50	350
Zinc (dissolved)	micrograms per litre	12	16	14	47	243

Annual Return

ENDEAVOUR COAL PTY LIMITED

Monitoring Point 11

Ambient water quality monitoring- West Cliff and North Cliff Collieries., Georges River located approximately 50 metres upstream of the confluence with Brennans Creek labelled "LDP11" on map titled "West Cliff and North Cliff Mine" dated May 2010.

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Conductivity	microsiemens per centimetre	12	44	130	260	555
pH	pH	12	44	6.5	7	8.7
Total suspended solids	milligrams per litre	12	12	<5	6	10

Monitoring Point 12

Ambient water quality monitoring - West Cliff and North Cliff Collieries., Georges River located approximately 50 metres downstream of the confluence with Brennans Creek labelled "LDP12" on map titled "West Cliff and North Cliff Mine" dated May 2010.

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Conductivity	microsiemens per centimetre	12	44	134	1724	3170
pH	pH	12	44	7.9	8.7	9.3
Total suspended solids	milligrams per litre	12	12	<5	8	14

Monitoring Point 14

Dust Monitoring - Appin Colliery, Dust Gauge "AE-DD14" is located to the SE of the coal stockpile on the property boundary.

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Ash	grams per square metre per month	12	12	0.6	1.1	2.4
Combustible solids	grams per square metre per month	12	12	0.6	1.6	2.9
Insoluble solids	grams per square metre per month	12	12	1.2	2.6	5

Monitoring Point 15

Dust Monitoring - Appin Colliery, Dust Gauge "AE-DD15" is located to the east of the coal stockpile near the sediment pond

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Ash	grams per square metre per month	12	12	0.4	0.9	2.5
Combustible solids	grams per square metre per month	12	12	0.3	1.4	3.9
Insoluble solids	grams per square metre per month	12	12	0.7	2.3	6.1

Monitoring Point 16

Dust Monitoring - Appin Colliery, Dust Gauge "AE-DD16" is located on the north property boundary near the Sydney Water tank.

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Ash	grams per square metre per month	12	12	0.3	2.2	18.7
Combustible solids	grams per square metre per month	12	12	0.2	0.8	2.5
Insoluble solids	grams per square metre per month	12	12	0.5	2.9	21.2

Monitoring Point 17

Dust Monitoring - Appin Colliery, Dust Gauge "AE-DD17" is located at the NE corner of the property boundary near the truck exit/entry point.

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Ash	grams per square metre per month	12	12	0.6	1.2	2.3
Combustible solids	grams per square metre per month	12	12	0.7	1.6	3.4
Insoluble solids	grams per square metre per month	12	12	1.3	2.8	5.3

Discharge & Monitoring Point 18

Discharge to waters.
Discharge quality and volume monitoring
(Stormwater Discharge) - Appin East Colliery, Underflow from the filter lagoon discharging through a v-notch weir labelled "LDP18" on map titled "Appin East Pit Top" dated May 2010.

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Oil and Grease	milligrams per litre	0	0	---	---	---
pH	pH	0	0	---	---	---
Total suspended solids	milligrams per litre	0	0	---	---	---

NOTE: No discharge from Point 18 during this reporting period.

Discharge & Monitoring Point 19

Discharge to waters. Discharge quality and volume monitoring.
(Surface Water Discharge) - Appin East Colliery, Dyna Sand Filter outlet at location labelled "LDP19" on map titled "Appin East Pit Top" dated May 2010.

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Oil and Grease	milligrams per litre	10	10	<5	<5	6
pH	pH	10	10	6.6	7.1	7.7
Total suspended solids	milligrams per litre	10	10	<5	<5	9

NOTE: No discharge during October and November.

Annual Return

ENDEAVOUR COAL PTY LIMITED

Discharge & Monitoring Point 20

Discharge to land.
Discharge quality and volume monitoring.
(Spray Irrigation Discharge) - Appin East Colliery., Envirocycle Irrigation Area as indicated by highlighted area labelled "LDP20" on map titled "Appin East Pit Top" dated May 2010.

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Biochemical oxygen demand	milligrams per litre	0	0	---	---	---
Oil and Grease	milligrams per litre	0	0	---	---	---
pH	pH	0	0	---	---	---

NOTE: No discharge from Point 20 during this reporting period.

Discharge & Monitoring Point 22

Discharge to utilisation area.
Water quality monitoring
Volume Monitoring. - Appin West Colliery, The 100mm poly pipe from the secondary stabilisation lagoon of the sewage treatment plant labelled "LDP22 Sample Location" on Plan A07-1240 "Appin West Effluent Irrigation Area" dated 30.08.11. The application area is labelled LDP22 "Irrigation Area"

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Biochemical oxygen demand	milligrams per litre	11	11	4	8	13
Oil and Grease	milligrams per litre	11	13	<5	6.8	20
pH	pH	11	12	6.8	7.0	7.6

NOTE: No discharge during January.

Discharge & Monitoring Point 23

Discharge to waters.
Water quality monitoring.
Discharge volume monitoring. - Appin West Colliery, Piped discharge outlet for stormwater labelled "LDP23" on map titled "Appin West Pit Top" dated May 2010.

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Oil and Grease	milligrams per litre	12	12	<5	<5	8
pH	pH	12	12	7.5	7.7	8.3
Total suspended solids	milligrams per litre	12	12	<5	8	20

Discharge & Monitoring Point 24

Discharge to waters.
Water quality monitoring. Discharge volume monitoring - Appin West Colliery, Piped discharge outlet for minewater labelled "LDP24" on map titled "Appin West Pit Top" dated May 2010.

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Conductivity	microsiemens per centimetre	12	12	729	997	1250
Oil and Grease	milligrams per litre	12	12	<5	7	21
pH	pH	12	12	6.7	7.2	8.1
Total suspended solids	milligrams per litre	12	12	<5	6	8

Monitoring Point 26

Dust Monitoring - Appin Colliery, Dust Gauge "AE-DD18" is located at the SW corner of the coal stockpile next to the loading bin

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Ash	grams per square metre per month	12	12	1.3	2.2	4
Combustible solids	grams per square metre per month	12	12	2.1	3.9	7.6
Insoluble solids	grams per square metre per month	12	12	3.4	6.1	11.4

Monitoring Point 27

PM10 Monitoring - Appin Colliery, Photometer "AE-PF1" is located at the NE corner of the property boundary near the truck entry/exit point.

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
PM10	micrograms per cubic metre	Continuous	Continuous	9.8	14.3	94

Monitoring Point 28

PM10 Monitoring - Appin Colliery, Photometer "AE-PF3" is located at the NW corner of the property boundary.

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
PM10	micrograms per cubic metre	Continuous	Continuous	6.6	9.7	65.8

Monitoring Point 29

Dust Monitoring - Appin West Colliery, Dust Gauge "AW-DD1" is located at the pit top between the mine access road, employee car park and EDL power plant.

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Ash	grams per square metre per month	12	12	0.2	0.7	1.4
Combustible solids	grams per square metre per month	12	12	0.2	0.5	0.7
Insoluble solids	grams per square metre per month	12	12	0.4	1.2	2.1

Monitoring Point 30

Dust Monitoring - Appin West Colliery, Dust Gauge "AW-DD2" is located at the junction of the mine access road and Douglas Park Drive.

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Ash	grams per square metre per month	12	12	0.2	0.5	1.1
Combustible solids	grams per square metre per month	12	12	0.2	0.5	1.2
Insoluble solids	grams per square metre per month	12	12	0.4	1.0	1.8

Monitoring Point 31

Dust Monitoring - West Cliff Colliery, Dust Gauge "W-DD1" is located at the junction of Wedderburn Rd and Appin Rd.

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Ash	grams per square metre per month	12	12	0.6	1.3	2.1
Combustible solids	grams per square metre per month	12	12	0.8	1.6	2.7
Insoluble solids	grams per square metre per month	12	12	1.4	2.9	4.6

Monitoring Point 32

Dust Monitoring - West Cliff Colliery, Dust Gauge "W-DD3" is located at the pit top south site.

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Ash	grams per square metre per month	12	12	0.5	2.0	3.7
Combustible solids	grams per square metre per month	12	12	0.3	1.3	2.2
Insoluble solids	grams per square metre per month	12	12	1	3.3	5.9

Monitoring Point 33

Dust Monitoring - West Cliff Colliery, Dust Gauge "AW-DD8" is located at Brennan Creek dam.

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Ash	grams per square metre per month	12	12	0.2	0.8	2.6
Combustible solids	grams per square metre per month	12	12	<0.1	0.4	1
Insoluble solids	grams per square metre per month	12	12	0.2	1.1	3.1

Monitoring Point 34

Dust Monitoring - West Cliff Colliery, Dust Gauge "W-DD10" is located on Wedderburn Road next to the product stockpiles.

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Ash	grams per square metre per month	12	12	9.9	22.4	35
Combustible solids	grams per square metre per month	12	12	7.7	13.3	20.4
Insoluble solids	grams per square metre per month	12	12	17.6	35.6	55.4

Monitoring Point 35

PM10 Monitoring - West Cliff Colliery, Photometer "W-PF1" is located at the junction of Appin Road and Wedderburn Road.

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
PM10	micrograms per cubic metre	Continuous	Continuous	15.9	19.9	107.4

Discharge & Monitoring Point 36

Discharge to waters. Discharge quality monitoring - Douglas Park Vent Shaft No.6, Piped discharge outlet from primary sedimentation dam as described in the Vent Shaft No.6 Water Management Plan.

Pollutant	Unit of measure	No. of samples required by licence	No. of samples you collected and analysed	Lowest sample value	Mean of sample	Highest sample value
Electrical conductivity	microsiemens per centimetre	8	8	912	2227	2930
pH	pH	8	8	7.6	7.9	8.1
Total suspended solids	milligrams per litre	8	8	<5	21	42

NOTE: No discharge during August, October, November, December.

B3 Volume or Mass Monitoring Summary

For each monitoring point identified in your licence complete the details of the volume or mass monitoring indicated in the tables provided below.

If volume or mass monitoring is not required by your licence, **no tables** will appear below.

Note that this does not exclude the need to conduct appropriate concentration monitoring of assessable pollutants as required by load-based licensing (if applicable).

Monitoring Point 4

Discharge Quality Monitoring. Volume Monitoring. - West Cliff and North Cliff Collieries.

Unit of measure	Frequency	No. of measurements made	Lowest result	Mean result	High result
kilolitres per day	Continuous	12	0	21	394

Discharge & Monitoring Point 10

Discharge to waters
Discharge quality monitoring
Volume monitoring - West Cliff and North Cliff Collieries.

Unit of measure	Frequency	No. of measurements made	Lowest result	Mean result	High result
kilolitres per day	Continuous	12	0	367	950

Monitoring Point 13

Volume monitoring - West Cliff and North Cliff Collieries.

Unit of measure	Frequency	No. of measurements made	Lowest result	Mean result	High result
kilolitres per day	Continuous	12	0	1637	3427

Discharge & Monitoring Point 18

Discharge to waters.
Discharge quality and volume monitoring
(Stormwater Discharge) - Appin East Colliery

Unit of measure	Frequency	No. of measurements made	Lowest result	Mean result	High result
kilolitres per day	Continuous during discharge	0	---	---	---

NOTE: No discharge from Point 18 during reporting period.

Discharge & Monitoring Point 19

Discharge to waters. Discharge quality and volume monitoring.
(Surface Water Discharge) - Appin East Colliery

Unit of measure	Frequency	No. of measurements made	Lowest result	Mean result	High result
kilolitres per day	Continuous during discharge	12	0	207	1144

Discharge & Monitoring Point 20

Discharge to land.
Discharge quality and volume monitoring.
(Spray Irrigation Discharge) - Appin East Colliery.

Unit of measure	Frequency	No. of measurements made	Lowest result	Mean result	High result
kilolitres per day	Continuous during discharge	0	---	---	---

NOTE: No discharge from Point 20 during reporting period.

Discharge & Monitoring Point 22

Discharge to utilisation area.
Water quality monitoring
Volume Monitoring. - Appin West Colliery

Unit of measure	Frequency	No. of measurements made	Lowest result	Mean result	High result
kilolitres per day	Continuous	12	0	24	77

Discharge & Monitoring Point 24

Discharge to waters.
Water quality monitoring. Discharge volume monitoring - Appin West Colliery

Unit of measure	Frequency	No. of measurements made	Lowest result	Mean result	High result
kilolitres per day	Continuous	12	0	384	1859

C Statement of Compliance - Licence Conditions

C1 Compliance with Licence Conditions

(□ the boxes)

1	Were all conditions of the licence complied with (including monitoring and reporting requirements)? (□ a box)	□ Yes ☑□No

2 If you answered 'No' to question 1, please supply the following details for each non -compliance in the format, or similar format , provided on the following page.

Please use a separate page for each licence condition that has not been complied with.

a) What was the specific licence condition that was not complied with?

b) What were the particulars of the non -compliance?

c) What were the date(s) when the non -compliance occurred, if applicable?

d) If relevant, what was the precise location where the non-compliance occurred?

Attach a map or diagram to the Statement to show the precise location.

e) What were the registration numbers of any vehicles or the chassis number of any mobile plant involved in the non-compliance?

f) What was the cause of the non -compliance?

g) What action has been, or will be, taken to mitigate any adverse effects of the non-compliance?

h) What action has been, or will be, taken to prevent a recurrence of the non -compliance?

3. How many pages have you attached?

Each attached page must be initialed by the person(s) who signs Section G of this Annual Return

3

C2 Details of Non-Compliance with Licence

Licence condition number not complied with
L2.4
Summary of particulars of the non-compliance
Oil and Grease sample result was above the EPL 100 Percentile limit
If required, further details on particulars of non-compliance
Sample EW1511205 at Water monitoring Point 4, returned a result of 12 mg/L which is over the EPL 100 Percentile limit of 10 mg/L
Date(s) when the non-compliance occurred, if applicable
5/8/15
If relevant, precise location where the non-compliance occurred (attach a map or diagram)
Spray irrigation on grassed utilisation area shaded as '002 Spray Irrigation' on the Map titled "West Cliff - EPA Licence Authorised Discharge Points, DP-2672A" forwarded to the EPA with the Licence Information Form.
If applicable, registration numbers of any vehicles or the chassis number of any mobile plant involved in the non-compliance
N/A
Cause of non-compliance
It is unlikely that there was a breach of the oil and grease licence limit due to the following: • No visible signs of oil and grease were observed on the day of sampling within the dam or the sewage treatment package plant; • All samples since June 2013 have been below the limit of reporting (<5 mg/L); and • All samples since June 2012 have been below 6 mg/L. The exact cause of the elevated level is unknown, though potentially due to contamination of the sampling bottle or cross-contamination at the Laboratory.
Action taken or that will be taken to mitigate any adverse effects of the non-compliance
No adverse effects occurred as it is unlikely that there was a breach of the licence limit. Even if levels were above the limit, this would've added a very small amount of oil and grease to the spray irrigation area. The monitoring point was re-sampled for O&G on 25/08 and the result was <5mg/L which is below the limit of reporting.
Action taken or that will be taken to prevent a recurrence of the non-compliance
Current quality control processes will be continued and information passed onto the Laboratory.

Licence condition number not complied with
L2.4
Summary of particulars of the non-compliance
Oil and Grease sample result above the EPL 100 Percentile limit
If required, further details on particulars of non-compliance
Sample EW1511206 at Water monitoring Point 22, returned a result of 12 mg/L which is over the EPL 100 Percentile limit of 10 mg/L.
Date(s) when the non-compliance occurred, if applicable
5/8/15
If relevant, precise location where the non-compliance occurred (attach a map or diagram)
The 100mm poly pipe from the secondary stabilisation lagoon of the sewage treatment plant labelled "LDP22 Sample Location" on Plan A07-1240 "Appin West Effluent Irrigation Area" dated 30.08.11. The application area is labelled LDP22 "Irrigation Area"
If applicable, registration numbers of any vehicles or the chassis number of any mobile plant involved in the non-compliance
N/A
Cause of non-compliance
The exact cause of the elevated level is unknown, however it is unlikely that there was a breach of the oil and grease licence limit due to the following: • No visible signs of oil and grease were observed on the day of sampling within the dam or the sewage treatment package plant; and • The sample monitoring point is located at the surface, while discharge to the irrigation area is taken from below the surface of the dam. There was a problem with sewage treatment sludge between 14 August and 27 August, although no oil and grease was visible. This issue was resolved by sampling undertaken on 2 September, when oil and grease was below the licence limit.
Action taken or that will be taken to mitigate any adverse effects of the non-compliance
The initial sample and the resample during August were above the licence limit for oil and grease. No adverse effects were expected due to the following: • The sample monitoring point is located at the surface, while discharge to the irrigation area is taken from below the surface of the dam, therefore it is unlikely that oil and grease (if present) was transferred to the irrigation areas • Even if levels were above the limit, this would've added a very small amount of oil and grease to the spray irrigation area and is an isolated event.
Action taken or that will be taken to prevent a recurrence of the non-compliance
An aeration systems has been installed in the sewage lagoons to improve the treatment efficiency and reduce sludge production.

Licence condition number not complied with
L2.4
Summary of particulars of the non-compliance
Oil and Grease sample result over the EPL 100 Percentile limit
If required, further details on particulars of non-compliance
Sample ES1601412 at Water monitoring Point 24, returned a result of 21 mg/L which is over the EPL 100 Percentile limit of 10 mg/L
Date(s) when the non-compliance occurred, if applicable
20/1/16
If relevant, precise location where the non-compliance occurred (attach a map or diagram)
Piped discharge outlet for mine water labelled "LDP24" on map titled "Appin West Pit Top" dated May 2010.
If applicable, registration numbers of any vehicles or the chassis number of any mobile plant involved in the non-compliance
N/A
Cause of non-compliance
It is unlikely that there was a breach of the oil and grease licence limit due to the following: • Water is discharged from the Appin West Filtration Plant which includes activated carbon, microfiltration and reverse osmosis processes to remove oil and grease and other contaminants. • No visible signs of oil and grease were observed on the day of sampling within the dam, water filtration plant or sampling location; • No samples have been above the licence limit since June 2012. The exact cause of the elevated level is unknown, though potentially due to contamination of the sampling bottle or cross-contamination at the Laboratory.
Action taken or that will be taken to mitigate any adverse effects of the non-compliance
No adverse effects were expected due to the high likelihood that the elevated reading was caused by sample and or laboratory contamination. The monitoring point was resampled on 12/2/16 and returned a result of <5 mg/l (below the limit of reporting).
Action taken or that will be taken to prevent a recurrence of the non-compliance
Current quality control processes will be continued and information passed onto the Laboratory.

D Statement of Compliance - Load-Based Fee Calculation Worksheets

If you are not required to monitor assessable pollutants by your licence, no worksheets will appear below. Please go to Section E.

If assessable pollutants have been identified on your licence (see licence condition L2), complete the following worksheets for each assessable pollutant to determine your load-based fee for the licence fee period to which this Annual Return relates.

Loads of assessable pollutants must be calculated using any of the methods provided in the EPA's Load Calculation Protocol for the relevant activity. A Load Calculation Protocol would have been sent to you with your licence. If you require additional copies you can download the Protocol from the EPA's website or you can contact us on telephone 02 9995 5700.

You are required to keep all records used to calculate licence fees for four years after the licence fee was paid or became payable, whichever is the later date.

PENALTIES APPLY FOR SUPPLYING FALSE OR MISLEADING INFORMATION

D1 - D8 (Not Applicable)

E Statement of Compliance - Requirement to Prepare Pollution Incident Response Management Plan (PIRMP) Under Section 153A of the POEO Act 1997

1 Have you prepared a PIRMP as required under s153A of the Protection of the Environment Operations Act 1997?

(☐ a box) ☑ Yes ☐ No

If you answered 'Yes' to question 1, please tick the appropriate box to indicate the following:

2 Is the PIRMP available at the premises?

(☐ a box) ☑ Yes ☐ No

3 Is the PIRMP available in a prominent position on a publicly accessible web site?

(☐ a box) ☑ Yes ☐ No

If the PIRMP is available on a publicly accessible web site please indicate clearly below the address of the web site where the PIRMP can be accessed:

Web site Address: http://www.south32.net/getmedia/452f6a12-772e-4eb1-96de-43a302175616/South32Web

4 Has the PIRMP been tested?

(☐ a box) ☑ Yes ☐ No

If you answered 'Yes' to question 4 please indicate clearly below the date that the PIRMP was last tested:

The PIRMP was last tested on 25 / 08 / 2015

5 Has the PIRMP been updated?

(☐ a box) ☑ Yes ☐ No

If you answered 'Yes' to question 5 please indicate clearly below the date that the PIRMP was last updated:

The PIRMP was last updated on 25 / 11 / 2014

6 How many times has the PIRMP been activated in this reporting period? 0

If the PIRMP has been activated, please indicate clearly below the date/s when the PIRMP was activated:

The PIRMP was activated on __ / __ / _____

The EPA's guidelines for preparation of pollution incident response management plans are available at

http://www.epa.nsw.gov.au/legislation/20120227egpreppirmp.htm

F Statement of Compliance - Requirement to Publish Pollution Monitoring Data Under Section 66(6) of the POEO Act 1997

1 Are there any conditions attached to your licence that require pollution monitoring to be undertaken?

(☐ a box) ☑ Yes ☐ No

If you answered 'Yes' to question 1, please tick the appropriate box to indicate the following:

2 Do you operate a web site?

(☐ a box) ☑ Yes ☐ No

3 Is the pollution monitoring data published on your web site in accordance with the EPA's written requirements for publishing pollution monitoring data?

(☐ a box) ☑ Yes ☐ No

If you publish pollution monitoring data on a web site please indicate clearly below the address of the web site where the pollution monitoring data can be accessed:

Web site address: http://www.south32.net/our-operations/australia/illawarra-coal/regulatory-document

The EPA's written requirements for publishing pollution monitoring data are available at http://www.epa.nsw.gov.au/legislation/20120263reqpubpmdata.htm

Note - if you do not maintain a web site, you must provide a copy of any monitoring data that relates to pollution, to any person requests a copy of the data at no charge to the person requesting the data.

G Statement of Compliance - Environmental Management Systems and Practices

1 Do you have an environmental management system (EMS) certified to ISO 14001 or any other demonstrated equivalent system[1]? (see note below on demonstrated equivalent)

(☐ a box) ☑ Yes ☐ No

If your answer to question 1 is 'No', please proceed to question 5. If your answer to question 1 is 'Yes', please proceed to question 2.

2 When was the last check of the EMS[2] completed (see note below on check of EMS)? 18 / 12 / 2015

3 Were there any non-conformances related to environmental issues identified in the last check of the EMS?

(☐ a box) ☐ Yes ☑ No

4 If there were non-conformances identified, were these non-conformances rectified?

(☐ a box) ☐ Yes ☐ No ☑☐ N/A

If you answered 'No' to question 1, please answer questions 5 - 11. If you answered 'Yes' to question 1 please proceed to section H. Questions 5-11 relate to any documented environmental practices, procedures and systems in place. Refer to http://www.epa.nsw.gov.au/licensing/EMCP.htm for guidance on how to complete questions 5 to 11. If unsure of the answer, tick No.

5 Have you conducted an assessment of your activities and operations to identify the aspects that have a potential to cause environmental impacts and implemented operational controls to address these aspects?

(☐ a box) ☐ Yes ☐ No

6 Have you established and implemented an operational maintenance program, including preventative maintenance?

(☐ a box) ☐ Yes ☐ No

7 Do you keep records of regular inspections and maintenance of plant and equipment?

(☐ a box) ☐ Yes ☐ No

8 Do you conduct regular site audits to assess compliance with environmental legal requirements and assess conformance to the requirements of any documented environmental practices, procedures and systems in place?

(☐ a box) ☐ Yes ☐ No

8a If yes, how often?

9 Are the audits of documented environmental practices, procedures and systems undertaken by a third party?

(☐ a box) ☐ Yes ☐ No

10 Have you established and implemented an environmental improvement or management plan?

(☐ a box) ☐ Yes ☐ No

11 Do you train staff in environmental issues that may arise from your activities and operations and keep records of this

(☐ a box) ☐ Yes ☐ No

[1] Demonstrated equivalent refers to an environmental management system that the EPA considers is equivalent to the accountability, procedures, documentation and record keeping requirements of an ISO 14001 system. For further information go to:
http://www.epa.nsw.gov.au/resources/licensing/150402-environmental-management-systems-guidelines.pdf

[2] Undertaking a 'check of an EMS' refers to the ISO 14001 requirements that an organisation demonstrates conformity to the requirements of its EMS and to the standard, these checks require third-party certification that requirements have been met.

H Statement of Compliance - Environmental Improvement Works

Before reporting on environmental improvement works please consider the following:

Environmental improvement works must meet the following criteria:

- They are not required to comply with licence conditions or legislative requirements.
- They have been undertaken voluntarily, and are in addition to any works required to comply with any licence conditions or legislative requirements under the Protection of the Environment Operations Act 1997 or its regulations.
- They relate to the licensed activity at the licensed premises.
- They aim to reduce air, water, noise pollution or incident potential at the premises.
- They were completed in the reporting period covered by this annual return. They are not ongoing.

If the works reported in this annual return do not meet the criteria set out above they will not be included in the calculation of the environmental management category for this licence.

1 Have you voluntarily completed any environmental improvement works in this licence reporting period that have resulted in demonstrated environmental improvements at the premises?

(☐ a box) ☐ Yes ☑ ☐ No

If you answered 'Yes', please provide the following supporting information:

Brief description of works
N/A
Demonstration of environmental improvement resulting from the works at the premises. **Include details of:** ▫ Controls in place before works undertaken ▫ New controls put in place ▫ Description of environmental improvements (e.g. reducing air, water, noise pollution or incident potential) due to the works. ▫ Where possible, quantitative data (e.g. monitoring) to demonstrate the improved environmental outcome.
N/A
Date when works were completed **(Note: ongoing works are not applicable)** __/__/____
Estimated cost of works:

Annual Return

ENDEAVOUR COAL PTY LIMITED

NSW EPA

I Signature and Certification

This Annual Return may only be signed by a person(s) with legal authority to sign it as set out in the categories below. **Please tick (☐) the box** next to the category that describes how this Annual Return is being signed.

If you are uncertain about who is entitled to sign or which category to tick, please contact us on telephone 02 9995 5700.

If the licence holder is:		the Annual Return must be signed and certified:
an individual	☐	by the individual licence holder, or
	☐	by a person approved in writing by the EPA to sign on the licence holder's
a company	☐	behalf by affixing the common seal in accordance with Corporations Act 2001, or
	☑	by 2 directors, or
	☐	by a director and a company secretary, or
	☐	if a proprietary company that has a sole director who is also the sole company secretary – by that director, or
	☐	by a person de legated to sign on the company's behalf in accordance with the Corporations Act 200 1 **and** approved in writing by the EPA to sign on the company's behalf.
a public authority (other than a council)	☐☐	by the Chief Executive Officer of the public authority, or
	☐☐	by a person delegated to sign on the public authority's behalf in accordance with its legislation **and** approved in writing by the EPA to sign on the public authority's behalf.
a local council	☐	by the General Manager in accordance with s.377 of the Local Government Act 1993, or
	☐	by affixing the seal of the council in a manner authorised under that Act.

It is an offence to supply any information in this form that is false or misleading in a material respect, or to certify a statement that is false or misleading in a material respect. There is a maximum penalty of $250,000 for a corporation or $120,000 for an individual.

I/We

- *declare that the information in the Monitoring and Complaints Summary in section B of this Annual Return is correct and not false or misleading in a material respect, and*
- *certify that the information in the Statement of Compliance in sections A, C, D, E, F, G and H and any pages attached to Section C is correct and not false or misleading in a material respect.*

If your licence has been transferred, suspended, surrendered or revoked by the EPA during this reporting period, cross out the dates below and specify the new dates to which this Annual Return relates below:

For the reporting period 01-Feb-2015 to 31-Jan-2016 or ____/____/____ to ____/____/____

SIGNATURE: Michael Rix

NAME: (printed) Michael Rix

POSITION: Director

DATE: 23 / 03 / 16

SIGNATURE:

NAME: (printed) Michael Thew

POSITION: Director

DATE: 24 / 03 / 2016.

SEAL(if signing under seal)

PLEASE ENSURE THAT ALL APPROPRIATE BOXES HAVE BEEN COMPLETED AND THAT THE CHECKLIST ON PAGE 2 OF THE ANNUAL RETURN HAS BEEN COMPLETED

APPENDIX C: FY2016 COMPLAINTS

COMPLAINTS REPORT

June 2016

BULLI SEAM OPERATIONS






Bulli Seam Operations - Community Complaints Report

Operation/Project	Month	Date	Nature of Complaint	Actions / Follow Up
	April 2015		No complaints received	
Processing & Logistics	May 2015	12/05/2015	Driver complained about piece of coal or rock falling from truck causing damage to his bonnet and windscreen.	Determined truck was in vicinity at the time. Requested caller obtain 3 quotes.
Appin Mine	May 2015	15/05/2015	Engine oil type odour being experienced.	Determined odour experienced is due to the area currently being mined. Westerly winds contributing to the ability to detect the odour.
Ventilation Shaft 6 - Projects	May 2015	19/05/2015	Resident complained about tractor type noise being experienced at their property at night from our activities.	Investigated and determined noise source from water treatment activities in pond located closest to residence. Decided that water treatment activities would not occur outside of daytime hours in that pond.
Ventilation Shaft 6 - Projects	May 2015	27/05/2015	Resident complained about tractor type noise being experienced at their property in daytime from our activities.	Investigated and confirmed noise source from water treatment activities in pond located closest to residence. Undertook noise monitoring. Noise from operations well within limits. Agreed to operate that pump at lower throttle speed.
Ventilation Shaft 6- projects	June 2015	1 June 2015	Resident complained about a banging noise coming from the site.	Incident reported to the Project Manager. Noise source investigated and rectified on site.
Ventilation Shaft 6- projects	June 2015	25 June 2015	Resident complained about the tailgates of trucks banging and emitting a loud noise	Incident reported to Project Manager. Drivers have been asked to drive slow after tipping and not let the tailgate bang.
Ventilation Shaft 6 - Projects	July 2015	15 July 2015	Resident complain about humming noise the fans at the Ventilation shaft	Advised resident the noise is during the start-up phase and would only last for the day.

Operation/Project	Month	Date	Nature of Complaint	Actions / Follow Up
Ventilation Shaft 6 - Projects	July 2015	23 July 2015	Resident complained about tailgate slamming shut from coal wash delivery	Incident reported to Project Manager. Noise source investigated and rectified on site.
	September 2015		No complaints received	
	October 2015		No complaints received	
707 Bulgo	November 2015	28/11/2015	Noise from 707 Bulgo	Noise source investigated and rectified on site.
707 Bulgo	November 2015	30/11/2015	Noise complaint from 707 Bulgo	Noise source investigated and rectified on site
Ventilation Shaft 6 - Projects	December 2015	1/12/2015	Complaint of dust emission at Vent Shaft 6.	Incident reported to Project Manager. Dust source investigated and actions implemented.
707 Bulgo	December 2015	2/12/2015	Noise complaint from 707 Bulgo	Noise reported to Project Manager and rectified on site.
Ventilation Shaft 6 - Projects	December 2015	4/12/2015	Light complaint from Vent Shaft site	Event reported and light source identified and work ceased immediately following the complaint.
Appin Area 9 Projects	December 2015	16/12/2015	Noise complaint from generator as part of Appin Area 9 rail works	Event reported and investigated. Work using generator ceased.

Operation/Project	Month	Date	Nature of Complaint	Actions / Follow Up
Appin Area 9 Projects	December 2015	16/12/2015	Noise complaint from generator as part of Appin Area 9 rail works	Event reported and investigated. Work using generator ceased.
Appin Area 9 Projects - RP&D	January 2016	13/01/2016	Resident complained about damage to personal property	Event reported and investigated and corrected by Project Manager.
Appin Area 9 Projects - RP&D	January 2016	19/01/2016	Resident complained about damage to personal property	Event reported and investigated and corrected by Project Manager.
	February 2016		No complaints received	
Appin Area 9 Projects - RP&D	March 2016	16/03/2016	Noise complaint from 707 Bulgo site	Event reported to Project Manager. The noise source ceased immediately following complaint.
Appin Area 9 Projects - RP&D	March 2016	18/03/2016	Resident complained about gates being left open on property	Event reported to Project Manager for investigation. Mitigation controls have been put in place to avoid a reoccurrence of this incident.
	April 2016		No complaints made for the month	
	May 2016		No complaints made for the month	

Operation/Project	Month	Date	Nature of Complaint	Actions / Follow Up
	June 2016		No complaints made for the month	

APPENDIX D: BSO EPBC APPROVAL 2010/5350 COMPLIANCE REPORT

Bulli Seam Operations Annual Compliance Report – August 2016 (EPBC 2010/5350)

Date of submission: 11 August 2016

South32 Website Upload Request Date: 11 August 2016

Abbreviations:

DOE – Federal Department of the Environment

DOPE – NSW Department of Planning and the Environment

OEH – NSW Office of Environment and Heritage

CCL – Consolidated Coal Lease

UOW – University of Wollongong

EPBC – Environment Protection and Biodiversity Conservation

In accordance with condition 14 of the EPBC approval (2010/5350) within three months of every 12 month anniversary of the commencement of the action, the person taking the action must publish a report on their website addressing compliance with each of the conditions of this approval, including implementation of any management plans as specified in the conditions. Documentary evidence providing proof of the date of publication and non-compliance with any of the conditions of this approval must be provided to the department at the same time as the compliance report is published.

Condition	Condition Summary	Status	Compliant Y/N
1	Persoonia Hirsuta Provide proposed *Persoonia hirsuta* offset area for approval.	Proposed off-set area submitted to DOE in the Persoonia hirsuta Offset Management Plan. Application submitted on 26 Nov 2013 to amend CCL724 via a s238 Condition under the Mining Act 1992 to legally secure a Persoonia Offset Area at West Cliff Mine as required by our Bulli Seam Operations EPBC Approval (2010/5350). The Minister for Resources and Energy amended CCL 724 on 23 March 2014.	Yes
2	Persoonia Hirsuta Develop a management plan for the *Persoonia hirsuta* offset area.	Persoonia management plan was submitted to DOE prior to the 31st December 2012 and approved on 22 November 2013 (ref 2013/10882). Plan has since been reviewed and was approved in April 2016. Latest Plan is available on our website. http://www.south32.net/getmedia/3d05a2ab-2694-4d0a-af4e-	Yes

		dc194ce6ef24/South32Web	
3	Persoonia Hirsuta Engage a suitably qualified expert to undertake targeted research to inform conservation activities. Make research publicly available.	University of Wollongong have been engaged to conduct research. The 'targeted' research consists of a series of honours projects. The following projects have been completed to date: 1. Honours project #1 titled *The Demography and Habitat Characteristics of the Endangered Persoonia hirsuta* (submitted 2013) 2. Honours project #2 titled *Conservation genetics of the rare and endangered plant, Persoonia hirsuta (proteaceae)* (submitted 2015) UOW commenced a third project in November 2015 to build on the research conducted under Project #2. This thesis will be titled *Understanding the Mating System* and will be completed October 2016. In addition, Mt Annan Royal Botanic Gardens (RBG) are undertaking trial propagation using cuttings collected from the West Cliff and other populations. This project is ongoing; one *P. hirsuta* has been successfully propagated vegetatively to date. MT Annan RBG has also collected seed from the West Cliff population and undertook seed viability tests. Mt Annan RBG (in collaboration with Illawarra Coal and Centennial Coal) has been granted ACARP funding to conduct research on seed germination biology and alternative ex situ storage of *Persoonia* germplasm for restoration. This project will address two main questions: 1) how to effectively propagate Persoonia species (both rare and common) for mine rehabilitation work; and, 2) what are the most appropriate ex situ conservation options to ensure restoration success. The project commenced February 2015 and is expected to be completed in March 2017.	Yes
4	Shale/Sandstone Transition Forest Conduct an ecological survey that demonstrates quality and extent of proposed offset area. Setup mechanism to protect the shale/sandstone transition forest offset in perpetuity.	Ecological survey completed and submitted to DOE on the quality and extent of the shale/sandstone transition forest. IC submitted a request to extend time to secure the SSTF area for conservation. Illawarra Coal submitted an application to establish a Biobank site across the SSTF Offset area. A Bio- banking Assessment Report (BAR) was submitted to OEH in late 2015. Illawarra Coal is currently working through the final stages of the Bio – banking agreement with OEH to gazette the area under the bio-banking scheme in perpetuity. This is expected to be completed by September 2016.	Yes
5	Shale/Sandstone Transition Forest	Management plan completed and submitted to DOE and approved by DOE. Plan	Yes

	Develop a management plan for shale/sandstone transition forest.	is available on our website. http://www.south32.net/getmedia/1a46f0b7-4d45-4249-b540-2b7905a7b1ff/South32Web During the 2015 period, Illawarra coal undertook ecological surveys to support the Bio-banking Assessment Report which was submitted to OEH to secure the offset in perpetuity and support the ongoing conservation management through the NSW Bio-banking scheme. It is anticipated that this agreement will change the current Plan for Management of the area. Once the agreement is finalised, Illawarra Coal will submit evidence of agreement and the Bio-banking Management Plan to The Department.	
6	Coal Wash Emplacement Staging and Rehabilitation Plan Develop a Coal Wash Emplacement Staging and Rehabilitation Plan for stage 4 coal wash emplacement area.	Emplacement management plan incorporates staging and rehabilitation for stage 4 coal wash emplacement area. Plan submitted 30th June 2013. Plan revised following feedback from OEH and DOPE; Plan re-submitted to DOPE and approved on 25 July 2014.. Plan re-submitted to DOE for subsequent approval on 28 July 2014. Still awaiting approval from DOE. Plan is currently under review by South32 - Revised Plan will be re-submitted for approval in 2016.	Yes
7	Southern Brown Bandicoot and Broad Headed Snake Management Plan or Plans Develop a Southern Brown Bandicoot and Broad Headed Snake conservation management plan or plans.	Draft Plans completed and submitted to DOE on the 15th May 2013. Plans revised following comments from DOE and OEH. Final Plans re-submitted to DOE and OEH on 29 April 2014. Plans approved on the 28 May 2014. Plans are available on our website. SBB - http://www.south32.net/getmedia/f28c8dce-799d-452d-ac2a-068dc51c0a0d/South32Web BHS - http://www.south32.net/getmedia/24df3027-ee85-4ec0-88e8-2a922361370e/South32Web Both Plans are currently under review by South32 - Revised Plans will be re-submitted for approval in 2016.	Yes
8	Surface and Ground Water Quality Monitoring and Adaptive Management Plan Develop a Surface and Ground Water Quality Monitoring and Adaptive Management Plan for species listed in the EPBC Act.	Draft Plan completed and submitted on the 30th September 2012 to DOE. Plan revised following comments from DOE. Final Plan approved on 3 July 2014. http://www.south32.net/getmedia/4acb4c95-fc41-46e8-95e3-5ebe291d5434/South32Web Plan is currently under review by South32 - Revised Plan will be re-submitted for approval in 2016.	Yes
9	Mine Closure Environmental Management Plan	Current mining plan is for next 30 years, therefore plan not required.	Yes

	Develop a mine closure plan 3 years prior to closure for EPBC Act listed species.		
10	Mine Closure Environmental Management Plan Management for EPBC listed bats through the decommissioning of mining equipment.	Plan not yet submitted. To be submitted in the mine closure plan.	Yes
11	Shapefiles Provide offset area shapefiles to the DOE.	Shapefiles provided on 26 November 2013.	Yes
12	Notification of Actual Date of Commencement Notification date of commencement to be supplied to DSEWPaC.	Letter sent to DOE 31 May 2012.	Yes
13	Publication Requirements publish all management plans, reports, strategies or agreements with DSEWPaC	Undertaken as required. See website. http://www.south32.net/our-operations/australia/illawarra-coal/regulatory-document	Yes
14	Compliance Report Publish a report on website addressing compliance with each of the conditions of this approval.	This compliance report meets this condition. The 2013 compliance report was submitted; however, the date was five days after the due date required by the condition. This was found to be non-compliant due to late submission of the compliance report. The 2014 report was uploaded to the website on 15 August 2014. The 2015 report was sent to the South32 corporate office on 15th Aug 2015 to upload to the website.	Yes – See comments regarding the 2013 report.
15	Accurate Records Must be Maintained Maintain accurate records substantiating all activities associated with or relevant to the conditions of approval.	Documents are maintained in the Illawarra Coal controlled document registers.	Yes
16	Minister's Approval of the Modification to a Management Plan, Report, Strategy or Agreement Apply to the minister for approval to modify management plans, reports, strategies or agreements.	Undertaken as required.	Yes
17	Minister's Modification to a Management Plan, Report, Strategy or Agreement Comply with the minister's request to modify management plans, reports, strategies or agreements.	No requests have been received from the minister.	Yes
18	Independent Auditor Commission and pay the full cost for independent environmental	Independent Environmental Audit was conducted by URS. The Audit commenced December 2013 and was completed in February 2014; the report was provided to	Yes

	auditor of the project.	Illawarra Coal on 2nd April 2014. A copy of the report was provided to DOE to satisfy Condition 18 (g). EPBC condition (14) was found to be non-compliant due to late submission of the 2013 compliance report (5 days late). This report is available on the South32 website. http://www.south32.net/getmedia/3e98b0b5-dfb8-465f-b55a-3ae743da1f31/South32Web Next audit due Dec 2016.	
19	Unsatisfactory Commencement of Action If work is not commenced within 5 years of approval, written approval needs to be obtained from the minister.	Work commenced 15th May 2012 as per date of commencement letter sent to Department of the Environment.	Yes

APPENDIX E: BSO CONSENT COMPLIANCE REPORT AND SUMMARY OF NON-COMPLIANCES

Schedule 2 Administrative Conditions		
Condition	**Condition Summary**	**Status**
	Obligation to Minimise Harm to the Environment Prevent and/or minimise any harm to the environment.	Management Plans developed and implemented to minimise harm to the environment.
	Terms of Approval Carry out projects in accordance with the EA, Statement of Commitments, PPR and conditions of this approval.	Management Plans and monitoring developed to meet EA, Statement of Commitments, PPR and conditions of this approval.
	Terms of Approval If there is any inconsistency between the above documents, the more recent document shall prevail to the extent of the inconsistency. However, the conditions of this approval shall prevail to the extent of any inconsistency.	Not triggered during the Reporting Period.
	Terms of Approval Comply with any reasonable requirement/s of the Director-General arising from the Department's assessment of: (a) any strategies, plans, programs, reviews, audits, reports or correspondence that are submitted in accordance with this approval; and (b) The implementation of any actions or measures contained in these documents.	Requirements from Director General included in the Management Plans.
	Limits on Approval – Mining Operations Carry out mining operations on the site until 31 December 2041.	Not triggered during the Reporting Period.
	Limits on Approval – Coal Extraction and Production Ensure that no more than 10.5 million tonnes of ROM coal is extracted from the site in a financial year, or transport more than 9.3 million tonnes of product coal from the site in a financial year.	FY16 – ROM Coal – 6.1 MT. Appin Mine extracted 3.2 million tonnes of 'Run of Mine' West Cliff Colliery extracted 2.9MT of 'Run of Mine' FY16 – Product Coal transported – 7.5MT
	Limits on Approval – Hours of Operation Undertake mining operations 24 hours a day, 7 days a week.	Mining operations are in accordance with hours of operation.
	Surrender of Consents and Approval Surrender all existing development consents and project approvals for mining operations relied on by the Proponent for the site (other than this approval)	Letters sent on 29 July 2014 to DoPE and 1 Aug 2014 to WSC advising that Illawarra Coal Holdings Pty Ltd surrenders all existing development consents and project approvals for mining (including Wollondilly Shire Council approvals for: Shaft

	in accordance with Sections 75YA and 104A of the EP&A Act.	and Electrical Substation 22 January 1972; Appin Mine 22 February 1972; West Cliff Mine 17 April 1975; West Cliff Extended 3 September 1986; Washing of Appin Coal at West Cliff 25 March 1997) operations relied on by the Proponent for the site (other than the Bulli Seam Operations Approval), subject to and in accordance with the regulations.
	Surrender of Consents and Approval Prior to the surrender of these consents and/or approvals, the conditions of this approval (including any notes) shall prevail to the extent of any inconsistency with the conditions of these consents and/or approvals.	Conditions transferred to updated management plans.
	Structural Adequacy Ensure all new buildings and structures, and any alterations or additions to existing buildings and structure that are part of the project are constructed in accordance with the relevant requirements of the BCA and any additional requirements of the MSB where the building or structure is located on land within declared Mine Subsidence Districts.	New buildings and structures were project managed by the engineering team to the relevant building codes.
	Demolition Ensure that all demolition work is carried out in accordance with *Australian Standard AS 2601-2001: The Demolition of Structures,* or its latest version.	No demolition carried out in the reporting period.
	Operation of Plant and Equipment Ensure that all plant and equipment used at the site is maintained in a proper and efficient condition and is operated in a proper and efficient manner.	Operations are conducted in accordance with approved management plans. Daily, weekly and monthly inspections of plant, equipment and site areas are conducted. This includes a number of system generated maintenance work orders. Regular site environmental inspections are undertaken to address inspections for leaking machinery and equipment. Mine machinery and equipment are maintained and serviced accordingly.
	Staged Submission of Strategies, Plans or Programs Submit any strategies, plans or programs required by this approval on a progressive basis.	Management Plans submitted as required.

Schedule 3 – Specific Environmental Conditions – Underground Mining		
Condition	**Condition Summary**	**Status/Other Documents**
1.	Subsidence – Performance Measures – Natural and Heritage Features, etc. Ensure that the project does not cause any exceedances.	For all observed impacts, the appropriate TARP's were applied, actions implemented and key stakeholders notified as required by the approved Subsidence Management Plan and Extraction Plan. See Section 3.13.2 & 3.13.3 of this AEMR for summary of the predicted vs observed impacts.
2.	Offsets Provide a suitable offset to compensate for the impact or environmental consequence.	Condition not triggered during Reporting Period.
3.	Performance Measures – Built Features Ensure that the project does not cause any exceedances of performance measure.	For all observed impacts, the appropriate TARP's were applied, actions implemented and key stakeholders notified as required by the approved Subsidence Management Plan and Extraction Plan. See Section 3.13.2 & 3.13.3 of this AEMR for summary of the predicted vs observed impacts.
4.	Performance Measures – Built Features Any dispute between the Proponent and the owner of any built feature over the interpretation is to be settled by the Director-General.	For all observed impacts, the appropriate TARP's were applied, actions implemented and key stakeholders notified as required by the approved Subsidence Management Plan and Extraction Plan. See Section 3.13.2 & 3.13.3 of this AEMR for summary of the predicted vs observed impacts.
5.	Extraction Plans Prepare and implement an Extraction Plan for first and second workings within each longwall mining.	SMP's and Extraction Plans prepared as required. Approved plans are available on the regulatory website. http://www.south32.net/our-operations/australia/illawarra-coal/regulatory-document
6.	Extraction Plans Ensure that the management plans include an assessment of the potential environmental consequences of the Extraction Plan, incorporating any relevant information that has been obtained since this approval and a detailed description of the measures that would be implemented to remediate predicted impacts.	Link to Subsidence Management Plans and Extraction Plans http://www.south32.net/our-operations/australia/illawarra-coal/regulatory-document
7.	First Workings Carry out first workings within the project area, other than in accordance with an approved extraction plan.	Link to Subsidence Management Plans and Extraction Plans http://www.south32.net/our-operations/australia/illawarra-coal/regulatory-document
8.	Payment of Reasonable Costs Pay all reasonable costs incurred by the Department to engage suitably qualified, experienced and independent experts to	Condition not triggered during Reporting Period.

	review the adequacy of any aspect of an Extraction Plan.	
9.	Improved Understanding and Prediction of Subsidence Impacts Prepare and implement a program to improve its prediction and understanding of subsidence impacts (in particular sub-surface impacts and impacts on groundwater resources).	See section 3.14.4 of this AEMR for information on the BSO Environmental Research Program.
10.	Improved Understanding and Prediction of Environmental Consequences on Significant Natural Features Prepare and implement a Research Program and allocate $1,000,000 in total to this program for expenditure over a period of seven years from the date of the program's approval.	As above.

Schedule 4 – Specific Environmental Conditions – General		
Condition	**Condition Summary**	**Status/Other Documents**
1.	Noise – Noise Impact Assessment Criteria Ensure that the noise generated does not exceed the identified criteria at any residence on privately-owned land or on more than 25 percent of any privately-owned land.	No exceedances of the noise criteria LAeq (15min) (for Appin East receivers) are attributed to mine related noise.
2.	Noise – Noise Impact Assessment Criteria Ensure noise generated does not exceed the identified criteria at any residence on privately-owned land or on more than 25 percent of any privately-owned land.	As above.
3.	Noise Mitigation Implement noise mitigation measures upon receiving written request from identified residents.	No requests received during the Reporting Period.
4.	Operating Conditions The Proponent shall: (a) implement best management practice, including all reasonable and feasible noise mitigation measures, to minimise the construction, operational and road traffic noise generated by the project; (b) operate a comprehensive noise management system on site that uses real-time noise monitoring data for mining operations and the implementation of noise mitigation measures to ensure compliance with the relevant conditions of this approval; and (c) regularly assess the real-time noise monitoring to ensure compliance with the relevant conditions of this approval, to the satisfaction of the Director-General.	Link to Noise Mgmt. Plan http://www.south32.net/our-operations/australia/illawarra-coal/regulatory-document
5.	Noise Management Plan Prepare and implement a Noise Management Plan.	Plan submitted and approved. http://www.south32.net/our-operations/australia/illawarra-coal/regulatory-document
6.	Road Traffic Noise Mitigation If after the end of June 2013, road traffic noise generated by the project (including employee vehicles) results in an exceedance by	Condition not triggered during Reporting Period.

	more than 2 dB(A) of the NSW criteria for road traffic noise on Douglas Park Drive or Macarthur Road at any residence on privately-owned land, then the Proponent shall, upon receiving a written request from the landowner, implement reasonable and feasible noise mitigation measures (such as double-glazing, insulation, and/or air conditioning) at the residence in consultation with the landowner. If within 3 months of receiving this request from the landowner, the Proponent and the landowner cannot agree on the measures to be implemented, or there is a dispute about the implementation of these measures, then either party may refer the matter to the Director-General for resolution.	
7.	Air Quality & Greenhouse Gas – Odour Ensure that no offensive odours are emitted from the site.	Condition not triggered during Reporting Period. One complaint received for odour during the reporting period it was transient in nature.
8.	Greenhouse Gas Emissions Implement all reasonable and feasible measures to minimise the release of greenhouse gas emissions from the site.	Link to Air Quality and GHG Mgmt. Plan http://www.south32.net/our-operations/australia/illawarra-coal/regulatory-document
9.	Air Quality Criteria Ensure all reasonable and feasible avoidance and mitigation measures are employed so that the particulate emissions generated by the project do not exceed the criteria.	Link to Air Quality and GHG Mgmt. Plan http://www.south32.net/our-operations/australia/illawarra-coal/regulatory-document
10.	Air Quality Acquisition Criteria If the particulate matter emissions generated by the project exceed the criteria in Tables 7, 8 and 9 at any residence on privately-owned land or on more than 25 percent of any privately owned land, then upon receiving a written request for acquisition from the landowner the Proponent shall acquire the land in accordance with the procedures in Conditions 5 - 6 of Schedule 5.	Condition not triggered during Reporting Period.
11.	Operating Conditions Implement best practice air quality management on site, including all reasonable and feasible measures to minimise the off-site odour, fume and dust emissions generated by the project, including from any spontaneous combustion on site.	Link to Air Quality and GHG Mgmt. Plan http://www.south32.net/our-operations/australia/illawarra-coal/regulatory-document
12.	Air Quality & Greenhouse Gas Management Plan Prepare and implement a detailed Air Quality & Greenhouse Gas Management Plan.	Link to Air Quality and GHG Mgmt. Plan http://www.bhpbilliton.com/home/society/regulatory/Documents/_coal/illawarra/bulliseam/131113_coal_illawarra_bulliseam_AirQualityandGreenhouseGasManagementPlanV2.pdf
13.	Meteorological Monitoring Ensure that there is a suitable meteorological station operating in the vicinity of the site.	Weather station installed at West cliff Mine, Appin Mine and No. 6 Shaft.
14.	Compensatory Water Supply	Water supplied as per the management plan.

	Provide a compensatory water supply to any owner of privately-owned land whose water supply is adversely impacted (other than an impact that is negligible) as a result of the project.	
15.	Surface Water Discharge Ensure all surface water discharges from the site (including from the Brennans Creek Dam) comply with the discharge limits (both volume and quality) set for the project in any EPL.	Surface water discharge monitored in accordance with the EPL. http://www.south32.net/our-operations/australia/illawarra-coal/regulatory-document
16.	Surface Water Management Plan Prepare and implement a Surface Water Management Plan.	Plan submitted and approved. Link to Surface Water Mgmt. Plan http://www.south32.net/our-operations/australia/illawarra-coal/regulatory-document
17.	West Cliff Coal Wash Emplacement Area – West Cliff Coal Wash Emplacement Area Management Plan Prepare and implement a West Cliff Coal Wash Emplacement Area Management Plan.	Plan submitted, and approved by the DoPE. http://www.south32.net/our-operations/australia/illawarra-coal/regulatory-document f. Plan was recently reviewed and will be re-submitted for approval in 2016.
18.	West Cliff Coal Wash Emplacement Area Biodiversity Offset Strategy Provide a suitable biodiversity offset strategy to compensate for the impacts of Stage 4 of the West Cliff Coal Wash Emplacement Area.	Throughout the period from 2013-2016, Illawarra Coal undertook numerous meetings and held discussions with senior officers of the Department of Environment and Planning, Office of Environment and Heritage, relevant Ministerial Offices and Water NSW in relation to the suitability of the proposed offsets. In March 2016, the final Strategic Biodiversity Offset was submitted to the Department of Planning and Environment for approval. The final Strategy was endorsed by OEH.
19.	West Cliff Coal Wash Emplacement Area Biodiversity Offset Strategy Provide appropriate long-term security for the offset areas by 31 December 2012.	As above.
20.	Underground Coal Wash Emplacement Trial Prepare and undertake an Underground Coal Wash Emplacement Trial.	Illawarra Coal submitted a revised Underground Coal Wash Emplacement Trial to the Department October 2013. The revised Plan proposed to defer the trial for 5 years for the following reasons: The trial replicates what has been

		demonstrated by another Southern District Colliery The declaration of Dharawal National Park has eliminated a significant area of potentially suitable roadways for underground coalwash emplacement Illawarra Coal's focus on diverting material from surface emplacement via alternative beneficial uses continues. Following discussions with the Department, further commitments have been included in the Plan to report on the research annually in the AEMR during the deferred period.
21.	Project Surface Infrastructure Management – Gas Drainage Management Plan Prepare and implement a Gas Drainage Management Plan.	Plans submitted and approved. http://www.epa.nsw.gov.au/prpoeoapp/ViewPOEOLicence.aspx?DOCID=33589&SYSUID=1&LICID=2504
22.	Service Boreholes Management Plan Prepare and implement a Service Boreholes Management Plan.	Link to Borehole Mgmt. Plan http://www.south32.net/our-operations/australia/illawarra-coal/regulatory-document
23.	Personal Emergency Device (PED) Communication Management Plan Prepare and implement a PED Communications Management Plan.	Plan has not been required. There are no plans to install a PED cable as technology has advanced and the BSO communications systems are being installed underground.
24.	Heritage – Heritage Management Plan Prepare and implement a Heritage Management Plan.	Plan submitted and approved. Link to Heritage Mgmt. Plan http://www.south32.net/our-operations/australia/illawarra-coal/regulatory-document
25.	Transport – Monitoring of Coal Transport Keep accurate records of the amount of coal transported from the site (on a daily basis) and make these records publicly available on its website at the end of each financial year.	Documents are maintained in the Illawarra Coal document registers. Records are on our website: http://www.south32.net/our-operations/australia/illawarra-coal/regulatory-document
26.	Traffic Management Plan Prepare and implement a Traffic Management Plan.	Plan was developed and submitted to the Director General on 21/12/2013. Plan was formally approved July 2015. .
27.	Visual – Visual Amenity and Lighting Minimise the visual impacts, and particularly the off-site lighting impacts, of the main infrastructure area and associated ancillary surface works.	Lighting setup in accordance with consent conditions.
28.	Waste	Waste management in accordance with the

	Minimise the waste (including coal reject) and ensure that the waste generated by the project is appropriately stored, handled and disposed of.	waste management plan.
29.	Waste Prepare and implement a Waste Management Plan.	Link to Waste Mgmt. Plan http://www.south32.net/our-operations/australia/illawarra-coal/regulatory-document
30.	Bushfire Management Ensure that the project is suitably equipped to respond to any fires on site; and assist the Rural Fire Service and emergency services as much as possible if there is a fire in the surrounding area.	Sites are equipped to manage bushfires. Asset protection zones are maintained.
31.	Rehabilitation – Rehabilitation Objectives Rehabilitate the site to describe satisfactory level.	Rehabilitation conducted in accordance with rehabilitation management plan.
32.	Progressive Rehabilitation Carry out the rehabilitation of the site progressively.	Rehabilitation conducted in accordance with rehabilitation management plan.
33.	Rehabilitation Management Plan Prepare and implement a Rehabilitation Management Plan.	Plan submitted and approved in 2012. Link to Mining Operations Plan/RMP http://www.south32.net/our-operations/australia/illawarra-coal/regulatory-document

Schedule 5 – Additional Procedures		
Condition	**Condition Summary**	**Status/Other Documents**
1.	Notification of Landowners Notify affected landowners in writing of the exceedance, and provide regular monitoring results to each affected landowner until the project is again complying with the relevant criteria.	Condition not triggered during Reporting Period.
2.	Independent Review As required commission a suitably qualified, experienced and independent person, to consult with the landowner to determine his/her concerns, conduct monitoring to determine whether the project is complying with the relevant criteria.	Condition not triggered during Reporting Period.
3.	Independent Review If the independent review determines that the project is complying with the relevant criteria in Schedule 4, then the Proponent may discontinue the independent review with the approval of the Director-General. If the independent review determines that the project is not complying with the relevant impact assessment criteria in Schedule 4, and that the project is primarily responsible for this non-compliance, then the Proponent shall: (a) implement all reasonable and feasible mitigation measures, in consultation with the landowner and appointed independent person, and conduct further monitoring until the project complies with the relevant criteria; or (b) secure a written agreement with the landowner to allow exceedances of	Condition not triggered during Reporting Period.

	the relevant criteria, to the satisfaction of the Director-General. If the independent review determines that any relevant acquisition criteria in schedule 4 are being exceeded and that the project is primarily responsible for this non-compliance, then upon receiving a written request from the landowner, the Proponent shall acquire all or part of the landowner's land in accordance with the procedures in Conditions 4-5 below.	
4.	Land Acquisition Make a binding written offer to the landowner within 3 months of receiving a written request.	Condition not triggered during Reporting Period.
5.	Land Acquisition Pay all reasonable costs associated with the land acquisition process.	Condition not triggered during Reporting Period.

Schedule 6 – Environmental Management, reporting and Auditing		
Condition	**Condition Summary**	**Status/Other Documents**
1.	Environmental Management Strategy Prepare and implement an Environmental Management Strategy for the project.	Strategy submitted and approved. Link to Environmental Management Strategy. http://www.south32.net/our-operations/australia/illawarra-coal/regulatory-document
2.	Management Plan Requirements Ensure management plans required under this approval are prepared in accordance with any relevant guidelines.	Management Plans are prepared in accordance with relevant guidelines.
3.	Adaptive Management Assess and manage project-related risks.	Condition not triggered during Reporting Period.
4.	Annual Review Review the environmental performance of the projects.	Refer to 2016 AEMR
5.	Revision of Strategies, Plans and Programs Review and revise strategies, plans and programs within 3 months of the annual review, the submission of an incident report, submission of an audit report and/or modification to the conditions of this approval.	Plans were reviewed as required by the recommendations in the Triennial Audit Report.
6.	Community Consultative Committee Establish and operate a new Community Consultative Committee (CCC) which must be operated in general accordance with the *Guidelines for Establishing and Operating Community Consultative Committees for Mining Projects* (Department of Planning, 2007, or its latest version), and be operating by 30 September 2012.	Community Consultative Committee is operational in accordance with the Guidelines for Establishing and Operating Community Consultative Committees for Mining Projects.
7.	Reporting – Incident Reporting Notify the Director-General and any other relevant agencies of any incident that has caused, or threatens to cause,	Condition not triggered during Reporting Period.

	material harm to the environment and provide a detailed report on the incident.	
8.	Regular Reporting Regularly report on the environmental performance on the website.	Link to BSO 14 Day EPL Reporting and BSO Project Approval monitoring requirements. http://www.south32.net/our-operations/australia/illawarra-coal/regulatory-document
9.	Independent Environmental Audit Commission and pay the full cost for independent environmental auditor of the project.	URS Australia Pty Ltd was engaged by IC to carry out an Independent Environmental Audit of the BSO. The audit commenced December 2013 and was completed in February 2014; the report was provided to IC on 2nd April 2014. Overall good compliance levels were achieved across approval and licence conditions with only 4 non-compliances and 3 indeterminates. 3 out of the 4 non-compliances related to previously reported EPL 2504 non-compliances; and Other non-compliance related to submission of 2013 Annual Report (EPBC approval) being 5 days late. Next audit due Dec 2016.
10.	Independent Environmental Audit Within 6 weeks of the completion of this audit provide a copy of the audit report.	As above.
11.	Access to Information From 30 June 2012, make copies of specified documents publically available on the website and keep them up to date.	All approved plans, strategies and monitoring results are on the south32 Regulatory Webpage. http://www.south32.net/our-operations/australia/illawarra-coal/regulatory-document

APPENDIX F: REHABILITATION COST ESTIMATE

Rehabilitation cost estimate provided only for Department of Industry, Division of Resource and Energy. Cost estimate is commercial in nature. Please contact the Department or Illawarra Coal representative for further information.