THE WALLERAWANG COLLIERIES LIMITED

2008 ANNUAL ENVIRONMENTAL

MANAGEMENT REPORT

Name of mine		Baal Bone Colliery	
Titles/Mining Leases		CCL 749, MPL 261, CL 391, ML 1302, ML 1382, ML 1607	
MOP Commencement Date	10/07/2006	**MOP Completion Date**	10/07/2009
AEMR Commencement Date	01/01/2008	**AEMR End Date**	31/12/2008
Name of leaseholder		The Wallerawang Collieries Limited	
Name of mine operator (if different)		Baal Bone Colliery	
Reporting Officer		Tony King	
Title		Environment and Community Co-ordinator	
Signature		.....	
Date	24/02/2009		

Managed by xstrata coal

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SECTION 1.0: INTRODUCTION

1.1 Scope

This Annual Environmental Management Report (AEMR) for Baal Bone Open Cut and Underground mines is prepared annually by Baal Bone Colliery to fulfil the reporting requirements of various regulatory departments.

The layout of this AEMR has been aligned to the Department of Primary Industries – Mineral Resources' (DPI-MR) document: '*Guidelines and Format for Preparations of an Annual Environmental Management Report'*, Version 3, January 2006.

The report will be submitted to the following Authorities:

- Department of Primary Industries –Minerals Resources (DPI-MR);
- Department of Planning (DoP);
- Department of Water and Energy (DWE);
- Lithgow City Council (LCC);
- Department of Environment and Climate Change (DECC);
- Sydney Catchment Authority (SCA);
- Forests NSW.

The reporting period for this AEMR is 1st January 2008 to 31st December 2008.

It should be noted that this AEMR does necessarily provide a comprehensive description of each individual operation or environmental control that is currently employed at Baal Bone; this level of detail is available in the Mining Operations Plan (MOP) for Baal Bone's Underground and Open Cut Operations (July 2006 and as amended).

Rather, this AEMR will focus on providing a succinct review of the significant operational and environmental activities undertaken throughout the year. It will also examine the performance of key site operations and environmental controls throughout the 2008 reporting period.

Included is a summary of monitored data (as applicable), a discussion regarding the level of compliance achieved; together with an overview of initiatives proposed and actions planned for the 2009 reporting period.

1.2 Consents, Leases and Licences

1.2.1 Current Consents, Leases and Licences

A list of all current consents, leases, licences and approvals are included below in **Table 1.1**.

Table 1.1. Consents, Leases, Licences and Approvals.

Type	Regulatory Authority	Approval Number	Holder	Issue Date	Expiry/Review Date	Scope
Development Consent	DoP	Nil	Coalex Pty Ltd	13/09/1982	Perpetuity (Under model provisions exp. 01.08.10)	Original development consent for Baal Bone Colliery – coal for export.
			Coalex Pty Ltd	31/12/1992	Perpetuity (Under model provisions exp. 01.08.10)	Section 102 EP&A Act (1979) modification of original Development Consent (13/09/1982) to include road haulage of 150,000 tonnes of coal per annum for industrial purposes
	DoP	164/98	The Wallerawang Collieries Ltd	19/08/1999	30/12/2000	Road haulage of 1.5 million tonnes of coal per annum for domestic market.
				25/08/2000	31/12/2003	Modification to DA 164/98 for the extension of coal haulage time for 900,000 tonnes of coal on the haulage road from Baal Bone Colliery by public road.
				23/12/2003	31/12/2015	Modification to DA 164/98 for the extension of the duration of the haulage road from Baal Bone Colliery to Mt Piper and Wallerawang Power Stations.
	Greater Lithgow Council	186/95	The Wallerawang Collieries Ltd	27/02/1996	Perpetuity	Development consent for open cut mining and associated development of Boxcut as part of the Northern Extension
	DoP	07_0035	The Wallerawang Collieries Ltd	24/10/2007	Perpetuity	Ventilation Shaft and Power Line Project
Environment Protection Licence	DECC	765	The Wallerawang Collieries Ltd	28/04/2006	17/11/2009	Premises and Scheduled Activity (Coal Mining/ Washery) Licence
Mining Operations Plan	DPI – MR	06/4648	The Wallerawang Collieries Ltd	10/07/2006	10/07/2009	MOP for Baal Bone Colliery OC and LW 25-28.
Mining Leases	DPI - MR	CCL 749	The Wallerawang Collieries Ltd	05/04/1990	23/03/2010	Mining Entitlement (Consolidates MPL 209, CL 246, CL 329, CL 330, CL331 and CL332) Various depths – refer Plan A
	DPI – MR	MPL 261 (Act 1973)	The Wallerawang Collieries Ltd	22/08/1990	22/08/2011	Mining Entitlement (Southern mine dewatering bores) Parish: Ben Bullen, Depth: Surface - 10m
	DPI – MR	CL 391 (Act 1973)	The Wallerawang Collieries Ltd	24/02/1992	24/02/2013	Mining Entitlement Parish: Ben Bullen Depth: > 20m

Type	Regulatory Authority	Approval Number	Holder	Issue Date	Expiry/Review Date	Scope
	DPI – MR	ML 1302 (Act 1992)	The Wallerawang Collieries Ltd	29/09/1992	29/09/2013	Mining Entitlement Parish: Ben Bullen Depth: >20m
	DPI – MR	ML 1389 (Act 1992)	The Wallerawang Collieries Ltd	09/05/1996	09/05/2017	Mining Entitlement Parish: Ben Bullen Depth: Surface – unlimited Surface - 20m
	DPI - MR	ML1607	The Wallerawang Collieries Ltd	08/01/08	08/01/18	Mining Lease (Purposes) Parish: Cox Depth: Surface – 10m
S126(1) Approval	DPI – MR	317524306001	Baal Bone Colliery	14/11/2005	Perpetuity	Section 126(1) of the CMRA (1982) Construction and operation REA 5
S100(1) Approval	DPI – MR	317551291001	Baal Bone Colliery	12/02/08	Perpetuity	Section 100(1) of the CMH&SA (2002) for the construction and operation of REA 6
Clause 88(1) Approval	DPI – MR	C05/2226	Baal Bone Colliery	17/08/2007	31/01/2009	Extension to original Section 138 CMRA (1982) approval (dated 09/05/05) to mine longwalls 25-28
Subsidence Management Plan	DPI-MR	06/7570	Baal Bone Colliery	07/12/2007	01/12/2014	Subsidence Management Plan for Extraction of Longwalls 29-31, Lithgow Seam
Occupation Permit	**Forests NSW**	14719	Baal Bone Colliery	05/03/1991	Perpetuity	Occupation permit relevant to the power line route from the company's freehold land to MPL 261 (Long Wall 1 Mine dewatering bore); includes various subsequent extensions.
		14161	Baal Bone Colliery	08/03/1991	Perpetuity	Occupation Permit for the powerline that supplies power to the railway loop on the western edge of Ben Bullen State Forest.
S22H (1)(a) Approval	DLWC	N/A	Baal Bone Colliery	27/07/1991	Perpetuity	Section 22H(1)(a) of the Rivers and Foreshores Act (1948) exemption. Permission to undertake activities on streams and drainage lines within the Baal Bone Mining Leases.
Bore Licences	DWE	80BL127440	The Wallerawang Collieries Ltd	03/06/2003	02/06/2008	Section 115 of the Water Act 1912. Bore – potable water supply (adjacent to southern boundary of site) – no longer in use not to be renewed in 2008.
	DWE	80BL136703	The Wallerawang Collieries Ltd	14/01/2008	13/01/2013	Section 115 of the Water Act 1912. Bore – (under UC1 and UC2). Main washery water make-up bore near UC1

Type	Regulatory Authority	Approval Number	Holder	Issue Date	Expiry/Review Date	Scope
	DWE	80BL135509	The Wallerawang Collieries Ltd	09/06/2007	08/06/2012	Section 115 of the Water Act 1912. Borehole No. 6 near Rail Loop; washery make-up and dust suppression.
	DWE	80BL236132	The Wallerawang Collieries Ltd	18/01/1995	Perpetuity	Section 115 of the Water Act 1912. Bore – Mine dewatering Long Wall 1 (South Bore 1)
	DWE	80BL236134	The Wallerawang Collieries Ltd	18/01/1995	Perpetuity	Section 115 of the Water Act 1912. Bore – Mine dewatering Long Wall 1 (South Bore 2)
	DWE	80BL239077	The Wallerawang Collieries Ltd	19/06/2006	18/06/2011	Section 115 of the Water Act 1912. Bore – Mine dewatering Long Wall 19. North Bore.
	DWE	10BL601877	The Wallerawang Collieries Ltd	08/06/2007	Perpetuity	BBN175; LW29-31 groundwater monitoring piezo
	DWE	10BL601816	The Wallerawang Collieries Ltd	08/06/2007	Perpetuity	BBN176; LW29-31 groundwater monitoring piezo
	DWE	10BL601817	The Wallerawang Collieries Ltd	08/06/2007	Perpetuity	BBN177; LW29-31 groundwater monitoring piezo
	DWE	10BL601970	The Wallerawang Collieries Ltd	05/09/2007	Perpetuity	BBN 179; LW29-31 groundwater monitoring piezo
Water Licence	DWE	80SL046064	The Wallerawang Collieries Ltd	17/07/2007	17/07/2012	Section 12 of the Water Act 1912. Diversion works, 2 pumps, overshot and block dams, bywash dam.
Acknowledgement of Dangerous Goods on Premises	Work Cover Authority	35/023231	The Wallerawang Collieries Ltd	05/04/2008	05/04/2009	Dangerous Goods Licence.
Radiation Gauge	DECC	29207	The Wallerawang Collieries Ltd	20/12/2007	16/01/11	To sell and posses – Radiation Control Act 1990. Coal quality sensing device
	DECC	1123	The Wallerawang Collieries Ltd	15/10/2007	15/09/09	Registration Certificate – Radiation Control Act 1990; fixed radiation gauge.

Abbreviations:

CCL – Consolidated Coal Lease
CL – Coal Lease
CMRA – Coal Mines Regulation Act 1982
DA – Development Application
DEC – Department of Environment and Conservation
DNR – Department of Natural Resources
DoP – Department of Planning
DPI-MR – Department of Primary Industries - Mineral Resources
EPL – Environment Protection Licence
ML – Mining Lease
MOP – Mining Operations Plan
MPL – Mining Purposes Lease
REA - Refuse Emplacement Area

1.2.2 Amendments During the Reporting Period

Baal Bone's Mining Operations Plan (MOP) was amended April 2008. The scope of this amendment (Amendment No. 5) included:

1. Development and extraction of longwall panels 29 to 31. Baal Bone has recently received Dept. Primary Industries (Mineral Resources) approval of the Subsidence Management Plan for LW 29-31.

2. Construction and operation of a ventilation shaft and ancillary powerline. Baal Bone has recently received approval from the Dept. Planning under Part 3A of the Environmental Planning and Assessment Act for the project.

3. Mining Lease 1607 (Act 1992), which has been granted to secure surface tenure over the area required for the ventilation shaft.

This Amendment was accepted by the DPI-MR on 18th April 2008.

1.3 Mine Contacts

Baal Bone Colliery can be contacted via telephone on (02) 6350 6900 and fax (02) 6359 0530. The postal and street addresses are as follows:

Postal: Baal Bone Colliery
PO Box 13, Lithgow NSW 2790

Street: Baal Bone Colliery
Off Castlereagh Highway
Cullen Bullen, NSW 2790

Personnel responsible for environmental issues at Baal Bone Colliery are shown in **Table 1.2**. The current organisation chart is shown in **Figure 1.1**.

Table 1.2. Mine Personnel Contact Details

Contact Person	Position	Contact Details
John Hayward	Operations Manager	Ph: (02) 6350 6928 Email: jhayward@xstratacoal.com.au Fax: (02) 6359 0596
Gary Linford	Technical Services Manager	Ph: (02) 6350 6945 Email: glinford@xstratacoal.com.au Fax: (02) 6359 0530
Tony King	Environment and Community Co-ordinator	Ph: (02) 6350 6920 Email: tking@xstratacoal.com.au Fax: (02) 6359 0530

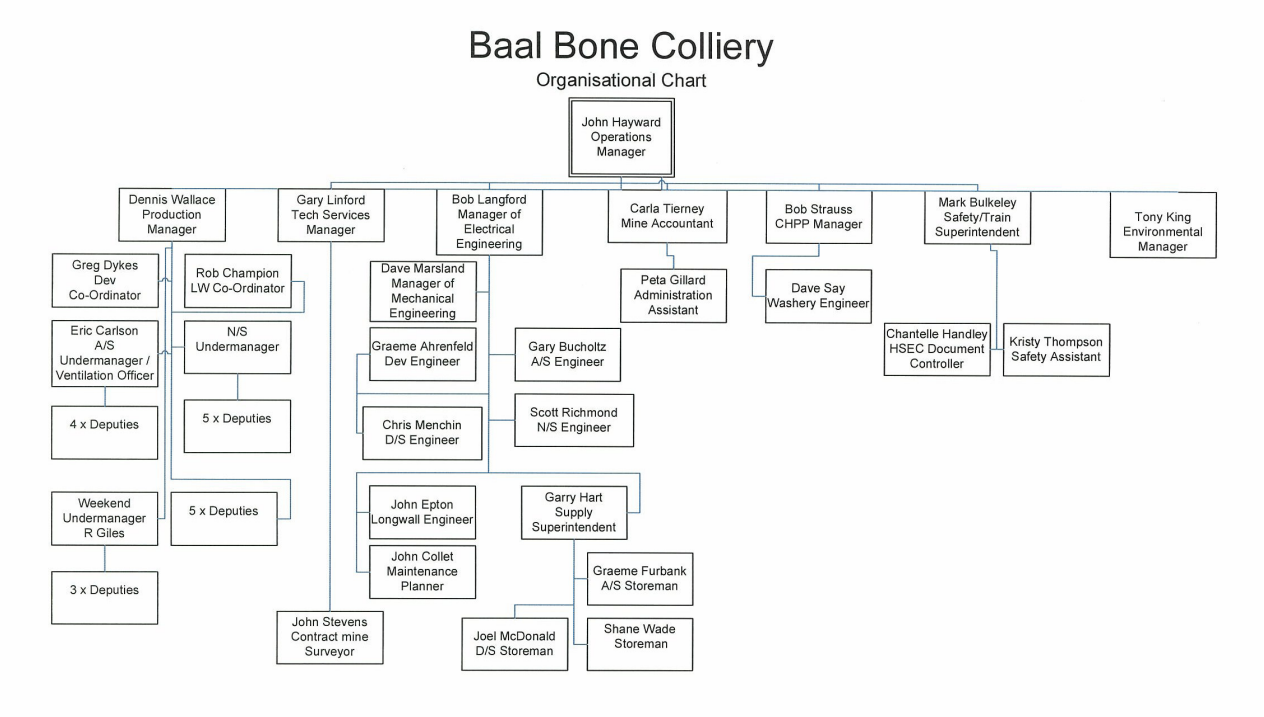


Figure 1.1. Baal Bone Organisational Chart

1.4 Actions Required at Previous AEMR Review and Site Inspection

The Dept. Primary Industries – Mineral Resources, Dept. Environment and Climate Change, Department of Water and Energy, State Forests and Lithgow City Council representatives attended a Joint Agency AEMR review meeting and site inspection at Baal Bone Colliery on 10th April 2008.

The purpose of the meeting was to review progress of site operations and to discuss issues relating to environmental management and performance for the 2007 AEMR reporting period. Baal Bone's AEMR was formally accepted by DPI in a letter dated 17 April 2008; there were no actions arising from the review.

1.5 Employment Status and Demographics

Employment details for staff based at Baal Bone Colliery are found in **Tables 1.3 – 1.5** below:

Table 1.3 Employment Type

Employment Type	Number of persons in reporting period
Permanent	178
Contractor	30

Table 1.4 Male/Female Breakdown of Workforce

Gender	Number of persons in reporting period
Male	202
Female	6

Table 1.5 Residential Location of Employees

Residential Location	Number of persons in reporting period
Lithgow Shire	182
Bathurst	11
Blue Mountains	7
Mudgee	2

1.6 Environmental and Community Vision and Policy

Baal Bone Colliery has developed an Environment and Community Vision and Policy. These policies have the commitment and support of Baal Bone Management and have been developed with the Xstrata Coal NSW (XCN) Environment and Community Vision and Policy. They are displayed in prominent locations accessed by the workforce, contractors and visitors, as well as being provided on the intranet for all staff awareness. The Environment and Community vision and policy confirms Baal Bone's commitment to being recognised leaders in environmental management and valued operators within the community.

1.7 Enduring Value – The Australian Mineral Industry Framework for Sustainable Development

Xstrata Coal is a signatory to "Enduring Value – The Australian Minerals Industry Framework for Sustainable Development". As Baal Bone Colliery is owned and managed by Xstrata Coal Pty Ltd. (Xstrata Coal), it is obliged to operate within the guidelines for environmental management as part of Enduring Value.

1.8 National Pollution Inventory

In December 1997, the NSW Parliament passed a number of new legislation that saw the start of the National Pollution Inventory (NPI) reporting process. The NPI is an internet database designed to provide the community, industry and the government with information on the types and amounts of certain substances being emitted to the environment.

In late September 2008, Baal Bone Colliery submitted an NPI report for the period of 1st July 2007 to 30th June 2008. The report detailed emissions of listed substances from Baal Bone Colliery to air, water and land requiring collation, analysis and interpretation of site-specific data. Results can be obtained from the NPI website www.npi.gov.au.

SECTION 2.0: OPERATIONS DURING THE REPORTING PERIOD

2.1 Exploration

There was no exploration activities conducted during the reporting period.

2.2 Land Preparation

No land clearing, vegetation removal or soil removing activities were undertaken during the reporting period.

Approximately 76.85 ha of rehabilitation seeding was completed during 2008 and the land preparation associated with these activities is discussed in Section 5, Rehabilitation.

2.3 Construction

The existing administration, amenities, workshops and coal handling infrastructure associated with the Baal Bone Colliery should remain unchanged for the remaining life of mine. Surface facilities and infrastructure are shown on **PLAN 1**.

Construction of an 11 kV transmission line and an upcast ventilation shaft begun in January 2008; this is to provide ventilation to the south east extension of the underground operations. Construction was completed and the infrastructure was commissioned in late March 2008. The vent shaft location is illustrated on **PLAN 2**.

Construction and operation of the transmission line and vent shaft were included in Amendment No. 5 to Baal Bone's MOP.

2.4 Mining

2.4.1 Longwall Mining

Underground operations continue to extract coal using longwall mining methods from the Lithgow seam. During 2008, the extraction of LW26 was completed in April and LW27 was completed in December. Approximately 525,000 million tonnes of minable coal remain in LW 28 with extraction scheduled for completion in March 2009.

Extraction of the LW29-31 south-east extension will then commence in April 2009 and is scheduled to be completed by Q2 2011. Development and extraction of LW29-31 were included in Amendment No. 5 to Baal Bone's MOP.

2.4.2 Open Cut Mining

Open cut extraction of coal at Baal Bone was completed in July 2007.

PLAN 1 & **PLAN 2** shows the current mine layout and lease areas for both the open cut rehabilitation areas, reject emplacement areas, underground operations and associated surface facilities.

2.4.3 Production

The total Run of Mine (ROM) production for the 2008 reporting period was approximately 1.683 million tonnes. The principle export markets for the product in 2008 were Japan and Taiwan. **Table 2.1** shows the production record for 2006-2008 at Baal Bone Colliery.

Table 2.1 Production Record (2006 -2008) for Baal Bone Colliery (1000 tonnes)

Product	2006	2007	2008
Domestic	629	0	0
PCI	159	147	30
Premium	-	-	-
Thermal	1770	1410	1211
Total Saleable	2558*	1557	1241
ROM Production	1,840 (UG) 648 (OC)	1,614 (UG) 411 (OC)	1,683 (UG)

* total coal sold in 2006 exceeds ROM production due to a significant stockpile carry over from 2005

2.4.4 Resource Utilisation

Mining at Baal Bone Colliery targets the Lithgow Seam of the Illawarra Measures. This is the only seam in the area of sufficient thickness and quality to warrant economic recovery. Other seams in the Baal Bone area do not justify mining operations.

The Lithgow Seam in the open cut area ranged in thickness from 1.9-2.7m and was mainly of dull, medium volatile and generally non-swelling bituminous coal of moderate ash content (average 19.4%) and low sulphur content (0.6%) (Corkery & Co., 1995). The overburden to coal ratio averaged 6 BCM/t.

The Lithgow Seam in the underground workings ranges from 2.25-2.5m in thickness and the full seam height is extracted.

2.4.5 Changes in Mining Equipment or Method

Mining method remains the same as the previous reporting period. The major mining equipment fleet utilised at Baal Bone during 2008 is outlined in **Tables 2.2a** and **b** below.

Table 2.2a. Washery Equipment

Equipment Type	Number of Units
Caterpillar Dump Truck (773)	1
Dozers (Michigan W 380, CAT D11)	2
Caterpillar Front End Loader (966F)	1
Bobcat Skid Steer Loader (753)	1
Washery Water Cart	1
Toyota Landcruiser Utility	1
Gradall Forklift	1

Table 2.2b Underground Mining Equipment

Equipment Type	Number of Units
Bobcat Skid Steer Loader	1
913 Eimco	4
912 Eimco	1
915 Eimco	1
130 Eimco	2
Forklift	2
Domino Road Grader	1
PJB Man transports	8

2.5 Mineral Processing

Baal Bone produces three grades of washed coal, principally for the export market; these being 9%, 14% & 18% ash coal.

During the 2008 reporting period 1.683 Mt ROM underground coal was washed at a nominal rate of 550 tonnes per hour, compared with 1.614 Mt washed during the 2007 reporting period.

There have been no changes or additions to the process or facilities during the reporting period.

2.5.1 Production, Processing and Waste Summary

Table 2.3 shows production and waste for the reporting period plus an estimate for the 2009 reporting period.

Table 2.3 Production, Processing and Waste Summary

	Cumulative Production			
	Start of Reporting Period	2008 Total (non cumulative)	**End of Reporting Period**	**End of next reporting period (estimated)**
Topsoil (freedig) stripped (**m^3**)	1,020,092	nil	1,020,092	1,020,092
Topsoil (freedig) used/spread (**m^3**)	461,540	nil	461,540	491,540
Waste Rock (open cut) (**m^3**)	5,810,526	nil	5,810,526	5,810,526
ROM coal (**1000 tonnes**)	53,951	1,683	55,634	57,696
Processing Waste (CHPP) (**1000 tonnes**)	11,897	472	12,369	12,497
Product (**1000 tonnes**)	41,967	1,241	43,208	44,709

2.5.2 Product Destination and Transportation

During the reporting period there were no changes to the product transportation process. Product destination and tonnages for 2008 has been summarised in **Table 2.4** below.

The total quantity of coal dispatched from Baal Bone during the reporting period included a total of 1,314,262 tonnes by rail and only 3,671 tonnes by road. This compares to road dispatches of 44,336 tonnes during 2007 and 628,194 tonnes during the 2006 reporting periods. Baal Bone holds a Development Consent to transport up to 900,000 tonnes per annum by public road to the Mount Piper and Wallerawang Power Stations.

Coal haulage by road to Mount Piper Power Station under the most recent Delta contract was concluded in January 2007. Due to the current price of export coal, and the relatively weak prices for domestic thermal coal, it is not envisaged that coal delivery to the power stations will recommence in the short to medium term.

Table 2.4 Product destination and tonnages for 2008

Destination	Tonnes dispatched (2008)	Mode of transportation
Export – Port Kembla	1,298,879	Rail
Bluescope Steel – Port Kembla	15,383	Rail
James Cummings – Auburn	3,513	Road
Other Domestic	158	Road

2.6 Waste Management

2.6.1 Washery Waste

Baal Bone Colliery reject comprises a mixture of high ash coal and non-coal materials, such as sedimentary rock and clay. These materials occur both within the coal seam and as floor or roof materials extracted during the mining operation. They are rejected during the beneficiation process on a specific gravity basis.

2.6.2 Coarse Reject

Baal Bone's coarse reject has a particle size ranging from 100 mm to 100 micron and comprises approximately 22% of Washery feed. Analysis of the Baal Bone coarse reject material confirms that it is non saline and pH is near neutral with negligible acid producing capacity. It does however exhibit poor physical characteristics with a coarse texture and low water holding capacity.

Even though it is chemically benign, this material is not suitable for use as a growth medium. All reshaped areas are therefore covered with a minimum of 300mm of soil (freedig) material to provide a covering layer in which a sustainable and protective vegetative cover will be established.

Coarse rejects are currently being strategically placed around in and around the southern open cut void to eventually create the design final landform. Three dimensional modelling completed in late 2006 confirms that a further 4.73Mt of coarse reject can be placed in this area. Based on current production rates this area should provide sufficient capacity for the remainder of the life of mine.

2.6.3 Fine Reject

Fine Washery reject is generally smaller than 100 micron in diameter and comprises around 7% of Washery feed. Fine reject is pumped as 20–25 % w/w slurry to the designated tailings emplacement area contained within the southern open cut void.

Baal Bone Colliery has previously disposed of fine rejects in Reject Emplacement Area 5 (REA 5) which was decommissioned in August 2008. Reject Emplacement Area 6 (REA 6) received a Section 100 (CMH&S Act) approval in on 12.02.08. Pumping of tailings into REA 6 commenced in August 2008.

REA 6 utilises the void of the southern open cut workings and will have a volume of approximately 485,000m^3. Based on expected delivery rates it will have an adequate capacity for fine material emplacement up until closure of mining activities in 2012.

Capping and rehabilitation of REA 5 will commence immediately once the tailings have dried sufficiently to enable work to safely proceed. It is anticipated that this work should commence in Q4 2009.

Leachate generated by REA 6 is to be collected in an adjacent leachate collection dam and will be returned to the process water circuit for reuse by the CHPP.

2.6.4 Open Cut Waste Rock

Open cut mining has ceased at Baal Bone, accordingly there was no open cut waste rock placed during the reporting period.

2.7 Ore and Product Stockpiles

The maximum working capacity of the Baal Bone coal stockpiles (both ROM and product) is approximately 1,000,000 tonnes.

During November 2008 the maximum tonnage of stockpiled underground ROM coal reached 162,000 tonnes and the maximum tonnage of stockpiled washed coal peaked at 185,000 tonnes in October.

2.8 Water Management

2.8.1 Process Water Circuit

Baal Bone Colliery has a cyclic Process Water Management System. That is, all site runoff is directed into and is reticulated around the Process Water Circuit for use in general site operations and the CHPP. Some water is discharged into the Jews Creek through an EPL licenced discharge point during high intensity rainfall events; although no water was discharged through this discharge point during the 2008 reporting period.

As at 31st December 2008, approximately 99 ML of water was held within the process water circuit, see **Table 2.5**. This water is used throughout the CHPP at a rate of 2.5 ML/day.

Tailings slurry from the CHPP is pumped to the tailings dam at an average rate of 150 m^3/hr. From the tailings dam, water is gravity fed through a filter embankment to the leachate collection dam, from where it is pumped back into the Dirty Water Dam. Approximately 300 ML of leachate water was recycled into the process water circuit in 2008.

Water from the Dirty Water Dam is subsequently pumped into the Process Water Dam prior to redistribution to the CHPP and to the underground operations for wash down, dust suppression and fire fighting purposes.

2.8.2 Potable Water

Potable water is purchased from State Water and is supplied through a connection into the Fish River Water Supply Pipeline. This connection services the administration centres and bathhouses, and is also used underground in a solcenic emulsion for the longwall hydraulic roof support system. Drinking water is also taken underground in containers.

Potable water usage for the reporting period was 24.703 ML. As a result of various water savings initiatives during 2008, consumption of potable water on site has been reduced by 5.249 ML compared to the 2007 reporting period. A total potable water reduction of 17.879 ML (a 58% savings) has been achieved over the past two years at Baal Bone.

Table 2.5 Stored Water at Baal Bone Colliery

	Volume Held			
	Start of Reporting Period	**End of Reporting Period**	**Volume lost/gained**	**Maximum Storage Capacity**
Dirty Water Dam	30 ML	37 ML	7 ML, gained	37 ML
Process Water Dam	55 ML	55 ML	Remained even	55 ML
Box Cut Sump	6.9 ML	6.9 ML	Remained even	6.9 ML
Controlled Discharge Water (Salinity Trading Schemes)	Nil	Nil	Nil	Nil
Contaminated Water	Nil	Nil	Nil	Nil

2.8.3 Sewage Treatment and Disposal

Sewage and grey water effluent from site facilities, including the administration building, bathhouse, CHPP and amenities are collected in a sump and directed through macerator pumps to an on-site sewage treatment plant (STP). The waste is treated by an activated sludge treatment process then is discharged into two maturation ponds, with a total residence time of approximately 20 days.

Following treatment and maturation the overflow from the second pond discharges onto a well vegetated transpiration bed; this is an EPL Discharge and Monitoring Point. The location of the STP and maturation ponds is shown on **PLAN 1**.

Contra-Shear Technology completed a formal operational review of this system in January 2008.

2.8.4 Changes to the Water Management System During 2008

There were no changes to the water management system at Baal Bone during the 2008 reporting period.

However, as discussed in last year's AEMR the Box Cut Sediment Dam was removed in Q4 2006 due to the advancing open cut operations. Whilst this was Licenced Discharge Point No. 5 it had not been utilised for a considerable period of time as the Box Cut precinct was no longer an active underground mining area.

All water from the Box Cut sump, which previously discharged through this point, then discharged directly into the LW19 goaf and is eventually pumped to the surface by the north mine dewatering bore and is discharged into Jews Creek via Licenced Discharge Point No. 6.

Subsequent to an application made to the Department of Environment and Climate Change, Baal Bone's Environment Protection Licence (No. 765) was formally amended on 19 February 2008 to reflect the above operational changes.

2.9 Hazardous Material Management

2.9.1 Status of Licence

Baal Bone holds an *Acknowledgement of Notification of Dangerous Goods on Premises* (35/023231). In order to be granted a licence to store explosives, in accordance with the Explosives Regulation (2005), Baal Bone has nominated suitable persons to hold an Unsupervised Handling Licence following appropriate state and federal security background check. Accordingly the Explosive and Detonator Magazine was also included in the Acknowledgement.

Details of hazardous materials stored on-site during the reporting period are provided in **Table 2.6.** Location of the storage of hazardous goods can be found on **PLAN 1**.

Table 2.6 Hazardous Materials Stored On Site

Hazardous Material	Dangerous Goods Classification	Maximum Quantity Stored	Storage Type
Explosives; blasting, Type A	Class 1.1D	480 kg	Surface Explosive Magazine
Detonator, non-electric and electric	Class 1.1B	1000 kg	Surface Explosives Magazine
Petroleum gases, liquefied	Class 2.1	45,500 L	Above Ground Tanks (Pit-top and CHPP)
Diesel	Class C1	50,000 L	UST (Pit-top)
Diesel	Class C1	47,000 L	AST (CHPP)

2.9.2 Material Safety Data Sheets

Under Baal Bone Colliery's Environmental Management System (EMS) there is a Hazardous Substance Standard (HSEC STD 5.03 – Hazardous Substances), which deals with the safe storage, handling and disposal of chemicals and other hazardous substances. Materials Safety Data Sheets (MSDS) are made available to all employees at the Store facility.

The Colliery also has a comprehensive online "Chemalert" database, which provides all employees easy assess to information on all chemicals held on site. Information includes but is not limited to: the safe handling of products, Personal Protective Equipment (PPE) requirements, storage, use and disposal of the materials and spill response procedures. Chemalert is available on most PCs including the one for general employee use in the lamp room.

2.10 Other Infrastructure Management

The location of existing infrastructure is shown on **PLAN 1**. During the 2008 reporting period the only changes to the existing infrastructure included the commissioning of an 11 kV transmission line, together with an upcast ventilation shaft to service the south east extension to the mine plan. These works have been discussed previously in this Report.

There were no other changes or additions to processes or facilities.

SECTION 3.0: ENVIRONMENTAL MANAGEMENT AND PERFORMANCE

Baal Bone Colliery maintains and operates an Environmental Management System (EMS), which has been prepared to reflect industry best practice and to specifically address Development Consent conditions, approvals, licence and other statutory requirements.

Detailed Plans of Management and Performance Standards for a wide range of environmental elements have subsequently been developed. These Plans and Standards detail relevant control measures, management strategies, monitoring requirements, reporting procedures and performance expectations/criteria.

SP Solutions Pty Limited conducts annual Broad Brush Risk Assessments (BBRA) at Baal Bone, with the 2008 review completed in December. Being a Broad Brush Risk Assessment this review tends to focus on high level health, safety, environmental and community issues.

In conjunction with a wide ranging EMS review completed during 2008, Baal Bone also commissioned a full review of the Environment and Community Risk Assessment (ECRA); this was conducted by **ngh**environmental in July 2008.

This process enabled a more comprehensive range of risks to be assessed and facilitated development of an updated Aspects and Impacts Register for Baal Bone. All management plans and operating procedures were reviewed accordingly and updated as required; several new documents were also developed so as to better manage identified risks / deficiencies.

It should be noted that this Section of the AEMR does necessarily provide a comprehensive description of each individual environmental control mechanism that is currently employed at Baal Bone; this level of detail is available in the Mining Operations Plan (MOP) for Baal Bone's Underground and Open Cut Operations (July 2006, with Amendments).

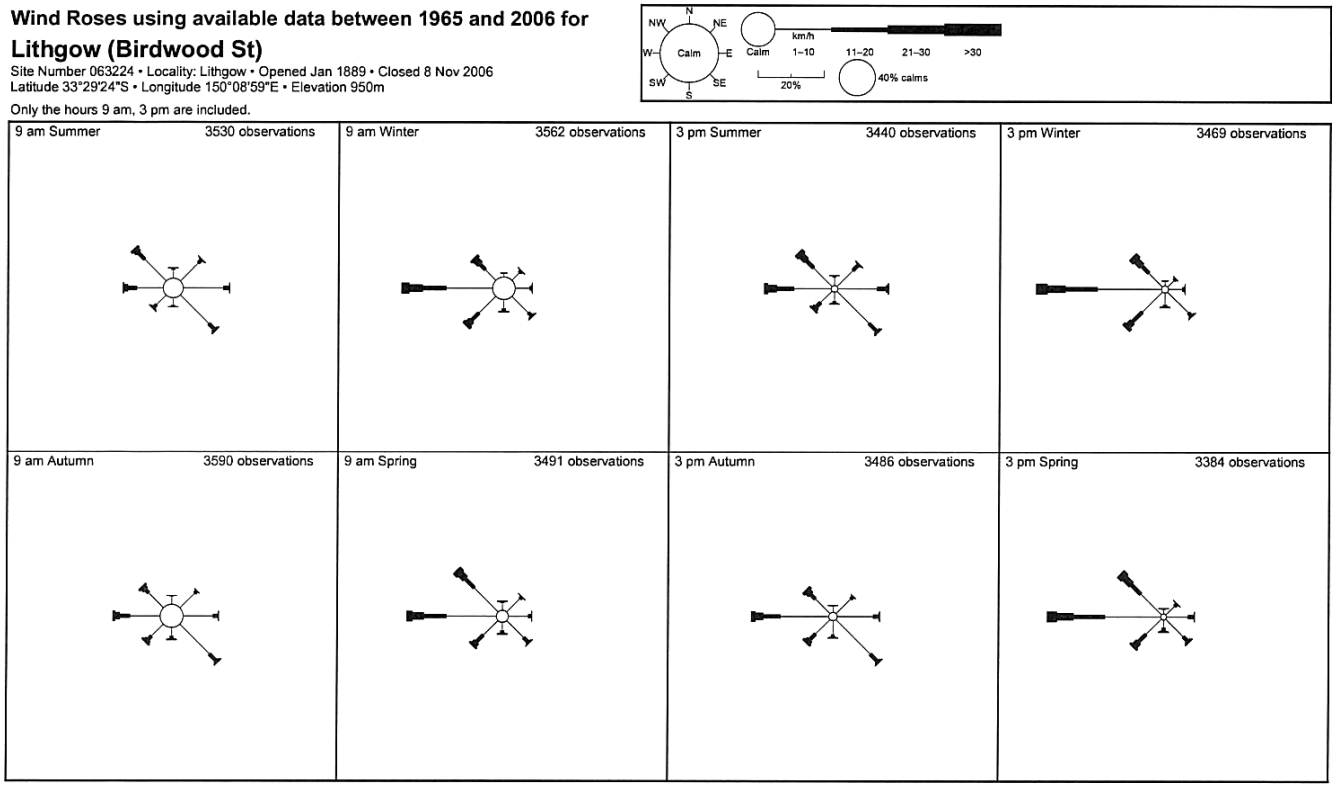
Rather, this Section will focus on providing a succinct review of the performance and/or modification of key control measures throughout the 2008 reporting period. Also included is a review of significant activities undertaken or actions completed throughout the year, a summary of monitored data (as applicable), a discussion regarding the level of compliance achieved; together with an overview of initiatives proposed and actions planned for the 2009 reporting period.

3.1 Air Pollution

3.1.1 Wind Speed and Direction

The Ben Bullen Range (and State Forest) provides reasonable shelter from winds with the exception of those from the north-west which have a clear fetch of approximately 12km upwind of the site. However, strong winds from the southwest and southeast may funnel through the gaps in the Ben Bullen Range and along the valleys.

Wind speed and direction at Baal Bone is comparable to the wind conditions from the Lithgow (Birdwood Street) Weather Station. Historic seasonal wind roses for this weather station are found in **Figure 3.1**.



Page 1 of 1

Figure 3.1 Historic Wind Roses for the Lithgow Weather Station (Birdwood Street)

3.1.2 Dust Monitoring and Sample Locations

Monthly dust fall-out monitoring is carried out in accordance with Australian Standard AS3580.10.1 and EPL requirements. Baal Bone has engaged Ecowise Environmental Pty Limited, a NATA Accredited laboratory, to undertake monthly sampling, monitoring and analysis.

Baal Bone maintains a network of 4 dust deposition gauges to monitor dust levels around site and in the vicinity of our nearest neighbour, these are:

- Sample Location DM1 (EPL Monitoring Point No. 7)
- Sample Location DM2 (EPL Monitoring Point No. 8)
- Sample Location DM3 (EPL Monitoring Point No. 9)
- Sample Location DM4 (EPL Monitoring Point No. 10)

Location of these gauges are illustrated on **Drawing 1**.

3.1.2 Modifications to the Dust Monitoring Network

There has been no change to any location of Ball Bone Colliery's dust fallout monitoring network during the reporting period.

3.1.3 Review and Interpretation of Dust Monitoring Results

Levels of *Total Solid Particles* were monitored in accordance with EPL 765 and the DECC Guideline of 4.0g/m^2/month has been adopted as a reasonable maximum level. Results of dust fallout monitoring conducted during the 2007 reporting period are illustrated graphically in **Figures 3.2 – 3.5** below.

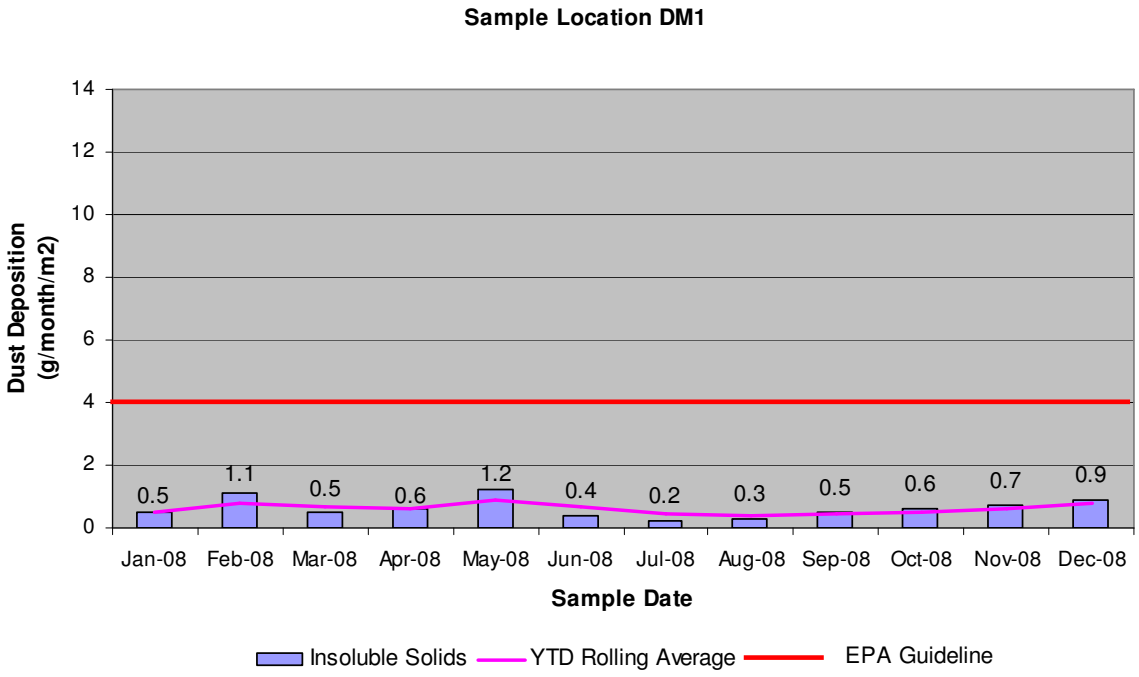


Figure 3.2. Monthly dust deposition results for Sample Location DM1

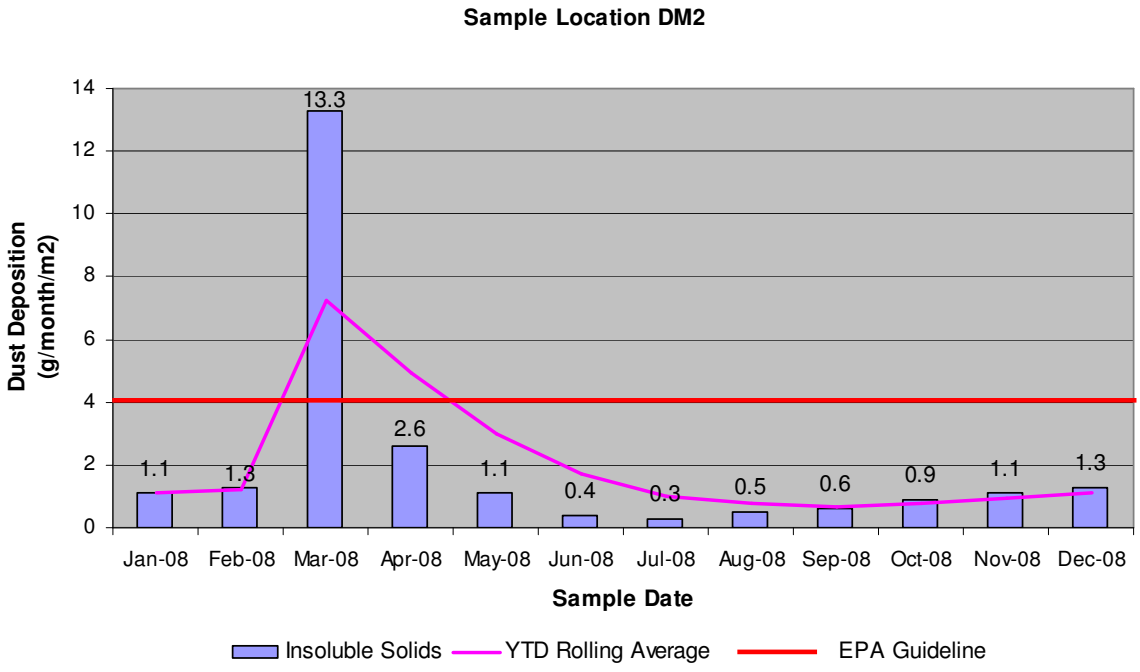


Figure 3.3. Monthly dust deposition results for Sample Location DM2

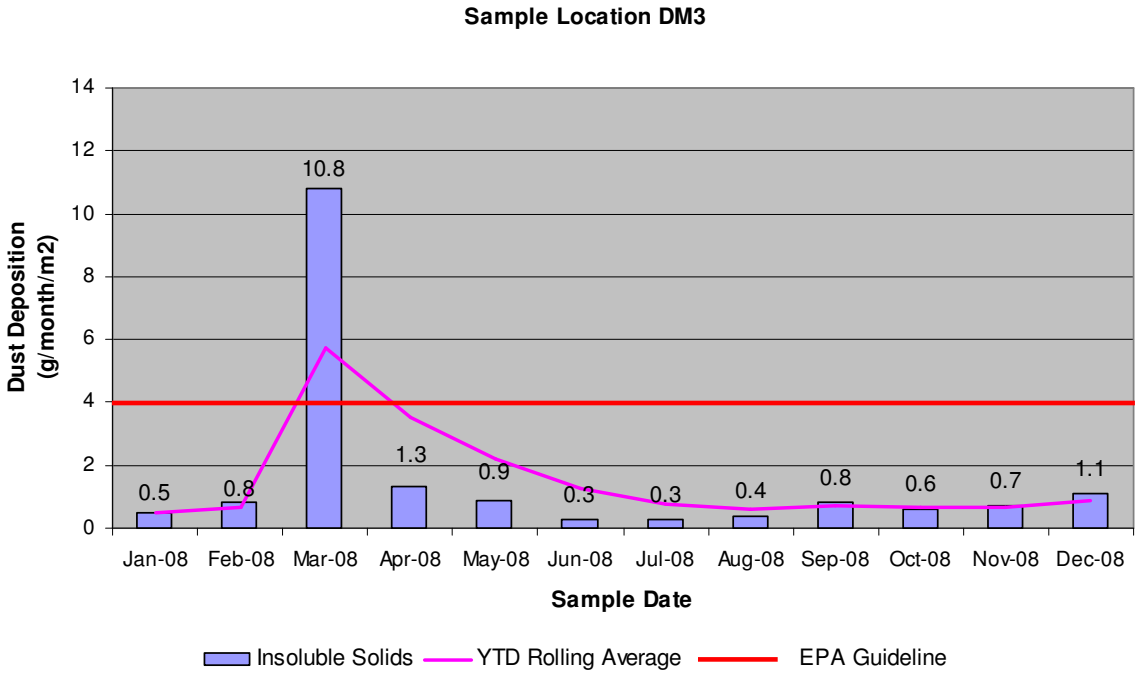


Figure 3.4. Monthly dust deposition results for Sample Location DM3

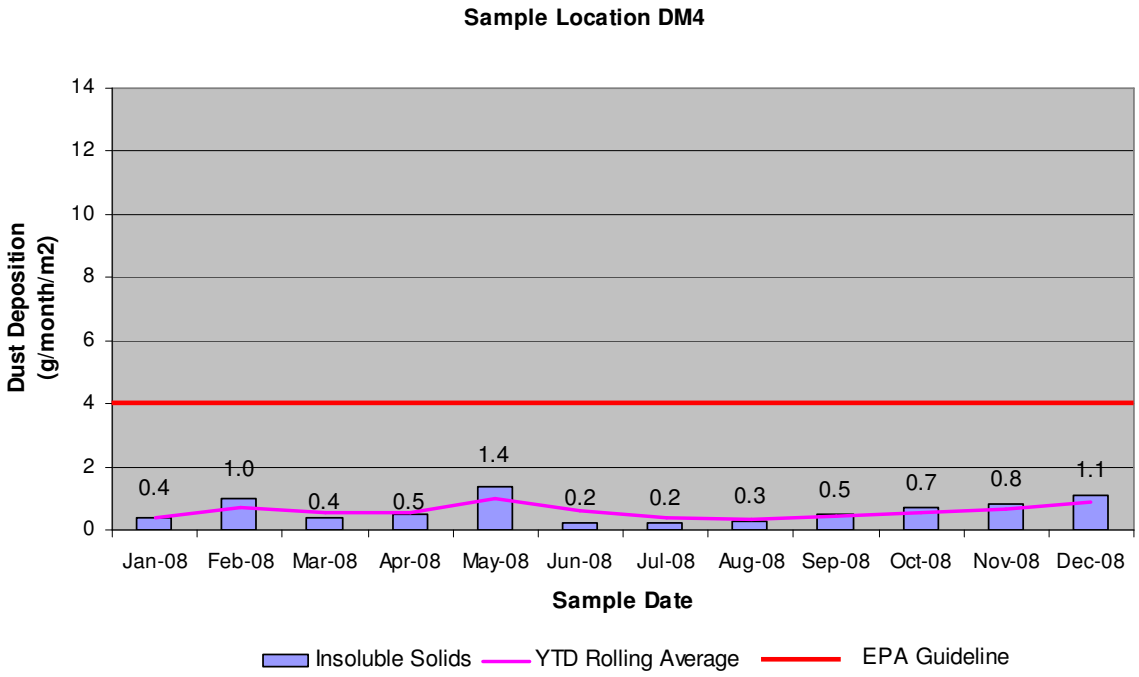


Figure 3.5. Monthly dust deposition results for Sample Location DM4

All four dust deposition gauges were sampled monthly during the reporting period. With the notable exception of the March readings for DM2 and DM3, all other monthly concentrations of *Total Solid Particles* were well below the DECC Guideline, based on AS 3580.10.1-1991, which suggests that the annual dust deposition average should not exceed 4.0g/m^2/month .

Field sheets supplied by the sampling contractor confirm that samples collected from DM2 and DM3 in March were *"cloudy brown with leaf matter"*. Deposition gauges DM2 and DM 3 are located on the western and eastern side of the Colliery respectively and are surrounded by open grassland areas.

As there were no abnormally dusty activities occurring on the site at the time (open cut mining was completed in July 2007), the presence of *"leaf matter,* combined with the location of the gauges, would tend to support an assumption that a significant wind storm may have been responsible for the abnormally high levels of debris and deposition.

No other abnormal or unseasonal spikes were recorded during the reporting period.

3.2 Erosion and Sediment Control

In non-active areas of the mining lease, there have been negligible levels of erosion and sedimentation. Agisted livestock were removed in 2007 to ensure the maintenance of a satisfactory level of ground cover. Good spring and early summer rains have subsequently resulted in a very good level of ground cover.

As discussed in Section 2, all active surface mining and rehabilitation areas fall within Baal Bone's Surface Water Management System which is subdivided into "clean water" and "dirty

water" systems. Features of the "clean water" system includes upslope diversion banks, levee banks, lined channels and drains and reed beds within the Ben Bullen Creek; features of the "dirty water" system include graded contour banks, containment bunds, primary arrestor/grit traps, sediment dams, water treatment plant and settlement dams.

The dirty water system is incorporated into Baal Bone's process water circuit. This is essentially a closed circuit which provides water for the CHPP, in addition to water for dust suppression, fire fighting and general underground operations. Water from this circuit is reused and is only discharged from site through a Licenced Discharge Point during high intensity rainfall events. No discharges occurred during 2008.

The Overshot Dam is located on the Colliery's northern boundary and is the final point of containment for the clean water system. It also provides an additional opportunity for settlement and/or other treatment if required. The discharge from the Overshot Dam is Licenced Discharge Point No. LDP1 as noted on EPL 765.

There were no discharges off the mine site through LDP1 during the 2008 reporting period.

3.2.1 Activities During the Reporting Period

Rehabilitation activities in both the southern and northern open cut areas progressed well during 2008, with 76.85 ha seeded. This included a mixture of both improved pasture areas and native woodland areas.

Restoration works along the Ben Bullen Creek diversion also commenced during the reporting period. These works included recreation of a system of pools, riffles and meanders; plus the immediate revegetation of several high risk areas of bank works.

Further detail regarding rehabilitation activities at Baal Bone are included in Section 5.

3.3 Surface Water

Baal Bone has engaged Ecowise Environmental Pty Limited, a NATA Accredited laboratory, to undertake monthly sampling, monitoring and analysis of a range of surface and subsurface waters.

Baal Bone maintains a network of 5 licenced Discharge and Monitoring Points in accordance with EPL 765 (viz. LD2, LD3, LD6, LDP1 and WMP1) (**Drawing 1 & Drawing 2**). As discussed in Section 2.8.4, several deletions were made to Baal Bone's EPL during 2008. These variations were predominantly due to the elimination of several licenced discharge points as a result of the previous open cut mining operations.

In addition to the licenced discharge points, another 23 monitoring points are located throughout the site and the data obtained is used to assist internal management and planning decisions.

A description of discharge and monitoring sites, analyses conducted, frequency of sampling and concentration limits (where applicable) are shown in **Table 3.1** below.

Table 3.1. Baal Bone Colliery Water Monitoring Locations and Monthly Analysis

NB: Monitoring points highlighted in yellow indicate Licenced Discharge and Monitoring Points.

Sample Name	Sample Location	Frequency	Pollutants Analysed	EPL Limits Apply
BBLD2	EPL Monitoring Pt No.2. In sump at discharge from STP maturation pond to transpiration bed area	Monthly during discharge	Oil & grease, TSS, pH, BOD, faecal coliforms, nitrogen, phosphorus	Not specified
BBLD3	EPL Monitoring Pt No. 3. In stilling pond at pipe outlet of south mine dewatering bores	Monthly during discharge	EC, oil & grease, sulphate, iron, TSS, pH, MBAS, Pseudomonas, flow rate	Oil & grease, pH, TSS,
BBLD6	EPL Monitoring Pt No. 6. In stilling pond at pipe outlet of north mine dewatering bore	Monthly during discharge	EC, oil & grease, sulphate, iron, TSS, pH, MBAS, Pseudomonas, flow rate	pH, iron, TSS
BBLDP1	EPL Monitoring Pt No.11 Immediately below the pipe outlet or in stilling pool below spillway of overshoot dam	Monthly during discharge	EC, oil & grease, sulphate, iron, TSS, pH, flow rate, hardness, MBAS, nitrogen, phosphorus	Oil & grease, pH, TSS, iron
BBWMP1	EPL Monitoring Pt No. 12 Pool within Ben Bullen creek upstream of active surface mining area	Monthly (during flow)	EC, oil & grease, sulphate, iron, TSS, pH, flow rate, hardness, nitrogen, phosphorus	Not specified
BBPOT	Potable water from main bathroom in Administration	Monthly	pH, EC, Hardness, heterotrophic standard plate count, total coliforms, E coli, Pseudomonas	
BBBH	Potable water from Washery bathroom	Monthly	pH, EC, Hardness, heterotrophic standard plate count, total coliforms, E coli, Pseudomonas	
BBLR	Leachate pond on western side of REA5	Monthly	EC, oil & grease, sulphate, iron, TSS, pH, flow rate, hardness	
BBMW No.5	Mine water discharge pipeline adjacent to No. 5 Adit	Monthly (only if discharging)	Flow rate, pH, EC, TSS, iron, sulphates, oil & grease, MBAS, heterotrophic standard plate count, faecal coliforms, pseudomonas	
BBMW No.3	Mine water discharge pipeline adjacent to No. 3 Adit	Monthly (only if discharging)	Flow rate, pH, EC, TSS, iron, sulphates, oil & grease, MBAS, heterotrophic standard plate count, faecal coliforms, pseudomonas	
BBPit 1	Pit-top grit trap/oil separator (eastern)	Monthly (only if discharging)	pH, oil & grease, MBAS	
BBPit 2	Pit-top grit trap/oil	Monthly	pH, oil & grease, MBAS	

Sample Name	Sample Location	Frequency	Pollutants Analysed	EPL Limits Apply
	separator (western)	(only if discharging)		
BBPit 3	Washery grit trap/oil separator	Monthly (only if discharging)	pH, oil & grease, MBAS	
BBDW	Dirty water dam	Monthly	EC, Iron, oil & grease, pH, Sulphate, TSS, Hardness, MBAS	
BBPRW	Process water dam	Monthly	EC, Iron, oil & grease, pH, Sulphate, TSS, Hardness, MBAS, heterotrophic standard plate count, pseudomonas	
BBSTP1	STP Maturation Pond No 1	Monthly	pH, BOD, Faecal coliforms, nitrogen, phosphorus	
BBSTP2	STP Maturation Pond No 2	Monthly	pH, BOD, Faecal coliforms, nitrogen, phosphorus	
BBBC	Box cut sump	Monthly	pH, EC, iron, sulphates	
BBBBC Mid	Ben Bullen Creek mid-way through site	Monthly (during flow)	Flow rate, pH, EC, TSS, iron, sulphates, hardness, oil & grease, nitrogen, phosphorus	
BBBBC End	Ben Bullen Creek upstream of the Overshot Dam	Monthly	pH, EC, TSS, iron, sulphates, hardness, oil & grease, nitrogen, phosphorus	
BBJ	Jews Creek junction with discharge channel from Overshot Dam (downstream of all mining operations and dewatering bore discharges)	Monthly (during flow)	Flow rate, pH, EC, TSS, iron, sulphates, hardness, oil & grease, nitrogen, phosphorus	
BBJC2	Jews Creek upstream of mining operations, but below dewatering bore discharges	Monthly (during flow)	Flow rate, pH, EC, TSS, iron, sulphates, hardness, oil & grease, nitrogen, phosphorus	
BBJC3	Jews Creek at confluence with un-named flowline from mine dewatering bore discharge	Monthly (during flow)	Flow rate, pH, EC, TSS, iron, sulphates, hardness, oil & grease, nitrogen, phosphorus	
BBJCH	Jews Creek headwaters upstream of all mining operations and mine dewatering discharges	Monthly (during flow)	Flow rate, pH, EC, TSS, iron, sulphates, hardness, oil & grease, nitrogen, phosphorus	
BBLW19 Sed Dam	North bore settlement dam	Monthly	EC, Iron, oil & grease, pH, Sulphate, TSS, hardness, MBAS, pseudomonas	

Sample Name	Sample Location	Frequency	Pollutants Analysed	EPL Limits Apply
BBN 134 - Pipe 2	Piezometer in Ben Bullen State Forest	Quarterly	pH, EC, Depth to water	
BBN 135	Piezometer in Ben Bullen State Forest	Quarterly	pH, EC, Depth to water	

BOD – Biochemical Oxygen Demand
COD – Chemical Oxygen Demand
EC – Electrical Conductivity
MBAS – Metheleyne Blue Active Substances
TSS – Total Suspended Solids

3.3.1 Interpretation and Review of Monitoring Results

Monitoring results for Baal Bone's seven licenced Discharge and Monitoring Points as required by EPL 765 are discussed below. Where available, samples were taken *monthly during discharge* in accordance with the EPL. However due to the continuing dry conditions discharges at many sites were minimal, with most of the water reused or recycled on site, and samples were not regularly available for collection. **Table 3.2** summarises the locations and months during which samples from the licenced Discharge and Monitoring Points were collected.

Results of these samples are tabulated below in **Table 3.3;** graphic interpretation of these results where the Licenced Discharge and Monitoring Points have Concentration Limits is included in **Figures 3.8 - 3.11**.

Table 3.2. Baal Bone's Licenced Discharge and Monitoring Points – samples available for collection in 2008

EPL Point	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
BBLD2	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
BBLD3	No discharge	Yes	No discharge	No discharge	No discharge	No discharge	No discharge	No discharge	No discharge	No discharge	Yes	No discharge
BBLD6	No discharge	Yes	No discharge	Yes	Yes	No discharge	No discharge	No discharge	Yes	No discharge	No discharge	No discharge
BBLDP1	No discharge	No discharge	No discharge	No discharge	No discharge	No discharge	No discharge	No discharge	No discharge	No discharge	No discharge	No discharge
BBWMP1	No inflow	No inflow	No inflow	No inflow	No inflow	No inflow	No inflow	No inflow	No inflow	No inflow	No inflow	No inflow

Table 3.3. Summary of concentration levels recorded for DECC licenced discharge points as required by EPL

EPL Point	Month	Electrical Conductivity uS/cm	Oil & Grease mg/L	Sulphate mg/L	Iron mg/L	TSS mg/L	pH	BOD mg/l	Faecal Coliforms cos/100mls	Nitrogen mg/l	Phosphorus mg/l
BBLD2 (STP)	Jan	-	3	-	-	110	7.4	54	66	15	5.9
	Feb	-	<2	-	-	18	7.1	29	880	5.3	4.2
	Mar	-	<2	-	-	92	7.1	47	100	15	6
	Apr	-	<2	-	-	33	7.1	23	960	7.7	8
	May	-	<2	-	-	70	7.2	47	960	8.5	9.7
	June	-	<2	-	-	37	7.2	51	130	12	3.1
	July	-	<2	-	-	41	7.3	42	30	8.6	4.2
	Aug	-	<2	-	-	64	8.0	71	20	15	7
	Sept	-	<2	-	-	94	9.1	28	60	9.1	4.7
	Oct	-	3	-	-	89	7.7	57	<10	12	4
	Nov	-	3	-	-	63	7.2	27	10	16	4.7
	Dec	-	<2	-	-	135	6.9	71	<1	17	5.7
BBLD3	Feb	1290	<2	279	0.39	<2	7.2	-	-	-	-
	Nov	1410	<2	239	5.5	9	7.3	-	-	-	-
BBLD6	Feb	1080	<2	293	0.1	<2	7.3	-	-	-	-
	Apr	1270	<2	407	0.13	<2	7.4	-	-	-	-
	May	1470	<2	445	0.19	<2	7.2	-	-	-	-
	Sept	1310	<2	349	0.14	<2	7.1	-	-	-	-

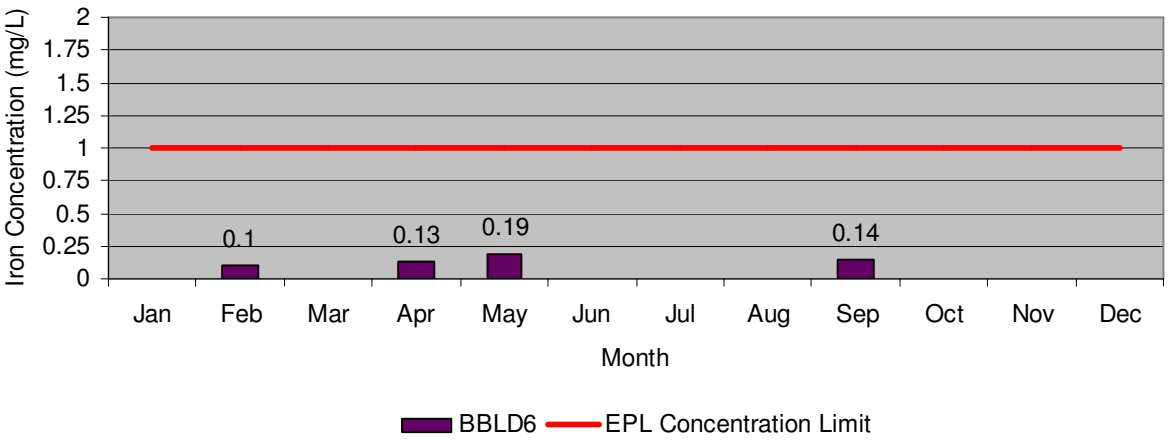


Figure 3.8. Total Iron Levels of Samples Recorded in Relation to EPL Concentration Limit of 1.0mg/L.

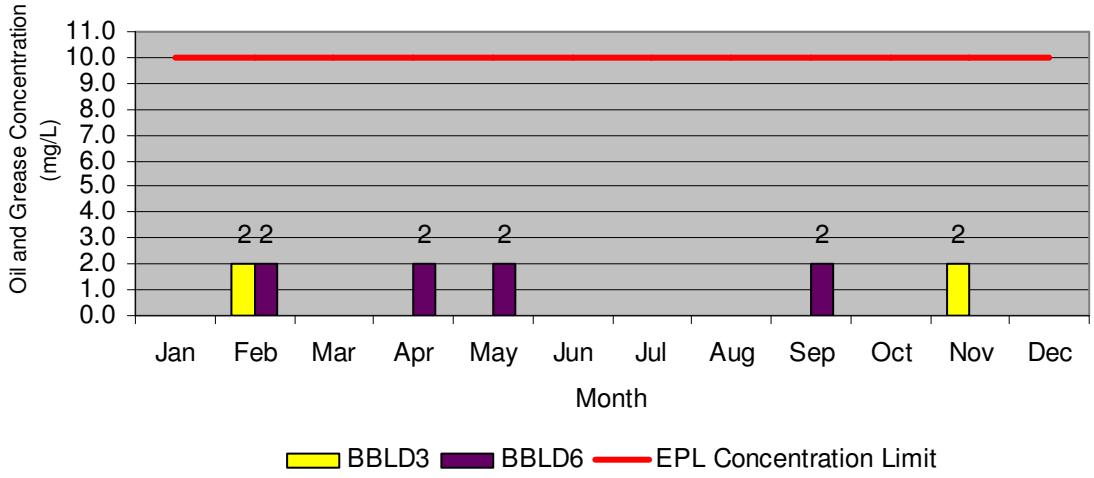


Figure 3.9. Oil and Grease Levels of Samples Recorded in Relation to EPL Concentration Limit of 10mg/L (Note: all values were reported as being <2).

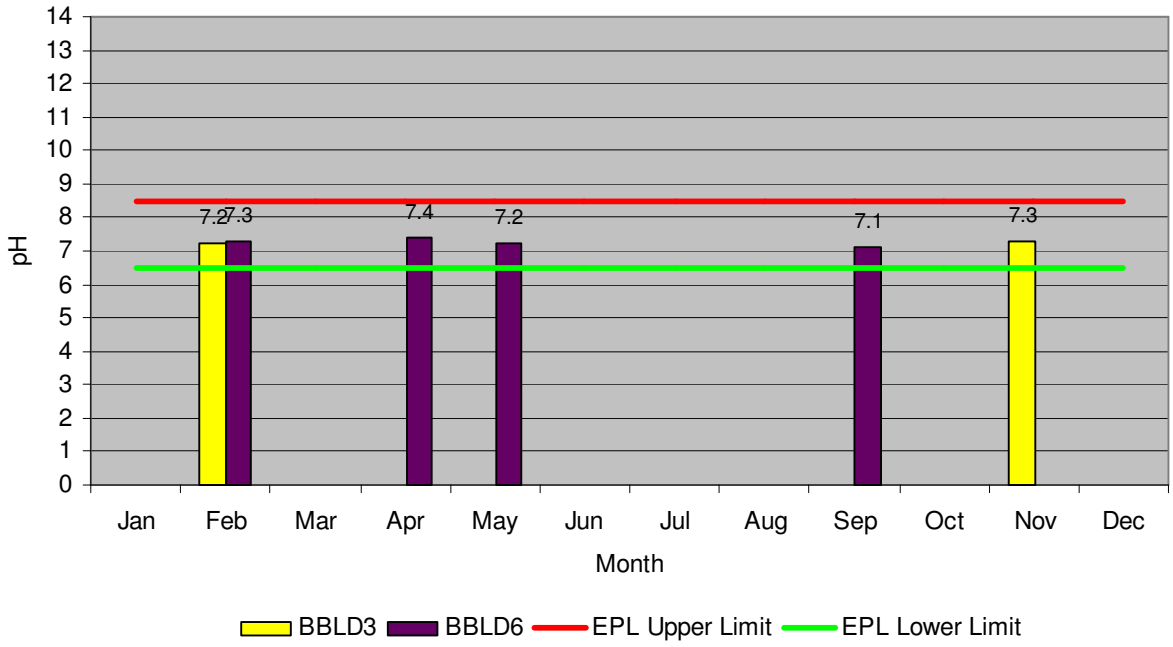


Figure 3.10. pH Levels of Samples Recorded in Relation to EPL Range of 6.5-8.5.

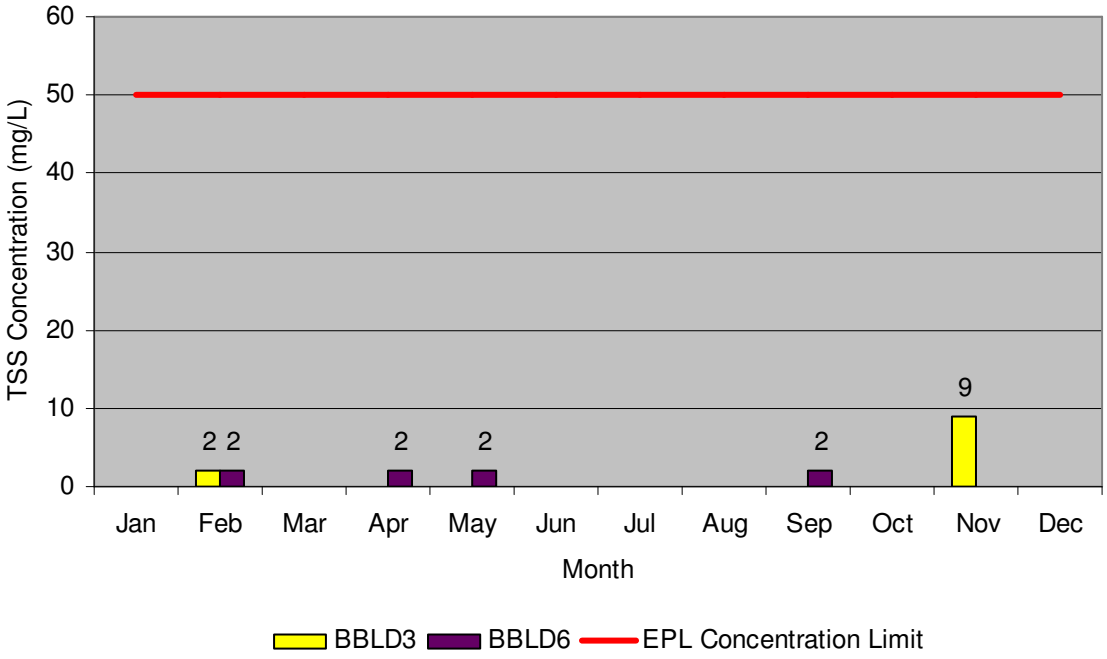


Figure 3.11. TSS Levels of Samples Recorded in Relation to EPL Concentration Limit of 50mg/L (Note: values shown as 2 were reported as being <2).

All samples recorded were within EPL Concentration Limits. A summary of monitoring results for EPL discharge and monitoring points (those with specified Concentration Limits) can be found below:

- all samples for both TSS and Total Iron were within EPL specified concentration limits of 50mg/L and 1.0mg/L respectively
- all samples returned oil and grease concentration levels of <2mg/L, which is well below the EPL Concentration Limit of 10mg/L;
- all samples returned pH results that were within the upper and lower EPL Limits (8.5 and 6.5 respectively).

3.4 Ground Water and Pollution

Baal Bone Colliery currently has ten bores and piezometers licenced with Dept. Water and Energy; these are summarised in **Table 3.4**.

Table 3.4 Licenced Bores and Piezometers

Licence Number	Expiry Date	Location
80BL127440	02/06/2008	Potable water supply (adjacent to southern boundary of site) – no longer in use, not to be renewed
80BL136703	13/01/2013	CHPP water make-up bore near UC1
80BL135509	08/06/2012	Borehole No. 6 near Rail Loop; previously used for dust suppression (low yielding; no longer used)
80BL236132	Perpetuity	Mine dewatering Long Wall 1 (South Bore 1)
80BL236134	Perpetuity	Mine dewatering Long Wall 1 (South Bore 2)
80BL239077	18/06/2011	Mine dewatering Long Wall 19. North Bore.
10BL601877	Perpetuity	BBN175; LW29-31 groundwater monitoring piezo
10BL601816	Perpetuity	BBN176; LW29-31 groundwater monitoring piezo
10BL601817	Perpetuity	BBN177; LW29-31 groundwater monitoring piezo
10BL601970	Perpetuity	BBN 179; LW29-31 groundwater monitoring piezo

It should be noted that licenced bore 80BL127440 is no longer in use and will not be renewed upon expiry.

The four groundwater monitoring piezometers were installed in 2007 to gather background data and to monitor subsidence effects on local groundwater regimes as part of the SMP for LW 29-31. Connell Wagner (Ian Forster) has been engaged to interpret data gathered by these facilities and to prepare quarterly reports.

To date no longwall mining in this area has occurred, so monitoring is providing information regarding baseline conditions. A strong correlation between standing water levels and rainfall has been established.

Baal Bone currently also monitors two active piezometers in the vicinity of previous workings; these are monitored quarterly for analytes including pH, EC, iron, sulfates, oil & grease and depth to ground. A further six piezometers have previously been blocked or otherwise destroyed by subsidence.

3.4.1 Ground Water Extraction

EPL 765 imposes volumetric limits on discharge from the north mine dewatering bore at LD6 of 12 ML/day; during the reporting period an average of 3.169 ML/day was discharged.

Bore Licences 80BL136703 and 80BL135509 as issued by Dept. Natural Resources impose a maximum total extraction limit of 750 ML/year. As stated previously, the yield from Bore 80BL135509 has proven to be unreliable and its use has since been discontinued. There was no water extracted from Bore 80BL136703 during the reporting period.

During the reporting period, the south mine dewatering bores (80BL236132 and 80BL236134) discharged a total of 1477 ML into the Jews Creek.

3.5 Contaminated Land

Known contaminated or polluted lands at Baal Bone are limited to those affected by hydrocarbons. Hydrocarbon contamination is discussed in Section 3.17.

There were no environmental incidents recorded or additional areas of contaminated land identified during the reporting period.

3.6 Threatened Flora

3.6.1 Floral Studies

Over the past 25 years Baal Bone Colliery has undertaken numerous floral and faunal studies within the lease to satisfy various planning and approval requirements, and in accordance with its Biodiversity and Land Management Plan.

From the floral surveys undertaken to date there have been no endangered species found, however 2 vulnerable species and 1 species of regional significance have been identified in the area around Baal Bone. These include Capertee Stringybark *(Eucalyptus cannonnii)*, Clandulla Geebung *(Persoonia marginata)* and Blue Devil *(Eryngium vesiculosum)* respectively.

Potential habitat for both *E. cannonnii* and *P. marginata* are isolated to areas north of the current lease area and they have not been affected by mining activities on site. Baal Bone has developed a Biodiversity and Land Management Plan to ensure that site operations (in particular vegetation clearing and ground disturbing activities) do not potentially impact on these species. This Plan was reviewed and updated in Q4 2008.

Gingra Ecological Surveys (Roger Lembit) have been undertaking routine seasonal baseline surveys of the LW 29-31 and also completed an end of panel/start of panel ecological assessment for LW's 26, 27 and 28.

None of the assessments/surveys mentioned have identified any populations of threatened plant species within the application area.

3.7 Threatened Fauna

Biodiversity Monitoring Services (previously known as Mount King Ecological Surveys) (Martin Denny) has continued with routine seasonal baseline surveys of the LW 29-31 area.

Four threatened species are known to occur in or close to LW 29-31 SMP Extraction Area, these include the Gang-gang Cockatoo *(Callocephalon fimbriatum),* Brown Treecreeper *(Climacteris picumnus),* Turquoise Parrot *(Neophema pulchella)* and the Squirrel Glider *(Petaurus norfolcensis).*

All surveys conducted to date indicate that there should be no significant impact on either of these four species, or the twenty six other threatened species identified with the potential to occur in the area.

3.8 Weeds

A structured weed eradication campaign was continued in 2008. A full land management review of the Baal Bone site was undertaken by Land Asset Management Pty Limited in April 2008, which identified targeted species and their location.

A comprehensive weed spraying program was subsequently completed during March and again in November. These programs targeted Blackberry, St John's Wort and Biddy Bush *(Cassinia arcuata).*

Ongoing maintenance spraying will continue in 2009.

3.9 Blasting

No blasting was conducted at Baal Bone during the reporting period.

3.10 Operational Noise

There were no noise related complaints recorded during the reporting 2008 period.

Baal Bone's Environment Protection Licence was amended February 2008 to include noise limitations for the new south eastern ventilation shaft; these limitations were included as Condition 18 of the project's Development Approval.

Compliance monitoring was completed during both the construction and operational phases by Atkins Accoustics and Associates Pty Ltd during March and May 2008. The measurement results and the assessment of the predicted noise level contribution to the residential assessment

location (Coates residence) confirmed that both the construction and operational noise from the fan installation satisfied the requirements of Condition 18 of the Minister Consent.

3.11 Visual, Stray Light

All lighting associated with the CHPP and the UC1 conveyor/ROM stockpile has been designed and constructed so as to minimise glare and stray light. No complaints have been received during the reporting period in this respect.

3.12 Aboriginal and European Heritage

3.12.1 Aboriginal Heritage

When the construction of the ventilation shaft was being planned it was expected that the access road through the Ben Bullen State Forest may require upgrading so as to safely allow access for heavy articulated vehicles.

Forests NSW requested Baal Bone Colliery to assess potential impacts of proposed track widening activities on several previously recorded Indigenous sites on the Department of Environment and Conservation (DECC) Aboriginal Heritage Information Management System (AHIMS). These rock shelter sites were identified as:

- Site 45-1-0123
- Site 45-1-0124
- Site 45-1-0125
- Site 45-1-0155

OzArk Environmental and Heritage Management Pty Ltd were commissioned by Baal Bone to undertake an Indigenous heritage assessment of the area. The closest site, 45-1-0124, was located over 80 m west of the track and is a considerable distance higher in terms of elevation. All other sites were located over 400 m from Long Swamp Road.

The assessment concluded that none of the identified sites were close enough to Long Swamp Road to require the development of specific mitigative measures against site disturbance. As an aside, road widening works were not undertaken as smaller rigid vehicles were used to convey materials to the vent shaft construction site.

In early 2007, an Indigenous Heritage Assessment was undertaken in conjunction with preparation of the LW29-31 Subsidence Management Plan (SMP) application. This assessment identified a potential rock shelter site (BBC-RS1) located above LW30 in the Ben Bullen State Forest.

Condition 23 of the SMP approval required Baal Bone to reach agreement with the DECC and the local Aboriginal community with regard to the ongoing management of this potential rock shelter site. OzArk were once again engaged to initiate the consultation process and to collaboratively develop an Aboriginal Heritage Management Plan (AHMP) for the site.

A meeting was held on Monday 27th September with representatives of the Indigenous community groups, as well as two DECC representatives, Maria Cotter (Northwest Regional Archaeologist) and Paul Houston (Aboriginal Heritage Planning Officer, Dubbo).

A draft AHMP was prepared and circulated to all participants for review and comment in November 2008. No submissions were received from the groups and the final report was submitted to DECC in December. Acceptance of this report is pending.

3.12.2 European Heritage

No European Heritage Sites have been identified within the Baal Bone mining lease.

3.13 Natural Heritage

No natural heritage sites have been identified within the Baal Bone mining lease. However, the Gardens of Stone National Park lies approximately 5 kilometres northeast of the Colliery and the Blue Mountains World Heritage Area is located approximately 80 kilometres to the southeast of the Colliery.

The Ben Bullen State Forest covers much of the lease area; it is anticipated that this will be gazetted as a State Conservation Area at some time in the future.

3.14 Spontaneous Combustion

No spontaneous combustion events occurred in 2008.

Baal Bone has a Spontaneous Combustion Management Plan for the ROM stockpile. The plan principally involves regulating the duration of ROM storage on the stockpile to reduce residence time and therefore potential oxidation, and monitoring of internal stockpile temperatures.

3.15 Bushfire Management

There was no outbreak of bushfire during the reporting period at Baal Bone Colliery.

In the event of a bushfire with the adjacent State Forest, Forests NSW would assume responsibility for all fire fighting and emergency response activities. An agreement was been reached between Forests NSW and Baal Bone regarding use of the Colliery's helipad, first aid room and process water dam in emergency situations.

In the event that a bushfire is ignited on company owned land or where bushfire poses a threat to the mining operations, the Baal Bone's Emergency Response Procedure will be activated.

In addition, site management will ensure that:

- all boundary roads around the land within the Colliery freehold land are maintained in a condition suitable for use as fire breaks and access tracks during an emergency situation;

- a water cart at the Washery can assist in fire fighting activities;
- main access road and helipad are maintained suitable for use by emergency services;
- dams, voids and any other areas that may be utilised as watering points can be accessed by fire fighting equipment;
- portable radios are used at the time of emergency solely by the emergency response team who are trained and are provided with protective clothing;
- site earthmoving equipment can be utilised; and
- emergency phone, fire extinguishers and fire depots are located at strategic locations around the surface facilities.

Bushfire preparedness has also been included in Baal Bone's Biodiversity and Land Management Plan.

3.16 Mine Subsidence

3.16.1 Current Approvals

Baal Bone currently holds a Section 138 approval (dated 9 May 2005) for extraction of LW's 25-28. This is supported by a *Subsidence and Environmental Plan and Monitoring Procedures for LW's 25-28* that received approval from the Principal Subsidence Engineer (DPI – Minerals) on 4 July 2006.

This s138 approval was due to expire on 1 January 2008, however a 12 month extension was sought due to unexpected delays to the mining sequence. Due to a change in legislation this extension approval was made under Clause 88 (1) of the Coal Mines Health and Safety Regulation 2006; it was received on 17 August 2007 and is due to expire on 31 January 2009.

A Subsidence Management Plan for development and extraction of LW 29-31 was lodged with DPI-MR in June 2007. Approval was received from The Deputy Director General on 7 December 2007, with the approved period of mining to expire on 1 December 2014 (or at the expiry/cancellation of Baal Bone's Coal and Mining Leases). Extraction of LW 29 is expected to commence in Q2 2009.

3.16.2 LW 26 End of Panel Subsidence Monitoring Report

An End of Panel Subsidence Monitoring Report was prepared in June 2008 for submission to the Department of Primary Industries (Minerals) in accordance with clause 6.1.7 of the Approval to Longwall Mine Panels 25 to 28, Baal Bone Colliery (Section – 138(1) Coal Mines Regulation Act 1982).

This condition requires Baal Bone to ensure that: *"The results of all monitoring undertaken as part of the subsidence and Environmental Management Plan be complied into a report and submitted to the Assistant Director Environment and the Principal Subsidence Engineer three months after the extraction of each longwall."*

The Subsidence Monitoring Report concluded that all survey results were within the predefined parameters for vertical subsidence at the 26.5 degree angle of draw, and for movement in the

east-west axis outside of the goaf as defined in Table 1 of Baal Bone's *Subsidence Monitoring and Environmental Management Monitoring Procedures for Longwalls 25 to 28.*

Maximum subsidence of 1,103mm was recorded at location C28 (centre of panel with 225m cover) on the C-C subsidence survey line. Predicted ranges for subsidence were 1,500 mm to 1,600 mm in the valley regions with 140-160m depth of cover and around 1.4m on the ridge lines with 230-240m depth of cover.

A maximum horizontal movement of 282mm was recorded at C29, with the predicted ranges being 700mm in the valley regions and 400mm on the ridges with the greater depth of cover.

The stress cell monitoring confirmed that there was a slight increase in horizontal stress parallel to the longwall face between the goaf of Longwall 26 and the Wolgan Escarpment. The magnitude of the stress change was low (2MPa in rock strata with an elastic modulus of 19GPa) which is equivalent in subsidence terms to a compressive strain of approximately 0.1mm/m. This indicated compressive strain of 0.1mm/m is much less than the 20-30mm/m that are typically experienced above longwalls panels at Baal Bone Colliery. The stress monitoring also indicated stress relief of approximately 6MPa in an east-west direction toward the goaf of Longwall 26 consistent with 0.4mm/m of tensile strain indicated by subsidence monitoring on B-B and C-C lines.

Two comprehensive surface inspections of the entire panel area were conducted following the completion of Longwall 26. These were an assessment of potential cracking and soil disturbance issues conducted by David Pritchard, plus an ecological review conducted by Roger Lembitt to assess impacts on vegetation resilience and health. Both reviews were undertaken in May 2008 (with reports presented in June 2008).

The inspection conducted by David Pritchard revealed minor surface cracking on both the western and eastern perimeters of longwall 26. The majority of cracking was evident in surface rock at ground level and the largest crack observed was approximately 20mm wide and ran for approximately 20m, which was located on the western perimeter of longwall 26.

The inspection found that there was only minor soil disturbance with one small area of soil showing cracking. It found that there was no evidence of trees falling over or large rock features slipping or breaking in the area. The inspection also revealed that the flow lines in the area have not been affected by any subsidence impacts. All cracking observed was within expected limits and it was concluded that subsidence impacts do not pose a safety risk to the general public.

Roger Lembitt's assessment of longwall 26 showed no evidence of decline in vegetation health resulting from the surface effects of subsidence.

Given the topography and vegetative cover of the extraction area, impacts from subsidence had a negligible environmental impact and are barely perceptible. The levels of vertical subsidence and horizontal movement were below the predicted ranges; there has been no damage to forest infrastructure and there has been no threat to the safety of the general public.

3.16.3 Subsidence Management Planning for LW's 29-31

As discussed previously, Baal Bone received SMP approval for the extraction of LW's 29-31 on 7 December 2007.

Although extraction of LW 29 is not currently scheduled to commence until Q2 2009, Baal Bone continued to undertake a range of baseline flora, fauna and hydrogeological studies during 2008.

During the 2008 reporting period the following activities were completed in accordance with the SMP's Conditions of Approval:

- Development and lodgement of a Wolgan Escarpment Management Plan (in which Baal Bone has committed to extend the buffer between the LW31 pinch points and the escarpment by an additional 50m) – Condition 15
- Development and lodgement of an additional Surface and Groundwater Response Strategy – Condition 16
- Development and lodgement of an Aboriginal Heritage Management Plan for the PAD (Rock Shelter) over LW30 – Condition 23.

3.16.4 Subsidence Crack Repair at LW23 Face Line

As part of Baal Bone's wide ranging surface inspection program, a Baal Bone employee noticed that a subsidence induced crack parallel to the original LW23 face line has not been successfully remediated.

Warning signs were immediately erected and a site meeting was held on 14 May 2008, with Stephanie Hutchinson and Gavin Jefferies of Forests NSW, and Chris Rudens of DPI-Minerals, during which remediation options were discussed.

Works were completed the week following and periodic subsequent inspections have confirmed the area to be in a safe and stable condition.

3.17 Hydrocarbon Contamination

A Preliminary (Phase 1) Assessment of Hydrocarbon Contamination at Baal Bone Colliery was conducted by HLA Environsciences Pty Ltd (HLA), with the report being finalised in April 2006. This assessment included a comprehensive soil and ground water investigation, sampling and monitoring program.

This assessment identified localised contamination from the Underground Storage Tank (UST) at the pit-top area and recommended ongoing groundwater monitoring to confirm the extent and level of contamination.

HLA were subsequently engaged to conduct a Phase 2 Hydrocarbon Contamination Assessment with the objective being to supplement previous investigations and to better quantify the nature and extent of potential soil and groundwater contamination. Concurrent

with this HLA were also engaged to determine remedial requirements following closure of the mine.

The Phase 2 assessment quantified TPH contamination in shallow soils within the CHPP and pit-top areas of the site. TPH impacts at depth up to 2.8 m bgs were identified in the vicinity of the two diesel storage tanks.

In early December 2008, ENSR Australia Pty Ltd (previously HLA) undertook an annual review of water quality in nine groundwater monitoring wells located in the vicinity of the CHPP and pit-top diesel storage tanks. The opportunity was also taken to collect and analyse samples of sediment from the base of the Dirty Water Dam for both hydrocarbon and heavy metal contamination.

The monitoring program confirmed that groundwater contamination appears localised in the vicinity of point sources (i.e. fuel storage tanks) and has generally shown a decrease in concentrations when compared to the previous sampling event conducted in September 2007.

The results of the sediment sampling indicate the presence of TPH, PAH with some elevation in levels of Nickel in the sediments of the dirty water dam. Management of these sediments at mine closure will be incorporated into the Remediation Action Plan.

3.18 Methane Drainage and Ventilation

During the reporting period, monthly gas bag samples from the underground ventilation system were analysed by Coal Mines Technical Services, a NATA accredited company.

Results from the sampling completed throughout the reporting period confirm non-detectable levels of methane at Baal Bone Colliery (<0.01%). Consequently, methane drainage is not required at Baal Bone.

3.19 Public Safety

Fences are in place around the mining lease area, with all other boundary gates locked and maintained in correct working order. All access points onto the mine area are signposted to warn the public of Baal Bone Colliery's mining operations and of the risks involved. Warning signs have also been erected along public tracks in the Ben Bullen State Forest warning of mine subsidence and prohibiting entry to unauthorised persons.

All employees and contractors who enter the mining operations or workshop areas are inducted and must be suitably trained. All visitors must sign in and be accompanied by an employee or staff member of the mine if they have not been inducted by the Safety and Training Superintendent.

No incidents relating to public safety have been recorded during the reporting period.

3.20 Other Issues and Risks

3.20.1 Reportable Incidents

Pursuant to Xstrata's Categorisation of incidents, any incident that falls into the categories below must be reported to the Group Environment and Community Manager, the General Manager for Open Cut or Underground Operations (depending on the type of incident) and the Chief Operating Officer.

Category I: An incident that has caused negligible, reversible environmental impact, requiring very minor or no remediation. For example, exceeding EPL Limits or a hydrocarbon spill >20L.

Category II: An incident that has caused minor, reversible environmental impact, requiring minor remediation. For example, Hydrocarbon spill >20L but <205L AND contained on site.

Category III: An incident that has caused moderate, reversible environmental impact with short-term effect, requiring moderate remediation. For example, illegal discharge offsite that causes local but reversible damage. Also, a hydrocarbon spill <205L that was not contained readily or a spill of any amount of hydrocarbon into public waterways.

Category IV: An incident that has cause serious environmental impact, with medium-term effect, requiring significant remediation. For example, an incident that requires a remediation program over 1-12 months.

Category V: An incident that has caused disastrous environmental impact, with long-term effect, requiring major remediation. For example, an incident that requires a long-term remediation program over 12 months.

There were no environmental incidents reported at Baal Bone during the reporting period.

There were no fines or penalties recorded during the reporting period

3.20.2 Audits Conducted During the Reporting Period

In an order to assess our environmental performance at Baal Bone and to plan and implement a process of continual improvement, a Vent Shaft / Transmission Line Compliance Audit was held in March 2008 and a Rehabilitation and Mine Closure Audit was conducted in June.

An independent external Coal Haulage Consent Audit was scheduled for August 2008, however following discussions with Department of Planning approval was given to postpone the audit for twelve months due to the lack of road haulage over the reporting period.

SECTION 4.0: COMMUNITY RELATIONS

4.1 Environmental Complaints

In accordance with Baal Bone Health, Safety, Environment and Community (HSEC) Procedure PRO 01.09.01.02.009 (Community Complaints Management), Baal Bone Colliery has a comprehensive system in place to document and respond to community complaints in a timely manner and to maintain a comprehensive complaints database.

Consistent with the Mine's Environmental Protection Licence, Baal Bone maintains a 24 hour telephone complaints line and answering service for the purposes of receiving and responding to any complaints from members of the public in relation to activities conducted within the Baal Bone Colliery.

Upon receipt of a complaint, the following details are obtained from the complainant:

- Date of complaint;
- Notification method;
- Date of incident;
- Name of complainant;
- Contact details of complainant;
- Type of complaint;
- Actions taken;
- Persons notified; and
- Details of follow up actions taken, if required.

Following the receipt of a complaint, a thorough investigation of the complaint is undertaken and the complainant advised of the results of the investigation. Any action to be taken to prevent a recurrence is undertaken as soon as practicable.

No community complaints were received by Baal Bone during the reporting period.

4.2 Community Liaison

4.2.1 Community Initiatives

During 2008 the following community involvement initiatives were implemented:

- Support of Ironfest arts and cultural festival in Lithgow
- Prize sponsorship of the annual Portland Art Show
- Sponsorship of team in the Movember Campaign
- Donation to Lithgow Christian Fellowship to provide Christmas lunch and Christmas hampers to the underprivileged in Lithgow.

Planned community involvement activities for 2009 include:

- Support of the Black Coal Competency Traineeship
- Augmentation of school resources at Capertee Public School
- Support of Ironfest arts and cultural festival in Lithgow
- Sponsorship of the Life Education Van to attend Capertee and Portland Primary Schools
- Prize sponsorship of the Portland Art Show
- Sponsorship of team in the Movember Campaign
- Sponsorhip of book prizes for the Cullen Bullen School annual speech day
- Donation to Lithgow Christian Fellowship to provide Christmas lunch and Christmas hampers to the underprivileged in Lithgow.

4.2.2 Community Consultative Committee

The Baal Bone Colliery Community Consultative Committee (CCC) has been established to provide a formal conduit for exchange of information and views between the local community and Baal Bone's Management Team.

Membership of the current Baal Bone CCC include:

- Ray Blackley (Resident)
- Barbara Milne (Resident)
- David Speirs (Adjacent landholder)
- Gary Wallace (Lithgow City Council)
- Mark Snow (Cullen Bullen Public School)
- John Hayward (Operations Manager)
- Tony King (Environment and Community Coordinator)
- Mark Bulkeley (Safety and Training Superintendent)

The CCC met at Baal Bone on the 1st May and 6th November 2008. Regular agenda items included:

- Operations Manager's update
- Health and Safety Manager's update
- Environment Manager's update
- Open cut rehabilitation update
- General Business and any other issues of concern from the community

The Baal Bone CCC is scheduled to meet again on 7th May 2009.

4.2.3 Baal Bone Newsletter

Baal Bone Colliery circulates a periodic community newsletter, *The Baal Bone Community Newsletter,* to approximately 250 neighbouring residents, to selected locations in Lithgow, Wallerawang and Portland, in addition to all Baal Bone employees and contractors.

The newsletter provides topical information regarding the mine's operational progress, environment and safety performance, and other areas of general interest including site rehabilitation and mine closure.

The next edition of the newsletter is scheduled for distribution in May 2009.

SECTION 5.0: REHABILITATION (in this AEMR period)

5.1 Buildings

No buildings were renovated or removed during the reporting period.

5.2 Rehabilitation of Disturbed Land

5.2.1 Final Landuse and Landform Design

As detailed in Baal Bone's current MOP, the basic objective for the rehabilitation of mined land at Baal Bone Colliery is to return the site to a condition where its landform, soils, hydrology, flora and fauna are self-sustaining, and compatible with the surrounding land fabric.

Therefore the proposed end land use for the site included a combination of grazing and bushland/wildlife habitat. This post-mining landscape would be dominated by Class V and Class VI which are compatible with adjoining lands. All rehabilitation and revegetation works undertaken at Baal Bone previously had been completed with this objective in mind.

A Final Landuse Options Workshop, which was held in November 2007 and included a range of agency and community stakeholders. This process validated the original rehabilitation objectives and confirmed the rehabilitation works completed to date were in accordance with these objectives.

5.2.2 Status of Land Shaping and Rehabilitation Works

During the reporting period approximately 450,000 m^3 of coarse reject from the CHPP was placed in the designated reject emplacement area. This material has been strategically placed around in and around the southern open cut pit to create the final design landform. Drainage paths, contour drains, ridgelines, and emplacements are being shaped in undulating informal profiles in keeping with natural landforms of the surrounding environment.

Rehabilitation activities are generally progressing in line the schedule proposed in the MOP, notwithstanding the previous drought conditions. The MOP was however amended during 2007 to account for the extended life of mine provided by the recently approved southeast extension into LW 29-31. The additional LOM has subsequently postponed the final rehabilitation of the fine and coarse reject emplacement area, in the southern open cut precinct, until the end of 2012.

During 2008 approximately 76.85 ha was rehabilitated; with 71.1 ha seeded in the north pit and 3.5 ha completed in the south pit. An additional 2.25 ha was also restored using a brush matting technique beneath the recently constructed transmission line to the new ventilation shaft.

Current rehabilitation status at the end of the reporting period is shown on **PLAN 1**. A summary of rehabilitation works at the start of the MOP period (July 2006), an estimate for the

end of the MOP period (July 2009) and actual rehabilitation completed during 2008 AEMR reporting period are detailed in **Table 5.1**.

5.2.3 Stabilisation and Restoration of Ben Bullen Creek

In June 2007 a Natural Channel Design and Restoration Plan was prepared for the Ben Bullen Creek by Natural Resource Assessments Pty Limited (NRA) and Revegetation Contractors Pty Limited. This plan now supersedes the outdated Surface Water Management Plan originally produced by Umwelt Australia Pty Limited.

The Natural Channel Design includes a series of pools and riffles, interconnected via a meandering flowpath. It also includes the design of two significant grade stabilisation structures within the Ben Bullen Creek. Concurrence for these works have been obtained from Dept. Water and Energy (previously DNR) and Dept. Primary Industries – NSW Fisheries.

Implementation of works in Sections 1 and 3 commenced in late 2007 and subject to favourable weather conditions they should be completed by late Q1 or early Q2 2008. Section 2 passes through the existing pit-top area and will restoration works not be implemented until final rehabilitation post mine closure.

Table 5.1 Summary of Rehabilitation Performance

	Area Affected/Rehabilitated (hectares)		
	Start of MOP	**End of 2008 AEMR Reporting Period**	**End of MOP Period (July 2009)**
A: MINE LEASE AREA			
A1 Mine Lease(s) Area	5002 ha		
B: DISTURBED AREAS			
B1 Infrastructure area (other disturbed areas to be rehabilitated at closure including facilities, roads)	64.05ha	70.54 ha	70.54 ha
B2: Active Surface Mining Area (excluding items B3 - B5 below)	15.25 ha	Nil	Nil
B3 Waste emplacements (dozer push and dumps in N and S) (active/unshaped/in or out-of-pit)	62.05 ha	44.36 ha	44.36 ha
B4 Tailings emplacements (REA 5) (active/unshaped/uncapped)	5.88 ha	9.88 ha	4.02 ha
B5 Shaped waste emplacement (awaits final vegetation)	93.77 ha	5.60 ha	5.60 ha
ALL DISTURBED AREAS	241.0 ha	130.38 ha	124.52 ha
C REHABILITATION PROGRESS (Cumulative)			
C1 Total Rehabilitated area (except for maintenance)	41.9 ha	156.02 ha	161.26 ha
D: REHABILITATION ON SLOPES (Cumulative)			
D1 10 to 18 degrees	6.25 ha	34.15 ha	38.25 ha
D2 Greater than 18 degrees	2.5 ha	2.5 ha	2.5 ha
E: SURFACE OF REHABILITATED LAND (Cumulative)			
E1 Pasture and grasses	Nil	Nil	Nil
E2 Native forest/ecosystems	41.9 ha	172.84 ha*	178.08 ha
E3 Plantations and crops	Nil	Nil	Nil
E4 Other (include non-vegetative outcomes)	Nil	Nil	Nil

5.2.5 Soil Amelioration

Previously, a comprehensive agronomic soil analysis of the freedig covering material has previously been undertaken through the Soil Conservation Service Soils Laboratory in Scone. The results confirm that the material is generally of a sandy clay loam texture, with high to spontaneous dispersion in most cases, as evidenced by EAT classes of 2(1) and 2(2). All

samples exhibited a low to moderate cation exchange capacity, with a corresponding low level of chemical fertility. Aluminium toxicity has the potential to be problematic as the pH was in the range 5.5 – 6.7 and many samples returned a high level of exchangeable aluminium.

Following recommendations provided by the SCS gypsum has been incorporated at a rate of 5,000kg/ha across the site to ameliorate the high dispersion percentage and to reduce the erodibility of the freedig material. Agricultural lime has also been included at a rate of between 2,000 – 2,500kg/ha as this will assist with both longer term dispersion amelioration and pH adjustment, thereby reducing potential for aluminium toxicity.

A Grower 12 type chemical fertiliser (20:20:40) at a rate of 250kg/ha has been applied on areas that are to be seeded with a predominantly exotic or improved pasture mix, and a low analysis organic type fertiliser (eg. Dynamic Lifter) at a rate of 250kg/ha has been applied on areas with a predominantly native mix.

During 2008, approximately 2.6 ha of steep slopes along the Ben Bullen Creek were revegetated as part of the creek restoration program. The length and steepness of these slopes required an additional level of amelioration to ensure success in these critical areas.

Go Compost from Soilco Pty Ltd was applied using a pneumatic mulch blower at a rate of approximately 150m^2/ha. *Go Compost* is a composted and recycled green waste material that adds organic carbon, nutrients and microbial material into an otherwise barren soil. It will also help to improve soil structure over time and will reduce dispersion and surface crusting.

The compost material was incorporated to approximately 200mm using a hydraulic excavator; the area was then hydroseeded and covered with a protective strawmulch.

The areas treated with this methodology exhibited a significantly improved level of germination, plant density and vigour.

5.2.6 Revegetation Species

A comprehensive series of species lists have previously been developed to reflect range of micro-climates on the site and to replicate the diverse nature of the endemic vegetation communities of the area; particularly those associated with the adjacent Ben Bullen State Forest.

These lists attempts to recreate several full and diverse vegetation communities in all dimensions and includes a wider range of native grasses and groundcovers, together with a more robust range of shrub and understorey species. Habitat species for the endangered Purple Copper Butterfly have also been included.

Revegetation of high risk and erosion prone areas such as steep slopes and some overland flowlines have been initially stabilised with a mix of quick growing, introduced pasture species, interspersed with a selection of native shrubs and small trees.

A riparian mix has also been selected that includes a range of macrophytes and other water plants to provide natural bioremediation and bioretention of pollutants, as well as habitat and food sources for aquatic life. This species list has been validated as part of the natural channel design and restoration plan prepared for Ben Bullen Creek.

5.2.7 Final Voids

Three dimensional modelling completed in late 2006 confirmed that a further 4.73Mt of coarse reject could be placed in the southern open cut void. Based on current production rates this area will provide sufficient waste storage capacity for the remainder of the life of mine (including the proposed LW's 29-31).

Baal Bone Colliery has previously disposed of fine rejects in Reject Emplacement Area 5 (REA 5) which was decommissioned in August 2008. Reject Emplacement Area 6 (REA 6) received a Section 100 (CMH&S Act) approval in on 12.02.08. Pumping of tailings into REA 6 commenced in August 2008.

REA 6 utilises the void of the southern open cut workings and will have a volume of approximately 485,000m^3. Based on expected tailings delivery rates it will have an adequate capacity for fine material emplacement up until planned cessation of mining activities in 2012.

As illustrated on **PLAN 1**, it is intended to retain this area for use as an active reject emplacement area. Final rehabilitation of this area will occur concurrent with mine closure. Approximately 178,000 m^3 of freedig covering material has been stockpiled in readiness.

Concurrent with the Part 3A application and Environmental Assessment for the continuation of operations at Baal Bone post August 2010, the consultants will be undertaking a comprehensive review of processing waste management. This will include an assessment of existing (remaining) capacity in REA 6, determination of future requirements, site investigation and environmental assessment of a proposed future REA if required.

5.3 Other Infrastructure

Following construction of the aerial bundled transmission line to the new south-east ventilation shaft, approximately 2.25 ha of disturbed area was rehabilitated. This area was rehabilitated by the Soil Conservation Service using the brush matting technique, with material that was harvested during the construction process.

No other infrastructure was rehabilitated during the reporting period.

5.4 Rehabilitation Trials and Research

There has not been any formal rehabilitation trials or research carried out at Baal Bone during the reporting period. However, due to the documented lack of fertile topsoil material at Baal Bone, gypsum as been used extensively during seedbed preparation. Several sources of gypsum have been used (both natural and by-product gypsum) and there has also been several different incorporation techniques used.

Following a detailed review of the effectiveness of the various treatments, a preferred methodology has subsequently been developed for all future rehabilitation works.

As discussed above in Section 5.2.5, the incorporation of recycled organic material was also used on a small area of creek banks during 2008. The learning's from this exercise will also be used to guide future rehabilitation works in similar areas.

During 2009 it is also proposed to assess the use of *Go Compost* as a maintenance treatment in areas that were revegetated around eight years ago. These areas currently exhibit a high level of surface crusting, with moderate to high rates of sheet and rill erosion.

5.5 Development of a Detailed Mine Closure Plan

5.5.1 Mine Closure Planning

In accordance with XC STD5.12 Mine Closure Planning, Baal Bone has commenced preparation of a Detailed Mine Closure Plan as the Baal Bone reserve has a LOM of less than five years.

Activities completed and/or initiated during 2008 have focussed on the following:

- Finalisation of Mine Closure Social Impact Assessment (Coakes Consulting)
- Implementation of Mine Closure Consultation Strategy
- Finalisation of Final Landuse Options Workshop and Risk Register (GSSE Environmental)
- Indicative market valuation of final Landuse options and accompanying cost to benefit and economic analysis of Landuse options (Trevor Hudson and Associates)
- Preparation of draft closure objectives and completion criteria for approved final Landuse options
- Finalisation of Mine Seal Design (Burke Engineering Services)
- Completion of a Demolition and Dismantlement Closure Study for the site (Liberty Industrial)
- Annual review of Phase 2 Contamination Assessment for both ground water and deposited sediments in water storages (ENSR Australia)

Mine closure planning activities proposed for 2009 will focus on:

- Completion of feasibility and cost-benefit analysis of preferred final Landuse options
- Refinement/finalisation of closure objectives and completion criteria for approved final Landuse options
- Development of scientifically based Rehabilitation Maintenance and Monitoring Plan using the concept of Landscape Function Analysis (LFA)
- XCN approval of selected final Landuse options
- Confirmation of planned closure budget for approved land uses
- Detailed Environment and Community Risk Assessment with respect to approved final land uses
- Development and collation of Detailed Mine Closure Plan document; this is to detail scope of all physical site works required, social mitigation/communication strategies, implementation costs, monitoring requirements, "sign off" and relinquishment procedures, closure indicators/milestones, timeline/critical path network etc.

It is proposed to have a Detailed Mine Closure Plan document prepared by Q4 2009.

5.5.2 Rehabilitation Liability Estimate

DPI-MR introduced a new Rehabilitation Security Deposit Policy in November 2005 for implementation from 1st July 2006. The new policy aims to encourage progressive rehabilitation through the regular review of rehabilitation liabilities, mainly through titleholders providing DPI-MR with an estimate of rehabilitation costs. The guideline requires that the titleholder's rehabilitation cost estimate is provided as a component of all AEMRs from 1st July 2006 (DPI-MR, 2006).

In October 2006, GSSE calculated Baal Bone Colliery's "close-now" rehabilitation liability to be $12,218,258.

Baal Bone subsequently completed a substantial quantity of rehabilitation work in conjunction with a small, but targeted open cut mining and rehabilitation project during 2006 and 2007.

GSSE once again reviewed Baal Bone's residual close-now liability in early 2007 and determined that the current rehabilitation cost estimate was $5,401,438. This was a decrease of $6,816,820 from the sum originally determined in October 2006.

Baal Bone's Security Deposit held by the DPI-MR was subsequently reassessed and an amended Security Guarantee in the sum of $5,432,800 was lodged with the Department in June 2008.

It should be noted that GSSE's liability review (spreadsheet dated 15.02.08) purposely accrued the value of all previously issued purchase orders (with works already underway) for those rehabilitation activities planned for 2008. As no additional work of any significance was completed during the year, Baal Bone's close-now rehabilitation liability effectively remains at $5,432,800.

SECTION 6.0: ACTIVTIES PROPOSED IN THE NEXT AEMR PERIOD

6.1 Operations and Systems

Projects and targets for the 2009 reporting period include the following:

- Lodgement of Part 3A Application and Environmental Assessment with the Department of Planning for the continued operations at Baal Bone post 10 August 2010
- Renewal of Consolidated Coal Lease 749
- Preparation of a fresh MOP to address continuing operations at Baal Bone and possibly the extraction of the proposed northern extension
- Extraction of LW28
- Finalisation of LW29-31 SMP Management Plans and commencement of extraction of LW29
- Continuation of baseline monitoring for LW 29-31
- Annual review and update of Baal Bone's EMS, including all associated Management Plans and Procedures
- Finalisation of Detailed Mine Closure Plan
- Third party audit of Baal Bone's Coal Haulage Consent.

6.2 Rehabilitation

The majority of the rehabilitation works on both the north and south open cut precincts have been completed during the 2008 reporting period. Focus for 2009 will be on maintenance and/or improvement of rehabilitation works completed so far. Contingent upon climatic conditions at the time, it is anticipated that some reseeding work may be undertaken in Autumn 2009.

It should also be noted that the southern void area will be maintained as a coarse and fine reject emplacement area for the remainder of the life of mine. Whilst it may be progressively or temporarily rehabilitated if the opportunity arises, final rehabilitation will be completed concurrent with mine closure. Similarly, the general underground infrastructure areas including the pit-top administration, bathhouses, workshops, conveyors, CHPP and rail loop will not be decommissioned and rehabilitated until after mine closure occurs.

Anticipated rehabilitation works to be completed within 2009 AEMR reporting period include the following:

- Maintenance of all existing rehabilitation areas in both the northern and southern open cut precincts
- Riparian tree planting (tubestock) along the restoration works on Section 1 and Section 3 of the Ben Bullen Creek

6.3 Community Relations

Community Relation projects for the 2009 AEMR reporting period include the following:

- Preparation of two community newsletters;
- Hosting of two CCC meetings;
- Conducting a mine Open Day to highlight open cut rehabilitation works (TBC);
- Support of the Black Coal Competency Traineeship
- Augmentation of school resources at Capertee Public School
- Support of Ironfest arts and cultural festival in Lithgow
- Sponsorship of the Life Education Van to attend Capertee and Portland Primary Schools
- Prize sponsorship of the Portland Art Show
- Sponsorship of team in the Movember Campaign
- Sponsorhip of book prizes for the Cullen Bullen School annual speech day
- Donation to Lithgow Christian Fellowship to provide Christmas lunch and Christmas hampers to the underprivileged in Lithgow.

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