Springvale Coal Services and Lamberts Gully Open Cut

2011 ANNUAL ENVIRONMENTAL MANAGEMENT REPORT

January 2011 – December 2011

LAMBERT'S GULLY OPEN CUT AND SPRINGVALE COAL SERVICES

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Mining Titles/Leases:
CCL733, ML204, ML1319, ML564, CL394, CL361, ML1448 and PLL133

Lambert's Gully Open Cut Mine, MOP Approval Period:	April 2006 to April 2012
AEMR Reporting Period:	1 Jan 2011 – 31 December 2011
Leaseholder:	Springvale Coal Pty. Ltd.
Mine Operator:	Springvale Coal Pty. Ltd.
Reporting Officer:	Rob Hunt
Title:	Environment and Community Coordinator
Signature:	R. J. Hunt
Date:	16 MARCH 2012

Table of Contents

List of Tables

List of Photos

APPENDICES

1. Introduction

Springvale Pty Ltd (Springvale Coal), a subsidiary of Centennial Coal Limited, owns and operates the Springvale Colliery, Springvale Coal Services Washery (Coal Services) and the previously operating Lamberts Gully Open Cut Mine (Lamberts Gully).

For this 2011 AEMR, Coal Services will be included for the first time as previously it was covered by the Springvale Colliery AEMR. This is due to confusion generated by the common environment protection licence, leases and overlapping consents covering essentially the same land area. Discussions at the 2010 Lamberts Gully AEMR meeting suggested having a Coal Services/Lamberts Gully AEMR.

Both Coal Services and Lamberts Gully operate under a common Environment Protection Licence (EPL 3607) which is held by Springvale Coal but have separate mining lease areas (some common) and development consents. This AEMR relates solely to Lamberts Gully and Coal Services and covers the reporting period January 2011 to December 2011. Production ceased at Lamberts Gully in June 2010.

The life Reject Emplacement Area (REA), the co-disposal area, Delta's ash emplacement, and Council's waste disposal activities will extend well beyond the life of the Lamberts Gully Open Cut. Access to the REA will remain open for the remaining life of the Washery and/or the Springvale Mine. This area will remain the responsibility of Coal Services for both management and rehabilitation.

Access to both the Council Waste Disposal Facility and the Ash Emplacement Area are in the process of being developed in consultation with both Lithgow City Council and Delta Electricity. The Lithgow City Council owned landfill area is subject to a separate development consent. The area has been partly fenced and is the responsibility of the Lithgow City Council. A land transfer is being negotiated between Springvale Coal and Delta Electricity for the Area 4 land. The Area 4 land is north of the conveyor belt and includes the old Lamberts Gully H pit final void. This are will be used by Delta for ash disposal.

During the reporting period there was no coal produced from open cut mining at the site and there are currently no plans to recommence mining at Lamberts Gully.

1.1 Historical Mining

Coal mining began at the Lamberts Gully site in 1942 under the name Big Spur. The site was later named Western Main. Below the open cut mine is an extensive series of underground workings which were part of the old Western Main Colliery, which mined the Lithgow Seam for over fifty years from the 1940s to 1990s (Brown, J 1989). Open cut mining has also occurred on the site since the 1940's as an adjunct to the underground operations.

Between 1980 and 1994 the previous owners (Clutha Coal, then BP Coal, Novacoal Australia and Cypress/Samsung Joint Coal Venture) developed the following open cuts:

- Bund Cut, Road Cut and Road Cut Extension– these were developed adjacent to the Castlereagh Highway and were designed to create both a bund wall and an adjacent void to allow backfilling with ash from Mount Piper Power Station.
- Western Main Open Cut Extension – this extension mined the barrier between the underground workings and the previous bund cut.

- Knoll Cut – this cut extended from Mudgee Road south towards the existing Washery and removed previous coal waste disposal areas which were causing acid leachate issues.

1.2 Description of Operations

Springvale Coal purchased the Western Main Colliery site from Novacoal Australia in October 1994 and took over the assets and leases. Lamberts Gully was located within the Western Main Colliery area (**Appendix 6 - Figure 1**).

Lamberts Gully was located north of Wallerawang and Lidsdale on the Castlereagh Highway. The operation is bordered by the Blackmans Flat Village to the east, Ben Bullen State Forest to the south and the Mount Piper Power Station (including its ash placement area) to the northwest (refer to **Appendix 6 - Figure 1**). Springvale Coal was the operator of Lamberts Gully, using Big Rim as the mining contractor.

The Lamberts Gully mining operations previously involved the removal of overburden and inter-burden (using bulldozers, loaders, and dump trucks) and multi-stripping of the Irondale, Lidsdale and Lithgow seams. Blasting was used to remove sections of overburden and inter-burden not suitable for ripping.

During the reporting period there was no coal produced from the open cut. There are currently no plans to commence mining at Lamberts Gully. Coal produced from underground mining at Springvale is sized at the Screening and Crushing Plant located adjacent to the ROM stockpile. The sized product is then delivered directly to either Wallerawang Power Station or Mt Piper Power Station or Coal Services by overland conveyor. This product is stockpiled at Coal Services for either processing in the Coal Handling Preparation Plant (CHPP) or for delivery to Mt Piper Power Station.

Coal processed at the CHPP is delivered to Lidsdale Siding via the overland conveyor for despatch by train to both Port Kembla and Newcastle to export markets by ship.

Coal Services consists of the following:

- ROM stockpile;
- Coal Preparation Plant.
- Clean Coal stockpile;
- Sedimentation dams;
- Conveyors and associated infrastructure;
- Reject Emplacement Areas; and
- Proposed Waste Emplacement Facility.

Coal Services provide employment to 18 people and can operate 24 hours per day, 7 days a week.

1.3 Consents, Leases and Licences

Consents

A Development Application (DA) for an extension to Lamberts Gully was submitted to the then Department of Planning (DoP) on the 20th October 2005, accompanied by a Statement of Environmental Effects. This DA was placed on public exhibition but was unable to be assessed under Part 4 of the EP&A Act and was resubmitted and re-exhibited under Part 3A of the EP&A Act during January 2006. The Project Approval (06-0017) was granted by the Acting Minister of Planning on the 12th of May 2006.

On the 5th December 2007, a submission was made to the then DoP for a modification to the project approval to allow for the removal of 100,000 tonnes of coal from the ramp area to be constructed on behalf of Lithgow City Council for a future waste disposal facility. The modification was granted on the 3rd September 2008 and work was completed on the new ramp area during the previous reporting period. Refer to **Table 1.1** for a summary of Consents.

Table 1.1: Consents

Planning System	Consent Number	Description	Consent Date	Status of Consent
Lamberts Gully DA (Council)	110/98	Open Cut Mine Lot 501, DP 825541, Castlereagh Highway Lidsdale (referred to as Lamberts Gully Open Cut)	14/9/1998	Enacted
Lamberts Gully Coal Mine (Minister for Planning)	06-0017	Lamberts Gully Mine Additional Operations Within Existing Mining Leases	12/5/2006	Enacted
Lamberts Gully Coal Mine (Minister for Planning)	06-0017	Modification to Project Approval allowing ramp construction for Lithgow City Council	3/9/2008	Enacted

Leases

Open Cut Mining is permissible in ML1448, which is known as the Lamberts Gully Open Cut. The Coal Services site and Overland Conveyor are on CCL 733, ML 1352, and MPL 314. **Table 1.2** displays the current status of leases.

Table 1.2: Status of Leases

Coal Services / Lamberts Gully	Expiry Date	Area (Ha)
Consolidated Coal Lease 733	03/07/2027	723.5
Mineral Lease 204	26/05/2012	10.12
Mining Lease 1319	04/07/2014	5.69
Mineral Lease 564	01/05/2025	19.75
Coal Lease 394	26/05/2013	17
Coal Lease 361	16/07/2032	14.26

Coal Services / Lamberts Gully	Expiry Date	Area (Ha)
Mining Lease 1352	22/06/2015	8.16
Mining Lease 1448	31/05/2020	95.16
Private Land Lease 133	10/08/2024	16.51

Mining Operations Plan (MOP)
The site still operates under the MOP submitted in May 2008 covering the period from April 2008 to April 2015, despite there being no mining during the reporting period. The MOP was approved by the then Department of Primary Industries on 9 July 2008.

Licences
Springvale Pty Ltd holds Environmental Protection Licence (EPL) 3607 under the Protection of the Environment Operations Act 1997 **(Appendix 1)**. The licence has an anniversary date of the 1st of January and allows for 6 discharge points and 5 dust monitoring points, covering both the Springvale Colliery and Coal Services/Lamberts Gully site.

EPL Variation

There was one EPL variation in June 2011 regarding:

- Deletion of any reference to blasting at Coal Service/Lamberts Gully;
- Modifying the due dates of two matters associated with water quality improvements and studies at Lamberts Gully.

Following discussions with the NSW Office of Environment and Heritage (OEH), it is expected that there will be a separation of EPL's between Lamberts Gully/Coal Services and Springvale Colliery in 2012.

1.4 Site Contacts

The Coal Services/Lamberts Gully site contacts are:

Coal Distribution Manager - West: Mr Graeme Glazebrook, (02) 6355 1567, mob: 0438 501 611, or email Graeme.Glazebrook@centennialcoal.com.au

Environment and Community Coordinator: Mr Rob Hunt, (02) 6355 7965, mob: 0428 602 069, fax (02) 63557964, or email Rob.Hunt@centennialcoal.com.au.

1.5 Actions Required at AEMR Review

DTIRIS sent letter dated 27 May 2011 in response to the 2010 AEMR, outlining the improvements required for the 2011 AEMR (see **table 1.3**)

Table 1.3: Actions/ Comments regarding AEMR

Recommendation/Comment	Comment
The Land and Property Management Authority (LPMA) has identified that the Pond Fines Area (co-disposal area) has encroached onto Crown Lands. At the request of the LPMA, the site is requested to conduct a survey of the area in question to confirm the extent of encroachment. The results of the survey are to be sent to LPMA and DTIRIS	The survey has been completed and this project managed by the Centennial Corporate survey department.
It is noted that the *Surface Water Management Plan* is to be updated on a six monthly basis until works are complete. Please provide updated copies of the plan to DTIRIS as they occur	SWMP to be updated if significant changes, not six monthly. There have been no updates of the SWMP during the reporting period. Revised SWMP to be completed in April 2012.
Plans *Rehabilitation* The Rehabilitation Plan (or Plans) needs to be updated to clearly show: • The correct title (the 2010 Plan was incorrectly labelled as 'Proposed Mining Activities' • The extent of areas which are part of the mine (clearly marking areas which have never been disturbed by mining activities and areas where rehabilitation liability has been formally transferred for either ash emplacement or the Lithgow Council waste disposal site). • The status of rehabilitation areas (previously rehabilitated, rehabilitated in the reporting period and to be rehabilitated in the next reporting period) for each part of the site; and • The various landcover types (disturbed, forest, pasture, other)	**Appendix 5** contains AEMR Plans It should be noted that the 2011 AEMR will cover both Coal Services and Lamberts Gully, resulting in changes to plans not related to 2010 AEMR for just Lamberts Gully.
Tables *Rehabilitation* Further updates to this Table are required. In particular, • The table needs to be consistent with the AEMR text and the Rehabilitation Plan and needs to account for all areas which have ever been disturbed by mine activity, either as Disturbed Areas (rows B1 to B5 = All Disturbed Areas) or Rehabilitation Areas (row C1). • The total amount for 'All disturbed Areas' and C1 Total Rehabilitated area' should not decrease over time; it should either stay the same or increase. However, in the 2010 AEMR Table, the total areas went from 117.2 ha (last report), to 140.5 ha (to date) and will apparently decrease to 109.5 ha for the next report • Areas in Section D in the 2010 AEMR show all rehabilitation as being on slopes greater than 10 degrees which is incorrect. Rehabilitation areas less than 10 degrees are not included in this section. • Total areas in Section E should always be equivalent to the corresponding amount in Section C.	**Section 5** outlines Rehabilitation Table. It should be noted that the 2011 AEMR will cover both Coal Services and Lamberts Gully, resulting in changes to table not related to 2010 AEMR for just Lamberts Gully.

1.6 Plans Required Under the Guidelines

Table 1.4 details the plans required for Coal Services/Lamberts Gully under the Department of Primary Industries (DPI) (now I&I NSW) Annual Environment Management Report (AEMR) Guidelines.

Table 1.4: Plans Required for Coal Services/Lamberts Gully under the AEMR Guidelines

Plans Required	Reference Number
Land preparation	Plan 3
Proposed Mining Activities	Plan 4
Proposed Rehabilitation	Plan 5

2. Operations during the Reporting Period

2.1 Report on Proposed Activities

A summary on the progress of the activities proposed for the 2011 reporting period is presented in **Table 2.1**.

Table 2.1: Summary of the Progress of Activities Proposed for 2011

Activities Proposed for 2011	Progress of Proposed Activities
Completion of the upgrade to surface water management as per the Pollution Reduction Program.	The pollution reduction program is ongoing, with further projects being completed during the 2012 reporting period. **Section 2.9** outlines the changes to surface water management in 2011.
Further consultation with Delta Electricity regarding the proposed ash emplacement area at Lamberts Gully.	Consultation ongoing.
Further consultation with council regarding the Lithgow City Council Landfill facility.	Consultation ongoing.
Lamberts Gully will continue rehabilitation monitoring in 2011 utilising the Ecosystem Function Analysis (EFA) monitoring methodology.	EFA was completed in 2011 and will continue in 2012.
Continue to inform and involve key stakeholders in the mine closure process for Lamberts Gully.	Consultation ongoing.
Rehabilitation maintenance works as previously described.	Minor rehabilitation maintenance was completed during the reporting period.
Routine annual weed spraying program.	Annual weed spraying was completed in 2011 and will continue in 2012.

2.2 Exploration

No exploration was carried out at Lamberts Gully during the reporting period.

2.3 Land Preparation

The land prepared for Lamberts Gully has been calculated as an area of approximately 80 hectares which is essentially comprised of areas involved with A Blocks, C Blocks, F Blocks, the perimeter of the REA and other miscellaneous areas.

There was no land preparation in 2011 reporting period as mining had been completed in June 2010 and no further mining is expected to occur.

The 2010 *Revised Mine Closure Plan* outlines the final land use for A and B Blocks including a long term Reject Emplacement Area (REA) for Springvale. E Block will be utilised by Delta Electricity for ash emplacement from their Mount Piper Power Station. In each case, land preparation is simply to seal off all existing underground workings exposed by the open cut and form a competent base for future filling operations. The majority of areas outside A and B blocks are completely rehabilitated or in the process of rehabilitation.

No rehabilitation was completed in 2012.

2.4 Construction

The upgrade to LDP006 was completed during the reporting period. The upgrade included the construction of a new concrete weir, gabion mattress and installation of a new flow monitoring system. **Section 2.9** details the upgrade to LDP006.

2.5 Mining

There was no Run of Mine (ROM) production from Lamberts Gully Open Cut during 2011, with mining ceasing during 2010. At this stage there are no plans for future mining at Lamberts Gully.

Table 2.2 displays the historical production figures and mined areas are shown in **Appendix 5-Plan 4**.

Table 2.2: Lamberts Gully ROM Coal Production

Calendar Year	Production Open Cut (Mt)
2004	0.04
2005	0.39
2006	0.29
2007	0.15
2008	0.23
2009	0.25
2010	0.04
2011	0

Lamberts Gully Open Cut

All previous mining operations were undertaken using contractor owned and operated equipment. Machinery included excavators, loaders, dozers, graders, dump trucks, water carts, drill and crusher.

Coal previously mined at Lamberts Gully was mined from the Irondale, Lidsdale and Lithgow seams. Reserves from the area were split into different areas called A, B, C, E, & F blocks. Overburden from these blocks was placed in the void created by the previously mined out areas. Previous mining areas at Lamberts Gully are identified in **Appendix 5 - Plan 4.**

Table 2.3: Production and Waste Summary for 2011

	Cumulative Production (cubic metres)		
	Start of Reporting Period	**At end of Reporting Period**	**End of next reporting (estimated)**
Topsoil stripped	169,032	169,032	169,032
Topsoil used/spread	62,251	62,251	62,251
Waste Rock	10,434,049	10,434,049	10,434,049
Ore	0	0	0
Processing Waste	0	0	0
Product (Tonnes)	1,379,977	1,379,977	1,379,977

2.6 Minerals Processing

During the reporting period, 1,445,008t of ROM (from Springvale Colliery) was processed at Coal Services achieving a recovery of 84.4% and producing 1,219,945t of product coal. Other activities on site relating to coal processing included operation of plant and equipment for the stockpiling and reclaim of coal along with maintenance of stockpiling and processing plant and equipment.

2.7 Waste Management

Waste generated on-site include: water, packaging, timber, waste oil, oil filters, oily water, empty oil drums, metal, hoses, and paper. Oil drums and filters (after rinsing and crushing) are disposed of with waste metals through metal recyclers. Aluminium cans are a separate stream which is sold to metal recyclers. Waste oil (and oily water) is disposed of by licensed waste transporters and recyclers, or treatment plants. Remaining waste is removed from site by a licensed waste contractor.

A system to recycle waste paper and cardboard is proving successful and has reduced general office waste. Regular waste management inspections are completed by the new waste contractor, JR Richards.

Coal fine reject (tailings) produced at the CHPP, are pumped from the Washery to the coal Reject emplacement area. Coarse reject is transported via truck to the Reject Emplacement area. During 2011 there was approximately 112,500t of coarse reject stockpiled in this area.

2.8 ROM and Coal Stockpiles

During the reporting period stockpiling and processing activities were carried out to address both production levels from the Springvale Underground mine and demand from both domestic customers (Delta Electricity) and export markets.

At the end of the reporting period, ROM stock totalled 342,168t. Processed coal at Coal Services was 93,062t and processed coal at Lidsdale Siding was 48,060t.

2.9 Water Management

Potable Water for the Lamberts Gully and Springvale Coal Services is supplied by Lithgow City Council (LCC) .This water is used in bathhouse and administration buildings. Water used in coal processing and dust suppression is supplied from existing surface dams. Water is discharged through the Licensed Discharge Point 6 (LDP006) (see **Appendix 6 - Figure 1**). Regular water monitoring ensures that quality is suitable for discharge under the site EPL conditions.

The water storage capacities are reported in **Table 2.4**. During the reporting period capacities of most of the dams were assessed and corrections have been made. Monitoring of dam water level and quality is now regularly undertaken. It should be noted that Coal Services Huon Dam is no longer part of Coal Services/Lamberts Gully, having being taken over by Delta Electricity.

Table 2.4: Stored Water at Coal Services/Lamberts Gully.

Water Storage	Volume Held (KL)		
	Start of Reporting Period	End of Reporting Period	Storage Capacity
Coal Services Retention Dam	6,900	6,900	6,900
Coal Services Cooks Dam	44,500	47,100	47,100
Coal Services DML Dam	40,600	109,800	172,700
Main Sediment Dam	17,300	30,100	30,100
Primary Settling dam	1,000	6,000	6,000
Lamberts Gully open cut sediment pond 1	200	200	200
Lamberts Gully open cut sediment pond 2	200	200	200

Site water management system is displayed in **Appendix 6 - Figure 3**.

2.9.1. Water Supply and Use

Potable water usage is metered by LCC and reported in the Springvale AEMR. Drinking water for employees is sourced from a local commercial drinking water supplier.

2.9.2. Process Water

Modifications were carried out to the site pumping system during the reporting period (consistent with an agreed PRP with OEH). Process water is now pumped from Cooks Dam to the CHPP water storage tanks via pontoon mounted duty and standby submersible pumps. A further submersible pump was also installed to pump excess water make from Cooks Dam to the DML dam for future use at the CHPP. Cooks Dam is replenished from underground aquifers with ample water available for processing operations during the reporting period.

2.9.3. Storm/Surface Water Management System

Surface water management systems are used for controlling the runoff water quality. Surface water management systems consist of separate clean and dirty water flow paths. Excess surface water is discharged through LDP006 **(Appendix 6 - Figure 1)**.

Existing surface water runoff is currently managed through drainage channels, pumps and a series of dams. The drainage channels follow the site contours and natural creek lines. There are a number of existing dams on site, serving a range of purposes for the site's operations.

The main surface water actions completed in 2011 (as per the requirements of the PRP) included:

- Establishing retention pond as rainfall runoff silt trap prior to discharge through LDP006.
- Construction of a spillway and treatment facility at Main Sediment Pond.
- Assessment of stockpile sediment pond capacity and installation of pumping back to the Washery discharge water.
- Establishing pumping capacity directly from Cooks Dam to the Washery.
- Flocculation of dams on site.
- Completion and submission to NSW OEH of the LDP006 ANZECC water limits study.

Upgrades to the site water management system will continue in 2012.

Table 2.5 below provides details of the storage dams at Lamberts Gully.

Table 2.5: Storage dams at Lamberts Gully/Springvale Coal Services

Dam Name	Function	Inflow	Outflow
DML Dam	Water retention	In addition to surface water runoff from upstream catchment areas, water is received from the coal seam and pumped from Cooks Dam.	Water is transferred from the DML Dam to the Cooks Dam via the existing coal seam.
Cooks Dam (see Photo 1)	Water retention	In addition to surface water runoff from upstream catchment areas, water is received from the DML Dam via existing coal seam and old workings.	Water is pumped from the Cooks Dam to the Washery Water Tank, and water overflows to the discharge point.
Retention Pond	Water retention and storage for use on site	Surface water runoff from upstream catchment areas.	Water overflows from this dam to the discharge point.

Water from the Retention Dam **(Appendix 6 - Figure 1)** is discharged through LDP006.

Photo 1: Cooks Dam at Coal Services.

2.9.4. Review of LDP006 Triggers

GHD and Centennial Coal undertook a review of proposed OEH discharge limits during the reporting period relating to LDP006. There are existing EPL discharge limits for LDP006 outlined in the EPL 3607 for pH, TSS and oil and grease (see **section 3.5**).

Following a detailed review of upstream, downstream (Neubecks Creek) and LDP006 water quality results, a series of specific trigger values have been set for nickel, zinc, aluminium, iron, manganese and electrical conductivity. This review of trigger values was a requirement of U2.1 (this condition has since been removed from the EPL) to *determine the appropriate discharge quality targets for nickel, zinc, aluminium, iron, manganese and electrical conductivity for licensed discharge point LDP006 using the ANZECC 2000 Water Quality Guidelines.*

This report has calculated site specific trigger values for the Coal Services discharge based on ANZECC & ARMCANZ (2000) (**Table 2.6**). The triggers are a further step in the decision process for assessing toxicants in ambient receiving waters. Prior to this, no triggers were assigned to Coal Services for nickel, zinc, aluminium, iron, manganese and EC.

Table 2.6: Site Specific Trigger Values for Neubecks Creek

Parameter	Wangcol Creek Upstream 80th percentile	ANZECC 90% Species Protection	LDP006 Median	Wangcol Creek D/S median	SSTV
EC (µS/cm)	1162	350	1240	1125	1162
Al (mg/L)	0.208**	0.08	0.008**	0.01	0.08
Fe (mg/L)	0.32	0.3+	0.19	0.25	0.32
Mn (mg/L)	2.07	1.9	2.59	1.4	2.07
Ni (mg/L)	0.014**	0.074*	0.251**	0.075	0.074
Zn (mg/L)	0.028	0.054*	0.106	0.045	0.054

* Hardness modified trigger values
** Site specific contaminant limits require 2 years of monthly data (i.e. 24 data entries). Aluminium and nickel do not meet this requirement therefore the ability to create site specific trigger values has its accuracy limited.
+ Canadian Guideline ANZECC & ARMCANZ p 8.3-123

2.9.5. Upgrade to LDP006

An upgrade was completed to the LDP006 weir during the reporting period. The upgrade included the construction of a new concrete weir, gabion mattress and installation of a new flow monitoring system. **Photo 2 and 3** illustrates upgrade to LDP006.

Photo 2 and 3: LDP006 was upgraded LDP006

2.9.6. Underground Mine Water System

Underground mining does not apply to this site.

2.9.7. Sewage Treatment Systems

The site sewage management system consists of a 2 Biocycle units. Sewage from the demountable buildings is connected to these systems and treated effluent is sprayed on surrounding land. Maintenance of the Bio-cycle unit is contracted to a local plumbing service provider.

2.10 Hazardous Materials Management

A MSDS register is maintained at Coal Services.

Mining ceased during 2010 so there is no requirement for blasting.

With the completion of open cut mining, the diesel and waste oil tanks associated with this process have been removed from site. An above ground self bunded diesel storage tank is located adjacent to the ROM Stockpile area .This facility is used to fuel machinery used only at the stockpile area. Other equipment used on the site is refuelled by mobile tankers.

Environmental Spill Kits are located around Coal Services. These are replenished as required.

2.11 Other Infrastructure Management

There are no other identified major infrastructure management issues apart from those mentioned in this document.

3. Environmental Management and Performance

3.1 Risk Management

Environmental Management at Coal Services/Lamberts Gully is undertaken via a risk-based approach. Assessing risk against pre-determined consequence and probability criteria allows for site resources to be efficiently involved in high risk or high consequence issues.

A risk assessment was carried out during 2006 as part of the MOP preparation. In 2010, two risk assessments were carried which incorporated the Lamberts Gully site and there were no significant changes from the 2006 risk assessment. The 2006 completed risk assessment is summarised in **Table 3.1.**

Table 3.1: Environmental Risk Identification for Lamberts Gully

	Mining Activity, Process or Facility														
	Exploration	Land preparation, vegetation and topsoil stripping	All construction activities including earth moving	Mine development and mining, surface and underground	use/maintenance of roads, tracks and equipment	waste rock emplacement management	Mineral processing facilities and infrastructure	Ore/product stockpiling and handling	Tailings impoundment management	Water management including storm event contingencies	Hazardous materials and fuel, handling/spills management	Sewerage	Rubbish disposal	Rehabilitation activities	Rehabilitated land and remaining features
Air pollution, dust/other	L	H	H	H	M	M	M	M	M	L	L	L	L	M	L
Erosion/sediment minimisation	L	H	H	H	M	L	L	L	M	H	L	L	L	M	L
Surface water pollution	L	L	L	L	L	L	L	L	M	L	M	M	L	L	L
Ground water pollution	L	L	L	L	L	L	L	L	M	L	M	M	L	L	L
Contaminate or polluted land	L	L	L	L	L	L	L	L	M	L	M	M	L	L	L
Threatened flora protection	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
Threatened fauna protection	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
Weed control and management	L	L	L	L	L	L	L	L	L	L	L	L	L	M	M
Operational noise	L	H	H	H	M	M	M	M	M	L	L	L	L	M	L
Vibration and air blast	L	H	H	H	L	L	L	L	L	L	L	L	L	L	L
Visual amenity, stray light	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
Aboriginal heritage	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
Natural heritage conservation	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
Spontaneous combustion	L	L	L	L	L	L	L	M	L	L	L	L	L	L	L

	Mining Activity, Process or Facility														
	Exploration	Land preparation, vegetation and topsoil stripping	All construction activities including earth moving	Mine development and mining, surface and underground	use/maintenance of roads, tracks and equipment	waste rock emplacement management	Mineral processing facilities and infrastructure	Ore/product stockpiling and handling	Tailings impoundment management	Water management including storm event contingencies	Hazardous materials and fuel, handling/spills management	Sewerage	Rubbish disposal	Rehabilitation activities	Rehabilitated land and remaining features
Bushfire	L	L	L	L	L	L	L	L	L	L	L	M	L	L	L
Mine subsidence	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Hydrocarbon contamination	L	L	L	L	L	L	L	L	L	L	M	L	L	L	L
Methane drainage/venting	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Public safety	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L

L - Low Risk
M - Medium Risk
H – High Risk

The identification and assessment of environmental risks at the mine has allowed management plans and procedures to be developed to minimise the potential risk on the environment and community. Management controls are required for all items which have been assessed as either high or medium risk.

3.2 Meteorological Monitoring

Meteorological data is sourced from a weather station located at the Pinedale Mine, located across the Castlereagh Highway opposite Coal Services/Lamberts Gully.

3.2.1. Rainfall

Total annual rainfall for the reporting period is reported in **Table 3.2**. This shows that overall the year was drier (705 mm) than the long term Lithgow average (859mm).

Total rainfall was lower than the previous year for the Pinedale/ Lamberts Gully weather station with a reduction in the number of wet days. November 2011 had the highest rainfall with 150 mm. **Appendix 3** illustrates meteorological data from Pinedale.

Table 3.2: 2011 Rainfall and Wet Day Data (mm)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
62.8	51.0	71.4	21.2	48.4	36.2	17.8	55.8	59.2	39.6	149.6	91.8	704.8
Number of Rain Days >1mm												
6	5	7	5	5	8	5	7	6	9	8	10	81

Data Source: Metford Laboratories-Pinedale weather station

3.2.2. Wind Speed and Direction

An analysis of wind direction and wind speed data was undertaken by Metford Laboratories Pty Ltd. A summary of wind data is included in **Table 3.3** and wind roses from Metford Laboratories meteorological monitoring are included in **Appendix 3.**

Table 3.3: 2011 Wind Data Summary

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Wind Speed (m/s)	1.51	1.79	1.45	1.34	1.35	2.30	1.79	1.40	2.29	1.49	2.00	1.39
Dominant Wind Direction	ESE	NW	S	SE	WNW	W	WNW	WNW	WNW	SE	NW	ESE

The most dominant winds during the reporting period were from the West-Northwest direction.

3.2.2. Temperature Summary

An analysis of air temperature data was undertaken by Metford Laboratories Pty Ltd. The air temperatures are monitored at 2m height and at 10m height**.** Details from Metford Laboratories meteorological monitoring are included in **Appendix 3.**

Table 3.4: 2011 Temperature Summary at 10m

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average temp (C^o)	20.1	19.3	15.8	10.9	6.54	5.84	4.86	6.67	9.70	11.63	16.47	14.36
Min temp (C^o)	9.2	6.8	6.1	0	-6.5	-4.8	-7.1	-3.8	-3.9	-1.6	4.4	1.9
Max temp (C^o)	36.5	33.6	26.4	22.9	18.1	15.1	14.6	19.8	24.0	26.2	29.7	27.5

3.3 Air Pollution

Potential dust sources from Coal Services/Lamberts Gully include unsealed traffic areas and coal stockpiles. Dust is controlled on unsealed traffic areas by the use of water carts.

3.3.1 Air Quality Monitoring Program

In accordance with condition 17 of Schedule 3 of Development Approval No 06-0017, an *Air Quality Monitoring Program* was submitted and was approved by the Director General on the 13th of December 2006.

Because of the close proximity of the two mines, Lamberts Gully entered in to an arrangement with Pinedale Mine to share air quality data and meteorological data.

The *Air Quality Monitoring Program* stipulates that dust emissions generated by the project must not cause additional exceedances of the long term impact assessment criteria listed in **Table 3.5, 3.6 and 3.7**.

Table 3.5: Depositional Dust: Long Term Impact Assessment Criteria

Pollutant	Average Period	Maximum increase in deposited dust level	Maximum total deposited dust level
Deposited dust	Annual	2 g/m^2.month	4 g/m^2.month

Table 3.6: HVAS Particulate Matter: Long Term Impact Assessment Criteria

Pollutant	Average Period	Criterion
Total suspended particulate (TSP) matter	Annual	90µg/m^3
Particulate matter < 10µm (PM_{10})	Annual	30µg/m^3

Table 3.7: HVAS Particulate Matter: Short Term Impact Assessment Criteria

Pollutant	Average Period	Pollutant
Particulate matter < 10µm (PM_{10})	24 hours	50µg/m^3

Detailed air quality data is available for the twelve month period and is presented in **Appendix 3**.

3.3.2 Air Quality Monitoring Program - Dust Results

A detailed analysis of the dust monitoring results is presented in **Appendix 3**. The locations of the dust monitoring stations are shown in **Appendix 6 – Figure 2**.

Coal Services/Lamberts Gully currently has 3 depositional dust gauges. Two of these gauges are located within the township of Blackmans Flat, whilst the third gauge is located to the south of Blackmans Flat. Data from Gauge D1 & D2 is shared by Pinedale Mine and Lamberts Gully Coal Mine. Dust Gauge D3 is owned solely by Springvale Coal.

Depositional dust results for 2011 show an annual average insoluble solids result of 0.7g/m^2/month for dust gauge D1; 0.5g/m^2/month for gauge D2; and 0.5g/m^2/month for D3. These results fall well below the nominated guideline of 4.0g/m^2/month, as stipulated in the *Air Quality Monitoring Program*. These depositional dust results were very similar to the previous reporting period.

Lamberts Gully Coal Mine currently has one HVAS TSP unit and one HVAS PM_{10} unit located adjacent to the township of Blackmans Flat (**Appendix 3**). Results from the TSP and PM_{10} units are shared by Pinedale Mine and Lamberts Gully Coal Mine. HVAS Particulate Matter summary results for the period January – December 2011 are shown in **Appendix 3.**

HVAS Total Suspended Particulate (TSP) results for the period January – December 2011 show an average result of 20 ug/m^3, which is well below the annual average TSP assessment criteria of 90 ug/m^3. This is a slight reduction on dust levels from 2010.

Similarly, the HVAS particulate matter results <10 um (PM_{10}) also show levels within the required *Air Quality Monitoring Program* assessment criteria. The average PM_{10} result was 11 ug/m^3 which considerably lower than the annual average PM_{10} assessment criteria of 30

ug/m^3. The highest PM_{10} result recorded during a single 24hour run day was 35 ug/m^3, which is well below the 24hour-maximum criteria of 50 ug/m^3.

Dust results across Lamberts Gully decreased slightly from the previous reporting period, possibly due to an increase in rainfall during the reporting period.

3.3.3 Green House Gas Emissions

In accordance with condition 33(c) of the project approval, greenhouse gas emissions (GHG) are monitored on an absolute basis and on a per tonne of coal produced basis. The main source of GHG emissions is the burning of diesel fuel on the site. The operations constantly seeks ways of reducing fuel consumption through efficient mine planning and machinery maintenance.

Centennial Coal has statutory reporting obligations for data collected under the NGER Act and the EEO Act. The data measured under these Acts is independently verified by an external auditor prior to submission to Government. This data is collected, audited and reported on a financial year basis and as such is reported externally to any agency on a financial year basis using the most up to date recently audited data.

Greenhouse gas results for Coal Services/Lamberts Gully are recorded as part of the Springvale AEMR.

3.4 Erosion and Sediment Control

Erosion and sediment control is part of the *Surface Water Management Plan (SWMP).*

Erosion and sediment control measures that are in place include:

- Staging of works;
- Controlling access into and within the site;
- Management of earthworks;
- Maintaining existing vegetation on site;
- Minimising erosion of disturbed areas;
- Flocculation of dams;
- Revegetating and rehabilitating areas as soon as possible after completion of required works;
- Progressive rehabilitation of the work areas will be undertaken in accordance with the Mine Closure Plan; and
- Contour banks are constructed reduce runoff velocities and direct runoff into sediment traps and collection ponds before potential discharge.

3.5 Surface Water Management

The upgrades to the site water management system are outlined in **section 2.9**.

Graphed surface water monitoring results (from LDP006) are presented in **Appendix 2**.

3.5.1 Review of Water Quality Monitoring Results – LDP006

Coal Services/Lamberts Gully only has one licensed discharge point, LDP006 under EPL 3607.

For LDP006, the concentration of a pollutant discharged at that point, must not exceed the concentration limits specified for that pollutant in the table.

Table 3.8: LDP006 discharge limit

POINT 6

Pollutant	Units of Measure	50 percentile concentration limit	90 percentile concentration limit	3DGM concentration limit	100 percentile Concentration Limit
Oil and Grease	milligrams per litre				10
pH	pH				6.5-8.5
Total suspended solids	milligrams per litre				30

For LDP006 where the pH of the receiving waters is outside the pH range 6.5-8.5, the licensee may discharge water that is outside the above pH range of 6.5-8.5, provided any water discharged does not vary the pH of the receiving waters by more than 0.5 pH units. Non compliances relating to EPL water parameters and discharge limits are outlined in **section 3.24**.

The pH for LDP006 for the reporting period ranged from 6.2 to 7.2. (**Appendix 2 - Graph 1**). Refer to **Section 3.5.4** for further information

Total suspended solids (TSS) for LDP006 ranged between 1 mg/L and 40 mg/L (8 December 2011), with an average result of 8.81 mg/L (**Appendix 2 - Graph 2**).

Total oil and grease (TOG) was below the EPL limit of 10mg/L throughout the reporting period. All results recorded for LDP006 were less than 5 mg/L.

Electrical Conductivity (EC) for LDP006 ranged from 727 µS/cm to 2660 µS/cm with an average of 2092 µS/cm (**Appendix 2 - Graph 3**).

Zinc for LDP006 ranged from 0.17 mg/L to 0.35 mg/L, with an average of 0.29mg/L (**Appendix 2 - Graph 4**).

Nickel for LDP006 ranged from 0.16 mg/L to 0.43 mg/L, with an average of 0.31 mg/L (**Appendix 2 - Graph 5**).

Total hardness for LDP006 ranged from 621 mg/L to 1110 mg/L, with an average of 926 mg/L (**Appendix 2 - Graph 6**).

Filterable Manganese for LDP006 ranged from 1.64 mg/L to 130 mg/L, with an average result of 10.31 mg/L (**Appendix 2 - Graph 7**).

Filterable iron for LDP006 ranged from 0.09 mg/L to 5.64 mg/L, with an average of 1.13 mg/L (**Appendix 2 - Graph 8**).

In addition to monitoring at LDP006, monthly ambient water quality monitoring is undertaken at locations immediately upstream and immediately downstream of LDP006 on Neubecks Creek. The same set of anolytes is monitored at LDP006 during discharge events. **Table 3.9** presents the minimum, maximum and average values of monitoring data at LDP006.

Table 3.9: Ambient water quality monitoring for LDP006

Pollutant	Unit of measure	Sampling Requirement	No. of samples collected and analysed	Minimum	Average	Maximum
pH	pH	Monthly during discharge	39	6.2	6.7	7.2
Total suspended solids	Milligrams per litre	Monthly during discharge	35	1	8.81	40
Oil and Grease	Milligrams per litre	Monthly during discharge	32	Below detection limit	Below detection limit	Below detection limit
Conductivity	Micro Siemens per centimetre	Monthly during discharge	38	727	2092	2660
Zinc	Milligrams per litre	Monthly during discharge	9	0.17	0.29	0.35
Nickel (Filt)	Milligrams per litre	Monthly during discharge	15	0.16	0.31	0.43
Total Hardness	Milligrams per litre	Monthly during discharge	15	621	926	1110
Filterable manganese	Milligrams per litre	Monthly during discharge	24	1.64	10.31	130
Filterable iron	Milligrams per litre	Monthly during discharge	24	0.09	1.13	5.64

3.5.2 Review of Discharge Volume Monitoring Results

Discharge from LDP006 (**Appendix 2 - Graph 9**) ranged between 0 kL/day and 53534 kL/day with an average of 2271 kL/day during discharge events. The annual average discharge decreased during the reporting period compared to 2010. The highest discharges occurred during January 2011 with flow results recorded above the EPL limit for volume discharge of 10,000 kL/day on eight occasions during January 2011 (see **section 3.23** for dates). These discharges were the result of heavy rainfall in December 2010 and January 2011. **Table 3.10** displays a comparison of volume data over the last 4 years.

Table 3.10: Comparison of Annual Discharge Volumes from LDP006

Licence Discharge Point	Lowest Discharge (kL/day)				Mean Discharge (kL/day)				Highest Discharge (kL/day)			
	2008	2009	2010	2011	2008	2009	2010	2011	2008	2009	2010	2011
LDP006	0.001	1.1	1.8	0.0	0.40	986	3062	2271	12.14	6384	67349	53534

3.5.3 Review of Surface Water Monitoring

A comparison of water quality data over the last five years (**Table 3.11**) generally shows that results are comparable to previous years. All parameters showed slight variations, with a large increase occurring in EC in July 2011. Manganese (filterable) increased significantly in November 2011.

Table 3.11: Comparison of Annual Average Water Quality Monitoring Results

	LDP006				
	2007	2008	2009	2010	2011
Zinc (mg/L)	0.10	0.09	0.2	0.25	0.30
pH	6.86	6.87	7.0	6.7	6.7
EC (uS/cm)	1224	1149	1730	1694	2092
TSS (mg/L)	12.08	4.08	4.2	14.5	8.8
Manganese (filterable) (mg/L)	2.82	2.52	3.6	2.04	10.3
Iron (filterable) (mg/L)	0.94	0.96	0.3	0.24	1.13
Oil & Grease (mg/L)	1.17	6*	<5	9.5	<5

The annual averages for Manganese (filterable) and Iron (filterable) increased during the reporting period. The annual averages for Zinc, pH and EC were similar to the previous reporting period. The annual average for TSS decreased during the reporting period.

3.5.4 Review of LDP006 Results Below EPL Criteria

Table 3.12 compares pH between Neubecks Creek upstream and downstream monitoring points when pH is less than 6.5 at LDP006. A pH of less than 6.5 was recorded at LDP006 on seven occasions during the AEMR period.

Table 3.12: Comparison between Neubecks Creek Upstream and Downstream when pH is less than 6.5 at LDP006

Date	U/S	LDP006	D/S	Difference U/S and D/S	Compliance Status
01-Sep-11	6.8	6.29	6.69	0.11	Y
06-Sep-11	6.74	6.16	6.77	-0.03	Y
22-Sep-11	6.62	6.31	6.83	-0.21	Y
05-Oct-11	6.74	6.16	6.76	-0.02	Y
06-Oct-11	6.8	6.32	6.55	0.25	Y
03-Nov-11	6.88	6.49	6.96	-0.08	Y
22-Dec-11	6.97	6.45	6.87	0.1	Y

For LDP006, where the pH of the receiving waters is outside the pH range 6.5-8.5, the licensee may discharge water that is outside the above pH range of 6.5-8.5, provided any water discharged does not vary the pH of the receiving waters by more than 0.5 pH units. **Table 3.12** above illustrates that this condition has been satisfied and there was less than 0.5 pH units between Neubecks Creek upstream and downstream.

3.6 Groundwater Pollution

There is no known groundwater pollution at the site.

3.7 Contaminated / Polluted Land

A Phase 1 Environmental Site Assessment was completed during 2009. This study reviewed the potential contamination on site. Hydrocarbon contamination is summarised in **section 3.20**.

3.8 Threatened Flora

Surveys were carried out for the proposed Lamberts Gully extension during 2005. The approved mining area consists of a tall open forest dominated by brittle gum (*Eucalyptus. mannifera)*, broad-leaved peppermint (*E. dives*) and red stringybark (*E. macrorhynca*) on the hills and slopes on the southern side of the Application Area, Tablelands – Peppermint Woodland and snow gum (*E. pauciflora*) and candlebark *(E. rubida)* on the broader flats to the north (Coxs Valley Woodland). The understory is comprised of plants that are generally less than 1m at maturity and isolated. There is a sparse to open grassland grass layer that is less than 0.5m height at maturity that ranges in foliage cover from 10 – 30%.

The survey found only one plant species listed as being rare or threatened – *E. cannonii* (Capertee Stringybark). Only five trees were found in the Tablelands Gum – Peppermint woodland to the east of the dam. This area was cleared in January 2007. The trees were felled and left for seed harvesting prior to being windrowed. Seed was harvested and some has been used in seeding of the rehabilitation program and some has been retained for future use. No other threatened species were observed during the floristic survey of the Application Area. The environmental assessment demonstrated that there is a very low likelihood that a viable local population will be placed at risk of extinction as a result of the development.

3.9 Threatened Fauna

The Bathurst Copper Butterfly inhabits the area and is listed in the *Threatened Species Conservation Act*. An eight part test was carried out on the butterfly to determine the need for a Species Impact Statement. It was found that the extent of modification to its habitat in relation to the total extent of the habitat in the region is minor. No local populations will be placed at risk of extinction as a result of the proposed development.

More recent surveys identified two additional threatened terrestrial fauna species, the brown treecreeper *(Climacteris picumnus*) and the painted Honeyeater *(Grantiella picta*). These two were observed on site while another five threatened species were noted as having the potential to occur within the area. Eight part tests were undertaken for each species as part of the Environmental Assessment which demonstrated that the proposed mine extension will not adversely affect individual threatened species or their habitat.

3.10 Weeds

The major weed threats include Blackberry, St. Johns Wort and Pampas Grass, which are controlled by the annual noxious weed control program. The weed control program focuses on controlling weeds on the Open Cut, Overland Conveyor and Coal Services sites.

There are very few weeds which have established in the Lamberts Gully Rehabilitation areas. Weed spraying was completed during 2011 targeting blackberry. Weed spraying will continue in 2012.

3.11 Operational Noise

3.11.1 Noise Monitoring Program

In accordance with Condition 5 of Schedule 3 of the Development Consent, a *Noise Monitoring Program* was submitted to the then Department of Planning (DoP) on the 14th August 2006. Following consultation with the then DoP, the Program was revised and resubmitted on the 25th September 2006 and approved by the Director General on the 13th December 2006. The noise monitoring program has been fully implemented.

As stipulated in the *Noise Monitoring Program*, noise generated by the project must not exceed the noise impact assessment criteria presented in **Table 3.13** below:

Noise monitoring locations are shown in **Drawing 2 of Appendix 3** (Air Quality, Noise and Meteorological Monitoring Report).

Table 3.13: Noise Impact Assessment Criteria

Residence	Day Period Assessment Criteria ($L_{Aeq, 15\ minute}$)
R1	38
R2	39
R3	39
R4	38
R5	38
R6	35
R7	42

3.11.2 Noise Monitoring Compliance Assessment

Noise monitoring for the Lamberts Gully Coal Mine is undertaken in accordance with the *Noise Monitoring Program* at two key locations. The first location is to the South West of Blackmans Flat township, adjacent to the Tailings Dam Wall (TD2). Noise levels recorded at this site are back calculated to reflect the levels present at the nearest affected residence to the North East of the Project Application area (noise monitoring locations R1 thru to R6. The second location is the nearest affected residence to the South East of the Project Application area (noise monitoring location R7).

In previous years, noise monitoring at Lamberts Gully has been carried out at several different locations including the Blackmans Flat residential monitoring locations (R1- R7), the tailings dam site (TD2), and also at pit-top monitoring sites (LGP).

Previous monitoring results have shown that monitoring undertaken at each of the residential locations is not representative of the noise generated from the Lamberts Gully operations, due to the dominance of other ambient noise sources present at these locations, namely the Castlereagh Highway.

In order to overcome the interference of road traffic noise from the Castlereagh Highway, noise monitoring was instigated at a pit-top monitoring location (LGP). The monitoring of noise generated by the Lamberts Gully operations at the LGP site allowed for noise data to be obtained without the interference of other local noise sources such as the Coal Services Tailings Dam and Washery operations; the nearby Castlereagh Highway; and other industry and mining operations located within the Blackmans Flat area.

During the 2011 period, monitoring was not carried out at the LGP site as mining operations at the site ceased in June 2010. Throughout the year bi-monthly monitoring has been conducted when possible (weather permitting) at the TD2 and R7 sites in order to obtain background noise data whilst mining operations were not occurring.

During 2011 routine bi-monthly attended noise monitoring was undertaken during the following periods:

- January – monitoring at TD2 and R7 undertaken on 21/01/11;
- April – monitoring at TD2 and R7 undertaken on 1/04/11;
- August – monitoring at TD2 and R7 undertaken on 1/08/11; and
- October – monitoring at TD2 and R7 undertaken on 4/10/11.

Noise monitoring during the March 2011 period was hampered by adverse weather conditions. Valid monitoring for the March 2011 period was therefore undertaken on 1 April 2011. Similarly, monitoring for the June period was affected by adverse weather conditions, hence monitoring were conducted on 1 August 2011. December monitoring was also affected by bad weather, with monitoring completed in January 2012.

A detailed analysis of the noise monitoring results and a figure showing location of noise monitoring stations is presented in **Appendix 3.**

During the reporting period, Lamberts Gully and Coal Services received no noise complaints.

3.12 Blasting

With mine production ceasing during 2010, there was no blasting undertaken during the reporting period.

3.13 Visual Stray Light

Visual stray light is not considered to pose any potentially adverse environmental impacts at the mine due to surface footprint, locality, and the distance to neighbouring properties. There have been no complaints received in the operating life of the mine in relation to visual stray light.

3.14 Aboriginal Heritage

Archaeological surveys were carried out prior to the development of original Lamberts Gully Mine and its subsequent proposed extension. The original survey identified two potential Occupation Sites adjacent to the proposed open cut area. A permit was granted by the Director of NPWS to conduct additional excavation work on these sites. This work was completed and the study concluded that the scientific, educational and heritage significance of both sites are low and insufficient to require further investigation or preservation.

No additional sites have been found during surveys in 2006 as part of the mine extension. However, one site previously found now lies within the proposed mining area. This site has been marked on mine plans and has been permanently fenced. The mine has developed an archaeological package which forms part of the inductions for both visitors and employees.

3.15 European Heritage

There are no identified areas of European heritage at Coal Services/Lamberts Gully.

3.16 Spontaneous Combustion

Spontaneous combustion from coal processing and stockpiling at Coal Services is considered as low risk. The mined coal seams have a low propensity for spontaneous combustion with no spontaneous combustion issues in relation to in-situ or for processed coal. The highest risk of spontaneous combustion appears to be when stockpiling remains for greater than approximately 1-2 years. Coal sent to Coal Services/Lamberts Gully is generally stockpiled for less than 1 year. There have been no incidences of spontaneous combustion in the life of the Lamberts Gully Open Cut Coal Mine or Coal Services.

3.17 Bushfire

No controlled burns were carried out during the reporting period and there were no bushfires onsite.

The risk of bushfire having an adverse environmental impact (outside of that from the historic burning regime of the Aboriginals) is low at Lamberts Gully Open Cut Coal Mine, as the local ecology is adapted to fire and robust bushfire management protocols are in-place, and bushfire management included in the Emergency Management System.

A *Bushfire Management Plan* was prepared for Coal Services during the reporting period. This *Bushfire Management Plan* outlined:

- Emergency procedures and numbers;
- Fire fighting equipment;
- Management of flammable materials;
- Training; and
- Water sources for fire fighting.

3.18 Mine Subsidence

Surface inspections have identified subsidence areas across the mining lease as the site is above historic underground workings. Previously where subsidence has been found which requires remediation the area is shaped, contour drains established, top-dressed and sown.

During 2011 there was no subsidence repairs completed.

3.19 Hydrocarbon Contamination

In October 2008, Springvale Colliery commissioned a “Spill Trailer” to administer efficient clean-up of chemical\hydrocarbon spills that may occur on the Pit top, Newnes Plateau, or at Coal Services/Lamberts Gully. The trailer can be offered as a service to neighbouring industry\communities as an engagement initiative. The Spill trailer reduces contamination risks as it able to contain a range of larger scale spill events.

During the reporting period, Coal Services continued to maintain hydrocarbon storage and inspect spill kits.

During the 2009 reporting period a Phase 1 Environmental Site Assessment was completed for Lamberts Gully by AECOM. The objectives of the Phase 1 ESA were to assess the potential for soil, sediment, surface water and groundwater contamination to be present at the above sites and using the findings of this assessment, determine if further investigation is required.

The work undertaken comprised a desktop review of available information to assess the environmental setting and identify potential sources of contamination resulting from current and historical land use. A site inspection of each site was also conducted.

The results of the qualitative risk assessment indicate that based on the information currently available, the potential contamination at the site presents a very low to moderate risk to human health and the environment. A summary of the risk ranking outcomes is provided in **Table 3.14** below.

Table 3.14: Summary of Risk Rankings from Phase 1 Study

Risk Ranking	Potential Source Area
Moderate Risk	Fuel and Oil Storage Area
	Former AT Area
	Former Pit Top Area
	Coal Services Workshop
	Sediment Control Ponds
	Former Pit Top Workshop Areas
	Tailings Ponds
Low Risk	Workshop
	General Site (explosives)
Very Low Risk	Washery and Transfer Towers

Source: AECOM

3.20 Methane Drainage/Ventilation

The previous underground mining operations completed at Lamberts Gully have not caused any issues relating to methane drainage/ ventilation. Since Centennial has managed the open cut operation the site has had no issues regarding methane drainage/ ventilation. Neighbouring underground operations in the Lithgow region have not recorded any issues relating to methane drainage/ ventilation.

3.21 Public Safety

Public safety risks associated with the Coal Services/Lamberts Gully are largely from public trespass on land around the open cut area. The site is sign posted and a regularly patrolled by a contract security service. The site is surrounded by a large perimeter fence.

During the reporting period, fencing had to be repaired on numerous occasions due to vandalism.

3.22 Other Issues and Risks

Other minor environmental risks were identified in the 2006 Lamberts Gully Environmental Risk Assessment, however, as these are low risk issues existing controls should be adequate.

3.23 Summary of Compliance

Heavy rainfall in December 2010 and January 2011 resulted in discharge events greater than the 10kL per day (*EPL – Condition L3.1)* on eight occasions in January 2011 (see **Table 3.15** and **Appendix 2 - Figure 9**).

Table 3.15: Discharge events greater than 10kL per day

Date	Volume (kL)
1/1/2011	18,130
2/1/2011	20,786
3/1/2011	53,534
4/1/2011	17,230
5/1/2011	10,376
6/1/2011	29,122
8/1/2011	10,599
12/1/2011	10,213

There was only one EPL non-compliance relating to surface water parameters during discharge events in 2011 (see **section 3.5**). On 8 December, 2011, a TSS level of 40 mg/L was recorded at LDP006, which is above the EPL criteria of 30mg/L (Condition L2 of EPL 3607).

The above non-compliances relating to volume discharge and the TSS exceedance from LDP006 will be reported in the Annual Return.

4. Community Relations

4.1 Environmental Complaints

There were no community complaints relating to Coal Services/Lamberts Gully during the reporting period.

4.2 Community Liaison

A Community Consultative Committee was formed and ran under the terms of the Lamberts Gully Coal Mine approval.

The CCC was officially closed during the reporting period, following consultation with the Department of Planning and Infrastructure.

4.3 SMP Consultation

SMP consultation is not applicable to the Lamberts Gully Open Cut mine or Coal Services.

5. Rehabilitation

A Rehabilitation and Mine Closure Risk Assessment was completed for Lamberts Gully in March 2010 to identify and scope the risks associated with rehabilitation and mine closure. This Risk Assessment involved both Lamberts Gully and Coal Services personnel and ensured a smooth transition during the completion of mining of Lamberts Gully and control of the site being taken over by Coal Services.

Prior to the risk assessment, aspects and categories were entered into the risk assessment spreadsheet based on the key steps in the Rehabilitation and Closure Costs spreadsheet. Based on these aspects, a detailed rehabilitation and closure methodology was developed, with risks and existing controls recorded by the risk assessment team. The risk assessment team then recommended additional controls to effectively manage the risks associated with rehabilitation and closure of the site.

5.1 Buildings

On the completion of mining in June 2010, several portable buildings associated with mining were removed. During the reporting period, there were no permanent buildings renovated or removed.

5.2 Rehabilitation of Disturbed Land

It is proposed to continue to rehabilitate areas of the Coal Services and Lamberts Gully areas that are not required for other future uses into a native forest ecosystem, similar to that immediately surrounding the site. This does not include the area to the north which is required for additional ash emplacement by Delta Electricity and to accommodate the Lithgow City Council Waste Emplacement Facility.

Appendix 6, Figure 4 illustrates the layout of the mining blocks at Lamberts Gully.

REA

Access to the REA areas will remain open for the remaining life of the Washery and these areas will remain the responsibility of Coal Services to both manage and rehabilitate. There are no plans for rehabilitation during 2012.

Council Waste Facility and Delta Ash Emplacement Facility

Separate access to both the Council Waste Disposal Facility and the Ash Emplacement Area will be developed in consultation with both Lithgow City Council and Delta Electricity. Once completed, these areas will become the responsibility of Lithgow City Council and Delta Electricity respectively to both manage and rehabilitate.

Delta has advised that their existing ash emplacement site will reach capacity by 2015, however to achieve effective design capacity there would be the need to commence preparation works on the Lamberts North site well before this date. Although the design of the ash emplacement has not been confirmed, the current proposal for the emplacement design is to span the old Huon Open Cut (referred to as the Huon drain). A box culvert will be installed to convey water to the existing bottom pond. This means that ash dumping could commence as soon as project approval is obtained.

The proposal for Delta to establish the new ash emplacement facility at Coal Services/Lamberts Gully is outlined in the Environmental Assessment (August 2010).

5.3 Other Infrastructure

There was no other infrastructure available for removal during the reporting period. All established infrastructure is required for the continued operations of the Washery.

5.4 Rehabilitation Trials and Research

AECOM Pty Limited (AECOM) have been engaged to undertake rehabilitation monitoring at Lamberts Gully. In 2010, one analogue woodland monitoring transect and three rehabilitation woodland transects were established at Lamberts Gully. In 2011 rehabilitation monitoring was completed again for the analogue and rehabilitation transects.

This monitoring program involved the utilisation of the CSIRO developed Ecosystem Function Analysis (EFA) tool (Tongway & Hindley, 2004), vegetation monitoring components and the AECOM developed Visual Monitoring tool. The EFA methodology created indices based on simple field indicators that reflect the measured variables of stability, water infiltration and nutrient cycling in turn monitoring the functional status of the landscape.

Permanent transects and associated photo reference sites were established in areas of post-mining rehabilitation and correspondingly in adjacent undisturbed areas to provide analogue/reference sites. The analogue sites are selected to represent as close as possible the slope, aspect and proposed vegetation characteristics of the revegetation areas. The analogue sites also provide data on the long-term goal for the revegetation area. 2010 was the first year of the EFA monitoring program.

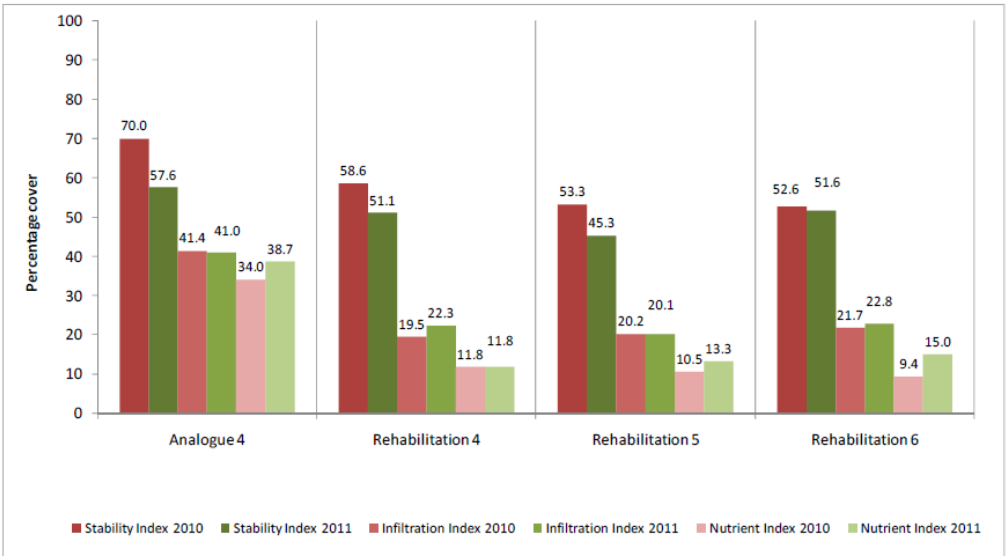

Figure 1: LFA: Soil Surface Condition Assessment – Lamberts Gully

Source: AECOM 2011

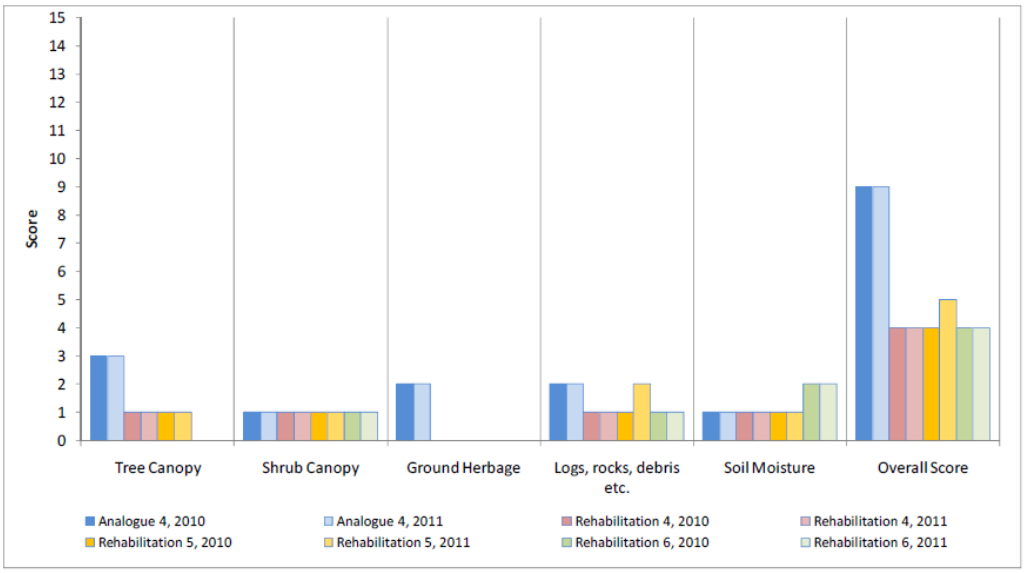

Figure 2: Habitat Complexity Score – Lamberts Gully

Source: AECOM 2011

Photo 4: Rehabilitation Monitoring Location at Lamberts Gully

Source: AECOM 2011

Analogue Results

The landscape organization index value recorded in 2011 is consistent with that recorded in 2010 for Analogue 4. The ground surface consisted of approximately 70% leaf litter, whilst the remaining 30% was made up of small clumps of grass and vegetative debris such as sticks and branches. The high amount of vegetative material and absence of bare ground also contributes to the relatively consistent stability, infiltration and nutrient index values at this transect over the past two years.

A 20% decrease in the percent of basal cover was recorded in 2011 compared to 2010 data, with a 20% shift toward more leaf litter. This may be due to areas of basal cover being sufficiently covered in leaf litter at the time of the survey whereby obscuring these patches from view. Future monitoring results will highlight whether the above situation exists or if a possible reduction in basal cover due to seasonal variation or dye back is in effect.

A significant increase in woody species density was observed at Analogue 4 across the stratum 1 height class (0 – 0.1m) during the 2011 survey. This increase may be attributable to the higher than average rainfall experienced within the local catchment in the months preceding the monitoring survey (http://www.bom.gov.au/jsp/ncc/cdio/cvg/av_accessed 9 May 2011) whereby providing favourable conditions for the promotion of the growth for seedlings germinated from local adult plants. Species richness did however not change during the 2011 reporting period.

The apparent decrease in canopy cover recorded in 2011 is due to a change in the method of calculating canopy cover compared to 2010.

Habitat complexity scores were consistent across the 2010 and 2011 reporting periods. The presence of feral animals remains an influence of disturbance at Analogue 4 (scats observed in 2011).

No fire disturbance was evident within the analogue transect sites.

Rehabilitation Results

Landscape organization index values recorded over the past two years are consistently low for rehabilitation transects 4, 5 and 6. The low values achieved suggest that the distribution of ground cover and other deposited material is irregular and fails to adequately capture resources such as water and nutrients in a sustainable fashion. In 2011 the percentage of bare ground present was 93%, 71% and 88% at rehabilitation transect 4, 5 and 6 respectively. All sites contained at a maximum <10% leaf litter and <15% grass over the past two years.

Stability, Infiltration and Nutrient Index values for each rehabilitation transect 4, 5 and 6 in 2011 are comparable to values recorded in 2010.

A slight increase in basal cover was observed at rehabilitation transect 4 and 6, whereas a slight decrease at rehabilitation transect 5 was noted. The percentage of bare ground decreased across all rehabilitation sites at Lamberts Gully.

All rehabilitation transects recorded a significant increase in woody species within stratum 1 and both rehabilitation transect 5 and 6 an increase in stratum 3, with a decline in stratum 2. This increase may be attributable to the higher than average rainfall experienced within the local catchment in the months preceding the monitoring survey whereby providing favourable conditions for the promotion of the growth for seedlings germinated from local

adult plants. The higher stratum 3 and lower stratum 2 numbers suggest that the trees previously recorded in stratum 2 have grown sufficiently over the past year.

An increase in the percentage canopy cover was recorded in 2011 despite the change in method. The increase in stratum 3 cover has resulted in greater canopy cover across rehabilitation transect 5 and 6.

Habitat complexity scores were consistent across the 2010 and 2011 reporting periods. The increase in deposited material such as logs and branches observed at rehabilitation transect 5 resulted in a slight increase in 2011.

The presence of feral animals (scats observed) and rill, gully and minor sheet erosion continues to affect Rehabilitation transects 4, 5 and 6, consistent with 2010 records. No fire disturbance was evident within the rehabilitation transect sites.

5.5 Rehabilitation Summary

Tables 5.1 and **5.2** summarise rehabilitation and maintenance areas.

Table 5.1: Rehabilitation Summary

	Area Affected/Rehabilitated (hectares)		
	To date	**Last report**	**Next Report (estimated)**
A: MINE LEASE AREA			
A1 Mine Lease(s) Area	1100.6 (CCL 733) does not include total area of leases associated with overland conveyor, Lidsdale siding and springvale pit top areas under control of coal services.		
B: DISTURBED AREAS			
B1 Infrastructure area (other disturbed areas to be rehabilitated at closure including facilities, roads)	22.4	1.3	22.4
B2: Active Mining Area (excluding items B3 - B5 below)	93.5	93.5	0
B3 Waste emplacements, (active/unshaped/in or out-of-pit)	44.1	44.1	0
B4 Tailings emplacements, (active/unshaped/uncapped)	25.3	18.3	25.3
B5 Shaped waste emplacement (awaits final vegetation)	0	0	0
ALL DISTURBED AREAS	185.3	157.2	47.7
C: REHABILITATION PROGRESS			
C1 Total Rehabilitated area (except for maintenance)	58.8	51.1	58.8
D: REHABILITATION ON SLOPES			
D1 10 to 18 degrees	56.4	48.7	56.4
D2 Greater than 18 degrees	2.4	2.4	2.4
D3 Less than 10 degrees	0	0	0
E: SURFACE OF REHABILITATED LAND			
E1 Pasture and grasses	0	0	0
E2 Native forest/ecosystems	58.8	51.1	58.8
E3 Plantations and crops	0	0	0
E4 Other (include nonvegetative outcomes)	0	0	0

Note: All of the current rehabilitation areas at Lamberts Gully are considered completed and under maintenance, i.e. they have all been seeded and are undergoing the process of

vegetation establishment. The inclusion of the coal services site for the 2011 AEMR has meant that areas affected are different to last years

Table 5.2: Maintenance Activities on Rehabilitated Land

Nature Of Treatment	Area Treated (ha)		Comment/control strategies/ treatment detail
	Report Period	Next Period	
Additional erosion control (drains re-contouring, rock protection)	0	0	
Re-covering (detail-further topsoil, subsoil sealing etc)	0	0	Not required
Soil Treatment (detail-fertiliser, lime, gypsum etc)	0	0	
Treatment/Management (detail-grazing, cropping, slashing etc)	0	0	
Re-seeding/Replanting (detail-species density, season etc)	0	0	
Adversely Affected by Weeds (detail-type and treatment)	58.8	58.8	Allowance for monitoring of all rehabilitation areas in next reporting period for weed invasion in rehab surfaces.
Feral animal control (detail – additional fencing, trapping, baiting etc)	0	0	

6. Activities Proposed in the Next AEMR Period

The activities proposed for the next reporting period include:

- Continuation of the upgrade to water management system;
- Further consultation with Delta Electricity regarding the proposed ash emplacement area at Coal Services/Lamberts Gully;
- Further consultation with council regarding the Lithgow City Council Waste Facility;
- Lamberts Gully will continue rehabilitation monitoring in 2011 utilising the Ecosystem Function Analysis (EFA) monitoring methodology;
- Continue to inform and involve key stakeholders in the mine closure process for Coal Services/Lamberts Gully;
- Rehabilitation maintenance works as previously described;
- Routine annual weed spraying program; and
- Separation of the EPL's for Springvale Coal and Coal Services/Lamberts Gully.

Appendix 1

Environmental Protection Licence 3607

Appendix 2

EPL Monitoring Results (Surface Water)

Appendix 3

Air Quality, Noise and Meteorological Monitoring Summary

Appendix 4

Rehabilitation and Decommissioning Costs

Appendix 5

AEMR Plans

Appendix 6

Figures