



Ashton Coal Operations Pty Limited Annual Environmental Management Report 2008/2009



ANNUAL ENVIRONMENTAL MANAGEMENT REPORT


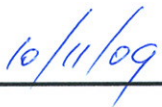
Name of mine	Ashton Coal Mine		
Titles/Mining Leases	ML1526 and ML1533		
MOP Commencement Date	1/11/2007	MOP Completion Date	31/12/2012
AEMR Commencement Date	2/09/2008	AEMR Completion Date	1/09/2009
Name of Leaseholder	White Mining NSW Limited & ICRA (Ashton) Pty Ltd & International Marine Corporation		
Name of Operator (if different)	Ashton Coal Operations Pty Ltd		
Reporting Officer	Peter Barton		
Title	General Manager		
Signature		Date	

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1.0 INTRODUCTION

The Ashton Coal Project (ACP) is located approximately 14km north-west of Singleton near the village of Camberwell. During the period of this Annual Environmental Management Report (AEMR), both the Open Cut and Underground mines have continued at full production.

The project currently consists of an open cut truck and shovel mine, underground longwall mine, associated Coal Handling Preparation Plant (CHPP), stockpiling, administration buildings, workshops, stores, bathhouse facilities and car parking.

This report has been developed in accordance with the conditions of Environmental Protection Licence No. 11879 and all relevant development consent conditions. The structure of this report is based on the document "*Guidelines and Format for Preparation of Annual Environmental Management Report*", Department of Mineral Resources, Document No. EDG03 MREMP Guide V3 dated January 2006.

Ashton Coal is owned by Felix Resources Limited (60%), Itochu Corporation (10%) and International Marine Corporation Group (30%) and operated by Ashton Coal Operations Pty Limited (ACOL).

This report covers the period 2 September 2008 to 1 September 2009. In accordance with Condition 9.3 of the Development Consent, Ashton has consulted with the Director-General of the Department of Planning in relation to the preparation of this report.

1.1 CONSENTS, LEASE AND LICENCES

An interim Mining Operations Plan (MOP) was submitted to the Department of Mineral Resources (DMR) in August 2003, prior to the commencement of construction activities on site. The Open Cut MOP was approved in 2004 and subsequently modified in 2005. The Underground MOP was approved in 2006. A variation to the Underground MOP allowing the installation of a dewatering bore and ventilation bore was approved in March 2007. A combined Site MOP which incorporates both the Open Cut and Underground operations was approved on the 1st September 2008. The Site MOP superseded the Open Cut and Underground MOPs. The Site MOP covers the period 1 November 2007 to 31 December 2012.

During the reporting period Mining Lease 1623 was granted. The 26.17ha lease covers an area of the North West Mains of the Underground Mine.

ACOL also received approval of the Subsidence Management Plan (SMP) for longwalls 5 – 6 and miniwalls 7 – 8 on the 2 July 2009. Miniwalls have been designed for panels 7 and 8 to ensure an aquaclude is maintained between the underground workings and Bowmans Creek.

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Panels 5 and 6 will remain at the full width of 210m whilst the miniwalls will utilise a width to depth ratio of 0.6. Extraction of longwall 5 is expected to commence in December 2009.

The following table (**Table 1**) provides a summary of the status of all leases, licences and approvals relevant to environmental management obtained by ACOL. Exploration Licence 5860 is currently in the renewal process.

Copies of all licences and approvals have been provided to government agencies and Singleton Council and are available for inspection at the ACOL site office.

Table 1. LEASES, LICENCES AND APPROVALS						
Ref	Detail	Granted	Authority	Area	Status	Expiry
PLANNING APPROVALS						
1	309-11-2001-i Development Consent	11/10/02	DoP ^	Schedule 1 of the Consent	Current	11/10/23
2	309-11-2001-i (M1) Modification to Development Consent (allows EPA to specify noise criteria in Table 5)	15/10/03	DoP	Schedule 1 of the Consent	Current	11/10/23
3	309-11-2001-i (M2) Modification to Development Consent (permits 10 m increase in height of EEA)	27/01/05	DoP	Schedule 1 of the Consent	Current	11/10/23
4	309-11-2001-i (M3) Modification to Development Consent (for the construction and operations of tailings pipelines between the mine and the former Ravensworth Mine)	19/02/07	DoP	Schedule 1 of the Consent	Current	11/10/23
5	DA 144/1993 Amendment for use of Ravensworth Void 4 – Tailings Disposal. (held by Macquarie Generation)	25/05/07	SSC	NA	Current	NA
6	DA486/2006 Train fuelling facility (held By QR)	28/11/06	SSC	Rail Siding	Current	28/11/11
7	ML 1533	26/02/03	DII ^{^^}	883.4 ha	Current	26/02/24
8	ML 1529	17/09/03	DII	128.7 ha (sub surface)	Current	11/11/12
9	ML 1623	5/11/08	DII	26.17ha	Current	30/10/29
9	Exploration Licence (EL) 5860	14/03/04	DII	272 ha	Renewal submitted	21/05/09
10	Exploration Licence (EL) 4918	17/09/99	DII	370 ha	Current	17/12/10
11	EPL 11879 (Open Cut Area and processing facilities)	02/09/03	DECCW *	As shown on EPL 11879 Fig 1	S/S	S/S
12	Variation to EPL 11879 (established Construction Noise Criteria)	10/11/03	DECCW	As above	S/S	S/S

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Table 1. LEASES, LICENCES AND APPROVALS						
Ref	Detail	Granted	Authority	Area	Status	Expiry
13	Variation to EPL 11879 (modified dust sampling requirements)	28/02/05	DECCW	As above	S/S	S/S
14	Variation to EPL 11879 (incorporation of UG mine)	17/11/05	DECCW	ML1533	Current	06/11/11
15	MINING OPERATIONS PLAN					
16	Interim MOP (for construction and initial 12 months operation of Open Cut & CHPP)	11/08/04	DII	N/A	S/S	S/S
17	MOP for Open Cut (for all associated life of mine activities)	22/07/04	DII	N/A	S/S	S/S
18	MOP Modification (for increase in EEA height & removal of WEA)	Jan 2005	DII	N/A	S/S	S/S
19	MOP Modification (for Glennies Creek Road Environmental Bund)	31/05/05	DII	N/A	SS	S/S
20	Interim Underground MOP (for first workings development)	20/12/05	DII	N/A	S/S	S/S
21	MOP for the Ashton Underground Mine (Development of underground operations for LW1-4 and associated facilities)	23/01/06	DII	N/A	S/S	S/S
22	Variation to the MOP for the Ashton Underground Mine	28/02/07	DII	N/A	S/S	S/S
23	MOP combining Open Cut and Underground operations	1/09/08	DII	N/A	Current	31/12/12
24	SUBSIDENCE MANAGEMENT PLAN					
25	Subsidence Management Plan (for the extraction of LW1-4)	08/03/07	DII	N/A	Current	Based on area not on year
26	Subsidence Management Plan (for the extraction of LW5-8)	02/07/09	DII	N/A	Current	Based on area not on year
26	WATER ACCESS LICENCES					
	WAL1358 / 20AL203056 Glennies Creek Supplementary 4ML	NA	DECCW	NA	Current	NA
	WAL15583 / 20AL204249 Glennies Creek General Security 354ML					
	WAL8404 / 20AL200941 Glennies Creek High Security 80ML					
	WAL997 / 20AL201311 Glennies Creek High Security 11ML					

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Table 1. LEASES, LICENCES AND APPROVALS						
Ref	Detail	Granted	Authority	Area	Status	Expiry
	WAL1120 / 20AL201624 Hunter River High Security 3ML					
	WAL1121 / 20AL201625 Hunter River General Security 335ML					
	WAL6346 / 20AL203106 Hunter River Supplementary 15.5ML					
	20SL044434 Bowmans Creek Irrigation 366ML					
	20SL042214 Bowmans Creek Irrigation 14ML					
	WORKS APPROVALS					
	20CA201565 Glennies Creek	1/07/04	DECCW	NA	Current	11/03/19
	20WA203822 Glennies Creek	14/12/07	DECCW	NA	Current	13/12/17
	20CA201626 Hunter River	1/07/04	DECCW	NA	Current	7/04/19
	GROUNDWATER LICENCES					
	20BL136766 Stock Domestic	12/01/88	DECCW	NA	Current	Perpetuity
	20BL168848 Test Bore	27/08/03	DECCW	NA	Current	Perpetuity
	20BL168849 Test Bore	27/08/03	DECCW	NA	Current	Perpetuity
	20BL169508 Mining 10ML	15/03/05	DECCW	NA	Current	14/03/10
	20BL169937 Mining 100ML	06/04/06	DECCW	NA	Current	
	20BL170596 Monitoring	16/10/06	DECCW	NA	Current	Perpetuity
	20BL171364 Mining 100ML	17/05/07	DECCW	NA	Current	16/05/12
	20BL172142 Test Bore	16/04/09	DECCW	NA	Current	Perpetuity
	20BL172143 Test Bore	16/04/09	DECCW	NA	Current	Perpetuity
	20BL172144 Test Bore	16/04/09	DECCW	NA	Current	Perpetuity
	OTHER LICENCES					
	Dangerous goods notification	17/08/09	Workcover	NA	Current	17/01/12
	Licence to Sell/Possess radioactive sources 28485	19/06/09	DECCW	NA	Current	18/06/12
	Radiation Registration 1281	02/05/09	DECCW	NA	Current	01/05/11
	Radiation Registration 12903	16/01/08	DECCW	NA	Current	16/01/10
	Radiation Registration 12905	16/01/08	DECCW	NA	Current	16/01/10
	Radiation Registration 12906	16/01/08	DECCW	NA	Current	16/01/10
	Radiation Registration 13001	03/03/08	DECCW	NA	Current	03/03/10
	AHIMS Permit No 1591 to collect Aboriginal artefacts north of the New England Highway under S90 of NPW Act	21/07/03	DECCW (NPWS)	239.8	Complete	21/07/08
	AHIMS Permit No 2783 to collect Aboriginal artefacts EWA86 under S90 of NPW Act	28/09/07	DECCW (NPWS)	NA	Current	NA

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Table 1. LEASES, LICENCES AND APPROVALS						
Ref	Detail	Granted	Authority	Area	Status	Expiry
	Part 3A permit No P1819 to install two power poles near Bowmans Creek	05/12/03	DECCW	N/A	Current	05/12/04
	Permit No CW802609 to construct levee bank on Bowmans Creek	08/09/03	DECCW	N/A	Current	07/09/13
	Clause 88(1) approval for safe operations and stability of workings and resource recovery longwall mining	28/02/07	DII	N/A	Current	1/06/2011
	S126 Approvals for emplacement of carbonaceous materials Ashton Open Cut	08/04/04	DII	N/A	Current	NA
	S126 Approvals for emplacement of carbonaceous materials Ravensworth Void 4	17/01/07	DII	N/A	Current	NA

[^] Department of Planning (DoP)

^{^^} Department of Industry and Investment (DII)

* Department of Environment, Climate Change and Water (DECCW)

S/S – superseded

N/A – Not available

TBA – To be advised

1.2 MINE CONTACTS

Positions of responsibility for operations and environment are detailed hereunder:

Table 2. KEY MINE CONTACTS			
Area of Responsibility	Name	Title	Contact Number(s)
General Manager	P. Barton	General Manager	(02) 6576 1111
Open Cut Mine	B. Chilcott	Mining Manager	(02) 6570 9128
Underground Mine	B. Wesley	Mine Manager	(02) 6570 9104
CHPP	P. Davis	Declared Plant Manager	(02) 6570 9148
Environment	L. Richards	Environment and Community Relations Manager	(02) 6570 9219
Environmental Contact Line			1800 657 639

ACOL's General Manager, Peter Barton, has overall responsibility for the operational and development phases of the project and is the statutory manager for the open cut coal mine. Brian Chilcott is Mining Manager for the open cut operation. Brian Wesley is the statutory Mine Manager for the Underground Mine. Paul Davis is the CHPP Manager and Declared Plant Manager. Lisa Richards is responsible for day-to-day environmental management and community relations and is the nominated Environmental Officer for the project. ACOL's Board of Directors has ultimate responsibility for Ashton's environmental performance.

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1.3 ACTIONS REQUIRED AT AEMR REVIEW

Outstanding Department of Primary Industries AEMR action items are presented in **Table 3**. The DII (formerly DPI) requested an interim report on the use of Organic Growth Medium (OGM) in rehabilitation practices at ACOL including the certification of OGM. Monitoring of the trial area is ongoing and will be addressed with a report to DII in the next reporting period. Under the revised Waste legislation administered by DECCW there is no exemption currently in place for the application of Municipal Solid Waste (MSW) derived composts to land. Whilst the industry is in negotiations with DECCW to develop this exemption DECCW has indicated that the general exemption is acceptable for mine rehabilitation however there are still issues to address regarding agricultural use. In the interim however Global Renewables Pty Limited (GRL) have obtained certification for OGM through the following bodies:

1. Department of Industry and Investment CA05 certification for phylloxera,
2. National Association for Sustainable Agriculture, Australia certification as an Input Manufacturer indicating the material is consistent with the organic standard, and
3. SAI Global certification under Australian Standard AS4454-2003 Composts, Soil Conditioners and Mulches.

The certification process includes up to 6 monthly third party auditing to ensure the product supplied meets the relevant requirements.

Table 3. DII AEMR ACTION LIST				
No	Issue	Action Required	Action Details	Status
1	MLA status	Mining lease applications over peripheral mining areas (road diversion, underground heading development in NE) are current. It is noted that a DA variation is current for the LW9 area.	ML 1623 for the Underground north west mains has been approved. Ashton plan on submitting a further variation for LW9 and other peripheral areas not yet covered by the mining lease.	Ongoing
2	Spontaneous combustion at the Tailings Storage Facility (TSF)	Control to be ongoing according to spon com management plan. A heating incidence requires immediate attention. Ashton is to liaise with Xstrata Ravensworth U/G Mine to confirm mining schedule, the TSF wall lift and spon com surveillance / control.	Management of heating incidence are on going. 6 Monthly surveys are undertaken to monitor incidences. Ashton is currently speaking with Xstrata regarding the Ravensworth UG mine schedule and the impact on the TSF wall lift.	Ongoing

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Table 3. DII AEMR ACTION LIST				
No	Issue	Action Required	Action Details	Status
3	Conservation Area	It was noted that a Plan Of Management has been drafted for DECC. Subsequent to a finalised agreement, a summary report in next AEMR on conservation (monitoring, procedures, and revegetation establishment).	The Conservation Agreement is in final draft and is expected to be signed before the end of 2009. Although the agreement has not yet been finalised the status of the conservation agreement, monitoring and regeneration works within the southern woodland are presented below in Section 3.6.	Ongoing
4	Rehabilitation trial	Improved native vegetation and grass cover is observed in the Organic Growth Medium (OGM) trial areas. DPI requests an interim report on the trial, including certification of OGM. Report to be supplied in early 2009.	Monitoring of the benefits of OGM and topsoil treatments to tree establishment and growth and groundcover has been undertaken during the reporting period. Further monitoring of the soil characteristics following OGM application is currently being undertaken. A report will be provided once this is completed. The certification of OGM is addressed above in Section 1.3.	In progress

1.4 INDEPENDENT ENVIRONMENTAL AUDITING

Under condition 9.2 of DA 309-11-2001-i Ashton Coal are required to undertake an internal audit of the performance of the project against conditions of the consent and other statutory approvals. To satisfy this condition, Ashton staff undertook the internal audit on-site as a desktop review and field inspection. Environmental compliance for the operation was assessed for the 2008 – 2009 reporting period. Non-compliances against conditions of the Development Consent and EPL recorded during the audit are presented in **Tables 4** and **5** respectively.

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Table 4. ENVIRONMENTAL AUDIT – NON COMPLIANT CONDITIONS OF DEVELOPMENT CONSENT (DA 309-11-2001-1)		
Condition	Description	Comments
2.7	Annual production of coal from the ACP shall not exceed 5.2 Mtpa of ROM coal.	A total of 5.33Mtpa of ROM coal was extracted from the Open Cut and Underground operations for the reporting period.
3.6	Environmental management plans are to be reviewed, and updated as necessary, at least every 5 years or as otherwise directed by the Director-General, in consultation with the relevant government agencies. Plans shall reflect changing environmental circumstances and changes in technology or best-practice management procedures.	The Ashton Soil Stripping Management Plan and Waste Management Plan have not been updated within 5 years.
3.46(b)	The Applicant shall prepare and implement a Flora and Fauna Management Plan (FFMP) for the DA area. The Plan shall include but not be limited to: details of strategic vegetation management, outlining timeframes for clearing and re-vegetation activities and a map illustrating the Plan. The Plan should aim to maximise scope for new vegetation to establish and restore ecological integrity;	Strategic vegetation management details and plans for Ashton are not included in the Flora & Fauna Management Plan (FFMP) (Pacrim, 2007). The FFMP should be updated with the required information that is currently included in the Ashton MOP and LRMP.
3.56	The Applicant shall prepare a Final Void Management Plan (FVMP) to the satisfaction of the Director-General, in consultation with DPI Minerals, DIPNR, and SSC. The Plan shall include, but not be limited to, the following: <ul style="list-style-type: none"> - The FVMP shall be submitted for the approval of the Director General, no later than the end of year 5 of the development or within such period otherwise agreed by the Director General. 	By the end of year 5 no FVMP has been submitted for approval.

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Table 4. ENVIRONMENTAL AUDIT – NON COMPLIANT CONDITIONS OF DEVELOPMENT CONSENT (DA 309-11-2001-1)					
Condition	Description				Comments
6.1	The Applicant shall comply with the following ambient air quality standards/goals:				
	Table 1 Long Term Particulate Matter Criteria				
	Pollutant	Standard/Goal	Agency		Sites 1, 3 and 8 were in exceedance of the 90µg/m ³ at 1 September 2009.
	Total Suspended Particulate Matter (TSP)	90ug/m ³ (annual mean)	NH & MRC		
	Particulate matter < 10um (PM ₁₀)	30ug/m ³	NSW DEC		All sites below 30ug/m ³
	Table 2 Short Term Particulate Matter Goal				
	Pollutant	Standard/Goal	Agency		
Particulate matter < 10um (PM ₁₀)	50ug/m ³	NSW DEC			
Table 3 NSW DEC Amenity Based Criteria for Dust Fallout					
	Pollutant Deposited Level	Averaging Dust Level	Maximum Increase Period	Maximum Total in Deposited Dust	Dust gauge sites D6, D7 and D8 were in exceedance of the 4g/m ² /month as at 1 September 2009
	Deposited dust	Annual	2 g/m ² /month	4 g/m ² /month	
6.22	The Airblast overpressure level from blasting operations carried out in or on the premises must not exceed:				Greater than 5% of blasts exceeded 115dBL at the Church (5.8%) and Village (5.2%) monitors for the 2008-09 reporting period. 1 exceedence of 120dBL was recorded at the Church (136dBL) and Village (132dBL) monitors
	(i) 115 dB (Linear Peak) for more than 5% of the total number of blasts over a period of 12 months; and				
	(ii) Exceed 120dB (linear Peak) at any time,				

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Table 4. ENVIRONMENTAL AUDIT – NON COMPLIANT CONDITIONS OF DEVELOPMENT CONSENT (DA 309-11-2001-1)		
Condition	Description	Comments
	at any residence or other noise sensitive receiver such as the St Clements Church and Camberwell Community Hall.	during the reporting period.
12.1	The Applicant shall ensure that all statutory requirements including but not restricted to those set down by the Environmental Planning and Assessment Act 1979, Local Government Act 1993, Protection of the Environment Administration Act 1991, Protection of the Environment Operations Act 1997, Rivers and Foreshores Improvement Act 1948, Water Act 1912, National Parks and Wildlife Act 1974, and all other relevant legislation, Regulations, Australian Standards, Codes, Guidelines and Notices, Conditions, Directions, Notices and Requirements issued pursuant to statutory powers by the SSC, DEC, DPI Minerals, NPWS, DIPNR, RTA, DPI - Agriculture, DPI - Fisheries and other Government agencies, are fully met.	Various non compliances with other licences and approvals were identified and are included in Table 5.

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Table 5. ENVIRONMENTAL AUDIT – NON COMPLIANT CONDITIONS OF EPL No. 11879					
Condition	Description				Comments
L7.2	The overpressure level from blasting operations carried out in or on the premises must not:				Greater than 5% of blasts exceeded 115dB(L) at the Church (5.8%) and Village (5.2%) monitors for the 2008-09 reporting period. 1 exceedence of 120dB(L) was recorded at the Church (136dB(L) and Village (132dB(L) monitors during the reporting period.
	(a) exceed 115 dB(L) for more than 5% of the total number of blasts carried out on the premises over the 12 months annual reporting period; and				
	(b) exceed 120dB(L) at any time				
	at any residence or other noise sensitive location (such as a school or hospital) that is not owned by the licensee or subject of a private agreement between the owner of the residence or noise sensitive location and the licensee as to an alternative overpressure level..				
M2.1	For each monitoring/discharge point or utilisation area specified below (by a point number), the licensee must monitor (by sampling and obtaining results by analysis) the concentration of each pollutant in Column 1. The licensee must use the sampling method, units of measure, and sample at the frequency, specified opposite in the other columns:				100% of PM10 data not collected. Data recovery rates at sites where non-compliance occurred were: <ul style="list-style-type: none"> • Site 1 TEOM – 99% • Site 3 TEOM – 98% • Site 4 TEOM – 94%
	Pollutant	Units of measure	Frequency	Sampling Method	
	PM10	µg/m ³	Daily	Australian Standard 3580.9.8 - 2001	
M8.1	In order to determine compliance with condition L7:				100% of data not obtained. Data recovery for locations as follows: <ul style="list-style-type: none"> • Village monitor vibration – 99%, • Village monitor overpressure – 84%, • Church monitor vibration – 99%,
	(a) Airblast overpressure and ground vibration levels must be measured at, or near, the nearest residence, or noise sensitive location, that is likely to be most affected by the blast and that is not owned by the licensee, or is the subject of a private agreement between the owner of the residence, or noise sensitive location, and the licensee as to an alternative overpressure or				

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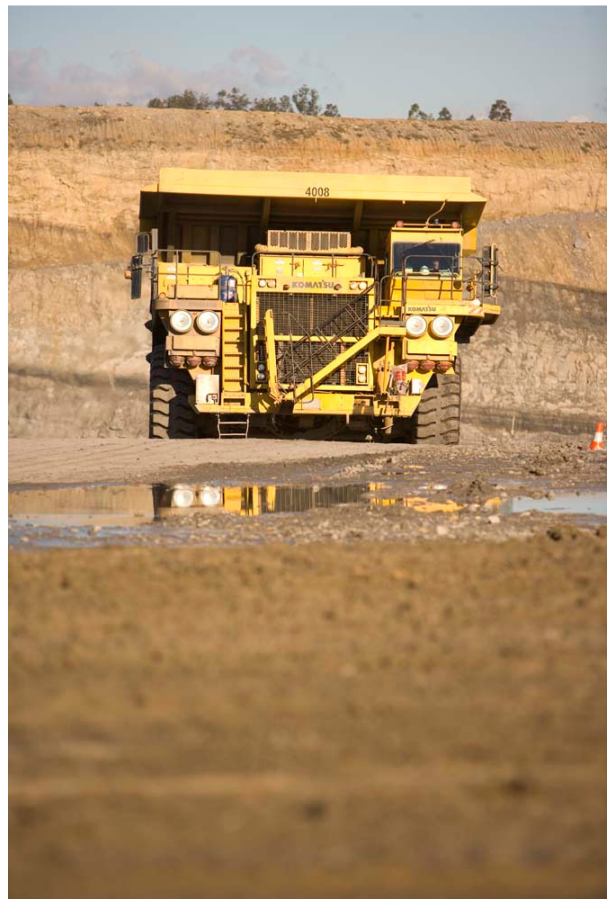
Table 5. ENVIRONMENTAL AUDIT – NON COMPLIANT CONDITIONS OF EPL No. 11879		
Condition	Description	Comments
	ground vibration level for all blasts carried out in, or on , the premises; and	<ul style="list-style-type: none"> • Church monitor overpressure – 78%.
	(b) Instrumentation used to measure the airblast overpressure and ground vibration levels meet the requirements of Australian Standard 2187.2 of 1993	



Figure 1. Ashton Coal Location Plan

1.5 ENVIRONMENTAL MANAGEMENT PLAN UPDATE

There were no Environmental Management Plans updated during the AEMR.



2.0 OPERATIONS DURING THE REPORTING PERIOD

2.1 EXPLORATION

Mining Lease 1533

- Open Cut - No exploration activities were undertaken in the open cut.
- Underground - 8 cored holes.

Exploration Licences 5860 & 4918

- Area being assessed - 86 holes (2 cored 84 open holes)

2.2 LAND PREPARATION

No clearing was undertaken during the reporting period.

2.3 CONSTRUCTION

2.3.1 Underground

During the period ACOL installed and commissioned a liquid Nitrogen vaporiser plant (BOC plant). The plant has been installed in response to anticipated departmental requirements to conduct Nitrogen inertisation of the goaf seal atmosphere during the longwall seal up process. The injection of Nitrogen into the goaf behind the longwall seals is to ensure the goaf atmosphere remains inert increasing the safety of operations by minimising the potential for spontaneous combustion and explosive atmospheres developing. When “inertness” of the mine seal atmosphere is confirmed the plant is shutdown until the next longwall sealing (approx every 6- 9 months).

An extension to the Underground bathhouses was completed to increase capacity from 30 showers to 48 showers. The temporary bathhouse facilities were removed once the extension was completed.

2.3.2 Coal Handling and Preparation Plant

No further construction was completed for the CHPP.

2.3.3 Open Cut

No construction was undertaken in the Open Cut operations during the reporting period.

2.4 MINING

2.4.1 Estimated Mine Life

The life-of-mine plan for the Open Cut Mine anticipates that open cut mining will be completed by late 2010.

The underground mine has now been operating since December 2005. The expected mine life is for a further 14 years (2023).

2.4.2 Mine Production and Mining Constraints

2.4.2.1 Geology

The major coal seams identified at Ashton are (in descending stratigraphical order); the Lemington, Pikes Gully, Arties, Upper Liddell, Middle Liddell, Upper Lower Liddell, Lower Lower Liddell, Upper Barrett and Lower Barrett seams.

The strata within the Foybrook Formation comprises in order of predominance, fine to coarse grained sandstone, siltstone, conglomerate, mudstone, shale and coal. The top of the formation corresponds with the base of the overlying Bulga Formation which in turn is overlain by the Archerfield Sandstone and Jerrys Plains Sub group respectively. The later includes the Bayswater Seam that has been mined in the adjacent Ravensworth development. Only a remnant portion of the Bayswater seam exists in the far western part of the project area.

The principal structural feature of the project area is the Camberwell Anticline. The axis of this structure trends along the eastern boundary of EL4918. The coal seams of principal interest subcrop along the eastern part of the mining area. These subcrops define the westerly dipping limb of the Camberwell Anticline. In the north eastern part of the project area the formation is folded around the axis of the Camberwell Anticline. At this location the formation is more steeply inclined, up to 22 degrees on the eastern limb, with a flatter dip of less than 10 degrees on the western limb. As mining has progressed minor faulting has been detected sub parallel with, and adjacent to, the crest of the anticline in the open cut operation. This faulting is predominantly reverse faults formed in conjunction with the Camberwell Anticline.

During the period no further geological faults or intrusions have been identified in the Underground or Open Cut mines.

Total geological resources within Ashton was 441 Million tonnes (Mt) at the end of December 2008. Of this quantum, 248 Mt is measured and 139 Mt indicated. Coal resources have been assessed from the in-situ coal inventory and have been further segregated on the basis of Underground or Open Cut development potential.

2.4.2.2 Open Cut

Seams

The seams targeted during Open Cut operations (in descending order) are as follows:

- Pikes Gully;
- Upper Arties;
- Arties;
- Upper Liddell;
- Middle Liddell;
- Upper Lower Liddell;
- Lower Lower Liddell;
- Upper Barrett;
- Upper Barrett Split;
- Lower Barrett Split.
- Lower Barrett; and

Coal Analysis

An assessment of the ROM coal that is recovered from the Open Cut mine found that it generally has an ash content of 18% to 32%. Following processing in the CHPP, steaming and semi soft coking coal is produced for the export market and sized raw coal for domestic consumption. Analysis of the recoverable coal revealed significant proportions of Vitrinite and low amounts of elements such as sulphur, chlorine and phosphorous.

Coal Reserves

The Open Cut is encompassed by ML 1533 which covers an area of 883 hectares (ha) and at the end of December 2008, had known extractable reserves of approximately 3.82 Mt of coal in some 14 seams and splits.

Mining Constraints

Significant mining constraints in the Open Cut operation include:

- The proximity of the village of Camberwell to the site;
- The location of the Main Northern Railway;
- Glennies Creek Road;
- Geological conditions that limit the area available for Open Cut mining; and

Mining Operations

Ashton Open Cut has approximately 18 months operation remaining at the current rate of 2.3 Mtpa ROM and 11.2Mbcm of overburden removed per year. Ashton Open Cut operates a fleet of hydraulic excavators and associated haul trucks along with support equipment consisting of watercarts, dozers and graders. Overburden is drilled and blasted prior to removal by the excavators. Overburden between seams is typically 15 – 20 m thick. Coal is usually free-dug by excavator or windrowed by dozers prior to loading in the case of thinner seams.

The Ashton Open Cut mine design has been developed to minimise environmental impacts on Camberwell village, particularly in relation to impacts from blasting vibration, dust and noise.

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The original mine plan with north-south strips and pit progressing from east to west has been progressively changed to east-west strips and mining from north to south. This concentrates the mining activity initially in the north-west corner of the pit, furthest from the village, and has the effect of creating a buffer as the mining operations deepen. Mining with this modified orientation minimises hauling of overburden along the southern boundary of the pit and concentrates most of the mining and hauling at levels below the environmental bund for longer periods. Mining is currently situated in the southern zone with dumping in the northern portion of the pit. The remaining void at the southern end of the operation will be progressively filled with CHPP reject from the continuing Underground operation.

Rehabilitation of the southern face of the Eastern Emplacement Area was completed to RL 135 during the reporting period. This has created a visual and acoustical barrier between the remaining dumping areas and Camberwell Village. The dump's drainage structure design incorporates water recovery maximisation for ongoing utilisation in the CHPP. The final void drainage will ensure decant water from CHPP reject co-disposal will also be recycled once the Open Cut operations cease.

Sufficient overburden will be stockpiled to enable the rehabilitation of Ashton, including Underground and CHPP areas following cessation of mining.

Hours of Operation

Under the conditions of the Development Consent and EPL11879, Open Cut mining operations are limited to the hours of 7:00 am to 10:00 pm, Monday to Saturday and 8:00 am to 10:00 pm on Sundays and public holidays. Hauling of reject material within the Open Cut pit area, operation of water carts and maintenance of equipment may be undertaken 24 hours a day 7 days a week.

Equipment Fleet

Mining of overburden and coal is conducted using hydraulic excavators supported by a range of trucks and other ancillary equipment.

The Open Cut mining fleet at Ashton consists of the equipment as outlined in **Table 6**.

Table 6. OPEN CUT AND CHPP MINING EQUIPMENT			
Number	Description	Number	Description
2	Liebherr 994B excavators	3	Cat 777 water trucks
1	Liebherr 994 excavator	2	Cat 16H grader
1	Cat 5130 excavator	6	D10 bulldozer
9	Komatsu 630E trucks	1	Komatsu WA 600 wheel Dozer
3	Komatsu 730E trucks	1	CAT 950E
2	Cat 789 trucks	1	Komatsu WA 900-E
1	TITON 600 Down-hole Hammer	1	Cat 938 wheel loader
1	Rotary Drill	1	Cat D8R dozer
1	Cat 994 Wheel Loader	2	Cat 992 Wheel loader

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Permanent workshop, office and refuelling facilities are located at the northern limit of the developing open cut and in the vicinity of the Clean Coal Stockpile and Train Loading Infrastructure.

2.4.2.3 Underground

At the end of December 2008, the underground mine had Reserve of 47.4Mt, of which 23.5Mt was proved and 23.9Mt was probable. The mining plan includes sequential mining of the Pikes Gully, Upper Liddell, Upper Lower Liddell and the Lower Barrett coal seams. Underground development commenced on the 21st of December 2005.

The requirements of the development consent and the subsidence guidelines of DPI (Minerals) have been merged, and a Subsidence Management Plan was approved in February 2007 for the first four longwall panels in the Pikes Gully Seam. During the reporting period Ashton received approval of the Subsidence Management Plan for Longwalls 5 - 6 and miniwalls 7 - 8 which included the undermining of sections of Bowmans Creek. Miniwalls have been designed for panels 7 and 8 to ensure an aquaclude is maintained between the underground workings and Bowmans Creek. Panels 5 and 6 will remain at the full width of 210m whilst the miniwalls will utilise a width to depth ratio of 0.6. Extraction of longwall 5 is expected to commence in December 2009.

Operations in this reporting period included development drivage for Longwalls 4 and 5, completion of Longwall 3 extraction in February 2009 and extraction of Longwall 4 from March 2009 onwards.

The underground mine has approval to operate 24hrs a day 7 days a week. At this stage mining production activities are undertaken on a five day week basis. Additional crews are available on the weekend for maintenance and services support. Underground equipment is listed in **Table 8** below.

Table 7. ASHTON INDICATIVE UNDERGROUND MINING EQUIPMENT			
Number	Description	Number	Description
3	12CM12 Continuous Miners	7	PJB Mk4.5
4	15SC Shuttle Cars	6	Jugganaut V2
4	21m3/s auxiliary ventilation fans	1	Jugganaut V3
3	Integral Rand 160 – 1000 cfm air compressors	2	Flakt Woods 315kW centrifugal fans
2	1050mm temporary conveyors (Jiffy drives)	2	1400mm conveyors (two VVVF drives each)
2	1600mm Conveyors (two VVVF drives each)	1	1600mm stacker conveyor (single VVVF Drive)
1	205m DBT Longwall	2	Stamler breaker feeder
1	Eichoff Shearer		

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The presence of a sandstone parting within the seam has resulted in the shortening of Longwall panels 1, 2, 3 and 4. The shortening of the panels creates an even greater distance from the saturated alluvial of the Hunter River.

2.4.3 Production and Waste Summary

Operations in the reporting period and predictions for the next reporting period are detailed in **Table 9**.

Table 8. PRODUCTION WASTE SUMMARY			
	CUMULATIVE PRODUCTION		
	Start of this Reporting Period	At end of this Reporting Period	Est', end of next Reporting Period
Topsoil Stripped (m ³)	158,200	158,200	158,200
Topsoil used/spread (m ³)	55,798	99,798	120,000
Waste Rock (BCM)	49,710,503	59,196,434	68,196,434
Open Cut Coal (RomT)	8,550,080	10,550,572	12,550,572
Underground Coal (RomT)	3,948,520	7,281,038	10,481,038
Total Coal (RomT)	12,498,600	17,831,610	23,031,610
Processing Waste (T)	4,677,287	6,706,605	8,682,605
Open Cut Product Coal (T)	5,202,152	6,481,656	7,721,656
Underground Product Coal (T)	2,306,039	4,260,836	6,244,836
Total Product Coal (T)	7,508,191	10,742,492	13,966,492

2.4.4 Changes in Mining Equipment or Method

In order to further reduce blast vibration impacts from shot firing electronic detonation was trialled successfully during the period and has now been adopted. Electronic detonation also allows improved timing of decked explosives in individual drill holes. This method detonates separate explosives in each hole, reducing the Maximum Instantaneous Charge (MIC) whilst using the same volume of explosives. When designed correctly, this leads to increased control over reinforcement of vibration at sensitive receivers.

2.5 MINERAL PROCESSING

The CHPP incorporates two modules (400tph and 600tph) which are operated independently to produce the total designed throughput of 1000tph. The associated materials handling is designed for 1000tph and includes two rotary breakers on the ROM coal side, one feeding Open Cut coal and the other Underground, and a skyline conveyor on the product coal side. Product coal is recovered through a series of coal valves and conveyed to a Train Loading Station mounted over a dedicated rail siding.

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The CHPP is operated by ACOL and manned on a 24 hours a day five days per week basis. However the CHPP has the ability where required to operate 24 hours a day seven days a week. Train loading may operate 7 days a week dependant on the rail schedule.

The CHPP processed 5.26Mt ROM coal during the reporting period to produce 3.23Mt of semi-soft and thermal product coal. Coal was transported by rail to the Port of Newcastle for sale on the export market. Some semi soft coking coal was sold to domestic steel mills.



Figure 2. Coal Handling Preparation Plant

2.6 WASTE MANAGEMENT

Coarse rejects are transferred to a rejects bin, loaded on to ACOL trucks and transported to the overburden dump for disposal. A total of 1.2Mt of coarse reject material were disposed of in this manner during the reporting period.

Fine rejects are pumped to the Mac Gen Void 4 tailings dam. A total of 812Kt of fine reject material was pumped to the Mac Gen tailings dam during the period.

2.6.1 Chemical/Physical Characteristics of Residues

Coarse rejects are generally mudstones and claystones, with some sandstones, and generally contain minimal amounts of carbonaceous material.

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The fine rejects contain finely disseminated clays and mudstone, which have been flocculated using a relatively inert chemical. It contains a higher concentration of carbonaceous material than the coarse reject.

2.6.2 Handling and Disposal Procedures

Procedures for the disposal of both coarse and fine reject material are contained in the MOP and the Tipping Rules developed by the Open Cut Mine Manager.

2.6.3 Monitoring and Maintenance of Containment Facilities

All coarse reject material is disposed of within the Eastern Emplacement Area and covered with inert overburden material.

Emplacement of all tailings occurs in the Ravensworth Void 4 tailings dam. The Tailings Emplacement Operations Plan defines the management of the Void 4 tailings facility.

Monitoring includes;

- Continuous Flow Monitoring,
- Twice a week inspections,
- Monthly inspections,
- Subsidence Monitoring, and
- Emplacement Surveillance Report

2.6.4 Sewage Treatment/Disposal

Ashton Coal Operations Limited operates three (3) on-site sewerage management systems, being:-

1. Underground mine bathhouse and administration building combined, which treats the waste from 48 showers, 14 WC's, 11 hand basins and 2 sinks. The sewage treatment system is a two stage Biolytix type with tertiary bromide dosing. Treated effluent is disposed of by spray irrigation. This system was upgraded during the report period. A buffer tank and controlled release pumping system was installed to elevate surges in bathhouse water being delivered to the Biolytix system during shift change.
2. CHPP facilities and open cut bathhouse combined, which treats waste from 25 showers, 11 WC's, 8 hand basins and 3 sinks. The sewage treatment system is an Envirocycle type with disposal of the treated effluent by spray irrigation.
3. Open cut mine workshop which treats 4 showers, 4 WC's, three hand basins and a sink. The sewage treatment system is an Envirocycle type with disposal of the treated effluent by spray irrigation.

2.6.5 Total Site Waste Management Program

Ashton Coal contracted Transpacific Industries to establish a total waste management program in the previous reporting period. The key objective of the program is to reduce waste to landfill by 20% over the first 5 years. To date the following changes have been implemented as part of the program:

- Increase in paper and cardboard recycling bins including under desk baskets, wheely bins and skip bins across site.
- Timber skip bins have been placed at each of the surface areas (UG surface, CHPP and OC workshop).
- Batteries are now recycled where possible.
- Used printer cartridges are now fully recycled through the 'Cartridges 4 Planet Ark' program.

A Transpacific Waste Management Officer (WMO) inspects ACOL's waste streams on a weekly basis. During these inspections the WMO identifies contamination of waste streams, and where efficiencies and improvements can be made to the system. All of this information is provided in a monthly report which is presented in Occupational Health, Safety and Environment meetings. Where heavy contamination is identified, the WMO will provide a toolbox talk to the relevant employees to increase the awareness of the problem.

Waste tracking is also completed by Transpacific with data provided in the monthly reports.

2.6.6 Waste Stream Volumes

The waste stream volumes are shown in **Table 9** below.

Waste streams are separated into five end uses. These being:

- Disposal – general waste, air filters and timber.
- Energy Recovery – grease.
- Recycling – oil emulsion, oil filters, batteries, paper and cardboard and scrap metal.
- Reuse – refurbished air filters.
- Treatment – hydrocarbon contaminated rags and drums.

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Table 9. WASTE STREAM WEIGHTS (KG) SEPTEMBER 08 – AUGUST 09	
Waste Stream	Volume (kg)^
Absorbents (kg)	993
Batteries - Lead Acid (kg)	7,092
Contaminated Rags – Hydrocarbons (kg)	3,893
Effluent (kg)	35,467
Empty Drums (Contaminated) (kg)	1,285
General Waste (kg)	271,487
Grease (kg)	2,800
Oil Emulsions (kg)	201,133
Oil Filters (kg)	21,227
Paper & Cardboard (kg)	12,400
Scrap Metal (kg)	134,160
Timber (kg)	84,933

^ Volume for some wastes is estimated from bin collections. This method potentially overestimates the actual waste produced.

Figure 2 presents percentage makeup of waste end use for the period.

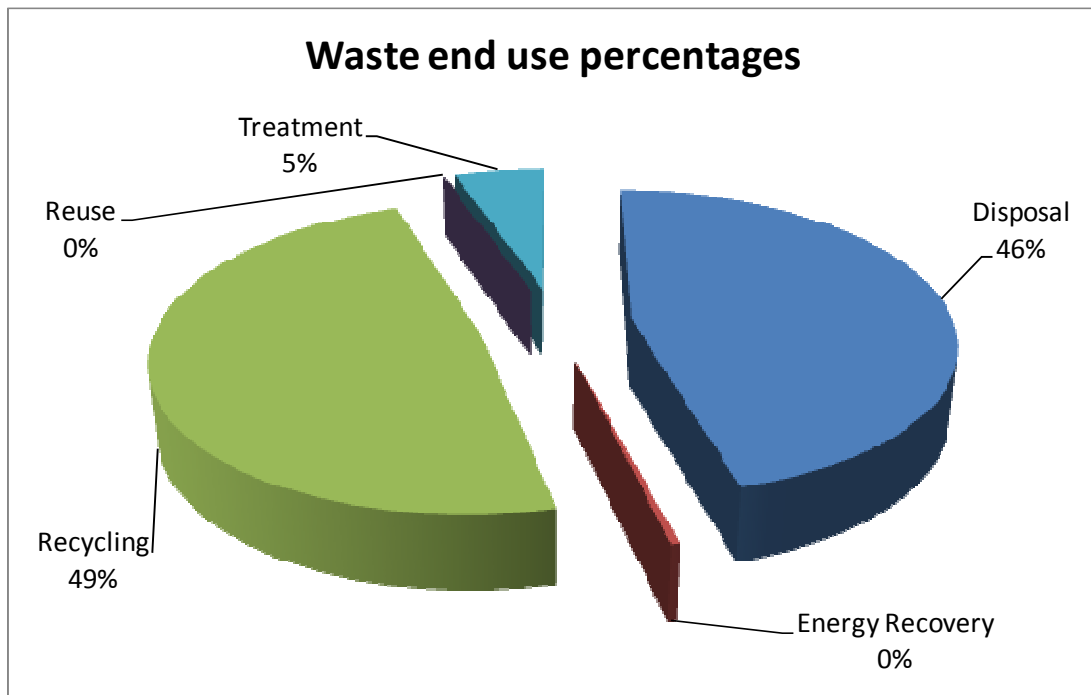


Figure 3. Waste end use percentages

2.7 ROM COAL AND COAL PRODUCT STOCKPILES

Both ROM coal and product coal are stockpiled adjacent to the CHPP. ROM coal from the Open Cut is stockpiled in a 100Kt stockpile. The capacity of the product coal stockpile is approximately 300Kt. All product coal was transported off site by rail during the reporting period. No changes are envisaged to this mode of transport.

2.8 WATER MANAGEMENT

Ashton is a nil discharge site and split water into three distinct water categories, Clean Water, Runoff Water and Mine Water.

2.8.1 Clean Water Management

Clean water is used only where there exists a need for water of that quality or there is a shortfall of Mine water for reuse. Clean water is currently sourced from:

- Glennies Creek; and
- The Hunter River.

This water is used untreated as raw water in the Underground, treated in an on-site water treatment plant for use in the office and bath house facilities, or used as raw top up water to the process water dam for use in the CHPP, wash down and dust suppression.

2.8.2 Runoff Water Management

Runoff water from some of the rehabilitation areas is directed to sediment control structures prior to runoff from site. These areas are minimised and the water is harvested back onto site for reuse as a priority.

2.8.3 Mine Water Management

All water contaminated by contact with carbonaceous material or collected from the general mining area catchment is classed as Mine water and is collected on site in storage dams. This mine water is utilised in the mining process for dust suppression and in the CHPP. Where the quality is suitable this water may also be used to irrigate rehabilitated areas. There has been no irrigation of rehabilitation areas within the open cut undertaken during the reporting period.

There is an agreement in place to use excess underground water from Glennies Creek Underground Coal Mine (Integra Coal). This water supply is used to top up process water levels and for dust suppression.

2.8.4 Drainage

Drainage from undisturbed areas is managed in one of two ways:

- The drainage from small undisturbed areas that do not form part of the general mine catchment area are permitted to follow their natural drainage path; or
- The drainage from areas that do form part of the general mine catchment area is channelled into the runoff water dam where it is pumped to the process water dam and used in the CHPP, for wash down or dust suppression.

Drainage from disturbed areas is captured in sedimentation control dams and transferred to the process water dam and used in the CHPP, for wash down or dust suppression.

2.8.5 Water Supply and Demand

Licences are held by ACOL to pump water from Glennies, and the Hunter River for use on the mine site (refer to **Table 1**). Full allocation for Water Access Licences was made available for the 2008-09 water year and again in the current 2009-10 water year.

Tables 10 and **11** show the balance of water draw from Glennies Creek and the Hunter River respectively over the reporting period. The Glennies Creek water draw includes pumped volume as well as a calculated draw to balance approved draw down in the Glennies Creek alluvium due to the underground operations. **Section 3.4** discusses in more detail the Underground alluvium impacts.

During 2006-2007 an extensive metering network was installed across site to enable detailed monitoring of all water movements on site. In 2008 Worley Parsons completed a water balance model for the site which has now been calibrated against two years worth of real site data. This model allows for future water management planning and is also utilised to undertake the 6 month site water balance. Site water balances are presented in **Table 12** and **13** for the periods 1 September 2008 to 28 February 2009 and 1 March 2009 to 31 August 2009 respectively. As detailed in **Table 12**, the initial 6 month period experienced above average rainfall with 429mm recorded. Approximately 40% of this rainfall occurred in February (see **Table 15**) resulting in an estimated 90ML of runoff during this month. This resulted in a 74ML increase in stored water over the period. All other water inflows and outflows were close to historical averages, with no water surpluses or deficits experienced.

As detailed in **Table 13**, the second half of the reporting period experienced below average rainfall with 229mm recorded, resulting in a reduction in rainfall runoff from the first period (*from 173 ML to 77ML*). The collective storages remained above 100ML for the period. However, a 35ML net reduction in total storage was recorded over the period. As with the first half of the year all other water inflows and outflows were close to historical averages, with no water surpluses or deficits experienced.

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Table 10. BALANCE OF LICENSED WALSANCE OF LICENSED DRAW FROM GLENNIES CREEK

Month	Total Volume Pumped	Underground Alluvial Impacts	Cumulative Volume Extracted	Available Water Determination	Pumping conducted under Uncontrolled Flow*	Pumping conducted under Controlled Flow	Days with uncontrolled flows	Water Purchases	Total Licensed ML	Available Water ¹	Drawdown of Available Water under controlled flows	Drawdown from Total Licensed ML
Column ID	B	C	D	E	F	G	H	I	J	K	M	L
Cell Formula			= Cum (B + C)								= M _{previous} + I - G	= J - D
2008-09 Water Year												
	3.6	5.27	8.9	100% GS & HS, 10% CO	0.0	8.9	NA		480.4	480.4	471.5	471.5
	14.1	5.27	28.3	100% GS & HS, 10% CO	0.0	19.4	NA		480.4	480.4	452.2	452.2
	17.1	5.1	50.5	100% GS & HS, 10% CO	0.0	22.2	NA		480.4	480.4	429.9	429.9
	12.9	5.27	68.6	100% GS & HS, 10% CO	0.0	18.1	NA		480.4	480.4	411.8	411.8
	60.9	5.1	134.7	100% GS & HS, 10% CO	0.0	66.0	NA		480.4	480.4	345.7	345.7
	23.5	5.27	163.4	100% GS & HS, 10% CO	0.0	28.8	NA		480.4	480.4	317.0	317.0
	80.1	5.1	248.6	100% GS & HS, 10% CO	0.0	85.2	NA		480.4	480.4	231.8	231.8
	42.0	4.76	295.4	100% GS & HS, 10% CO	0.0	46.8	NA		480.4	480.4	185.0	185.0
	26.1	5.27	326.7	100% GS & HS, 10% CO	0.0	31.3	NA		480.4	480.4	153.7	153.7
	17.5	5.1	349.3	100% GS & HS, 10% CO	0.0	22.6	NA		480.4	480.4	131.1	131.1
	36.8	5.27	391.4	100% GS & HS, 10% CO	0.0	42.1	NA		480.4	480.4	89.0	89.0
	21.7	5.1	418.1	100% GS & HS, 10% CO	0.0	26.8	NA		480.4	480.4	62.3	62.3
Total at end of Water Year	356.3	61.9	418.1		0.0	418.1						
2009-10 Water Year												
Jul-09	8.5	5.27	8.5	100% GS & HS, 10% CO	0.0		NA		480.4	480.4	471.9	471.9
Aug-09	41.1	5.27	49.6	100% GS & HS, 10% CO	0.0		NA		480.4	480.4	430.8	430.8

¹ Available water is available water determination plus any additional water purchased

GS – General Security

HS – High Security

CO – Carry Over

Table 11. BALANCE OF LICENSED WATER DRAW FROM HUNTER RIVER

Month	Total Volume Pumped	Cumulative Total	Available Water Determination	Pumping conducted under Uncontrolled Flow*	Pumping conducted under Controlled Flow	Total Licensed ML	Available Water ¹	Drawdown of Available Water under controlled flows	Drawdown from Total Licensed ML
A	B	C	D	E	F	G	H	I	J
		= Cum B						= I - F	= G - C
2008-09 Water Year									
Jul-08	15.4	15.4	100% GS & HS, 10% CO	0.0	15.4	386.8	386.8	371.1	371.1
Aug-08	49.5	64.8	100% GS & HS, 10% CO	0.0	49.5	386.8	386.8	321.7	321.7
Sep-08	33.0	97.8	100% GS & HS, 10% CO	0.0	33.0	386.8	386.8	288.7	288.7
Oct-08	28.0	125.7	100% GS & HS, 10% CO	0.0	28.0	386.8	386.8	260.8	260.8
Nov-08	42.6	168.3	100% GS & HS, 10% CO	0.0	42.6	386.8	386.8	218.2	218.2
Dec-08	13.4	181.7	100% GS & HS, 10% CO	0.0	13.4	386.8	386.8	204.8	204.8
Jan-09	23.1	204.8	100% GS & HS, 10% CO	0.0	23.1	386.8	386.8	181.7	181.7
Feb-09	26.5	231.3	100% GS & HS, 10% CO	0.0	26.5	386.8	386.8	155.2	155.2
Mar-09	16.9	248.2	100% GS & HS, 10% CO	0.0	16.9	386.8	386.8	138.3	138.3
Apr-09	31.4	279.6	100% GS & HS, 10% CO	0.0	31.4	386.8	386.8	106.9	106.9
May-09	26.4	306.0	100% GS & HS, 10% CO	0.0	26.4	386.8	386.8	80.5	80.5
Jun-09	32.5	338.6	100% GS & HS, 10% CO	0.0	32.5	386.8	386.8	47.9	47.9
Total at end of Water Year	338.6	338.6		0.0	338.6				
2009-10 Water Year									
Jul-09	14.0	14.0	100% GS & HS, 10% CO	0	14.0	386.8	386.8	372.8	372.8
Aug-09	44.4	58.4	100% GS & HS, 10% CO	0	44.4	386.8	386.8	328.4	328.4

GS – General Security
 HS – High Security
 CO – Carry Over

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Table 12. WATER BALANCE RESULTS FROM 1 SEPTEMBER '08 TO 28 FEBRUARY '09		
Rainfall Over Period	429mm	
Stored Water at Start of Period	67 ML	
Stored Water at End of period	141 ML	
Change in Storage	+74 ML	
Water Movements	Total Flow Over Period (ML)	Average Daily Flow (ML/day)
Water Inflows		
– Rainfall Runoff	173	0.95
– Hunter River Extraction	171	0.94
– Glennies Creek Extraction	203	1.11
– Inflow from Glennies Creek Mine	143	0.78
– Pump out from open cut	111	0.61
– Net Water make from underground operation	87	0.48
Total Inflows	888	4.88
Water Outflows		
– Dust Suppression	239	1.31
– Coal Processing Plant	536	2.95
– Evaporation Losses	39	0.21
Total Outflows	814	4.47
Inflows – Outflows	74	-

Table 13. WATER BALANCE RESULTS FROM 1 MARCH '09 TO 31 AUGUST '09		
Rainfall Over Period	229 mm	
Stored Water at Start of Period	141 ML	
Stored Water at End of period	107 ML	
Change in Storage	-35 ML	
Water Movements	Total Flow Over Period (ML)	Average Daily Flow (ML/day)
Water Inflows		
– Rainfall Runoff	77	0.42
– Hunter River Extraction	167	0.92
– Glennies Creek Extraction	184	1.01
– Inflow from Glennies Creek Mine	192	1.05
– Pump out from open cut	99	0.55
– Net Water make from underground operation	72	0.40
Total Inflows	791	4.35
Water Outflows		
– Dust Suppression	243	1.34
– Coal Processing Plant	560	3.07
– Evaporation Losses	24	0.13
Total Outflows	826	4.54
Inflows – Outflows	-35	-

2.9 HAZARDOUS MATERIAL MANAGEMENT

2.9.1 Fuel Containment

The open cut workshop and fuel storage facilities have a dedicated bunded area for both fuel and oil storage. No changes have been made to these facilities in the reporting period.

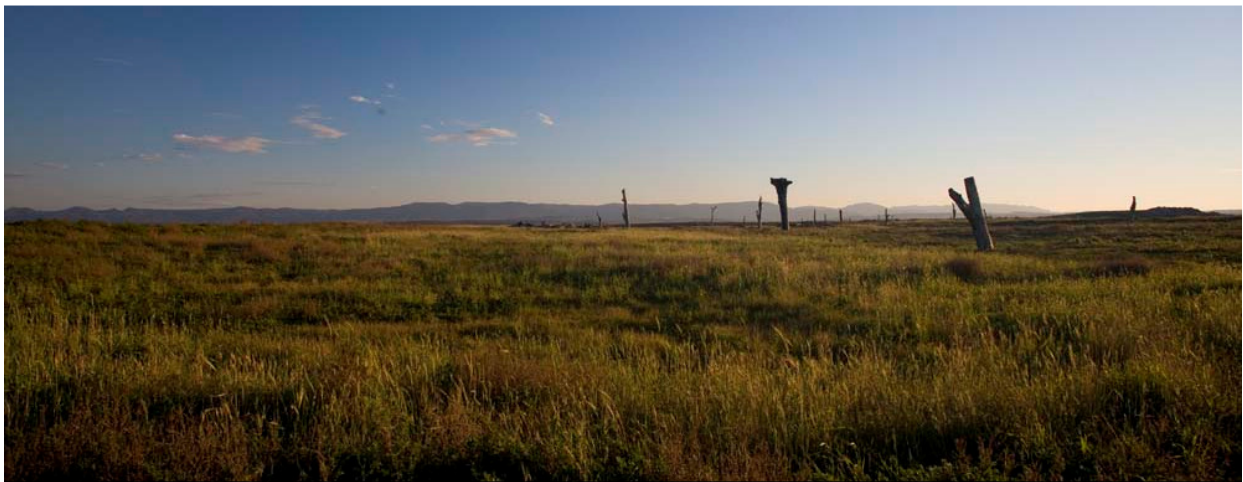
Only small volumes of specialised lubricants are stored at the CHPP. These are stored in a dedicated bunded area.

2.10 OTHER INFRASTRUCTURE MANAGEMENT

Other infrastructure established on site includes a railway siding, various roads, electricity reticulation, site communications and water reticulation system.

Tailings Disposal

Ashton disposes of tailings in Macquarie Generations Void 4 (East) at Ravensworth. Inspections are undertaken to assess the storage capacity of the detention ponds and check for any damage or leaking in the pipeline.



Top of eastern emplacement rehabilitation

3.0 ENVIRONMENTAL MANAGEMENT AND PERFORMANCE

3.1 AIR POLLUTION

3.1.1 Air Pollution Management

Ashton Coal has an approved Air Quality Management Plan. Controls have been put in place in accordance with this plan to control potential causes of air pollution. These controls are considered to have been adequate for the reporting period, these are described below.

Planning Controls

ACOL has implemented the following planning controls:

- A network of real time environmental monitoring stations has been established on site;
- ACOL has developed protocols involving specific operational controls when the wind is emanating from the northwest sector to minimise the effect of emissions on the village of Camberwell. The trigger to stop operations is generated by real-time monitoring.
- Large earth berms and tree plantations between the operations and the village have been constructed and planted;
- External overburden emplacement areas have been completed and rehabilitation will be complete within three years;
- The active mining area continues to be minimised.

Engineering Controls

Engineering controls are implemented on the ACOL site during mining operations. These include but are not necessarily limited to:

- Water carts utilised around the site to keep trafficked areas in a damp condition;
- All stockpiles are kept damp by the use of fixed or mobile water sprays under dry and windy conditions;
- Roads are regularly graded to ensure that loose dust-generating surface material is kept to the lowest level practicable;
- Speed limits on mine roads are restricted to 60 km/hr. Speed limits will be reduced if required to maintain dust emission at minimum levels;
- Roads are clearly delineated to minimise trafficked areas and to ensure that traffic is kept to watered areas;
- Drills are fitted with dust control equipment and graded rock will be used to stem blast holes. Drill rigs use water injection for drilling and drill areas are wet down prior to drilling during dry and windy conditions;
- Haul trucks and other earthmoving equipment with upwardly directed exhausts are used on site to minimise the generation of dust by exhaust emissions;
- All diesel equipment used on site is maintained properly and fitted with appropriate pollution control devices; and
- Underground ventilation fans are monitored to manage particulate emissions.

Operational Controls

Active controls involve the continuous management of dust generating activities to ensure that dust emissions do not affect nearby sensitive receptors. Operations are managed in response to real time air quality and weather data measured within the village and surrounds in accordance with set protocols. Other controls include day-to-day planning of mining activities and taking account of forecast weather and actual weather conditions.

Specific Operational controls include:

- There will be no dumping on high levels of emplacement areas when ten minute average wind speeds exceed 10 m/s and the wind is emanating from the northwest sector;
- Dumping, dozing, loading and haulage operations will be managed to minimise the amount of visible dust exiting the “lease” area; and
- Blasting is to be undertaken using procedures that will involve an assessment of meteorological conditions and will be designed to prevent dust and other emissions causing exceedences, or air quality goals or nuisance effects. Such controls are detailed in the Blasting and Vibration Management Plan.
- Four water carts are used onsite at Ashton Coal. Two of these operate permanently during open cut operations with the remainder being utilised when the conditions necessitate.

Improvements during the Reporting Period

Improvements made during the reporting period to reduce the potential for the generation of dust from site activities include;

- A further 33ha of the Eastern Emplacement Area was rehabilitated,
- Instillation of additional water sprays around the underground surface area to reduce dust generation from roads and lay down areas.

There are daily operational changes which are undertaken as standard practice by the Open Cut Examiner, and CHPP supervisors. These are based on standard scenarios of pit and weather conditions and/or response to complaints. These standard controls are listed above and are inclusive of moving operations within the pit, operation of additional water carts and stockpile water sprays. In addition to these standard scenario controls other higher level operational changes may be undertaken on site at the discretion of the Mine Manager in consultation with the Environmental Officer. These additional higher level operational changes are listed in **Table 14**. Things that may be considered higher level controls include cancellation or change of blast times and shutting down of pit operations.

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Table 14. OPERATIONAL CHANGES RELATING TO DUST IMPACTS		
Date	Issue	Changes Undertaken
15/09/2008	Windy conditions experienced. EO contacted OCE regarding wind speeds.	All dumping relocated to lower dumps. All water carts operating.
22/09/2008	EO identified dust levels increasing.	Ensure water carts operating. All dumping brought to lower levels.
21/10/2008	PM10 levels increasing with strong winds.	Topsoil hauling ceased. Relocate dumping from southern boundary to northern.
31/10/2008	Increasing dust levels in Camberwell, dust complaint received.	Ex 19 shutdown at 9am due to observations from the OCE. At 10:45am dumping relocated to northern boundary. At 1:30pm Ex 21 shutdown. At 1:40pm Ex 20 shutdown. At 30 shutdown at 2pm. Ex 21 and 30 started back up at 4:30pm. Ex 19 started up at 5:30pm. Following this dust levels increased so Ex 19 was shutdown for remainder of day.
3/11/2008	OCE contacted EO following relocation of dumping to an exposed location. EO inspected area and identified that some dust was leaving site.	Dumping in exposed area ceased following inspection.
4/11/2008	Both available 777 water carts broke down within 30 minutes.	Ex 20 and 21 were shutdown for 2 hours to reduce wheel generated dust whilst water carts were repaired.
8/11/2008	Dozer operator observed dust leaving site. Complaint received.	Relocated dumping away from exposed area to the northern boundary.
3/12/2008	Winds increasing rapidly. EO observed dust from topsoil hauling leaving site.	OCE was contacted and hauling ceased.
13/01/2009	Water cart breakdown.	Ex 21 shutdown for 1 hour.
5/03/2009	A regional dust storm followed by mud rain was experienced with dust fallout continuing through to the 6 th .	All water carts operating and overburden movements restricted to protected areas. Ashton maintained a low contribution during the period.
15/04/2009	PM10 levels increasing at Site 1.	Start up remaining water carts. Shutdown Ex 19.
1/07/2009	High wind speeds from 3am onwards causing elevated PM10 levels.	From start of Open Cut operations at 7am all water carts were operating and Ex 30 was shutdown. At 4pm when dust levels upwind of site began to decrease the 994 Loader was shutdown.
19/07/2009	Dust complaint received.	All water carts operating. Ex 30 shutdown following complaint.
12/08/2009	PM10 levels increasing in Camberwell Village	Inspection of Pit and Glennies Creek Rd suggested dust from drill rig leaving site. Drill 5 was shut down and water cart used to focus on area adjacent Glennies Creek Road.
14/08/2009	Dust observed by EO.	Ex 20 shutdown.
15/08/2009	Dust complaint received.	Relocate Ex 20 to northern side of dig face.
15/08/2009	2 nd dust complaint received.	Ex 20 moved to lower dump.
20/08/2009	Spike in PM10 levels observed.	Slow down operations to reduce potential dust emissions.
21/08/2009	Strong winds from the north west. Increasing PM10 levels. Thick dust throughout region causing a visibility problem in pit.	All operations ceased at 8pm.
24/08/2009	Strong north westerly winds. Increasing PM10 levels.	Following inspections and PM10 results Ex 19 was shutdown at 10:30am for remainder of day, 994 Loader shutdown at 10am for remainder 9 hours and Ex 30 shutdown at 3pm for 3.5 hours.

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Table 14. OPERATIONAL CHANGES RELATING TO DUST IMPACTS

Date	Issue	Changes Undertaken
25/08/2009	Strong north westerly winds. Elevated PM10 levels.	Ex 19 shutdown for entire day. Ex 30 shut down at 12pm for remainder of day and Ex 20 shutdown for 1.5 hours at 2pm.
26/08/2009	Strong north westerly winds. Elevated PM10 levels.	Ex 19 and 30 shutdown at start of operations at 7am. Ex 19 remained down for entire day. Ex 30 started back up at 4pm. 994 Loader shutdown for 5 hours.
27/08/2009	Strong north westerly winds. Elevated PM10 levels.	Ex 19 and 30 shutdown for entire day due to wind speeds.
28/08/2009	Strong north westerly winds. Elevated PM10 levels.	Ex 30 shutdown for entire day. Ex 19 shutdown at 3pm for 3 hours and 994 Loader shutdown at 4pm for 2.5 hours.
29/08/2009	Strong winds experienced from the north west followed by high dust levels throughout the region.	All operations ceased at 9:10pm due to dust.

3.1.2 Meteorological Monitoring

Ashton established two meteorological monitoring stations prior to the commencement of construction and operation activities on site. These are located at Monitoring Location 1 in the village of Camberwell and at the Repeater Station on the ridge above the village (see **Figure 5**). The repeater station is the primary meteorological station from which wind direction and speed are assessed for mine operation purposes, whilst Location 1 is primarily used to measure temperature inversions. These weather stations are calibrated annually.

Rainfall

Rainfall data for the reporting period is displayed in the following table.

Table 15. RAINFALL DATA 2008-2009		
Month	Rainfall (mm)	Long Term Median Rainfall *(mm)
Sep-08	73.8	50.4
Oct-08	60.0	34.5
Nov-08	51.6	64.6
Dec-08	50.0	83.4
Jan-09	3.6	69.6
Feb-09	161.6	94.7
Mar-09	84.8	68.5
Apr-09	47.6	41.3
May-09	42.8	43.6
Jun-09	27.4	34.8
Jul-09	20.9	40.8
Aug-09	0.4	31.5
Total	624.5	657.7

*Long Term Median Data from Bureau of Meteorology, for Singleton STP.

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Annual rainfall for the period was below the long term median for Singleton NSW. Whilst in the past two years there has been a return to average rainfall, there were a number of months where rainfall was well below the average. Dry spells were particularly pronounced during December 08 to early February 09 and from May 09 through to August 09.

Wind Speed and Direction

Observed wind patterns for the period are outlined in the following table:

Table 16. WIND PATTERNS BY MONTH 2008- 2009		
Month	Primary Wind Direction (Quadrant)	Secondary Wind Direction (Quadrant)
September	NW	SE
October	NW	SE
November	SE	NW
December	NW	SE
January	SE	-
February	SE	-
March	SE	-
April	SE	NW
May	NW	SE
June	NW	-
July	NW	-
August	NW	-

Winds generally followed a consistent trend to the longterm climatic conditions experienced in the Hunter Valley with a dominance of north westerlies from mid Autumn through to mid Spring and southerlies through October to April. There was however a greater occurrence of north westerlies during the summer period with December 2008 unusually dominated by north westerlies.

3.1.3 Dust Criteria and Monitoring

A network of real-time environmental monitoring stations was installed prior to the commencement of operations and is utilised to ensure continued compliance with the criteria established in the Development Consent and the EPL.

3.1.3.1 Particulate Matter < 10µg (PM₁₀)

The criteria for particulate matter less than 10µm (PM₁₀) is as follows:

- Annual mean less than 30µg/m³ on a cumulative basis,
- 24 hour average contribution from Ashton Mine not to exceed 50µg/m³, and
- Maximum cumulative 24 hour average not to exceed 150µg/m³.

Locations of PM₁₀ monitoring stations are detailed on **Figure 5** and Table 17.

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Table 17. LOCATION OF PM ₁₀ MONITORING STATIONS	
Monitoring Station No	Location
1	Camberwell village (north)
2	Camberwell village (south)
3	Property east of Camberwell village
4	On site north of Eastern Emplacement Area
7	On site at country end of rail siding
8	Camberwell village (east)

Monitoring Locations 4 and 7 are situated to the north of mining operations, immediately south of the Main Northern Railway and are intended to monitor the incoming concentrations of PM₁₀ dust when the prevailing winds are from the northwest, which is the wind direction that presents the greatest risk of impact to the village of Camberwell.

The Ashton contribution to the concentration of PM₁₀ at community sites is calculated by subtracting the incoming dust concentration (the lowest level recorded at sites 4 or 7 is used for this calculation) from the ambient level of dust concentration at the four community sites. This is a very conservative calculation.

PM10 data for the reporting period is presented below. Monitoring results indicate that the annual cumulative average at all 4 Community sites (1, 2, 3 and 8) was below the annual criteria of 30µg/m³. There were no recorded exceedences of the 24hour average criteria of 150µg/m³ at all Community sites. On three occasions the 24hour Average Ashton Contribution of 50µg/m³ was exceeded at either site 1 or site 8 or both..

The first exceedence of the Ashton Contribution occurred at Site 1 (53 µg/m³) on the 15th September 2008. Real-time trends at Site 1 and 7 show that the exceedence of criteria is directly related to strong winds and a dust storm which presented towards the end of operations (approx. 9pm). Prior to the dust storm coming through the area PM10 levels were within criteria. At 10pm when Open Cut operations shut down the rolling 24hr PM10 average at Sites 1 and 7 was 67.9µg/m³ and 27.3µg/m³ respectively. This equates to an Ashton Contribution of 40.6µg/m³. However following the dust storm the 24hr average PM10 levels at all sites increased significantly causing an exceedence of the Ashton contribution criteria at Site 1. As Open Cut operations were shutdown at the time of the sharp increase in dust levels it indicates the operations onsite were not the cause of the exceedence and the dust storm has had a significant impact on PM10 levels in Camberwell.

The second exceedence occurred at Sites 1 (55 µg/m³) and 8 (62 µg/m³) on the 31st October 2008. The following sequence of events and controls were implemented for the day.

- Wind speeds strengthened significantly at 9am. All monitoring sites including those upwind recorded an increase in PM10 levels.
- At 9am Excavator 19 was shutdown to reduce ACOL contribution to PM10 levels.
- At 10:45am dumping was relocated into pit.

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- Dust levels decreased until approximately 1pm when they spiked back up as wind speeds continued to increase.
- At 1:30pm Excavator 20 was shutdown,
- At 1:40 Excavator 21 was shutdown
- At 2pm Excavator 30 was shutdown
- By 2pm all operations in the Ashton Open Cut pit were ceased.
- Dust levels once again began to decline.
- Following shift change at 4:30pm Excavator 21 and 30 (coal unit) were started back up. Dust levels did not increase.
- Excavator 19 was then started up at 5:30pm. Real-time dust levels increased following this so 19 was shut back down for the remainder of the day.
- Excavator 20 remained down for the whole day.

As shown above all operations in the open cut pit were ceased for a large portion of the day however the Ashton contribution was still exceeded. It is suspected that other activities to the north of Ashton Coal's operations are impacting on cumulative dust levels in Camberwell, however Ashton's background site 7 did not seem to be indicative of the up wind impacts. To support this, it was noted on this day that the two upwind Sites 4 and 7 recorded 24hr averages of 62 $\mu\text{g}/\text{m}^3$ and 38 $\mu\text{g}/\text{m}^3$ respectively. Historically these two sites have shown only slight variations and Ashton has historically in accordance with its management plans has used the lower of the two sites, generally Site 7, alone for background data as it has provided a more conservative Ashton contribution assessment. It appears evident now that this approach no longer provides a reasonable indication of background levels as site 4, during days dominated by north westerly winds, is showing significantly higher levels of PM10 than Site 7. The average of Sites 4 and 7 on the 31st October was 50 $\mu\text{g}/\text{m}^3$. If this average was used as the background PM10 level, The Ashton contribution at Site 1 would have been 43 $\mu\text{g}/\text{m}^3$ and Site 8 50 $\mu\text{g}/\text{m}^3$.

The final exceedence was recorded at Site 1 (53 $\mu\text{g}/\text{m}^3$) on the 25th August 2009. Heavy winds were experienced from 2am onwards on the 25th with a dust storm following shortly after at 3am. The effects of the dust storm were recorded at all TEOMs till approximately 11am. At the start of Open Cut operations all water carts were running and Excavator 19 was not started up. At 12pm Excavator 30 was shutdown to reduce PM10 levels in Camberwell further following the reduction in dust loads from the dust storm. At 2pm Excavator 20 was also shutdown. From this point on 10 minute average PM10 levels at Site 1 ranged between approximately 30 $\mu\text{g}/\text{m}^3$ and 100 $\mu\text{g}/\text{m}^3$ with an average of 75 $\mu\text{g}/\text{m}^3$. The 24 hour average for Site 1 on the 25th August 2009 was 104 $\mu\text{g}/\text{m}^3$. The 10 minute PM10 average at Site 1 remained below this figure from the time the dust storm dissipated. This indicates the 24 hour average recorded at Site 1 was the result of high dust levels during the dust storm and not the result of lower PM10 levels recorded once the dust storm had cleared.

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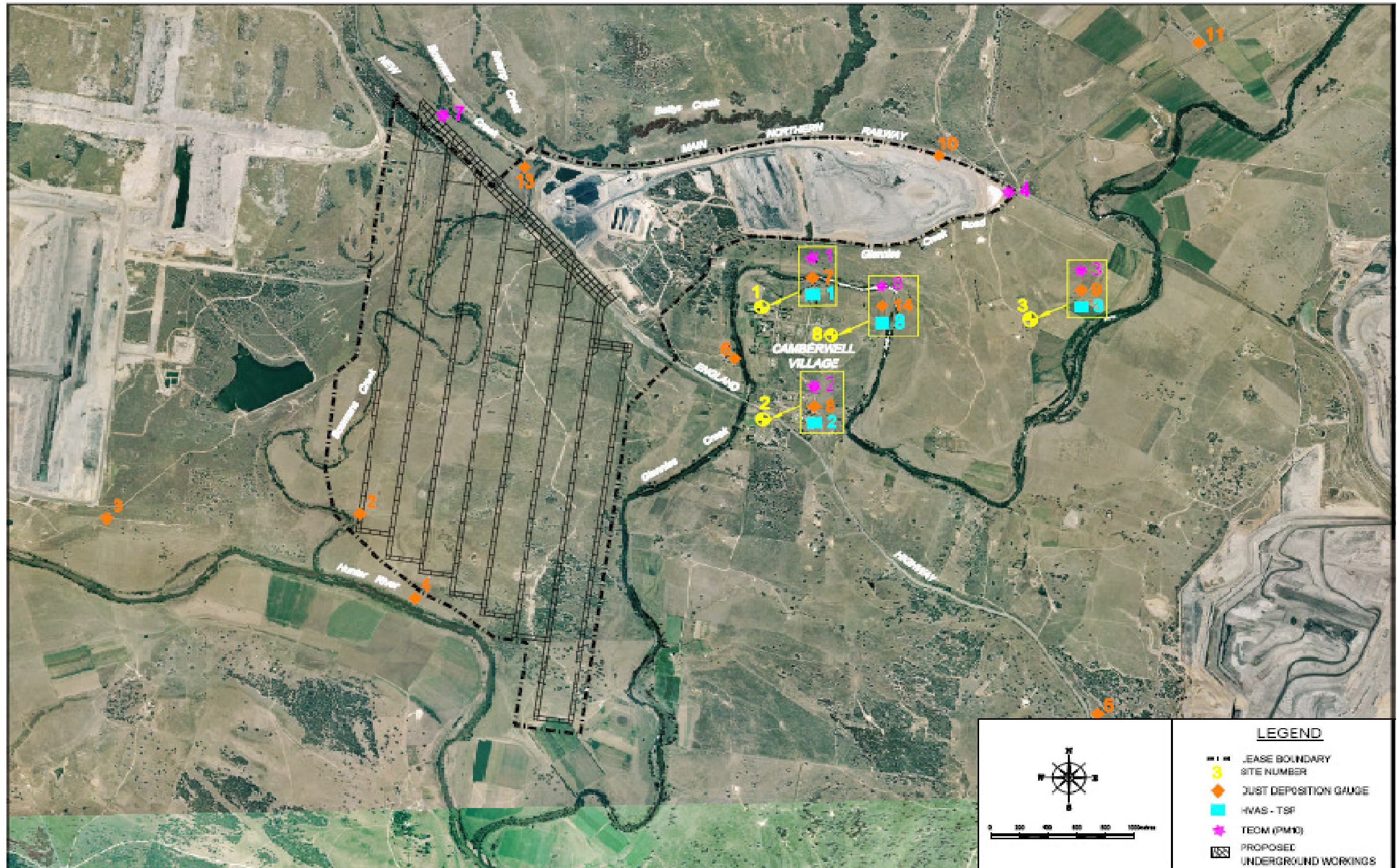


Figure 4. Air Quality Monitoring Locations

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Historic Trends

Long term PM 10 results from 1996 to 2001 are available for a monitoring location in close proximity to ACOL’s Site 1. These results are shown below. It is difficult to undertake a direct comparison of these results with the the ACOL monitoring results as the historic results are based on the operations of a HVAS PM10 operated every 6 days and the ACOL monitoring system is a realtime monitoring system operating 24 hours a day 7 days a week . The results however do give an indication of the historic PM10 levels within the Village of Camberwell prior to the commencement of the ACOL operations. As seen in the graph below there are several periods in time where the historic annual average is above the cummulative annual average criteria of 30µg/m³.

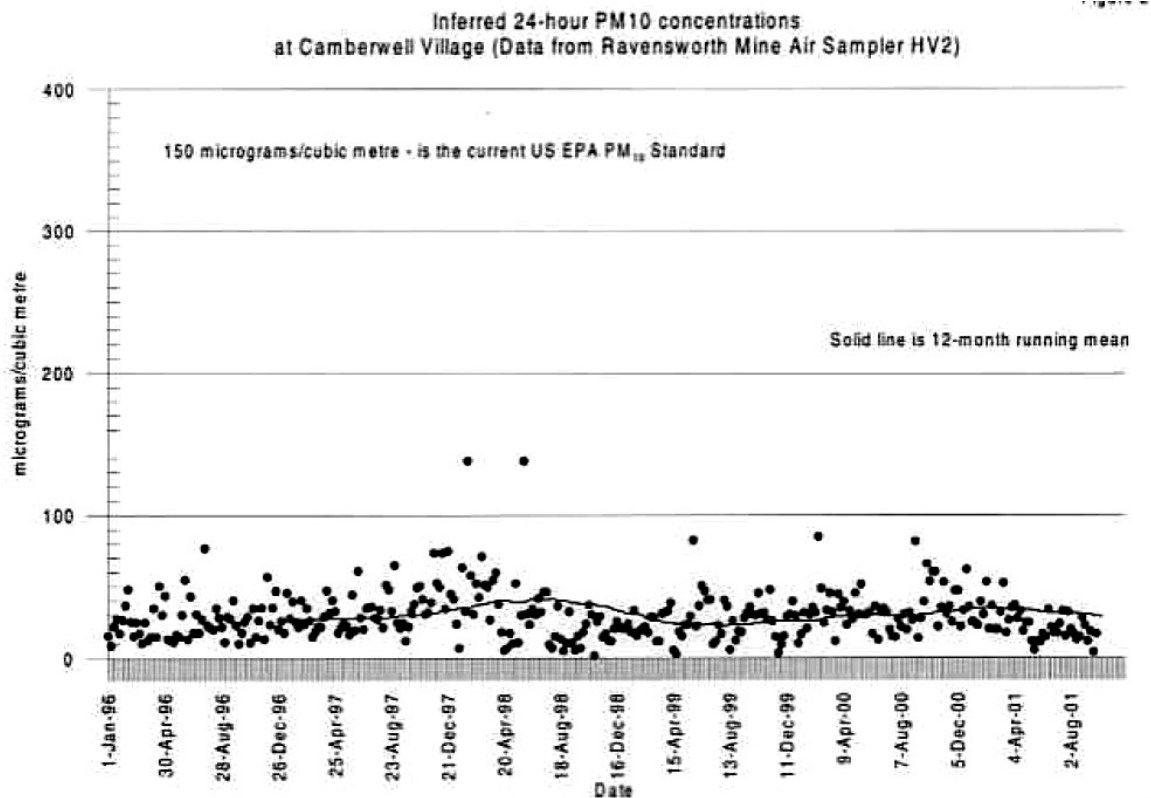
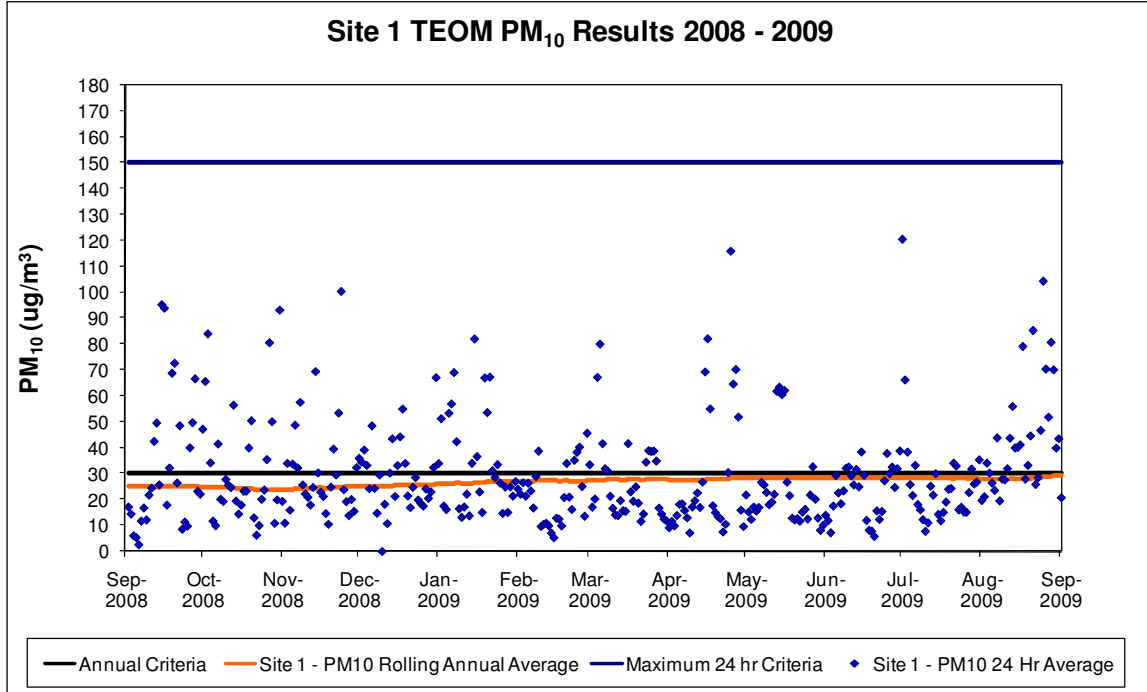


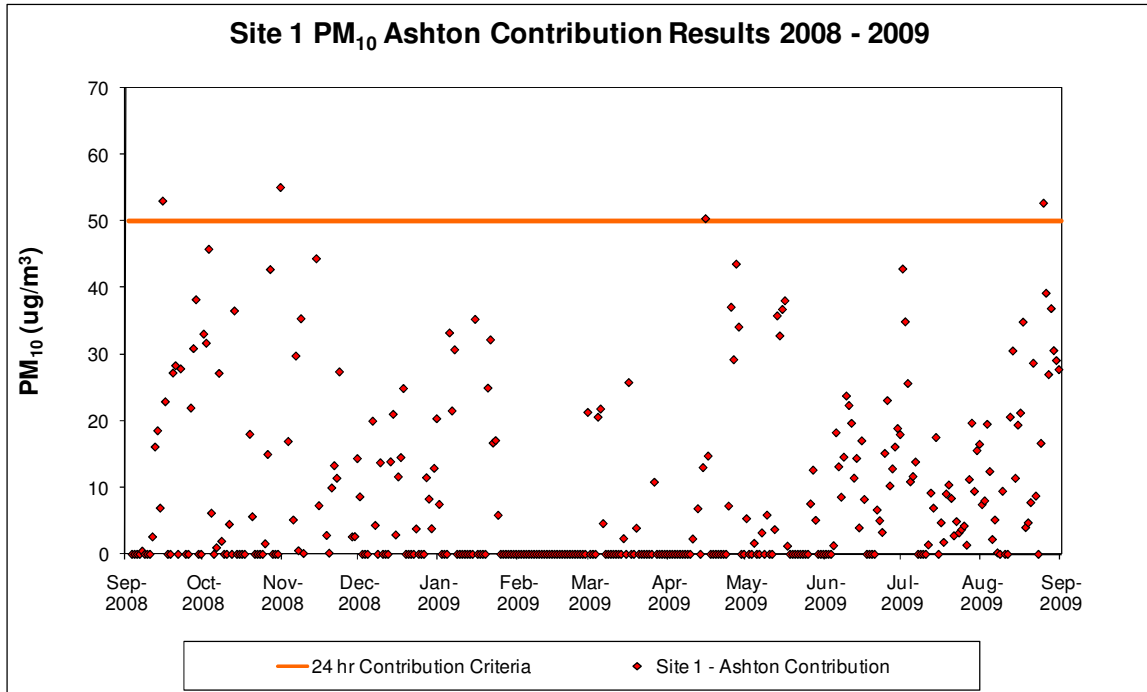
Figure 3

Site 1 TEOM

Site 1 is located in the northern portion of the village of Camberwell. 99% of data was captured for Site 1 for the reporting period. Results of PM₁₀ monitoring at this location were as follows.



The rolling average PM₁₀ results for Site 1 demonstrates compliance with the annual goal of 30µg/m³. Site 1 also demonstrated compliance with the maximum 24hr Criteria of 150µg/m³.

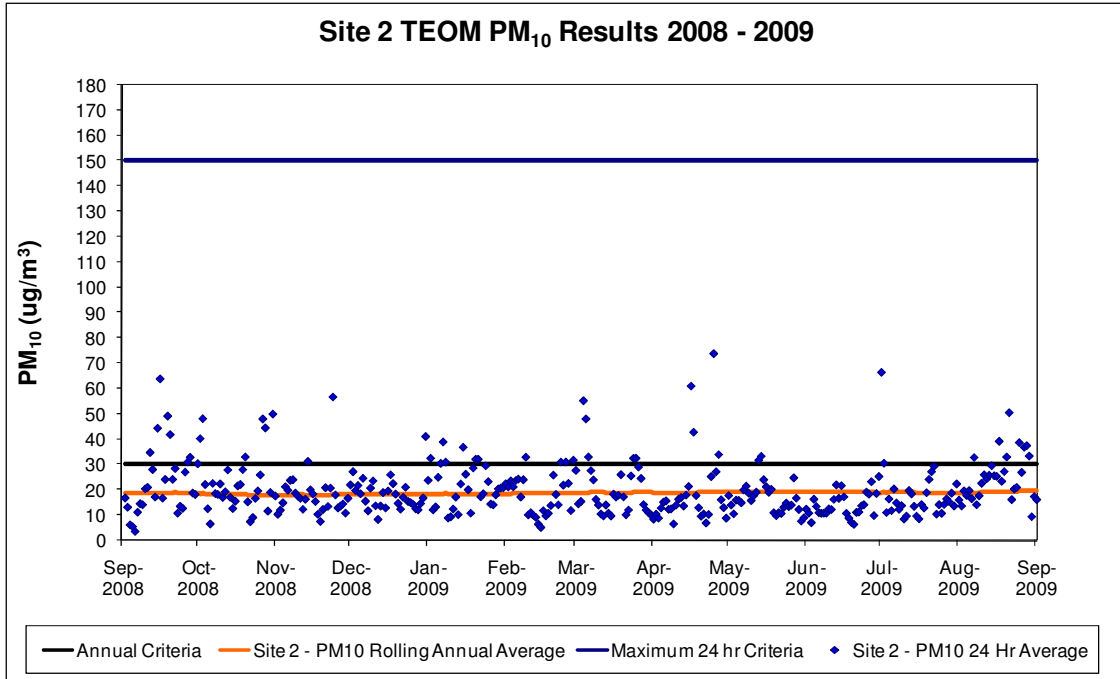


Note: Ashton Contributions are calculated where there is a NW wind direction otherwise the contribution is plotted as 0.

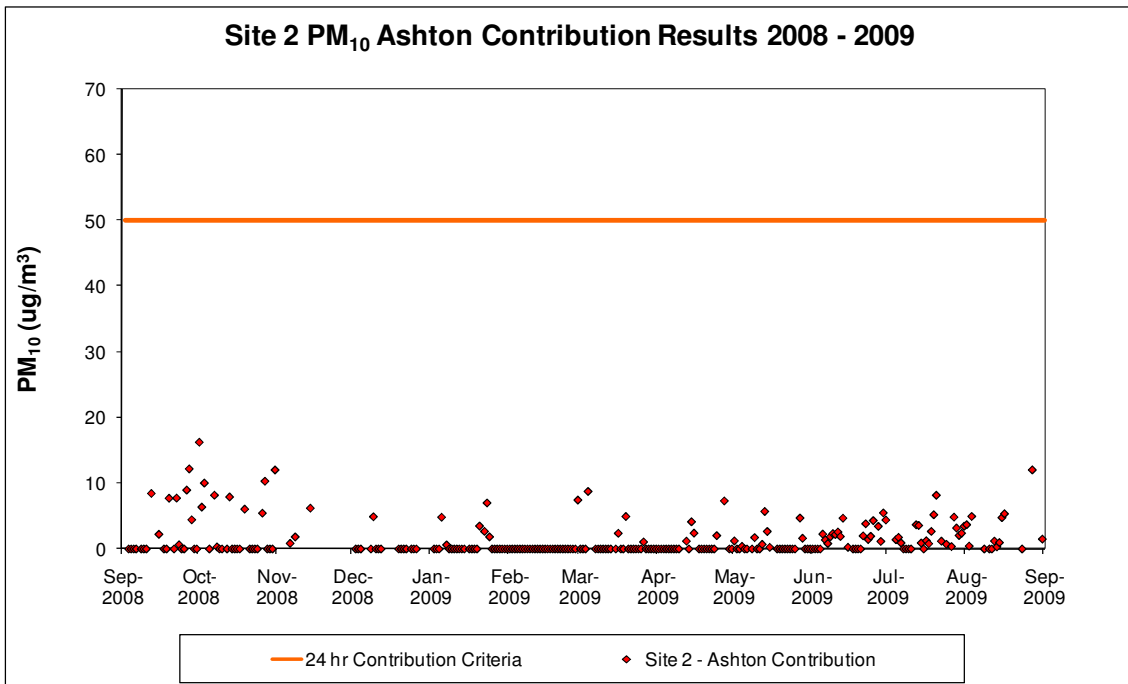
There were 3 instances where Ashton’s community contribution was recorded above the criteria of 50µg/m³. These exceedences are addressed above.

Site 2 TEOM

Site 2 is located in Camberwell village on the south side of the New England Highway. 100% of data was captured from Site 2 for the reporting period. Results of PM₁₀ monitoring at this location were as follows:



The rolling average PM₁₀ results for Site 2 demonstrates compliance with the annual criteria of 30µg/m³ and with the maximum 24 hour criteria of 150µg/m³.



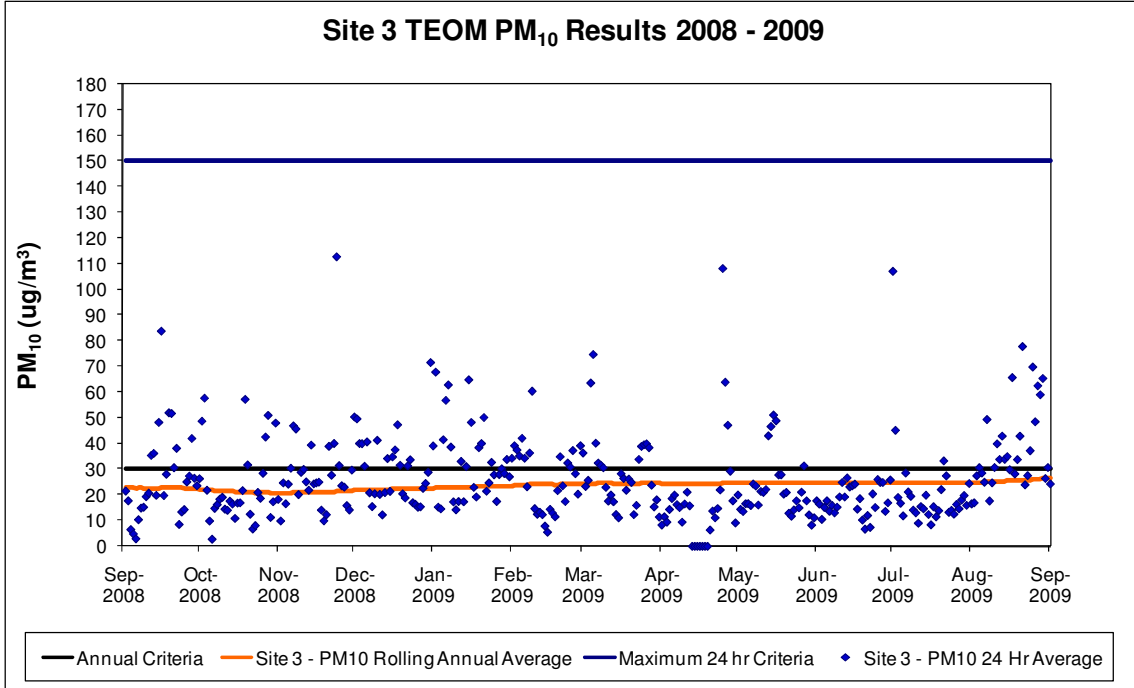
Note: Ashton Contributions are calculated where there is a NW wind direction otherwise the contribution is plotted as 0.

Site No 2 is located close to the New England Highway, and may be influenced by passing traffic when the winds emanate from the north, however Ashton remained in compliance with the criteria of 50µg/m³ at all times.

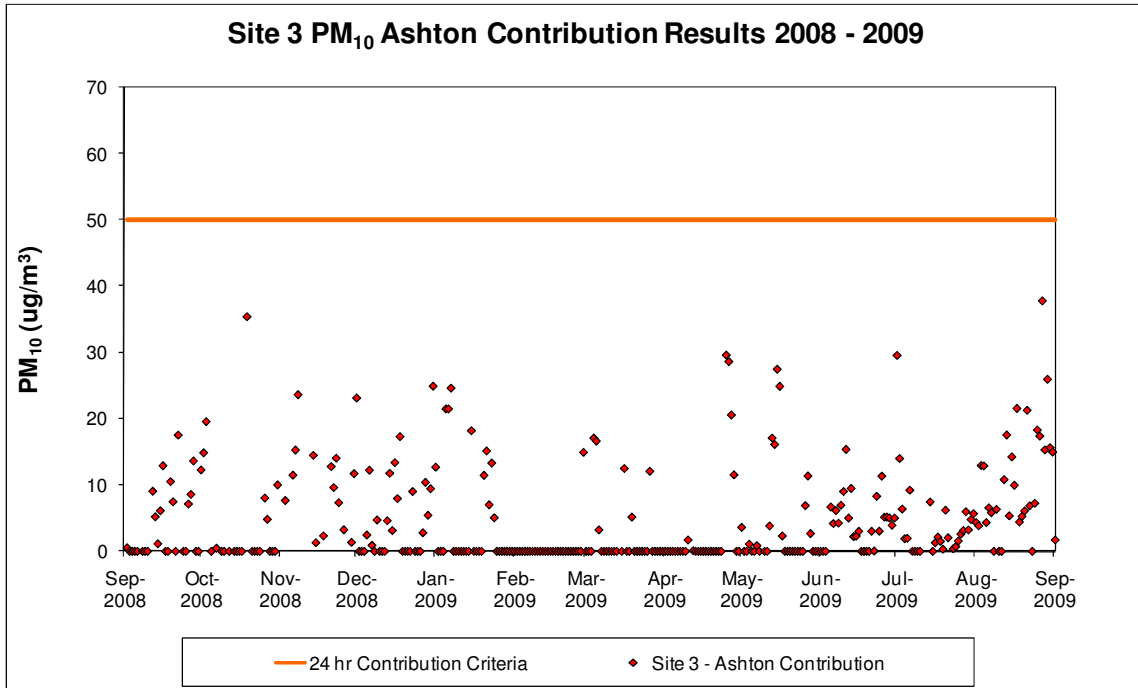
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Site 3 TEOM

Site 3 is located on a farming property to the east of the Eastern Emplacement Area. 98% of data was recovered at Site 3 for the reporting period. Results of PM₁₀ monitoring at this location were as follows:



The rolling average PM₁₀ results for Site 3 demonstrates compliance with the annual criteria of 30µg/m³. Site 3 also complied with the maximum 24 hour criteria of 150µg/m³.

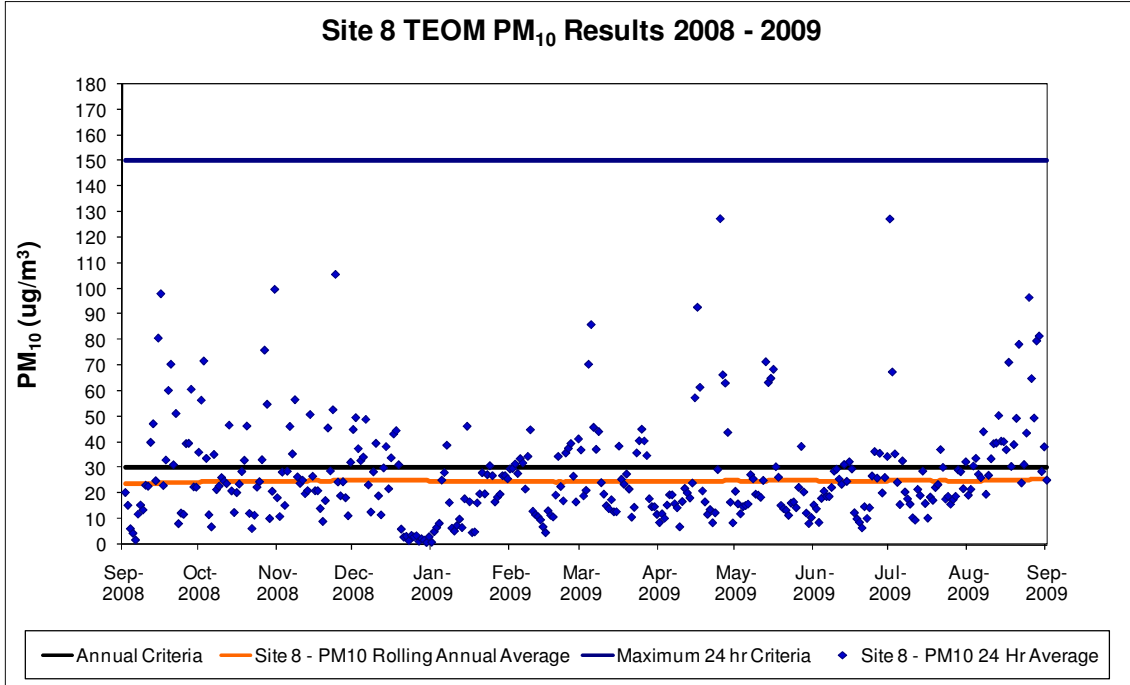


Note: Ashton Contributions are calculated where there is a NW wind direction otherwise the contribution is plotted as 0.

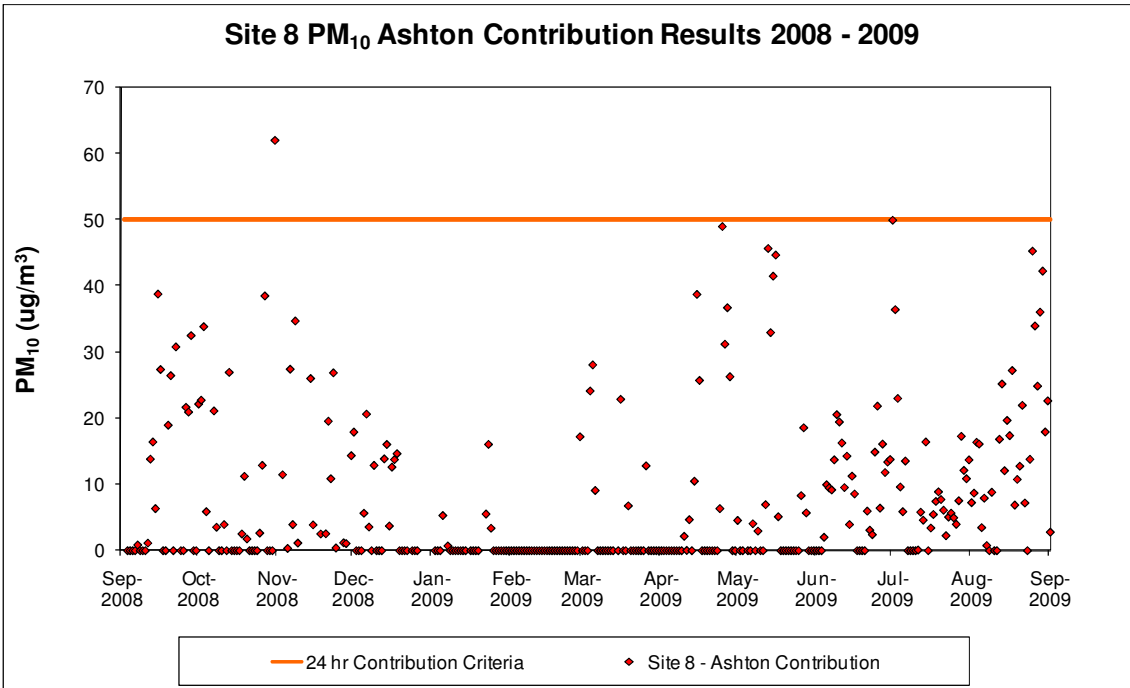
Site 3 remained in compliance with the Ashton contribution criteria of 50µg/m³ at all times.

Site 8 TEOM

Site 8 is located on the eastern side of Camberwell Village. The site recorded a 100% data recovery rate.



Site 8 showed compliance with the annual criteria of $30\mu\text{g}/\text{m}^3$. Site 8 also complied with the maximum 24 hour criteria of $150\mu\text{g}/\text{m}^3$.



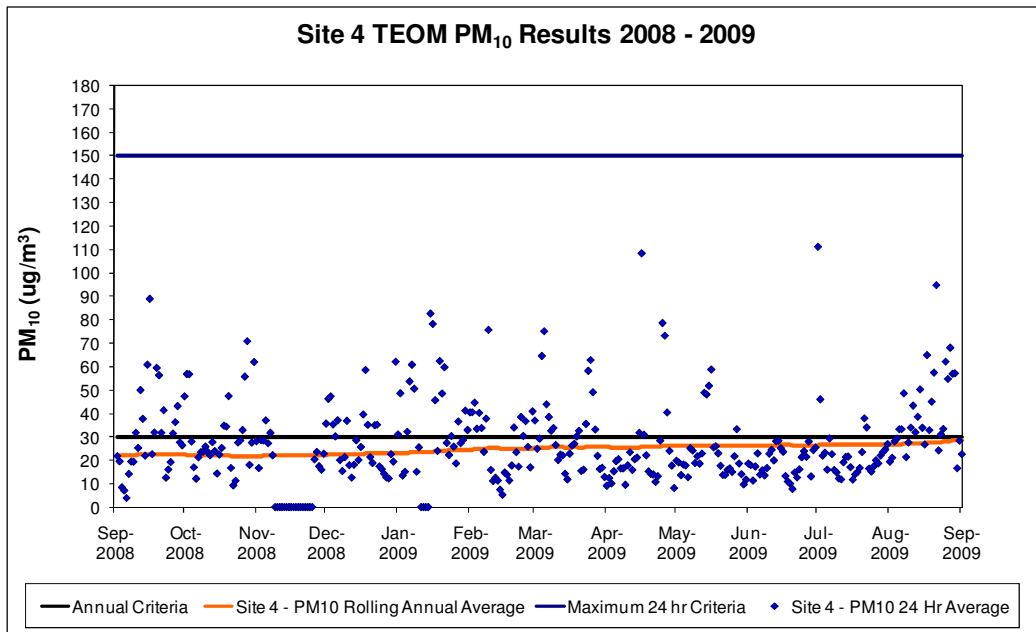
Note: Ashton Contributions are calculated where there is a NW wind direction otherwise the contribution is plotted as 0.

One exceedence of Ashton’s community contribution ($50\mu\text{g}/\text{m}^3$) was recorded at site 8 during the reporting period. The result of $62\mu\text{g}/\text{m}^3$ was recorded on the 31 October 2008. Details regarding the exceedence are addressed above.

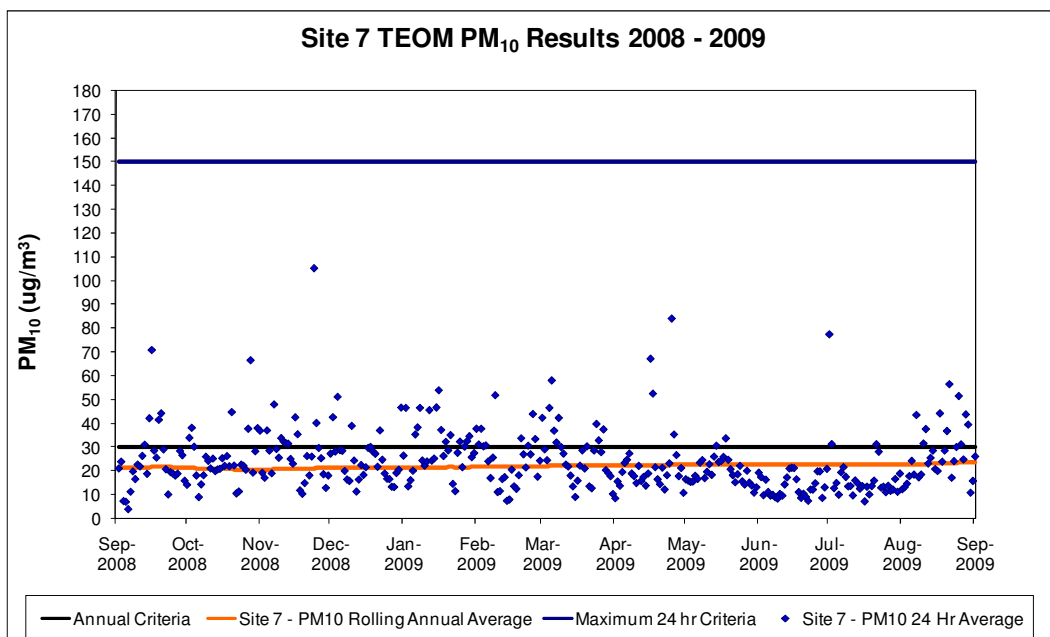
Site 4 / 7 TEOMs (On-Site)

The annual criteria of 30µg/m³ is not expected to apply to onsite TEOMS however the annual criteria was still achieved at Site 4 and 7. Comparison of Site 4 and 7 results show why Site 7 is selected for most calculations of Ashton’s Contribution. It is generally the lowest of the background TEOMs.

Site 4 is located on the eastern tip of the eastern emplacement area, next to Dam 5/6. 94 % of data was recovered at site 4 for the reporting period. Data loss was caused by a power surge which damaged the unit.



Site 7 is located adjacent to the Main Northern Railway at the country end turnout. The site is remote from mining operations. 98% of data was recovered from this site during the monitoring period.



3.1.3.2 Total Suspended Particulate Matter (TSP)

The High Volume Air Samplers (HVAS) operate for a 24 hour period on every sixth day (specified DECC schedule). HVAS measure cumulative dust levels from all sources. The criterion applicable to these gauges is an annual average of 90µg/m³. 100% of data was recovered at sites 1, 2, 3 and 8. 24 hour results are presented below. There is no 24 hr criterion for Total Suspended Particulates.

The locations of High Volume Air Samplers to monitor TSP are detailed in **Figure 5** above. They are as follows:

Table 18. LOCATION OF TSP MONITORING STATIONS	
Monitoring Station No	Location
1	Camberwell village (north)
2	Camberwell village (south)
3	Property east of Camberwell village
8	Camberwell village (east)

Historic Trends

Historic TSP results are available for a location close to Site 1 in Camberwell Village. The results for this site are shown below. They show historically prior to the commencement of the ACOL operations the annual average has exceeded the 90µg/m³ (annual mean) criteria at various times.

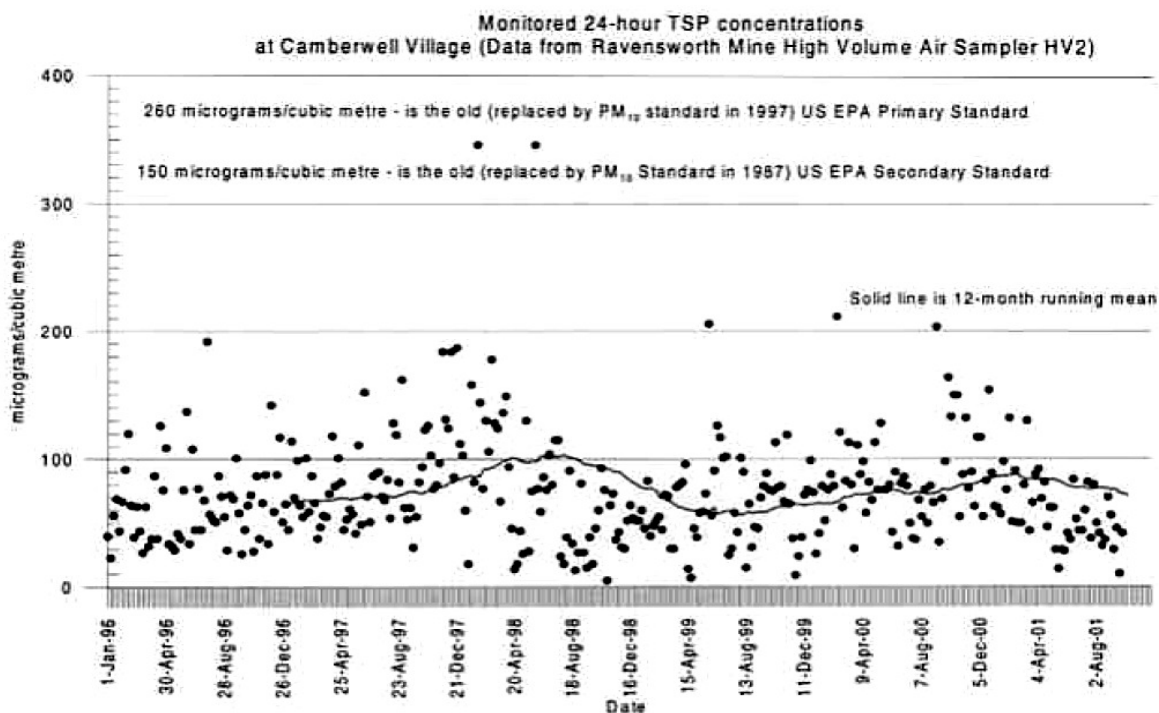
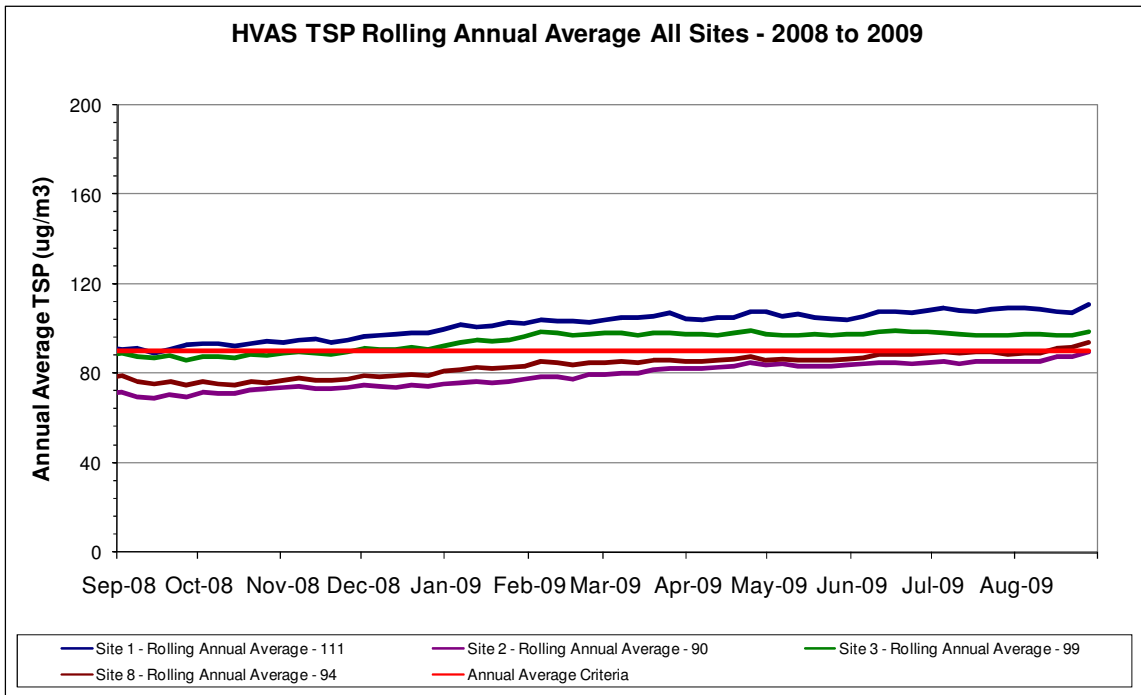
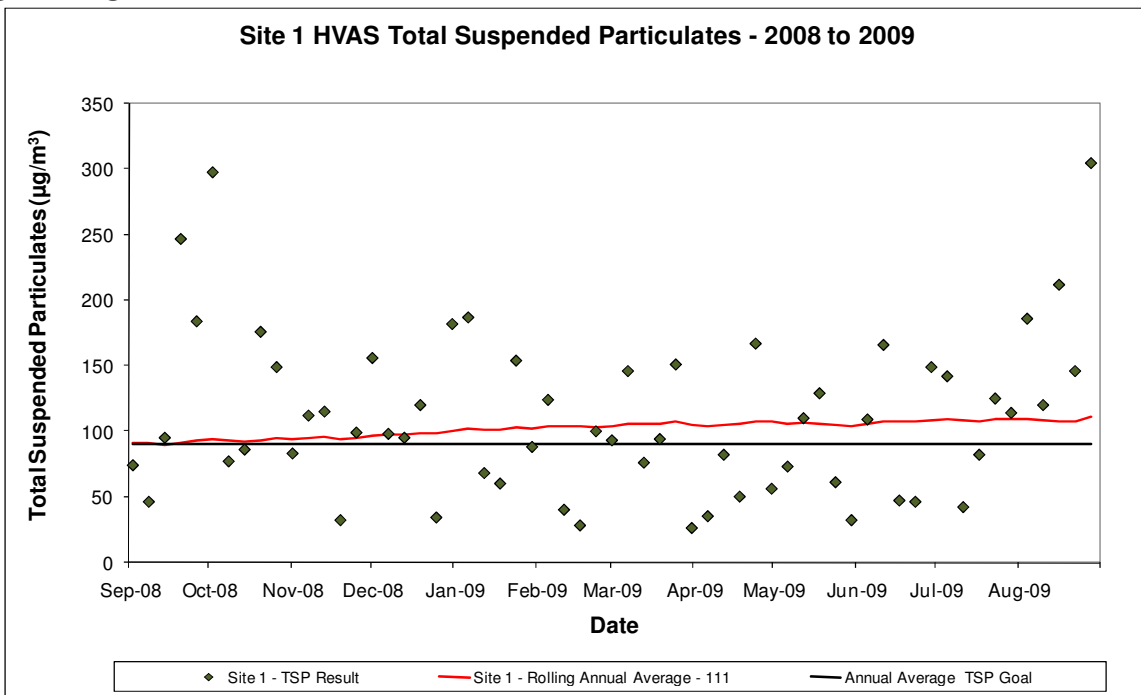


Figure 2

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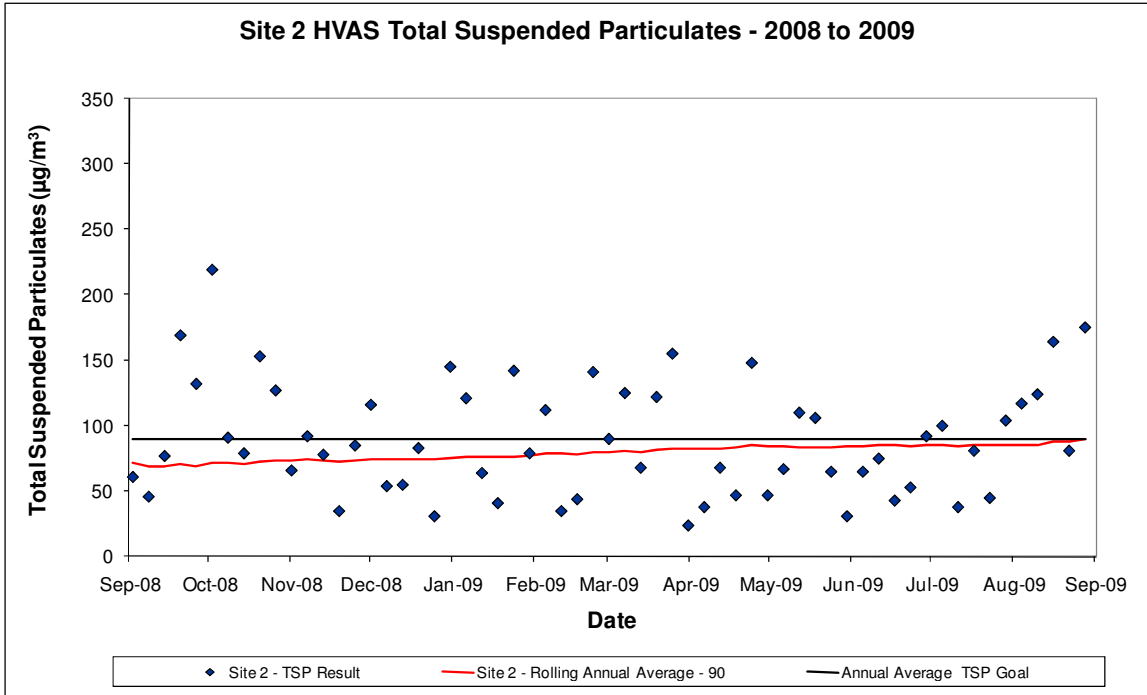
Site 1 HVAS



The cumulative rolling annual average for TSP at site 1 demonstrated non-compliance with the annual average criteria of 90µg/m³. The annual average for the reporting period was 111µg/m³. The figure above shows a general increase in TSP results at Site 1 over the past 12 months.

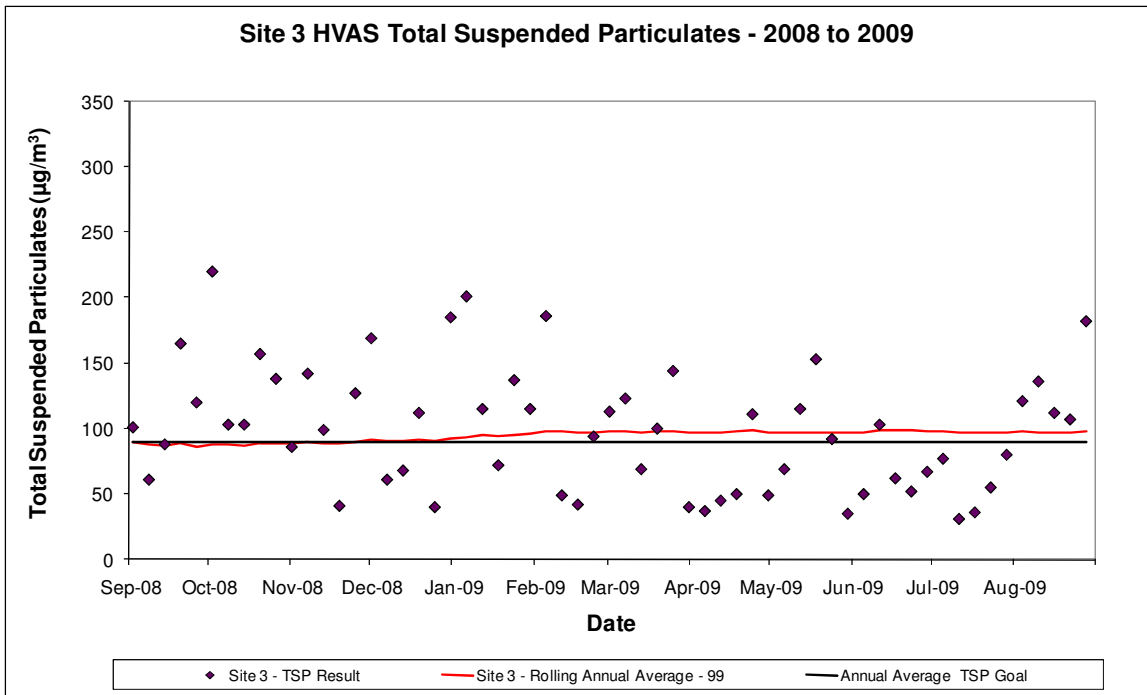
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Site 2 HVAS



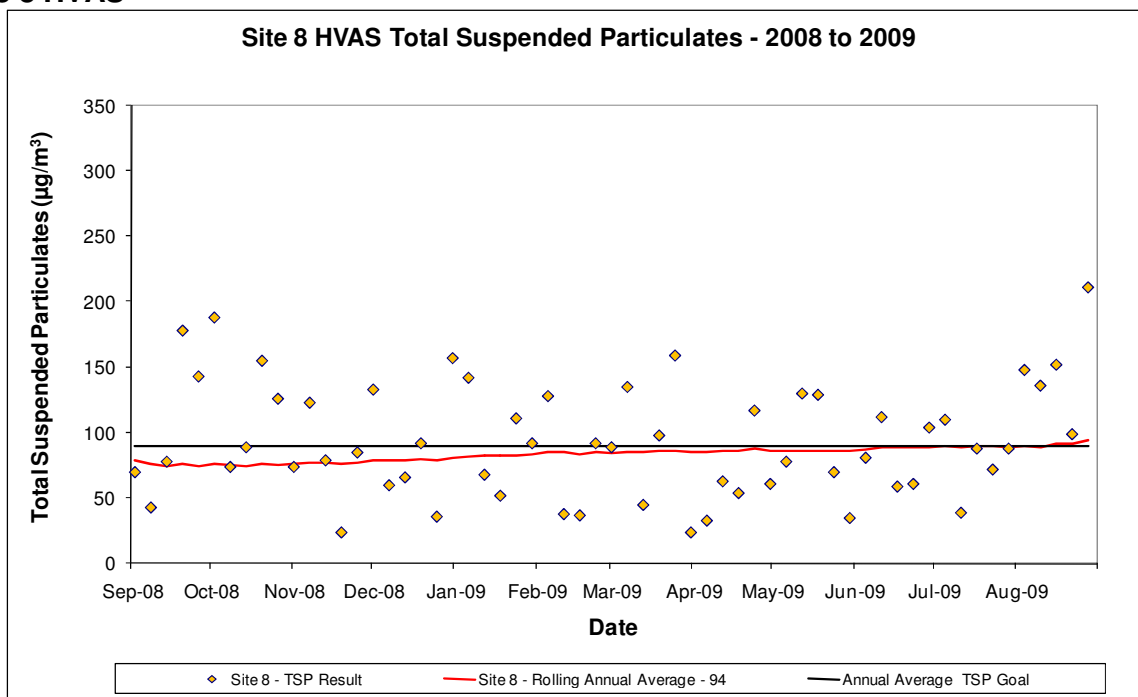
The cumulative rolling average TSP results for Site 2 complied with the annual average TSP goal of 90µg/m³ for the reporting period. The annual average for the reporting period at Site 2 was 90µg/m³.

Site 3 HVAS



The cumulative rolling average TSP results for Site 3 exceeded the annual average TSP goal of 90µg/m³ during the reporting period. The annual average for the reporting period at Site 3 was 99µg/m³.

Site 8 HVAS



The cumulative TSP rolling annual average exceeded Ashton Coals criteria (90µg/m³) for the reporting period. The annual average at Site 8 for the reporting period was 94µg/m³.

3.1.3.3 Dust Deposition Gauges

The location of Dust Deposition gauges is detailed on **Figure 5**. They are as follows:

Table 19. LOCATION OF DUST DEPOSITION GAUGES	
Monitoring Station No	Location
2	Ravensworth property west of open cut
4	Ashton property near Hunter River
5	New England Highway SE of Camberwell village
6	St Clements Church
7	TEOM site 1 - Camberwell Village
8	TEOM site 2 - Camberwell Village
9	TEOM site 3 – Property east of Camberwell
10	On site - TEOM site 4 (near East OB dump)
11	NE of Emplacement Area on Glennies Creek Rd
13	On site – TEOM site 7 (country end turnout)
14	TEOM site 8 – Camberwell Village

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Data recovery for all depositional dust gauges is as follows:

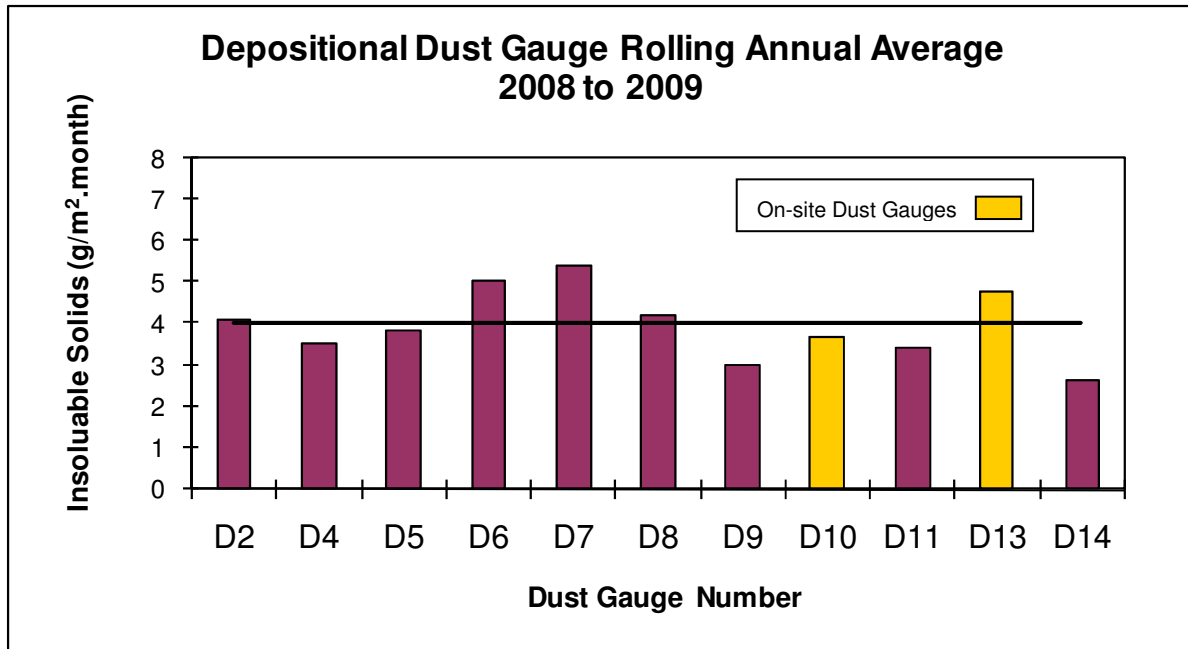
Table 20. DUST DEPOSITION GAUGES – EXTENT OF CONTAMINATION		
Gauge Number	Data Availability (%)	Data Loss
D2	100	NA
D4	100	NA
D5	100	NA
D6	100	NA
D7	100	NA
D8	100	NA
D9	100	NA
D10	100	NA
D11	100	NA
D13	100	NA
D14	100	NA

The following table shows the annual average insoluble solids for each gauge over the 2008 – 2009 reporting period. Dust gauge D2 (annual average = 4.1g/m²/month) is located in close proximity to a neighbouring operation and due to the progression of their pit, now lies within the 4g/m²/month impact zone identified in their environmental impact assessment. Gauges D6, D7 and D8 exceeded the annual average of 4g/m²/month for the reporting period. During the August dust monitoring period (11/08/2009 to 10/09/2009) two separate dust storm events occurred that led to ACOL shutting down all operations. These were observed on the 21 August and 29 August at around 8:00pma and 9:00pm respectively. High depositional dust results recorded in the August 09 period will have been significantly impacted by these two events.

Table 21. INSOLUBLE SOLIDS ANNUAL AVERAGE RESULTS		
(EXCLUDING CONTAMINATED GAUGES)		
Dust Gauge	Annual Average EIS Background Values (g/m².month)	Annual Average 2007– 2008 (g/m²/month)
D2	3.5	4.1
D4	1.6	3.5
D5	2.0	3.8
D6	1.5	5.0
D7	NA	5.4
D8	NA	4.2
D9	NA	3.0
D10 (on site)	NA	3.7
D11	NA	3.4
D13 (on site)	NA	4.8
D14	NA	2.6

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The annual average dust deposition for all depositional dust gauges is as follows:



3.2 EROSION AND SEDIMENT

3.2.1 Erosion and Sediment Management

All runoff from disturbed areas is collected in a series of sedimentation and settling dams established in accordance with the Erosion and Sediment Control Management Plan (ESCP). Monitoring indicates that these dams have been working effectively in controlling sediment flow. Gypsum has been used in drains where there is a high potential for sediment movement during heavy rainfall events. The Gypsum works by dropping the sediment out of entrainment in the overland water flow.

Major runoff storage dams are located in the following areas:

- On the north-west side of the CHPP (Process Water Dam and Settling Dam);
- On the eastern side of the Eastern Emplacement Area (Dam 5/6); and

In addition, there are a number of minor runoff capture dams that intercept runoff water before it departs site. These dams also contain sedimentation control devices in the form of hay bales, silt fences, etc where required.

3.2.2 Erosion and Sediment Monitoring

Visual inspections are undertaken on a regular basis and stream water quality results are presented in the following section.

3.3 SURFACE WATER POLLUTION

3.3.1 Surface Water Management

Ashton Coal has an approved Site Water Management Plan. Controls have been put in place in accordance with this plan to control potential causes of water pollution. These controls are considered to have been adequate for the reporting period.

3.3.2 Surface Water Monitoring

The water monitoring locations are detailed in **Figure 5** as well as the following table:

Table 22. SURFACE WATER MONITORING LOCATIONS		
Monitoring Station	Stream	Location
SM 1	Bettys Creek	Glendell land upstream of Ashton
SM 2	Bettys Creek	Just upstream of confluence with Bowmans Creek
SM 3	Bowmans Creek	Water pool at north west corner of mine lease
SM 4	Bowmans Creek	Water pool just downstream of New England Highway
SM 5	Bowmans Creek	Halfway down Ashton property
SM 6	Bowmans Creek	Just upstream of confluence with Hunter River
SM 7	Glennies Creek	Upstream of Ashton Mine
SM 8	Glennies Creek	Halfway down Ashton property
SM 9	Hunter River	Upstream of confluence with Bowmans Creek
SM 10	Hunter River	Downstream of confluence with Bowmans Creek
SM 11	Glennies Creek	Upstream of confluence with Hunter River
SM 12	Hunter River	Downstream of confluence with Glennies Creek
SM 13	Hunter River	Upstream of confluence with Glennies Creek midway between Bowmans Creek and Glennies Creek.
SM 14	Hunter River	Directly Upstream of confluence with Glennies Creek

Abbreviations used within Section 3.3 are as follows:

μS/cm microsiemens per centimetre
mg/l milligrams per litre
TDS Total Dissolved Solids
TSS Total Suspended Solids
EC Electrical Conductivity

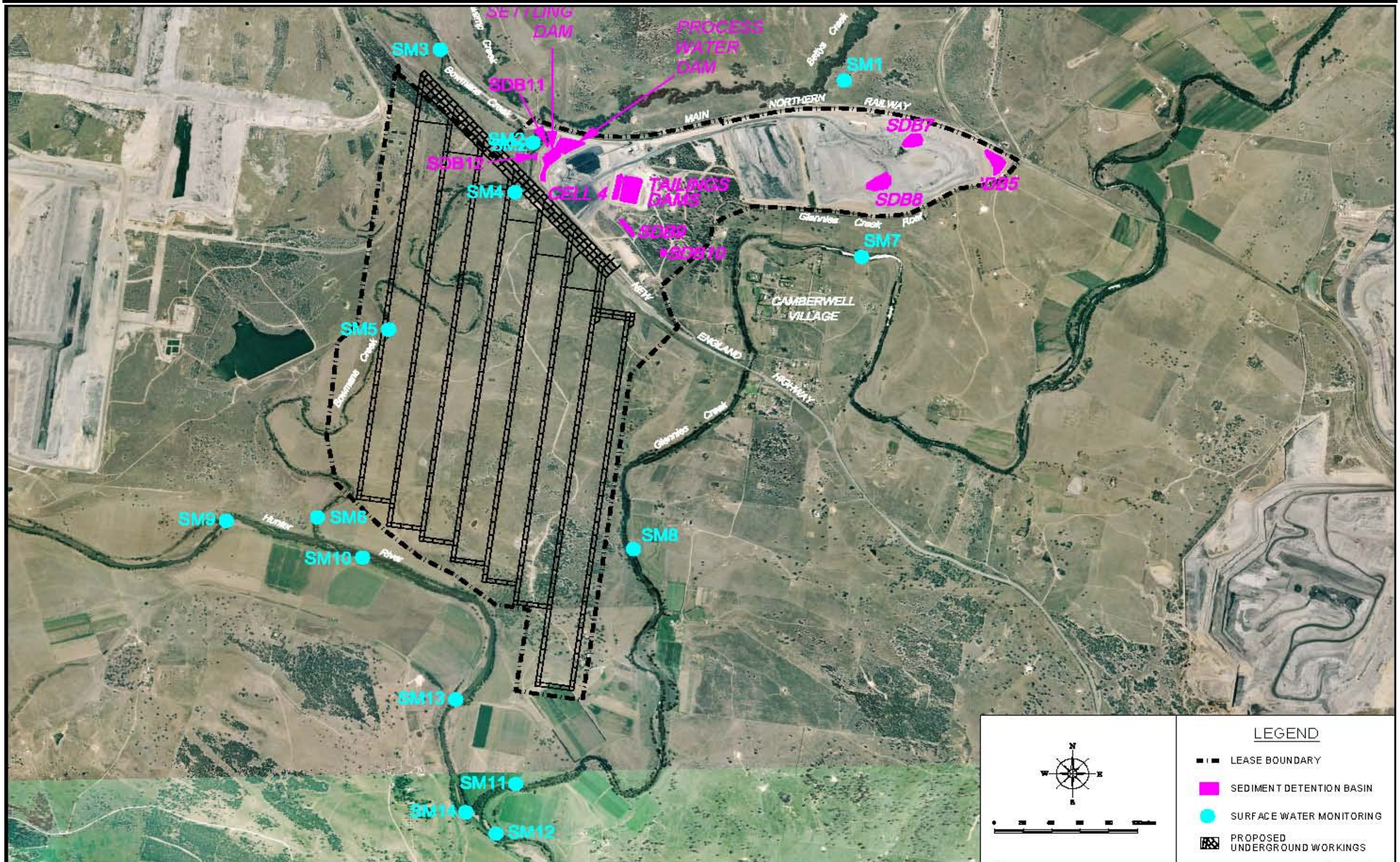


Figure 5. Water Quality Monitoring Locations

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3.3.2.1 Monthly Water Quality Monitoring Results

All monthly water samples were collected and analysed during the reporting period for pH, Electrical Conductivity (EC), Total Dissolved Solids (TDS), Total Suspended Solids (TSS) Total Hardness (CaCO₃), and Oil and Grease (O & G). Monitoring locations SM1 and SM2 in Betty's Creek were intermittently wet following heavy rainfall. In April 09 SM12 was not accessible following heavy rainfall. As a result no analysis is available for the site during this month.

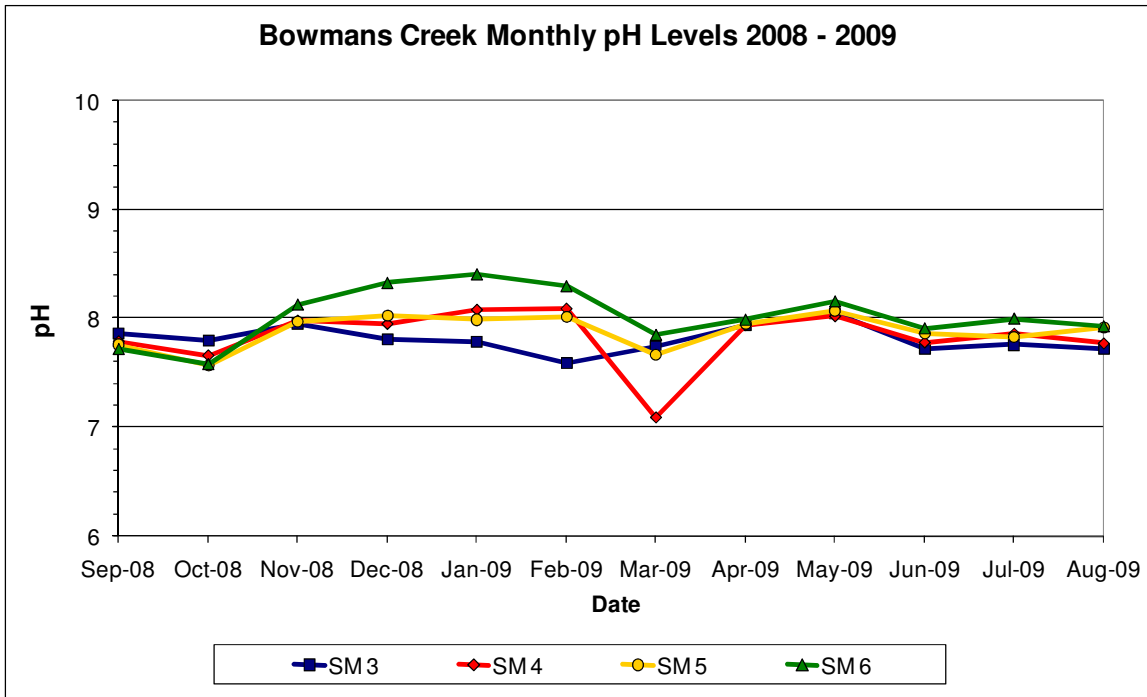
pH

The results of monthly pH monitoring were as follows:

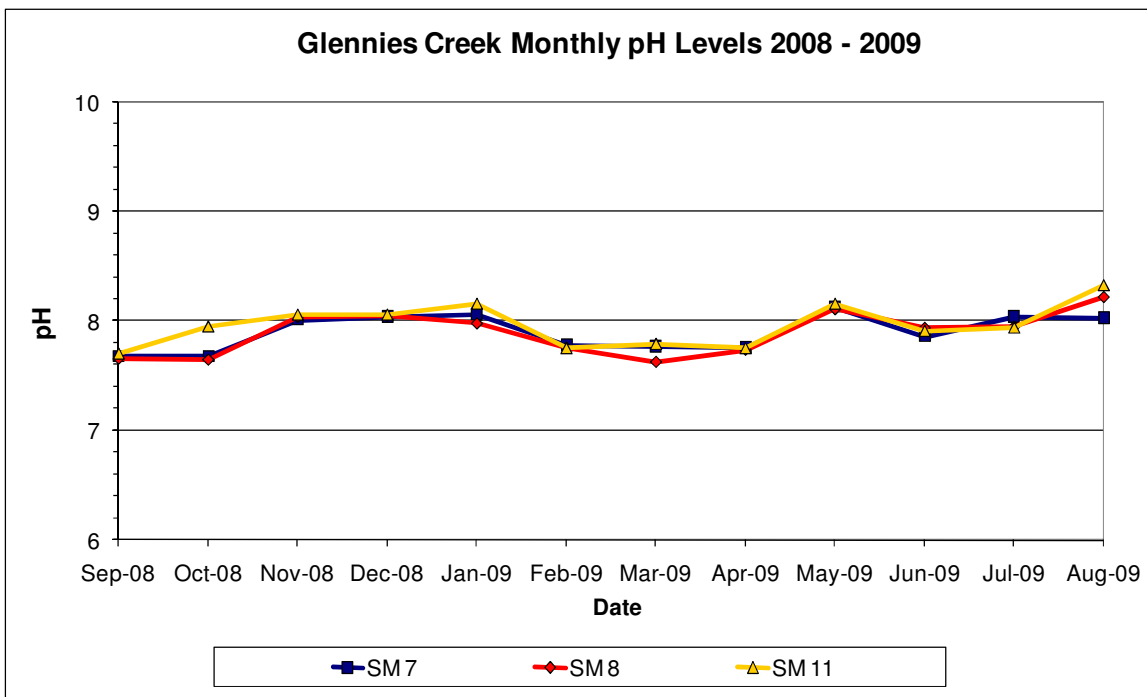
Table 23. pH RESULTS 2008 - 2009														
pH	SM 1	SM 2	SM 3	SM 4	SM 5	SM 6	SM 7	SM 8	SM 9	SM 10	SM 11	SM 12	SM 13	SM 14
Sep-08	8.1	7.9	7.9	7.8	7.8	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.8	7.8
Oct-08	Dry	Dry	7.8	7.7	7.6	7.6	7.7	7.7	7.6	7.9	8.0	7.8	7.8	7.9
Nov-08	Dry	Dry	8.0	8.0	8.0	8.1	8.0	8.0	8.4	8.4	8.1	8.3	8.4	8.4
Dec-08	Dry	Dry	7.8	8.0	8.0	8.3	8.0	8.1	8.4	8.4	8.1	8.4	8.4	8.5
Jan-09	Dry	Dry	7.8	8.1	8.0	8.4	8.1	8.0	8.5	8.5	8.2	8.2	8.5	8.5
Feb-09	Dry	Dry	7.6	8.1	8.0	8.3	7.8	7.8	8.4	8.4	7.8	8.1	8.3	8.3
Mar-09	Dry	Dry	7.7	7.1	7.7	7.9	7.8	7.6	7.8	8.1	7.8	8.1	8.2	8.2
Apr-09	7.2	7.1	7.9	7.9	8.0	8.0	7.8	7.7	8.2	8.1	7.8	NA	8.1	8.0
May-09	Dry	Dry	8.1	8.0	8.1	8.2	8.1	8.1	8.2	8.2	8.2	8.1	8.3	8.2
Jun-09	Dry	Dry	7.7	7.8	7.9	7.9	7.9	7.9	8.1	8.0	7.9	8.0	8.1	8.1
Jul-09	Dry	Dry	7.8	7.9	7.8	8.0	8.0	8.0	8.3	8.4	7.9	8.3	8.4	8.4
Aug-09	Dry	Dry	7.7	7.8	7.8	7.9	7.9	8.0	8.2	8.3	7.9	8.3	8.4	8.4
Min	7.2	7.1	7.6	7.1	7.6	7.6	7.7	7.6	7.6	7.7	7.7	7.7	7.8	7.8
Ave	7.7	7.5	7.8	7.8	7.9	8.0	7.9	7.9	8.1	8.2	7.9	8.1	8.2	8.2
Max	8.1	7.9	8.1	8.1	8.1	8.4	8.1	8.1	8.5	8.5	8.2	8.4	8.5	8.5

Monthly water quality monitoring in Bowmans Creek, Glennies Creek and the Hunter River indicated that pH levels throughout the reporting period were consistently within the neutral to slightly alkaline range (7.1 - 8.5).

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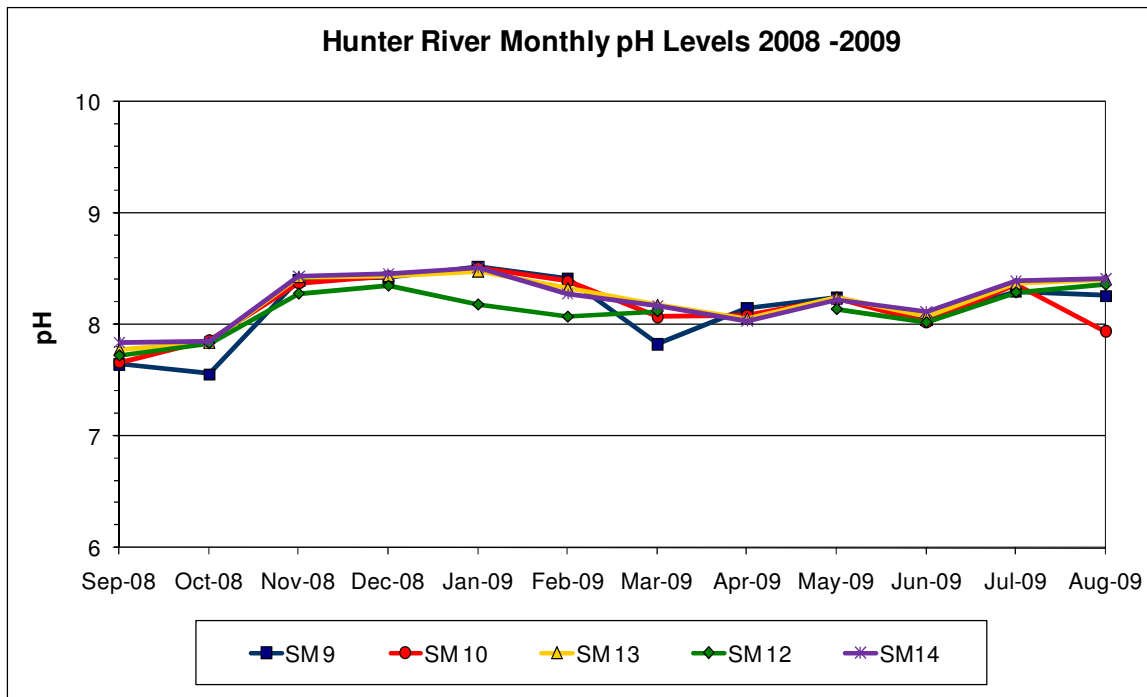


pH levels in Bowmans Creek (SM3, SM4, SM5 and SM6) were neutral to slightly alkaline (ranging from 7.1 to 8.4) and remained within the acceptable recommended pH range.



Glennies Creek (SM7, SM8 and SM11) pH levels were neutral to slightly alkaline (ranging from 7.7 to 8.2) with little variation between sites, and remained within the acceptable recommended pH range.

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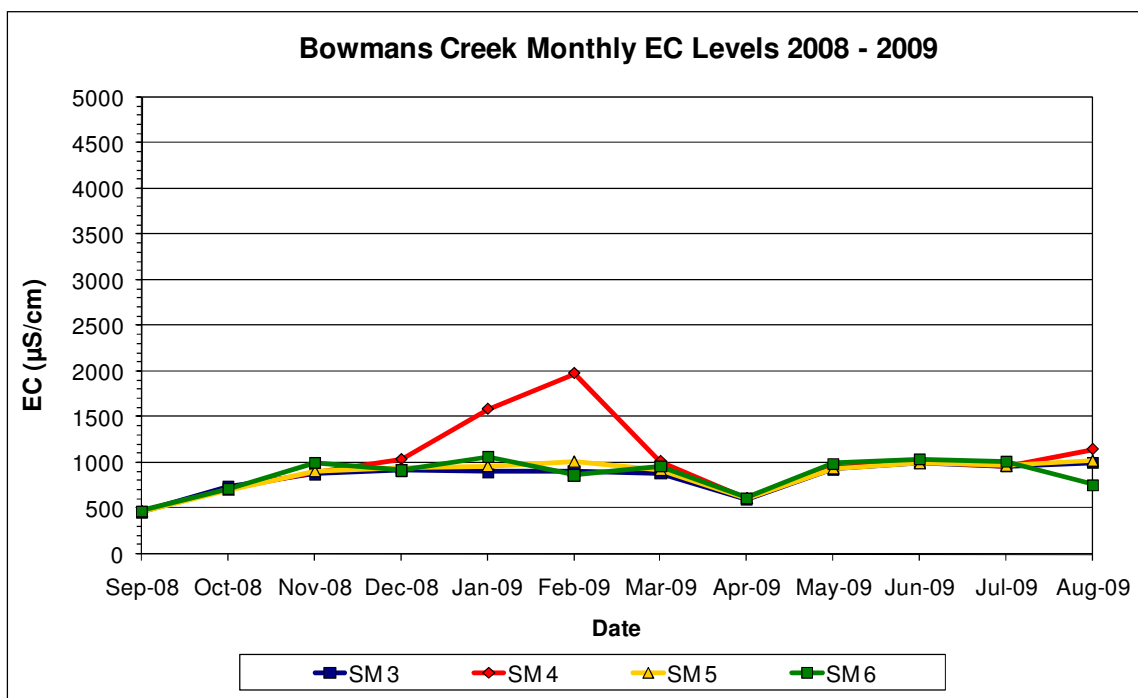
pH levels in the Hunter River (SM9, SM10, SM12, SM13 and SM14) were neutral to slightly alkaline (ranging from 7.6 to 8.5) with minimal variation between sites, and remained within the acceptable recommended pH range. Similar to Glennies Creek slight pH fluctuations throughout the reporting period followed a very similar pattern across all sites. pH is often slightly lower at SM12 (particularly during dry spells) as it is located downstream of the confluence with Glennies Creek.

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Electrical Conductivity (EC)

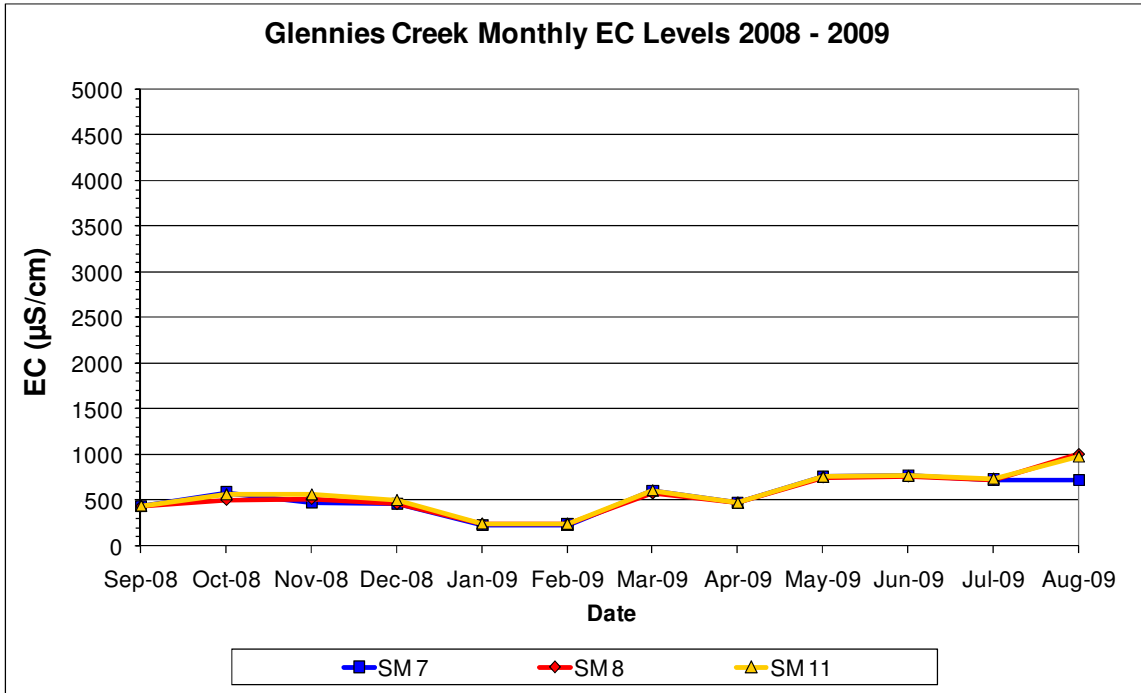
The results of EC monitoring are as follows:

Table 24. ELECTRICAL CONDUCTIVITY RESULTS 2008 – 2009														
EC	SM 1	SM 2	SM 3	SM 4	SM 5	SM 6	SM 7	SM 8	SM 9	SM 10	SM 11	SM 12	SM 13	SM 14
Sep-08	211	225	463	470	472	476	442	435	476	507	439	535	635	637
Oct-08	Dry	Dry	738	714	711	714	587	503	789	790	565	716	789	802
Nov-08	Dry	Dry	879	905	915	1000	483	514	1120	1100	564	930	1100	1100
Dec-08	Dry	Dry	917	1040	952	916	462	457	793	794	502	730	778	784
Jan-09	Dry	Dry	903	1590	971	1060	235	239	1000	990	243	404	1000	996
Feb-09	Dry	Dry	910	1980	1020	866	239	239	744	754	240	437	789	805
Mar-09	Dry	Dry	887	1020	929	962	612	576	943	876	609	828	874	872
Apr-09	203	203	599	612	617	615	478	473	586	605	471	NA	597	607
May-09	Dry	Dry	930	954	945	989	762	754	918	925	757	827	906	913
Jun-09	Dry	Dry	1000	1020	1000	1040	774	764	600	638	769	694	658	669
Jul-09	Dry	Dry	966	971	974	1010	729	725	953	954	738	902	956	952
Aug-09	Dry	Dry	1000	1150	988	1030	757	724	1010	1000	762	982	994	995
Min	203	203	463	470	472	476	235	239	476	507	240	404	597	607
Ave	207	214	849	1036	875	890	547	534	828	828	555	726	840	844
Max	211	225	1000	1980	1020	1060	774	764	1120	1100	769	982	1100	1100

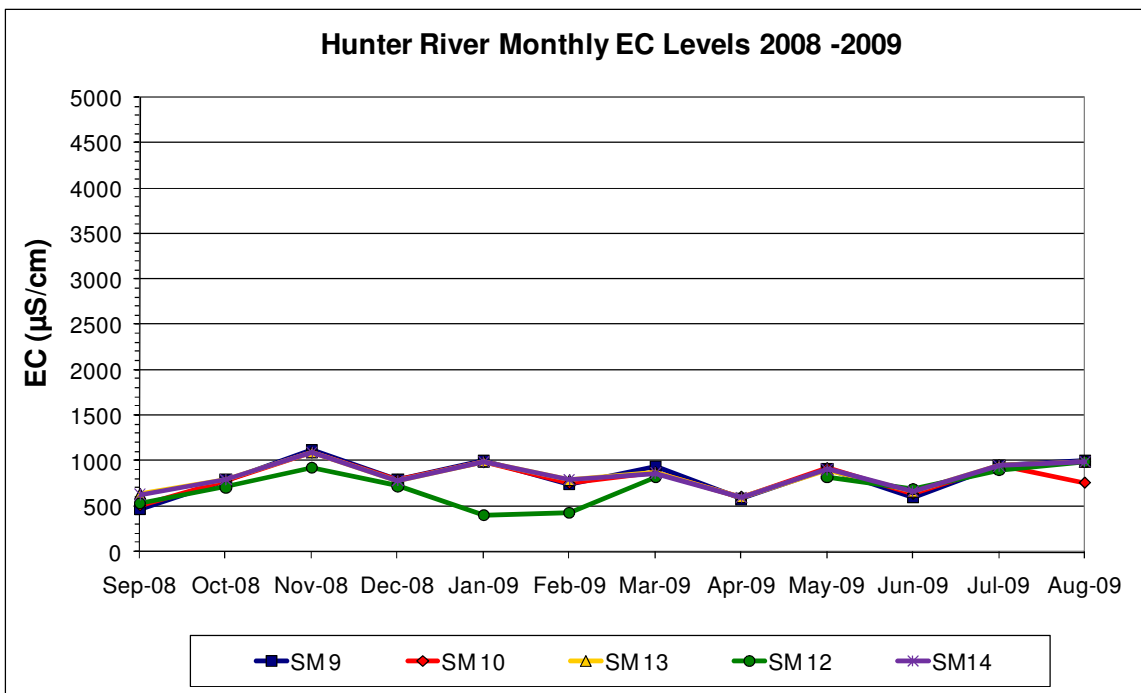


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Electrical Conductivity (EC) levels in Bowmans Creek fluctuated between 463µS/cm and 1980µS/cm. During the dry spell in January and early February 2009 Bowmans Creek ceased to flow and saline groundwater inflows (>10,000µS/cm) became the dominant water source for the pool at SM4. As a result EC levels began to increase. This has been identified in the past with EC levels >10,000µS/cm being recorded in the past.



The EC of water in Glennies Creek (SM7, SM8 and SM11) remained consistently low. All three sites trended together throughout the period indicating no impacts from Ashton Coal Operations.



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The EC of the Hunter River (SM9, SM10, SM12, SM13 and SM14) generally trended together throughout the period. SM12 is located downstream of the confluence with Glennies Creek and is affected by the lower EC levels of Glennies Creek under low flow conditions as seen in January and February 2009.

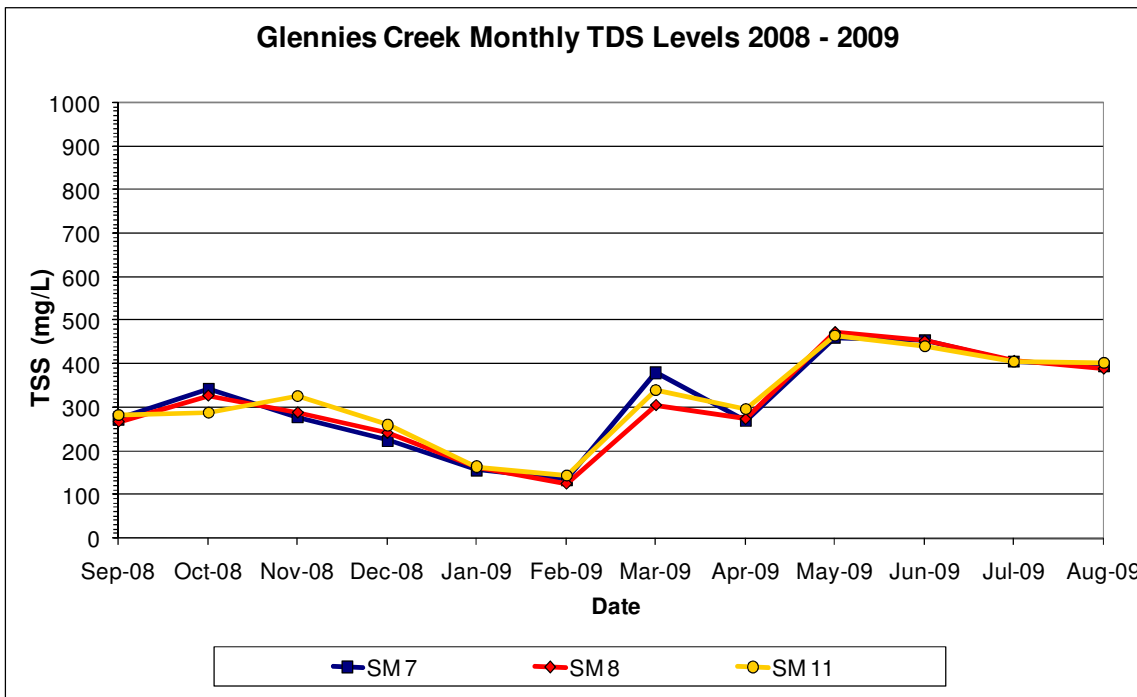
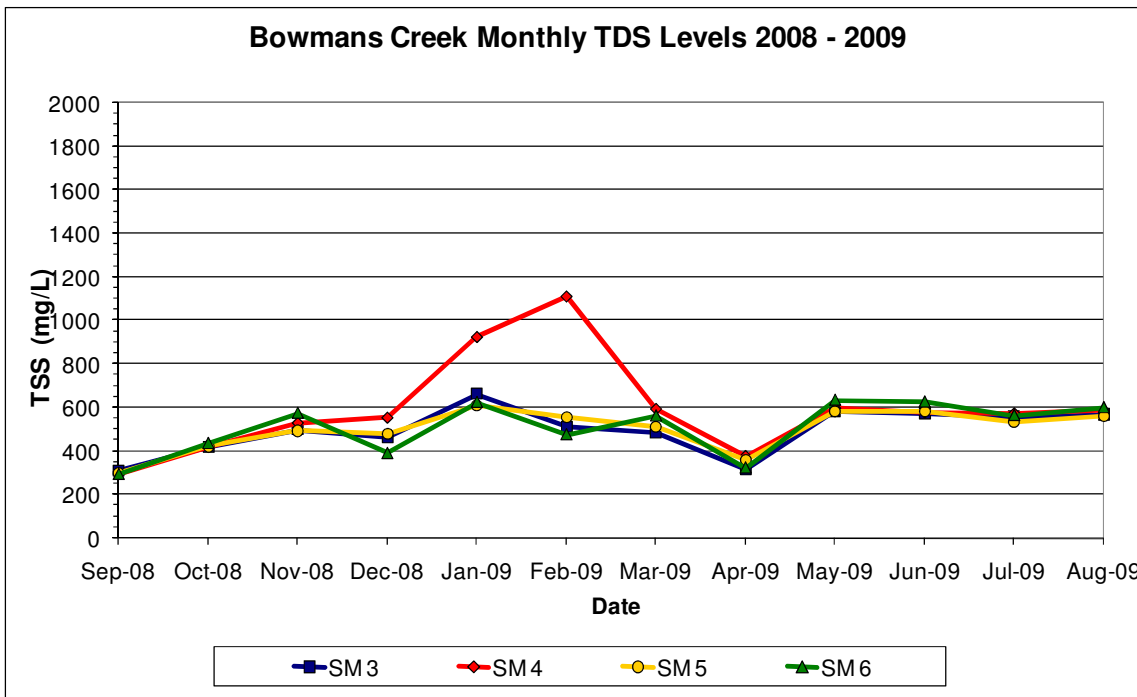
Total Dissolved Solids (TDS)

Monthly TDS results are as follows:

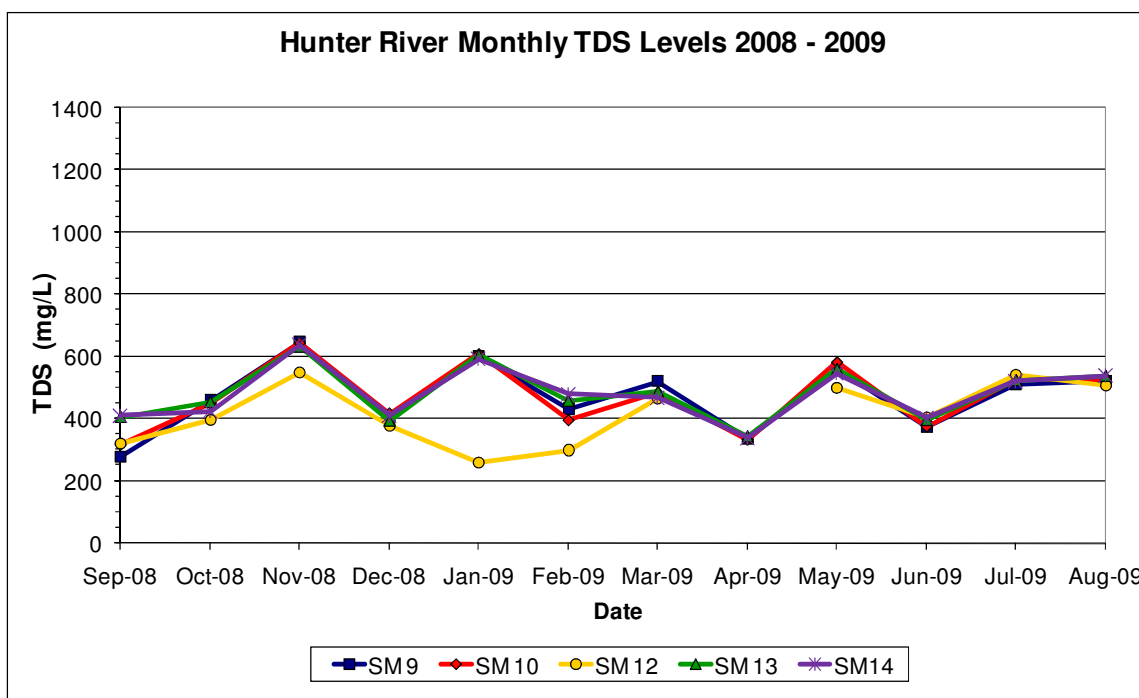
Table 25. TOTAL DISSOLVED SOLIDS RESULTS 2008 - 2009														
TDS	SM 1	SM 2	SM 3	SM 4	SM 5	SM 6	SM 7	SM 8	SM 9	SM 10	SM 11	SM 12	SM 13	SM 14
Sep-08	363	326	310	296	298	294	274	268	278	318	284	322	406	410
Oct-08	Dry	Dry	418	420	422	436	342	328	458	450	288	398	454	424
Nov-08	Dry	Dry	498	530	494	574	278	289	646	644	326	550	632	638
Dec-08	Dry	Dry	462	554	478	390	224	242	408	418	260	378	394	410
Jan-09	Dry	Dry	662	924	612	624	157	162	602	608	164	260	604	592
Feb-09	Dry	Dry	512	1110	556	476	135	125	432	396	144	300	458	480
Mar-09	Dry	Dry	484	594	514	562	380	306	520	484	340	466	488	468
Apr-09	369	373	318	378	358	324	270	274	334	334	296	NA	344	338
May-09	Dry	Dry	584	598	584	634	460	474	560	582	466	500	560	546
Jun-09	Dry	Dry	574	578	586	626	454	454	372	376	442	406	396	404
Jul-09	Dry	Dry	560	574	534	564	406	408	510	526	406	544	524	522
Aug-09	Dry	Dry	568	588	564	600	396	390	522	528	404	508	538	538
Min	363	326	310	296	298	294	135	125	278	318	144	260	344	338
Ave	366	350	496	595	500	509	315	310	470	472	318	421	483	481
Max	369	373	662	1110	612	634	460	474	646	644	466	550	632	638

TDS results closely reflect EC results.

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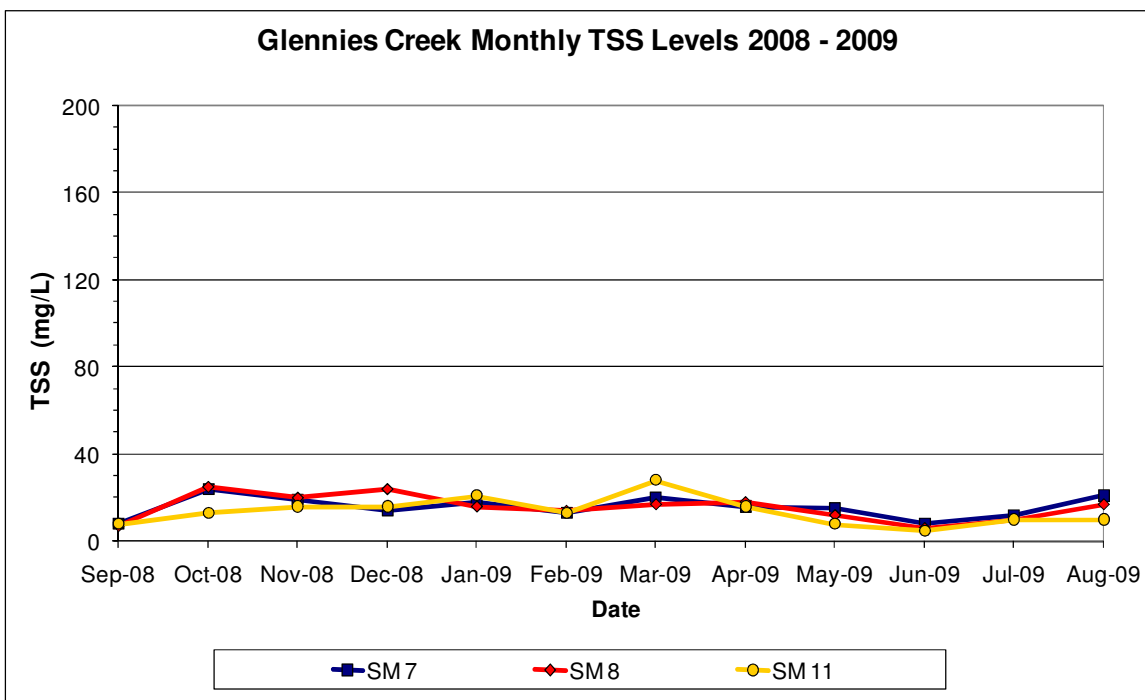
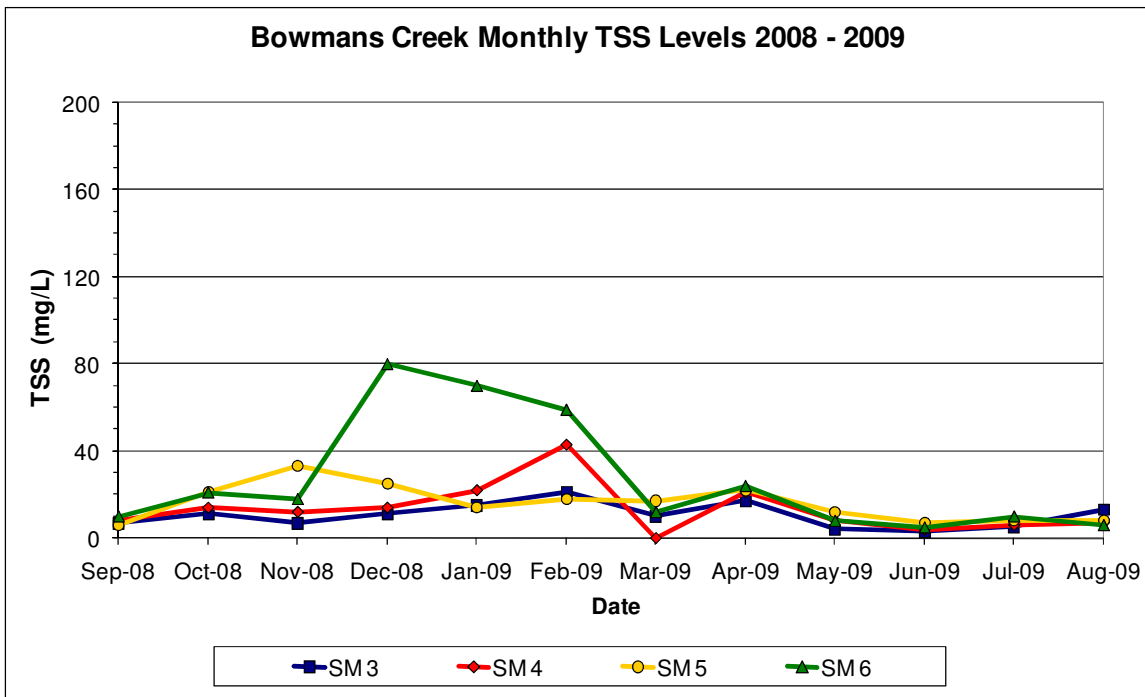


Total Suspended Solids (TSS)

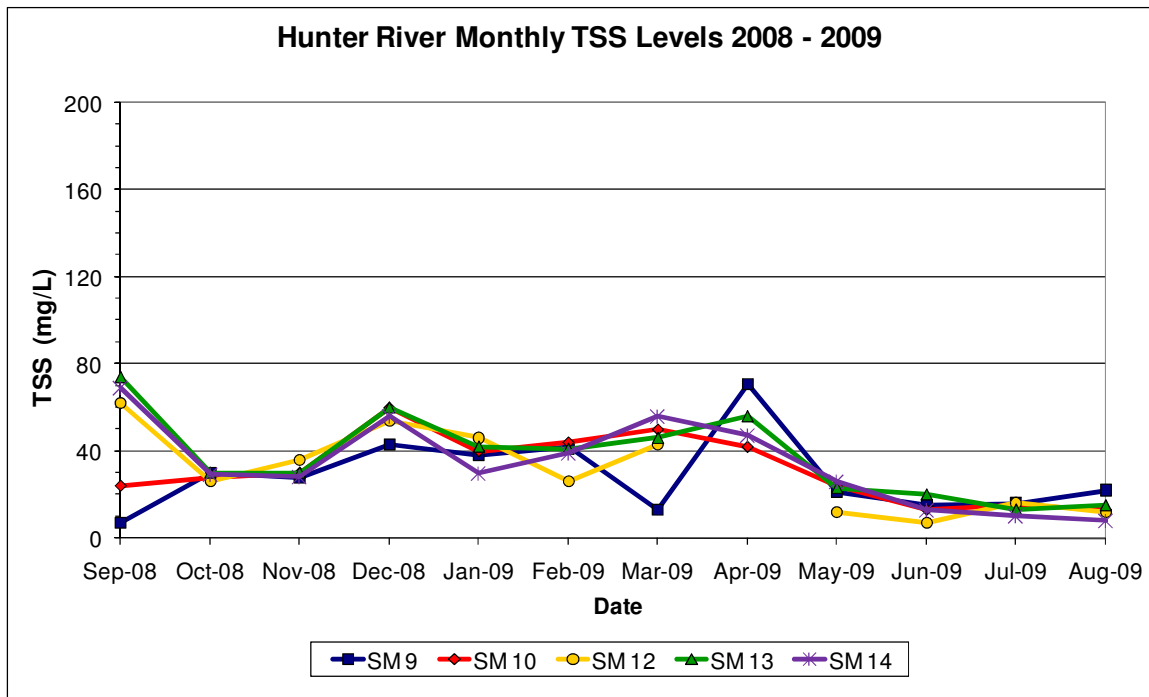
Monthly TSS results are shown in **Table 28**. A contaminated result was recorded at SM4 in March 09. The contamination appears to be the result of algae and organic matter present in the sample. No other sites recorded the high TSS level. The Process Water Dam recorded a TSS level of 24mg/L at the same time.

Table 26. TOTAL SUSPENDED SOLIDS RESULTS 2008 - 2009														
TSS (mg/L)	SM 1	SM 2	SM 3	SM 4	SM 5	SM 6	SM 7	SM 8	SM 9	SM 10	SM 11	SM 12	SM 13	SM 14
Sep-08	24	41	7	8	6	10	8	7	7	24	8	62	74	69
Oct-08	Dry	Dry	11	14	21	21	24	25	30	28	13	26	30	29
Nov-08	Dry	Dry	7	12	33	18	19	20	28	30	16	36	30	28
Dec-08	Dry	Dry	11	14	25	80	14	24	43	60	16	54	60	56
Jan-09	Dry	Dry	15	22	14	70	18	16	38	40	21	46	42	30
Feb-09	Dry	Dry	21	43	18	59	13	14	42	44	13	26	41	39
Mar-09	Dry	Dry	10	CT300	17	12	20	17	13	50	28	43	46	56
Apr-09	120	137	17	21	22	24	16	18	71	42	16	NA	56	47
May-09	Dry	Dry	4	8	12	8	15	12	21	24	8	12	23	26
Jun-09	Dry	Dry	3	4	7	5	8	6	15	13	5	7	20	13
Jul-09	Dry	Dry	5	6	8	10	12	10	16	15	10	16	13	10
Aug-09	Dry	Dry	13	7	8	6	21	17	22	13	10	12	15	8
Min	24	41	3	4	6	5	8	6	7	13	5	7	13	8
Ave	72	89	10	14	16	27	16	16	29	32	14	31	38	34
Max	120	137	21	43	33	80	24	25	71	60	28	62	74	69

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Total Hardness (CaCO₃)

Table 27. TOTAL HARDNESS RESULTS 2008- 2009														
CaCO ₃ (mg/L)	SM 1	SM 2	SM 3	SM 4	SM 5	SM 6	SM 7	SM 8	SM 9	SM 10	SM 11	SM 12	SM 13	SM 14
Sep-08	29	31	103	103	103	102	97	95	104	116	95	141	175	178
Oct-08	Dry	Dry	168	172	167	167	141	139	255	247	138	203	253	251
Nov-08	Dry	Dry	189	187	170	192	119	122	364	331	130	266	344	337
Dec-08	Dry	Dry	204	198	172	237	115	112	251	251	119	227	245	253
Jan-09	Dry	Dry	183	254	178	307	62	63	315	315	66	118	319	449
Feb-09	Dry	Dry	189	320	194	250	68	66	241	244	71	129	248	257
Mar-09	Dry	Dry	174	178	176	183	143	132	180	268	135	252	264	266
Apr-09	33	36	126	122	124	124	103	96	161	136	97	NA	149	151
May-09	Dry	Dry	201	196	187	195	184	182	286	268	177	215	264	265
Jun-09	Dry	Dry	223	222	208	215	190	188	192	195	187	196	196	201
Jul-09	Dry	Dry	204	200	193	207	166	158	290	288	161	257	275	279
Aug-09	Dry	Dry	231	226	202	212	180	176	310	308	183	290	299	303
Min	29	31	103	103	103	102	62	63	104	116	66	118	149	151
Ave	31	34	183	198	173	199	131	127	246	247	130	209	253	266
Max	33	36	231	320	208	307	190	188	364	331	187	290	344	449

Oil and Grease

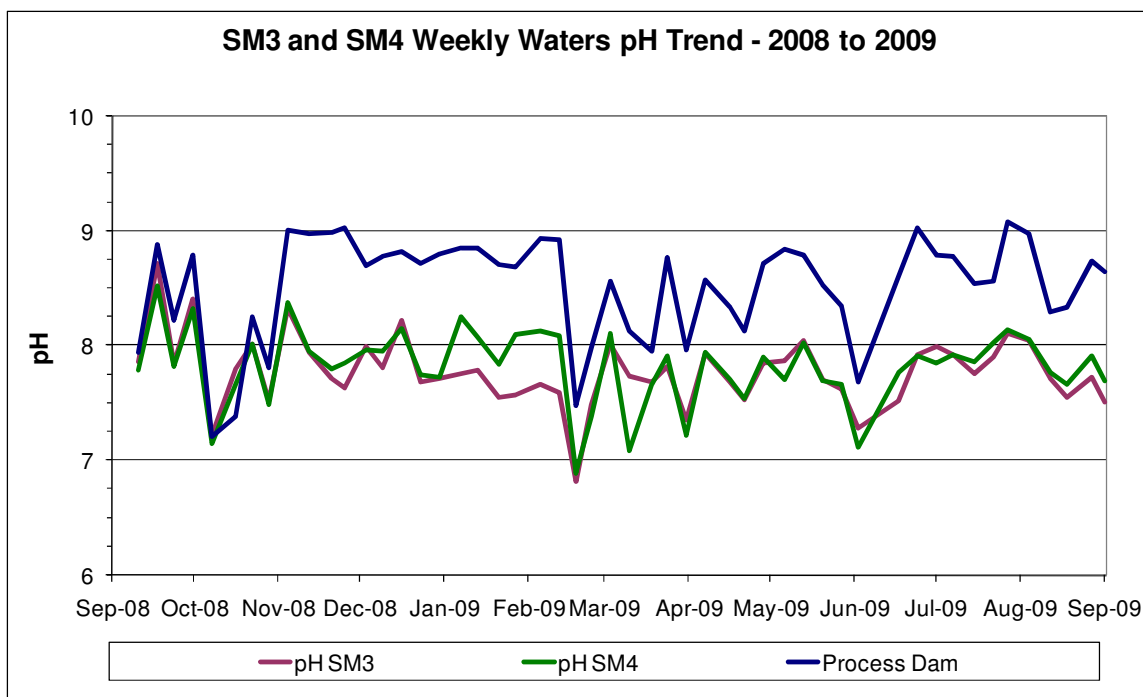
There were no two instances of hydrocarbons recorded during the reporting period.

Table 28. TOTAL OIL & GREASE RESULTS 2008 – 2009														
Oil & Grease (mg/L)	SM 1	SM 2	SM 3	SM 4	SM 5	SM 6	SM 7	SM 8	SM 9	SM 10	SM 11	SM 12	SM 13	SM 14
Sep-08	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Oct-08	Dry	Dry	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Nov-08	Dry	Dry	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Dec-08	Dry	Dry	<5	<5	<5	6	<5	<5	<5	5	<5	<5	<5	<5
Jan-09	Dry	Dry	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Feb-09	Dry	Dry	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Mar-09	Dry	Dry	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Apr-09	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	NA	<5	<5
May-09	Dry	Dry	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Jun-09	Dry	Dry	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Jul-09	Dry	Dry	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Aug-09	Dry	Dry	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Min	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Ave	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Max	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5

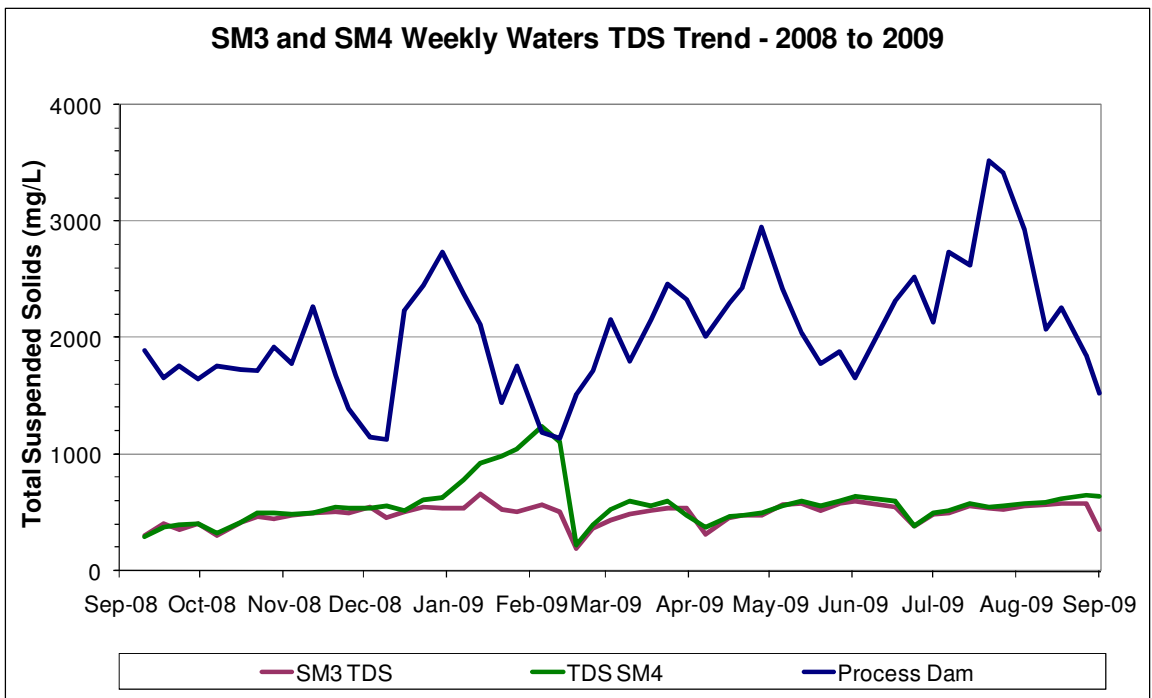
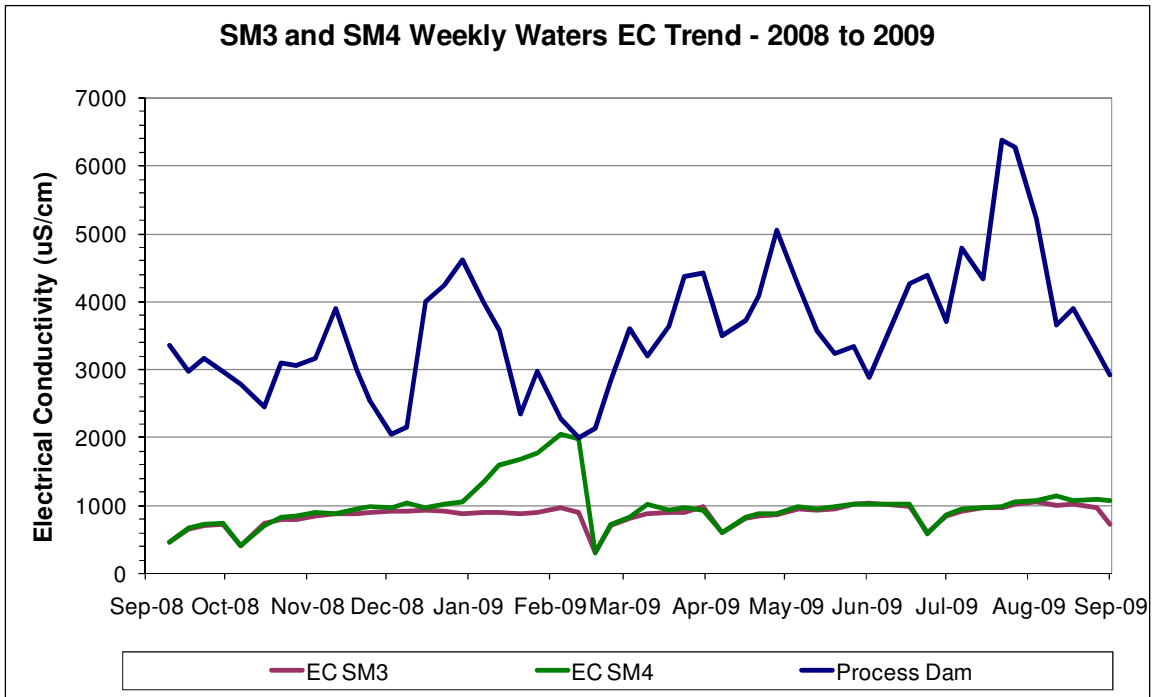
3.3.2.2 Weekly Water Quality Monitoring Results

Weekly water samples were collected and analysed during the reporting period for pH, Electrical Conductivity (EC), Total Dissolved Solids (TDS), Total Suspended Solids (TSS) Total Hardness (CaCO₃) and Oil and Grease (O & G). The purpose of sites SM3 and SM4 are to determine if the process water dam located adjacent to Betty’s and Bowmans Creek is discharging dirty water into the creek system. The results of this monitoring indicate that there were no discharges during the monitoring period. As indicated above a high TSS result of 300mg/L was recorded at SM4 on the 18th March 2009. It is believed this high reading is the result of algae and organic matter present in the sample. The Process Water Dam reading on the 18 March 2009 was 24mg/L. No other results downstream of the site recorded elevated TSS results.

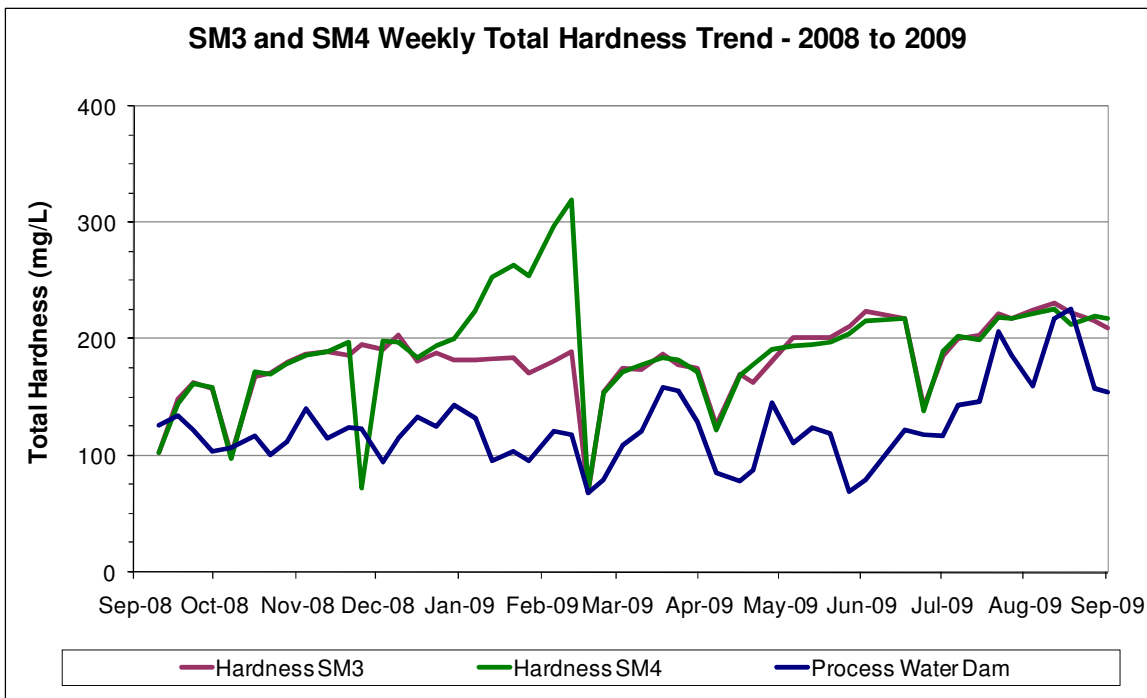
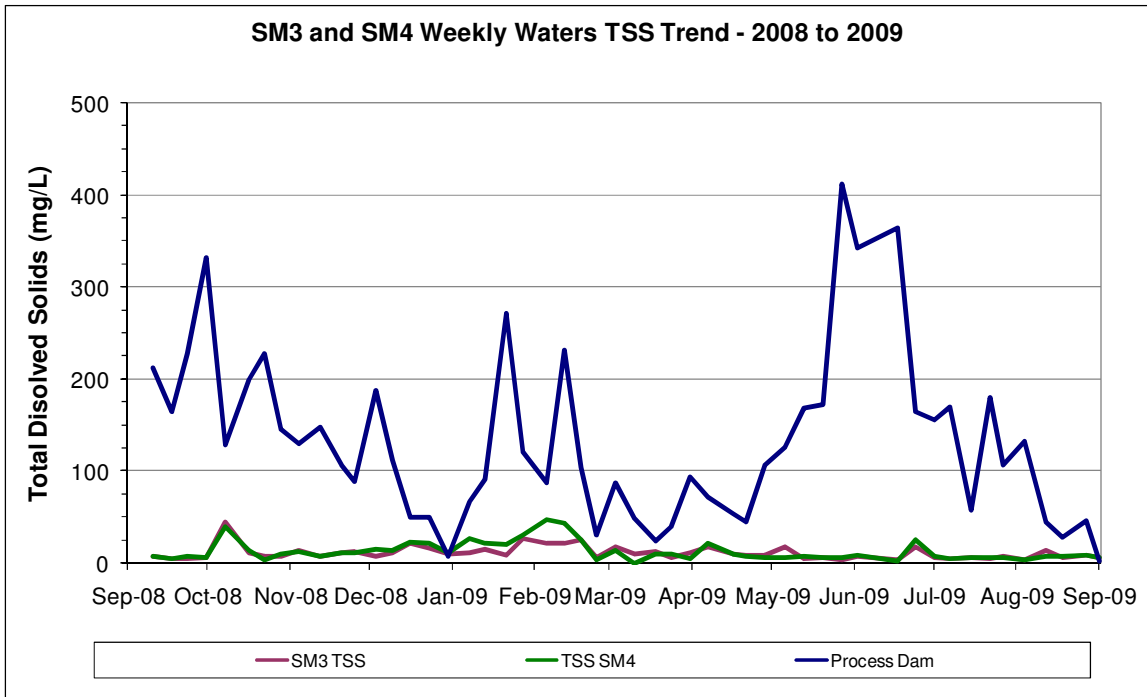
Fluctuation in Hardness at SM3 and SM4 are closely correlated with rainfall events. There was however a decrease in Hardness recorded on the 25 November 2008. This result was also accompanied by a decrease in the concentration of Ca and Mg. It is believed that the decrease was caused by microbial activity SM4.



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3.4 GROUND WATER POLLUTION

As required by Consent Condition 9.2 (d), a groundwater reports has been prepared by an independent expert covering the reporting period 1 September 2008 to 1 September 2009. This report has been included in **Appendix 2**.

3.4.1 Summary

The groundwater report included in Appendix 2 details the monitoring and other work carried out as part of the groundwater management activities for the period. The results of all groundwater monitoring are presented, together with analysis of trends. Actual impacts derived from the analysis of this data are compared to the impacts predicted for this stage of mining in both the EIS studies and studies carried out in support of the LW1-4 SMP Application.

The groundwater analysis details that over the 2008-09 reporting period:

- The groundwater monitoring network was expanded to establish baseline conditions in the Glennies Creek alluvium and the main coal seams as part of the proposed South East Open Cut project and mining of the Upper Liddell seam in the underground area.
- Groundwater monitoring frequency was altered in preparation of the extension of mining of the Pikes Gully Seam beyond LW1-4.
- Apart from the initial drawdown observed in the Glennies Creek alluvium during the mining of LW1, no mining impacts have been observed in the Glennies Creek, Bowmans Creek and Hunter river alluvium.
- Large drawdown responses in the Pikes Gully and Permian overburden units have continued to be observed in the immediate LW1-4 mining area. Piezometers located in the barrier between LW1 and Glennies Creek did not show any additional responses to underground mining.
- Total groundwater inflows to the underground mine (1.8 to 7.4 L/s) have been below inflow rates predicted in the EIS at this stage of mining (13.5 to 15 L/s).
- Seepage inflows to the underground mine from Glennies Creek alluvium (0.8 to 1.7 L/s) have been below the EIS predictions at this stage of mining (2.8 to 3 L/s).

In summary all groundwater-related impacts from underground mining during the review period were below the levels predicted in the EIS (2001), and in the LW1-4 SMP groundwater assessment carried out in 2006.

3.5 CONTAMINATED AND POLLUTED LAND

There are no known areas of contaminated or polluted land at the Ashton Coal Project.

3.6 THREATENED FLORA AND FAUNA

3.6.1 Flora and Fauna Management

Condition 3.46 of the Development Consent requires the preparation of a Flora and Fauna Management Plan (FFMP), which was approved by DEC, DoP, DNR and DPI in August 2006. Autumn and Spring Fauna monitoring was conducted during the period as part of the Flora and Fauna Management Plan.

3.6.1.1 Conservation Area

ACOL are working with DECC NPWS to finalise the conservation agreement and a final agreement is expected to be signed between ACOL and the Minister before the new year. Monitoring of the flora and fauna of the conservation area has been ongoing including monitoring of a number of nest boxes. While the agreement has not yet been finalised the area is being managed as intended in the agreement, the area has been fully fenced to exclude grazing and sign posted as a conservation area. Weed works have been conducted during the reporting period including the removal African Boxthorn. Works to be conducted in the next reporting period include further weed works focusing on St John's Wort and African Boxthorn.

3.6.2 Fauna Monitoring

Fauna habitat surveys were carried out in both the spring and autumn seasons during the reporting period. These surveys are continually assessing the habitat value and species and abundance and diversity within ACOL lands. The main focus of the monitoring is the southern woodland (voluntary conservation area) which consists of open grassy woodland dominated by *Allocasuarina luehmannii*. Sub-dominant species include *Eucalyptus crebra* (narrow-leaved ironbark), *Eucalyptus melliodora* (yellow box) and *eucalyptus fibrosa* (grey box).

A number of monitoring techniques are undertaken as part of the Fauna surveys. These include:

- Pitfall trapping. Ten permanent pitfall traps have been installed at four locations. Between surveys the traps are sealed.
- Elliot A Traps. 50 traps were placed along two transects to monitor small and medium terrestrial mammals.
- Hair tubes. 30 tubes were placed throughout the southern woodland for 10 nights to monitor small and medium terrestrial mammals.
- Elliot B Traps. Twenty traps were mounted on trees along the survey transects at approximately 2 metres above the ground. They were used to target small to medium sized arboreal mammals.

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- Hair funnels. Ten funnels were mounted on tree trunks along the transects for ten nights targeting arboreal mammals.
- Targeted amphibian surveys were undertaken.
- Two Anabat echolocation call detectors were used over two consecutive nights to record and identify bat calls.
- 10 minute diurnal bird point surveys were conducted over four days.
- Targeted Grey-Crowned Babbler, Speckled Warbler and Hooded Robin surveys were conducted (see 3.7.3 below).
- Spotlighting was undertaken.
- Nest boxes. A total of 28 nest boxes and 14 bat boxes have been installed on ACOL property and these boxes were monitored for species use.

Flora surveys indicate that the Southern Woodland is regenerating slowly, however this is generally dominated by Bull Oak. Terrestrial and arboreal mammal trapping recorded the presence of the Yellow-footed Antechinus (*Antechinus flavipes*), Common Brushtail Possum (*Trichosurus vulpecula*), Sugar Glider (*Petaurus breviceps*) (Spring only), Bush Rat (*Rattus fuscipes*) (Autumn only) and the introduced House Mouse (*Mus musculus*). Amphibian species identified during the surveys included Peron's Tree Frog (*Litoria peronii*), Broad-palmed Frog (*Litoria latopalmata*), Common Eastern Froglet (*Crinia signifera*).

A large number of common bird species were observed in the southern woodland throughout the period and similar to those previously recorded. The Tawny Frogmouth (*Podargus strigoides*) and the Brown Falcon (*Falco berigora*) were identified for the first time in the southern woodland whilst the Variegated Fairy-wren (*Malurus lamberti*) was observed for the first time since 2005. The Flame Robin (*Petroica phoenicea*) was also observed for the first time during the Autumn 2009 survey. This species along with the Scarlet Robin (*Petroica boodang*), previously identified within the Southern Woodland, have been given preliminary determination for listing as a vulnerable species under the TSC Act in May 2009.

6 microchiropteran bat species were observed during the Spring 2008 and Autumn 2009 surveys. Two of these species, the Large Footed Myotis (*Myotis macropus* syn *Myotis adversus*) and the Eastern Bent-wing bat (*Miniopterus schreibersii oceansis*) have not been observed in the Southern Woodland since Summer 2006.

3.6.2.1 Significant Fauna Species

A total of 5 threatened bird species have now been identified within the Southern Woodland. The Scarlet Robin, previously identified in 2005 and the Flame Robin, identified during the reporting period were given preliminary determination for listing as a vulnerable species under the TSC Act in May 2009. The Speckled Warbler and Grey-crowned Babbler have been identified in the Southern Woodland in previous reporting periods and have continued to reside in the Southern Woodland throughout 2007-08. The hooded Robin was observed during the 2006 Spring survey however has not been observed since.

During the Spring 2008 and Autumn 2008 surveys the Grey-crowned Babbler population situated within the Southern Woodland increased significantly. During the Spring survey the population increased to 12 individuals, returning the same population as 2005. In the Autumn survey however the population increased dramatically to 35 individuals with 16 being observed foraging on the one day. Cattle have now been excluded from the southern woodland for 4 years and during this period there has been a natural restoration of the previously degraded shrub layer. This is likely to be the cause for the increased population of Grey-crowned Babbler with the species requiring a dense shrub layer for foraging. The Speckled Warbler population increased to 2 individuals during the Spring 2008 survey followed by a further increase to 7 individuals during the Autumn 2008 survey. **Figure 6** below shows the change in population size of the both the Grey-crowned Babbler and Speckled Warbler over time.

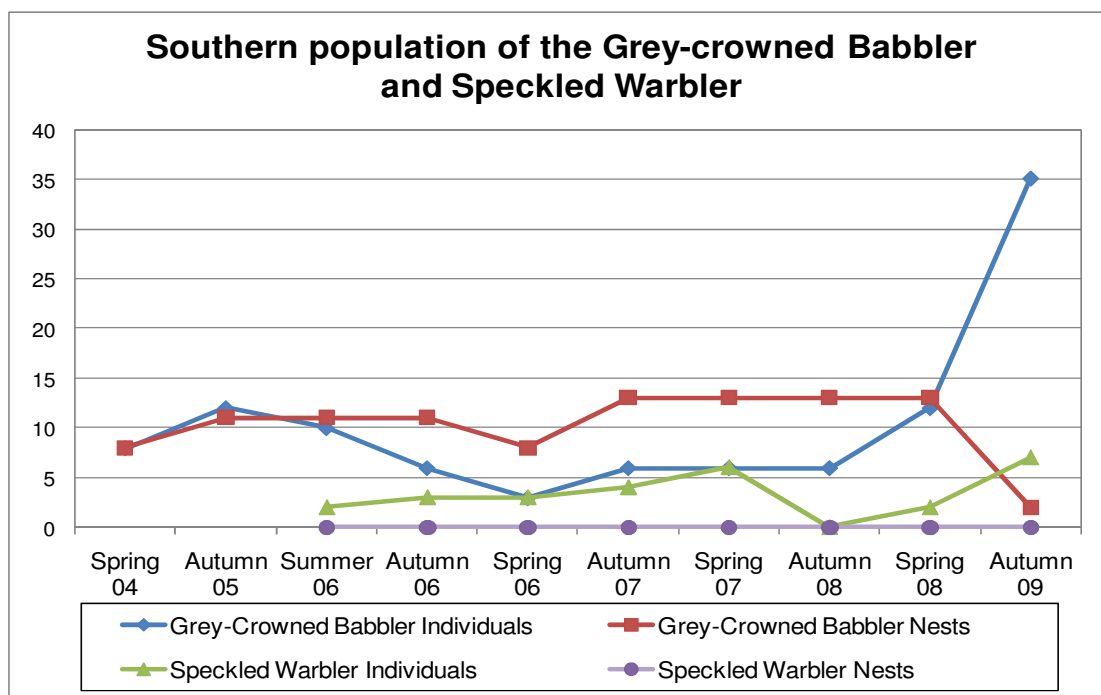


Figure 6. Southern population of the Grey-crowned Babbler and Speckled Warbler

Prior to clearing for Open Cut mining in the North East Open Cut Pit at Ashton Coal, a population of Grey-crowned Babbler was present within the grassy woodland habitat. Ongoing monitoring of the progressively cleared area and the adjacent remnant south east of Glennies

Creek Road suggests that the resident population previously located within the Open Cut disturbance area has relocated to the adjacent remnant. **Figure 7** shows the change in population size and presence of nests over time. All vegetation within the North East Open Cut has now been cleared. No assessment of the remnant was undertaken during Autumn 2009.

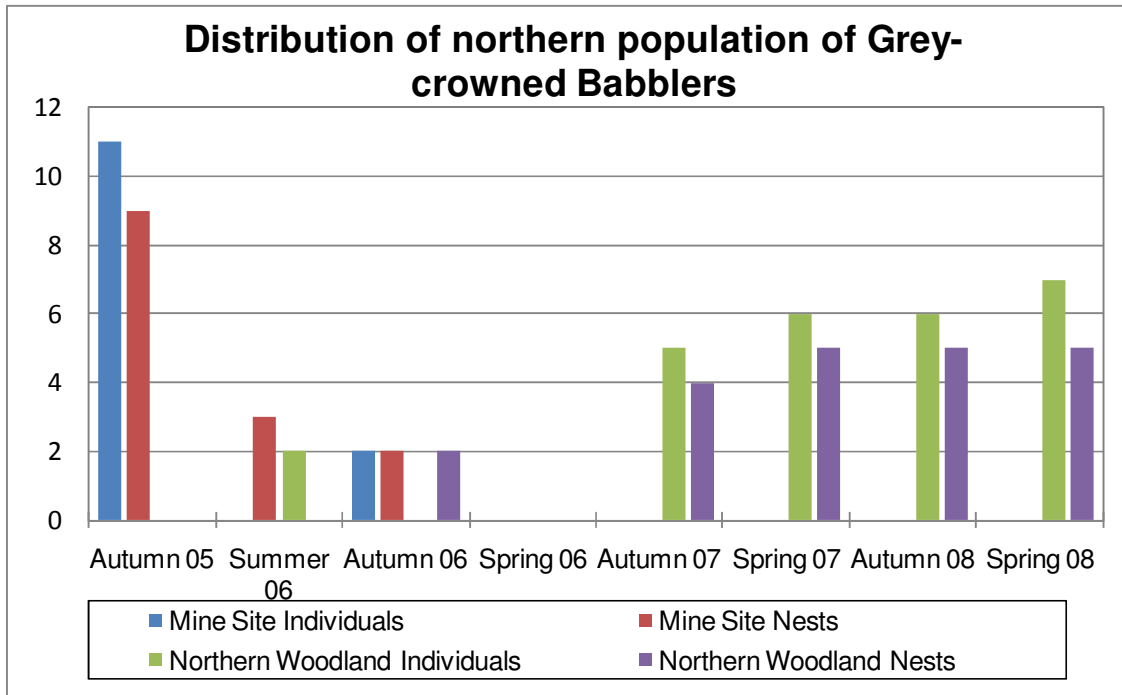


Figure 7. Distribution of northern population of Grey-crowned Babbler

3.6.2.2 Nest Boxes

A total of 28 nest boxes and 14 Bat boxes have been installed within ACOL property. The nest boxes target a number of different species. They are monitored biannually for resident fauna, evidence of use and presence of pest species.

The existing Brushtail Possum population is utilising the nest boxes with evidence of use (scat and hair analysis) in 16 boxes and a further 5 boxes supporting brushtail possums in Spring 2008 and 2 boxes in Autumn 2009. Whilst 6 microchiropteran bat species have been identified within the Southern Woodland there has still only been one possible incidence of evidence of use in the bat boxes to date which was recorded in Autumn 2009 as nesting material however no hair or scat samples were found. It is expected that the presence of rough barked eucalypts within the Southern Woodland is providing preferable roosting sites for bat species. **Figure 8** shows nest box usage over time. It is evident that there has been a gradual increase in usage since their installation.

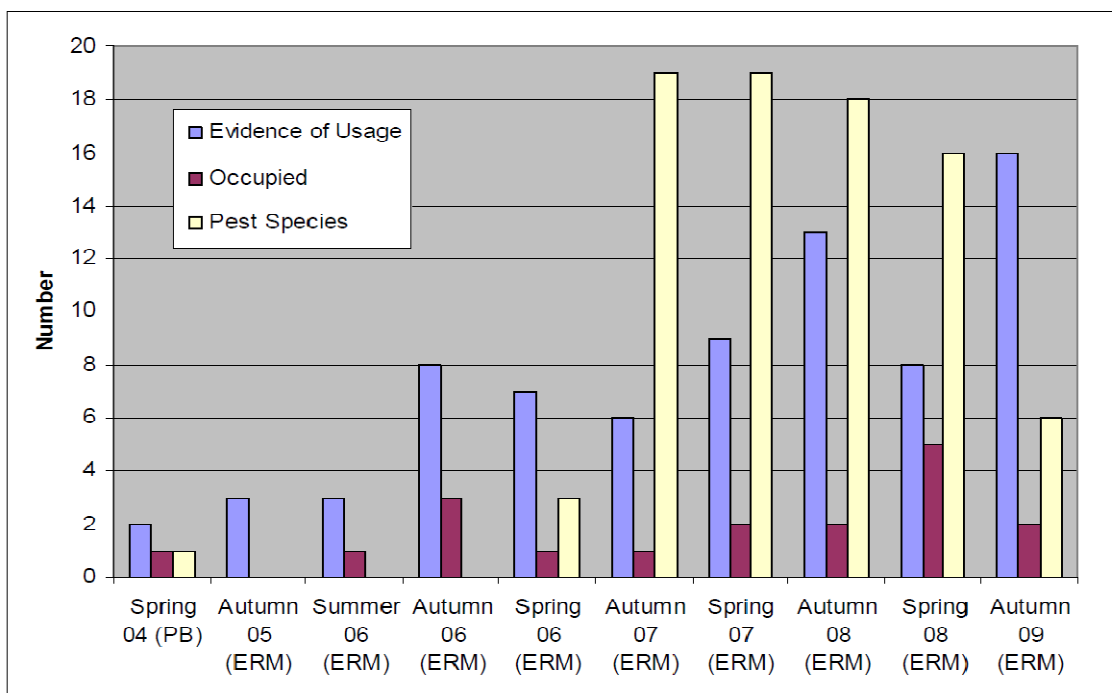


Figure 8. Nest box usage

3.7 AQUATIC ECOLOGY MONITORING BOWMANS AND GLENNIES CREEK

As required by Consent Conditions 3.19 and 3.20 under Development Application DA No 309-11-2001-i issued by the Minister for Planning, aquatic ecological monitoring was undertaken during the reporting period. Monitoring conducted during the period builds on sampling studies conducted between 2006 and 2008 and the initial benchmarking conducted during the EIS phase in 2001. Monitoring was conducted in Spring 2008 and Autumn 2009.

As there are no specific expected impacts on creek morphology or function arising from the present approved long wall extraction (Panels 1 to 4), the studies completed during the period incorporate monitoring sites more or less evenly spaced along the two creeks with upstream, mid stream and downstream sites. In terms of overall study aims, the Aquatic Ecology Monitoring study endeavours to answer the following questions:

- Are there measurable differences in aquatic ecological attributes between creek pools upstream, alongside and downstream of mining operations?
- Are observed differences directly attributable to mining impacts or can differences be attributed to spatial (between-site) and/or temporal (between-survey) differences?
- Do the creeks provide (and continue to provide) suitable aquatic habitat?
- Do the creeks continue to provide suitable fish passage?

3.7.1 Sampling Methods

The adopted sampling methods are based on existing methods being utilised for monitoring long-term aquatic ecological change in several of the Illawarra coal mining catchments (e.g.,

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BHP Billiton 2001). The study follows the National River Process and Management Program River Bio-assessment Manual methods (NRPMP 1994) as adapted for the National River Health Program (now referred to as the AusRivAS method (Turak et al 1999).

The AusRivAS protocol provides a number of definitions of sites and habitats within sites for selection of sampling locations and recommends that, wherever possible, two habitats (riffles and edges) be sampled at each site. The following AusRivAS definitions are relevant and sampling has conformed to these definitions:

- A site is "a stream reach with a length of 100 m or 10 times the stream width, whichever is the greater"
- A riffle habitat is "an area of broken water with rapid current that has some cobble or boulder substratum". However, "sampling riffles where the substratum consists predominantly of large boulders may be difficult and may not produce reliable results".
- Edge habitat is "an area along the creek with little or no current".

Given the location of a number of the study sites in reaches of creeks where there are predicted to be periods of little or no connecting flow between pools or where there are predicted to be no riffle sections available for sampling, it was decided that only pool 'edge' samples would be sampled, as riffle samples could not be guaranteed for all (or possibly even for most) sites at all sample times.

The final adopted design includes the following features:

- Sampling the aquatic macro invertebrate fauna of a minimum of three creek pools in each creek twice a year (in Spring and Autumn) using the AusRivAS sampling, sorting and identification protocols.
- Estimation of fish occurrence by a combination of bait-trapping, dip netting and observation, with all captured fish identified in-situ and immediately released.
- Depth profiles of basic water quality parameters: Temperature, Electrical Conductivity (salinity), water acidity (pH), Dissolved Oxygen and Turbidity, at each site during each sampling run.
- Recording of changes in creek riparian condition and of aquatic plant distribution within the study areas at each sampling time.

The particular reach selected for sampling within each of the sample locations was selected on the basis of it being;

- (i) a reach with high drought resistance (generally based on pool size, depth and riparian cover) and
- (ii) a reach with high aquatic habitat diversity; ideally deep pools connected by gentle riffles, abundance of stream bed litter, presence of snags, presence of aquatic vegetation and good extent of cover of overhanging riparian vegetation.

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Seven sites were selected and sampled with a view to assessing within- and between-creek variability:

- BCUp Bowmans Creek Upstream. Located upstream of mine lease area, approximately 1.3 km upstream from New England Highway. This is also an Ashton Coal water quality monitoring site (SM3).
- BCLW5 Bowmans Creek Upstream Intermediate site located at creek bend overlying Longwall 5.
- BCLW7 Bowmans Creek Downstream Intermediate site about 1.2 km downstream from BCLW5, overlying Longwall 7. Also Ashton Coal water quality monitoring site (SM5).
- BCDown Bowmans Creek Downstream located about 200m upstream from Hunter River confluence. Ashton Coal water quality monitoring site (SM6).
- GCUp Glennies Creek Upstream about 50m downstream from church, and 300m upstream from New England Highway.
- GCMid Glennies Creek intermediate located on bend at closest point to longwall 1 approximately 1.4 km downstream from New England Highway, and 500m upstream from Ashton Coal water monitoring site SM8.
- GCDown Glennies Creek Downstream located approximately 1.5km downstream from GCMid, and 2km upstream from Hunter River confluence.

3.7.2 Monitoring Results

3.7.2.1 Bowmans Creek

Stream flows were higher during Autumn 2009 than during the Spring 2008 sample and increased over the three sample days from 17.8 to 25.5 ML/day. Stream waters were relatively clear and low turbidity was recorded over all sites.

The four sites sampled in post flood autumn 2007, taxa diversity means have increased marginally over each survey from 14.0 taxa (autumn 2007), to 17.0 taxa (spring 2007), 18.8 taxa (autumn 2008) and 20.8 taxa (spring 2008 and autumn 2009).

The number of taxa not previously recorded from the study area continues to increase each survey with 11 further taxa recorded in Autumn 2009 not previously recorded. There were however a number of taxa not recorded during the Spring 2008 and Autumn 2009 surveys that

had been previously observed. Overall there have been 64 macroinvertebrate taxa recorded from the Bowmans Creek sites over five surveys.

The overall Autumn 2009 creek SIGNAL score (3.75) was lower than the Autumn 2008 (4.00) and Spring 2008 (3.93) values, but higher than the Autumn 2007 (2.95) and Spring 2007 (3.64).

There were five species of fish encountered from Bowmans Creek during the period, all of which have been commonly occurring over the life of the monitoring program. Long necked turtles have not previously been recorded from Bowmans Creek during the current monitoring program and during the Autumn 2009 survey a juvenile was found at BCMW7. Previous evidence of long necked turtles in the study area with observations of turtle shells within the same length of creekline (between BC1 and BCMW7) in 2005. It is possible that the creek population may have been depleted due to the combined effects of drought (2005 to mid 2007) followed by intense flooding in June 2007. The recovery of creek populations since that time would be assisted by offline water storages (such as dams) which weren't as impacted by the drought and floods.

3.7.2.2 Glennies Creek

Creek conditions were similar to the previous two surveys in Glennies Creek with mean daily stream flows being slightly higher. Macrophyte abundance was also similar to that formerly encountered, which consisted mainly of *Myriophyllum*, clasped pondweed and Elodea, and cumbungi plus river clubrush.

Water quality was generally good across all parameters measured for the Autumn 2009 survey. Water turbidity was low across all sites.

There were 41 macroinvertebrate taxa identified from five Glennies Creek sites for during the Autumn 2009 survey, three of which had not previously been recorded from Glennies Creek study sites. The Autumn 2009 survey recorded a site taxa diversity mean value of 24.0 ± 0.8 taxa. This is higher than most former surveys except Autumn 2008 which recorded 42 taxa with a site mean of 24.2 ± 1.0 taxa. There have been 63 macroinvertebrate taxa recorded from the Glennies Creek sites over the past five surveys.

Most sites scored relatively high SIGNAL scores when compared to previous sample occasions, and the overall creek SIGNAL score was marginally higher in Autumn 2009 (at 3.95) than all former survey creek SIGNAL scores. Even though the site SIGNAL means over all surveys indicate that the highest scores are attained at GCU_p and decrease for each site heading downstream, GCU_p recorded the lowest SIGNAL score for this survey.

Two species of frog were positively identified during the course of sampling from riparian habitats within site reaches. The dwarf tree frog was found in numbers at GCO_{CU}_p and the broad palmed frog was found at GCM_{id}.



Figure 9. Bowmans Creek (BCMW7) looking upstream, Autumn 2009



Figure 10. Glennies Creek (GCOCDown) looking upstream, Autumn 2009.



Figure 11. Glennies Creek (GCOCDown), Autumn 2009.

3.8 WEEDS

3.8.1 Weed Management

The Weed Management Plan has been revised under consent condition 3.7 and approved by the Department of Planning. Weed works conducted during the period focused on the following species:

- Green Cestrum, a Class 3 noxious weed. Controlled using cut and paint techniques with Roundup Biactive®. Approximately, a total of 2ha situated along the banks of Glennies Creek were treated.
- African Boxthorn, a Class 4 noxious weed. Controlled using cut and paint techniques with Roundup Biactive®. A total of 37ha were treated.
- Galinea, an environmental weed. Sprayed with Grazon Extra®. A total of 1ha was treated within the VCA.
- St John's Wort, a Class 4 noxious weed. Sprayed with Grazon Extra®. A total of 59ha were treated during the period.

Figure 12 shows the location of weed works conducted during the period.

A weed survey was undertaken during the period. This identified key areas for treatment in the 2009 - 2010 reporting period. Key weeds to be addressed are:

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- Follow up treatment of St John's Wort throughout all ACOL land holdings,
- Follow up treatment of Green Cestrum throughout all ACOL land holdings,
- Continued treatment of African Boxthorn across the Ashton Property and Conservation Area,
- Treatment of Galinea in rehabilitation areas and topsoil stockpiles.

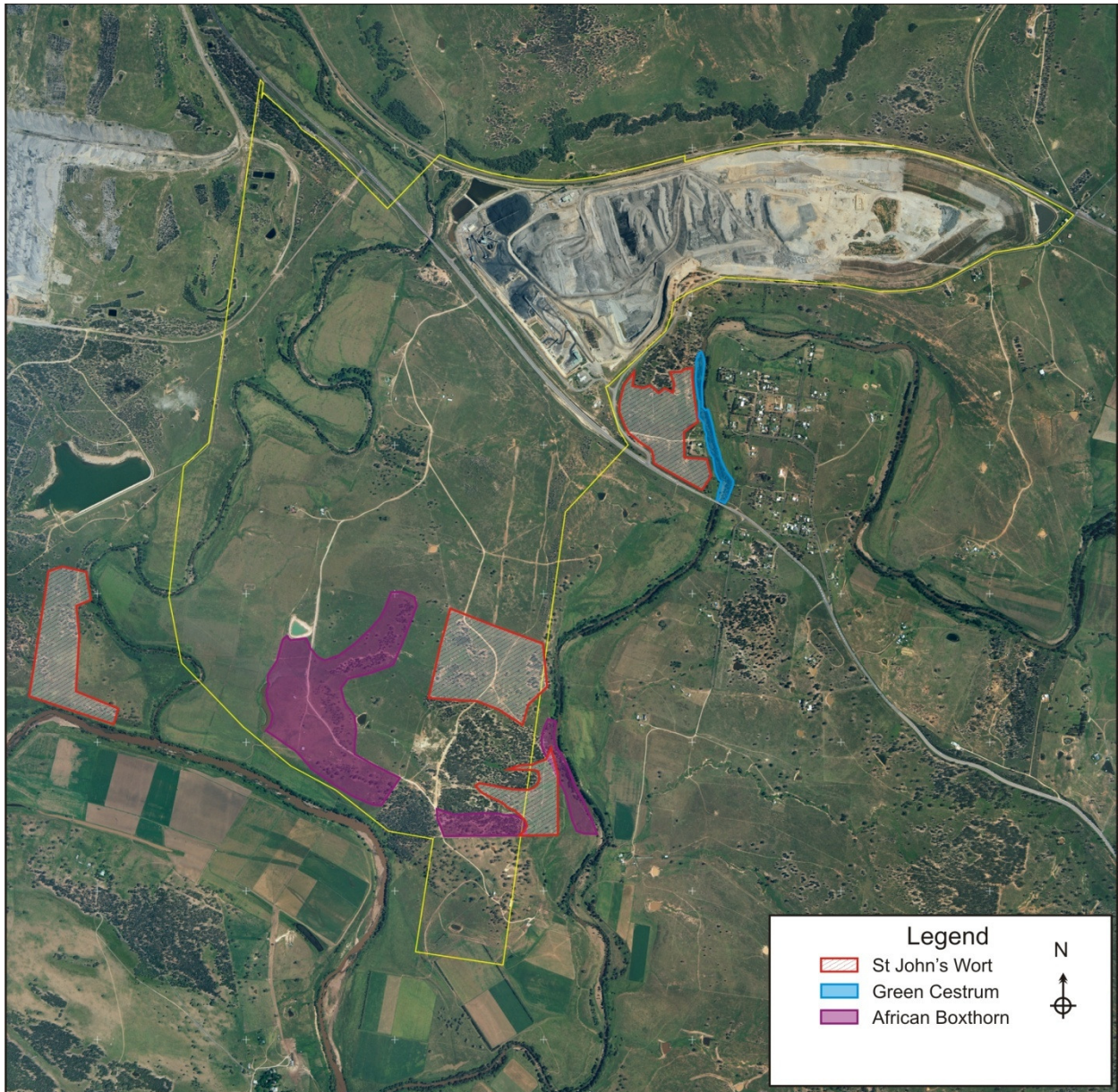


Figure 12. Overview of weed control works September 2008 to August 2009

3.9 BLASTING

3.9.1 Blast Management

Due to the proximity of the Main Northern Railway, Glennies Creek Road and the village of Camberwell to the mining operations area, the Blasting and Vibration Management Plan (BVMP) along with a complex series of controls have been established to ensure that blasts conform to the criteria defined in the Development Consent and the EPL.

Blasting times are limited to the hours of 9am to 5pm Monday to Saturday inclusive by the Development Consent, However the EPL states that blasting cannot occur on Sundays or public holidays without the prior approval of the DECC. During the reporting period no blasts were conducted on Sundays or Public Holidays.

To ensure that ground vibration does not exceed criteria at receptor locations, the Maximum Instantaneous Charge (MIC) is calculated for each blast at the design stage. Procedures are also in place to ensure that sufficient depth of crushed stemming material is also placed in the collar of each blast hole to minimise the effects of air blast (air overpressure).

The BVMP also requires the completion of a Blasting Environmental Checklist prior to each blast. This checklist ensures that meteorological conditions are appropriate for the blast to occur. There are also checklists for Community Notification and Notification of the Common Management Committee when the common requires closing.

The Road and Rail Closure Management Plan (RRCMP) also requires the closure of Glennies Creek Road or the New England Highway if any part of the road comes within the 500 metre zone of exclusion that is required to be established around each blast. If any blast is within 200 metres of the Main Northern Railway, ACOL seek possession of the railway for the duration of the blast. This ensures that no rail traffic enters the zone of exclusion within the blast period.

The residents of Camberwell village and all occupiers of buildings within two kilometres of blasting locations are provided advance notice of planned blasting events on the Ashton website (www.ashtoncoal.com.au) and, excepting where they have requested to be removed from the contact list, at least one hour prior to each blasting event, by telephone.

Due to fire damage to St Clements Church caused by an arsonist, no structural assessments were undertaken by Ashton Coal on St Clements Church during the reporting period. The historic church has now been listed as a heritage building under the NSW Heritage Act. Ashton Coal has assisted the clean up project with labour and support and has offered to provide any assistance to the congregation where required.

3.9.2 Blast Criteria and Monitoring

The Development Consent defines the following criteria:

“The Airblast overpressure level from blasting operations carried out in or on the premises must not exceed:

- (a) 115dB (Lin Peak) for more than 5% of the total number of blasts during each reporting period; and*
- (b) 120dB (Lin Peak) at any time*

At any residence or other noise sensitive receiver such as the St Clements Anglican Church and Camberwell Community Hall

The ground vibration peak particle velocity from blasting operations carried out in or on the premises must not exceed:

- (a) 2mm/s for more than 5% of the total number of blasts carried out in or on the premises during each reporting period; and*
- (b) Exceed 10mm/s at any time*

At any residence or other noise sensitive receiver such as the St Clements Anglican Church and Camberwell Community Hall.”

A total of 172 blasts took place during the reporting period. A summary of the results is given below while a comprehensive list of blast monitoring results is presented in **Appendix 4**.

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The locations are detailed hereunder:

Table 29. LOCATION OF BLAST MONITORING STATIONS	
Monitoring Station No	Location
1	Camberwell village (north)
2	St Clements Church

Table 30. SUMMARY BLAST MONITORING RESULTS				
	St Clements Church		Camberwell Village	
	Vibration	Overpressure	Vibration	Overpressure
Results Captured	171	120	170	132
Data Recovery (%)	99%	70%*	99%	77%*
Results >2mm/s	3		5	
Results >2mm/s (%)	1.8%		2.9%	
Results >10mm/s	0		0	
Results > 115dBL		9		10
Results > 115dBL (%)		5.2%		5.8%
Results > 120bBL		1		1

*It should be noted that the lower data recovery for Overpressure is due predominantly to the Blast monitors being triggered by Vibration. Due to the strict controls in place for Ashton Coal and low overburden depth many blast are so small that they do not trigger the monitors for vibration hence it is a technical non-measurement for Overpressure, while it is expected that due to the small shot, overpressure would also be well below criteria.

At the end of the 2008-09 reporting period blast Vibration results remained within all criteria. At the end of the period the 115dBL overpressure limit was exceeded more than 5% of the time at both the Church (5.2%) and Village (5.8%) blast monitoring locations. The 120dBL limit was also exceeded on 1 occasion at both monitoring locations.

On the 25th June 2009 Ashton fired an Upper Liddell shot which exceeded the 120dBL criteria at the Church (135dBL) and Village (132dBL) monitors. Following the exceedence a full investigation was conducted into the cause of the exceedence and any further actions identified. The investigation report was supplied to DECCW, DoP and DII. The investigation identified that the primary cause of failure was the deviation of one of the drill holes towards the free face effectively reducing the burden confining the explosives. This allowed blast energy to escape through localised jointing in the rock. The deviation of the drill hole is likely to be the result of one or both of 2 factors. The first is the flexing of the drill rod. As the drill rod penetrates through the ground the rod can flex as the width to length ratio increases. The 30m hole was drilled with a 150mm rod, a depth not previously drilled by the specific drill rig on a face hole at Ashton. Secondly, the rod may have been deviated by a change in strata. This second factor however is likely to have been a lesser cause. To attempt to overcome future problems associated with the deviation of drill holes Ashton has adopted a procedure where down-the-hole logging will be undertaken on the outer row of all eastern exposed faces with a height greater than 15m, down to a depth of 50m below surface level.

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Throughout the reporting period a number of blasts were cancelled or rescheduled due to weather forecasts and experienced weather conditions. These are detailed in **Table 31**.

Table 31. OPERATIONAL CHANGES RELATING TO BLAST IMPACTS		
Date	Issue	Changes Undertaken
15/09/2008	Windy conditions.	Blast cancelled.
27/10/2008	Windy conditions.	Blast cancelled.
30/10/2008	Windy conditions.	Blast cancelled.
28/11/2008	Windy conditions.	Blast cancelled.
15/05/2009	Forecast provided on the 15 th May indicated windy conditions at midday on the 16 th .	Blast brought forward to 9am.
16/05/2009	Winds picked up before 9am.	Blast cancelled.
2/07/2009	Windy conditions.	Blast cancelled.
3/07/2009	Windy conditions.	Blast cancelled.
4/07/2009	Windy conditions.	Blast cancelled.
7/08/2009	Windy conditions.	Blast cancelled.
21/08/2009	Windy conditions.	Blast cancelled.
24/08/2009	Forecast indicated windy conditions at 12pm.	Blast brought forward to 9am.
26/08/2009	Windy conditions.	Blast cancelled.

3.9.3 Long-term Blasting Trends

Long term blasting trends are presented in **Figure 13**. Compliance with the 5% criteria for overpressure and vibration has significantly improved over the past 6 years of operation. Electronic detonation has allowed the continued decrease in blast vibration results at both the Church and Village monitors. The increase in overpressure results above 115dB_L is primarily the result of the close proximity of blasting to Camberwell Village during the last quarter of the period. During this time a number of surface shots (including the 120dB_L) exceedence were fired. These figures are expected to decline again once these surface shots have been completed.

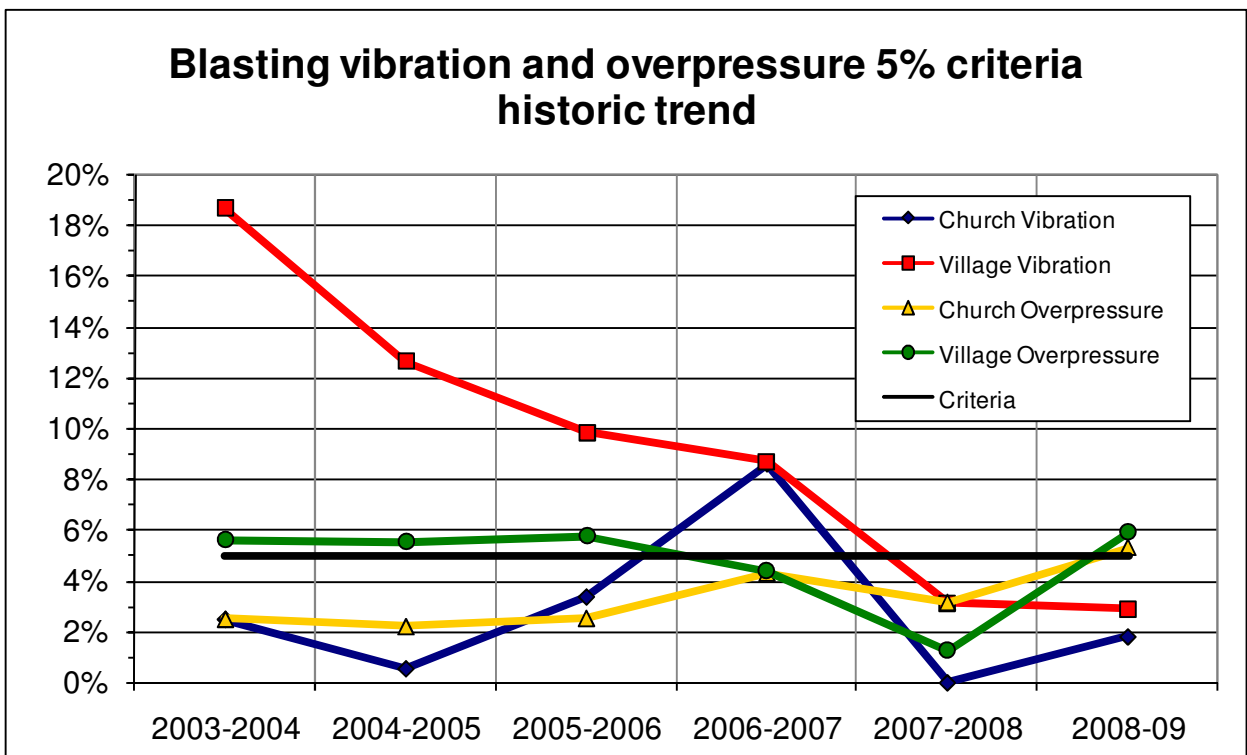


Figure 13. Blasting vibration and overpressure 5% criteria historic trend

3.10 OPERATIONAL NOISE

3.10.1 Noise Management

The Noise Management Plan for phase 2 of Ashton Coal's mining operations has been approved by the Department of Planning. As part of this plan a set of proactive and reactive mitigation measures have been identified to assist in reducing the noise impact from ACOL on the neighbouring residence. The inversion study conducted by Spectrum Acoustics during the previous reporting period indicated that even when a strong inversion ($+7.5^{\circ}\text{C}/100\text{m}$) is in place, trucks that are dumping on the northern side of the 135RL dump, Camberwell village falls in the acoustic shadow zone of the eastern emplacement. As a result ACOL has committed to restricting dumping at night to both the northern side and lower areas of the Open Cut, particularly when winds are emanating from the North West.

Major noise mitigation measures implemented during the reporting period include:

- A review of the noise model was conducted to reassess the acquisition and management zones for the operations. This was also undertaken in considering the relocation of equipment to the southern portion of the pit.

There are also a number of standard operational controls undertaken to reduce the noise impact on the Village of Camberwell, these are;

- During inversion and NW wind conditions (noise enhancing conditions) machinery is removed from the southern exposed faces and relocated to the northern boundary or lower levels within the pit.
- When achievable after 6pm in the evening under NW winds, machinery is removed from the southern exposed faces and relocated to the northern boundary or lower levels within the pit.

In addition to these standard practices a number of specific operational changes were made during the reporting period in response to either complaints or identified noise issues, these are presented in the table below.

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Table 32. OPERATIONAL CHANGES REGARDING NOISE IMPACTS		
Date	Issue	Changes Undertaken
26/09/2008	Noise complaint received.	Trucks hauling to the 130RL dump were relocated in pit.
27/10/2008	Noise complaint received.	Dumping was relocated from the southern face to the northern boundary.
6/11/2008	Noise complaint received.	Relocated dumping on the southern boundary to in pit and to the north.
1/12/2008	Noise complaint received.	Topsoil hauling to 135RL ceased.
11/06/2009	Noise complaint received.	Shutdown Excavator 30.
12/06/2009	Noise complaint received.	Shutdown Excavator 30 and 994 loader.
29/06/2009	Inspection by General Manager and Environmental Officer (EO) identified dozer audible as track clatter in Camberwell Village.	Dozer operating 130RL dump replaced by rubber tired dozer and half of trucks relocated to a lower dump.
6/07/2009	Inspection of Camberwell Village identified Excavator 30 audible in Camberwell Village.	Excavator 30 shutdown following inspection.
12/07/2009	Inspection of Camberwell Village by EO identified Ashton's operations audible in Camberwell.	Contacted OCE and identified drill rigs operating in exposed area likely cause of noise. Both rigs shut down.
13/07/2009	Noise complaint received.	Truck movements reduced to remove retard noise.
14/07/2009	Following noise analysis from previous nights, a management decision was made to shutdown drill rigs at 8pm and 9pm due to the exposed nature of the drill pattern.	Drill rigs shutdown at 8pm and 9pm
15/07/2009	The same procedure was adopted from the following night with the rigs operating in the same location.	Drill rigs shutdown at 8pm and 9pm
18/07/2009	Noise complaint received.	Excavator 30 was shutdown along with the D8 Dozer.
19/07/2009	Noise complaint received.	While drill rigs were operating in a more sheltered position then earlier in the month they were identified as the source and both drill rigs shutdown.
20/07/2009	Inspection by EO identified Ashton operations audible in Camberwell Village.	First drill rig shutdown. Slight decrease in noise levels observed. Second drill rig shutdown reducing Ashton noise.
14/08/2009	Noise complaint received.	994 Loader shutdown.

3.10.2 Noise Criteria and Monitoring

Noise generated by the Ashton Coal Project must not exceed the limits specified in Condition 6.34 (Table 5), which is detailed hereunder, except as may be expressly provided by an EPA Licence,

Table 33. (DC TABLE 5) NOISE LIMITS (dB(A))				
Location	Day	Evening	Night	
	L _{Aeq} (15 minute)	L _{Aeq} (15 minute)	L _{Aeq} (15 minute)	L _{Aeq} (1 minute)
Any residence not owned by the Applicant or not subject to an agreement between the Applicant and the residence owner as to an alternate noise limit	38	38	36	46

The above criteria do not apply when wind speeds are greater than 3m/s and/or there is an inversion in place of greater than 3°C/100m.

Quarterly Noise Monitoring

Condition 6.44 of the Development Consent requires detailed noise monitoring surveys at potentially affected residences on a 3-monthly basis. All monitoring was performed by Spectrum Acoustics, utilising manned monitoring methods as specified in the EIS.

Quarterly noise monitoring results are as follows. Where exceedences of the EPL and DC criteria have occurred these are shown in red:

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Table 34. 1ST QUARTER NOISE RESULTS NOVEMBER 2008 (11 NOVEMBER 2008):

ACP Noise Monitoring Results – 11 November 2008 – Day							
Location	Time	dB(A) Leq	ACOL dB(A)	Comments	WS and Direction	Inversion °C/ 100m	ACP Noise Sources
Richards	3.50 pm	39	Inaudible	Wind (38), birds (30), other mines (30), ACP inaudible	4.2 ESE	n/a	n/a
Stapleton	4.35 pm	40	Inaudible	Wind (38), traffic (37), ACP inaudible	3.6 ESE	n/a	n/a
Clarke	4.15 pm	41	27	Wind (39), birds (37), ACP (27)	4.7 ESE	n/a	Haul trucks
Horadam	4.53 pm	51	Inaudible	Traffic (51), insects (33), ACP inaudible	3.5 ESE	n/a	n/a
Moss	5.10 pm	60	Inaudible	Traffic (60), ACP inaudible	3.3 ESE	n/a	n/a
ACP Noise Monitoring Results – 11 November 2008 - Evening							
Location	Time	dB(A) Leq	ACOL dB(A)	Comments	WS and Direction	Inversion °C/ 100m	ACP Noise Sources
Richards	7.55 pm	44	Inaudible	Insects (44), other mines (30), ACP inaudible	3.5 ESE	n/a	n/a
Stapleton	8.35 pm	39	30	Other mines (34), insects (31), traffic (30) ACP (30)	2.2 ESE	n/a	Haul trucks
Clarke	8.18 pm	49	<30	Insects (49), other mines (30), traffic (30), ACP (<30)	2.6 ESE	n/a	Haul trucks, dozer tracks
Horadam	8.55 pm	49	Inaudible	Traffic (48), insects (43), ACP inaudible	2.0 ESE	n/a	n/a
Moss	9.12 pm	45	Inaudible	Frogs & insects (42), traffic (42), ACP inaudible	2.5 ESE	n/a	n/a
ACP Noise Monitoring Results – 11 November 2008 - Evening							
Location	Time	dB(A) Leq	ACOL dB(A)	Comments	WS and Direction	Inversion °C/ 100m	ACP Noise Sources
Richards	10.02 pm	41	Inaudible	Insects (39), other mines (35), ACP inaudible	1.7 ESE	n/a	n/a
Stapleton	10.41 pm	36	Inaudible	Other mines (33), traffic (30), insects (30), ACP inaudible	1.7 E	n/a	n/a
Clarke	10.23 pm	49	Inaudible	Insects (49), other mines (30), ACP inaudible	1.8 ESE	n/a	n/a
Horadam	10.58 pm	49	Inaudible	Traffic (49), other mines (30), ACP inaudible	1.4 E	n/a	n/a
Moss	11.17 pm	47	Inaudible	Traffic (44), frogs & insects (44), ACP inaudible	1.2 ESE	n/a	n/a

During the monitoring conducted on the 11 November 2008 winds were light and emanating from the South East throughout the period. There were no noise exceedences recorded during the survey.

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Table 35. 2ND QUARTER NOISE RESULTS FEBRUARY 2009 (28 FEBRUARY 2009):

ACP Noise Monitoring Results – 28 February 2009 – Day							
Location	Time	dB(A) Leq	ACOL dB(A)	Comments	WS and Direction	Inversion °C/ 100m	ACP Noise Sources
Richards	4.00 pm	39	Inaudible	Wind (38), birds & insects (32), farm machinery (30), ACP inaudible	1.7 WNW	n/a	n/a
Stapleton	4.42 pm	43	Barely audible <30	Traffic (43), wind (33), ACP barely audible (est. <30)	1.8 WNW	n/a	Mine hum
Clarke	4.25 pm	44	Barely audible <30	Traffic (42), wind (35), birds (35) ACP barely audible (est. <30)	2.0 WNW	n/a	Mine hum
Horadam	5.00 pm	49	Inaudible	Traffic (49), ACP inaudible	1.1 WNW	n/a	n/a
Moss	5.17 pm	68	Inaudible	Traffic (68), ACP inaudible	1.4 WNW	n/a	n/a
ACP Noise Monitoring Results – 28 February 2009 – Evening							
Location	Time	dB(A) Leq	ACOL dB(A)	Comments	WS and Direction	Inversion °C/ 100m	ACP Noise Sources
Richards	8.00 pm	38	36	ACP (36)* , birds & insects (32), dogs (30)	2.7 NNW	n/a	Truck revs and retards, dozer
Stapleton	8.37 pm	46	42	ACP (42)* , frogs & insects (40), traffic (40)	3.2 NNW	n/a	Truck revs and retards, dozer
Clarke	8.21 pm	43	38	Traffic (39), ACP (38)* , insects (37)	3.0 NNW	n/a	Truck revs and retards, dozer
Horadam	8.57 pm	49	<35	Traffic (49), insects/frogs (36), ACP audible not measureable (est. <35)	2.7 NNW	n/a	Truck revs
Moss	9.15 pm	64	<35	Traffic (64), insects/frogs (45), ACP audible not measureable (est. <35)	2.6 NNW	n/a	Truck revs
ACP Noise Monitoring Results – 28 February 2009 – Night							
Location	Time	dB(A) Leq	ACOL dB(A)	Comments	WS and Direction	Inversion °C/ 100m	ACP Noise Sources
Richards	10.04 pm	38	Inaudible	Insects & frogs (37), mine noise (31), ACP inaudible	3.4 NNW	n/a	n/a
Stapleton	10.43 pm	42	Inaudible	Traffic (39), frogs & insects (38), mine noise (36), ACP inaudible	2.2 NNW	n/a	n/a
Clarke	10.26 pm	40	Inaudible	Mine noise (34), traffic (33), train (33), ACP inaudible	2.6 NNW	n/a	n/a
Horadam	11.00 pm	47	Inaudible	Traffic (44), frogs & insects (43), ACP inaudible	0.9 WSW	n/a	n/a
Moss	11.18 pm	63	Inaudible	Traffic (63), ACP inaudible	1.0 SSW	n/a	n/a

Throughout the monitoring survey winds were light to moderate from the north west. During the evening monitoring session Ashton noise was recorded at 42dBA and 38dBA at the Stapleton and Clarke residences respectively. Spectrum Acoustics indicated however that these noise levels include contributions from other mining operations to the north of Ashton. Using the noise levels recorded from the night session for these operations the actual Ashton contribution to these noise levels was calculated. These are presented in **Table 36**. It was identified that the actual noise contribution for ACOL at the Stapleton and Clarke residences were 40dBA and

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36dBA respectively. Wind speeds at the time of the Stapleton (40dBA) evening recording were greater than 3m/s and thus the result is not recorded as an exceedance as described above.

Table 36. 28 FEBRUARY 2009 ACOL EVENING/NIGHT RELATIVE NOISE CONTRIBUTIONS

Location	Total Noise (dBA)	Other Mines (dBA)	ACOL Contribution (dBA)
Richards	36	31	34
Stapleton	42	36	40
Clarke	38	34	36

Table 37. 3RD QUARTER NOISE RESULTS MAY 2008 (11 MAY 2009):

ACP Noise Monitoring Results – 11 May 2009 – Day							
Location	Time	dB(A) Leq	ACOL dB(A)	Comments	WS and Direction	Inversion °C/ 100m	ACP Noise Sources
Richards	4.00 pm	38	Inaudible	Other mines (35), birds & insects (33), traffic (32), ACP inaudible	2.6 / ESE	n/a	n/a
Stapleton	4.47 pm	44	Inaudible	Traffic (43), birds & insects (38), ACP inaudible	2.2 / ESE	n/a	n/a
Clarke	4.30 pm	35	Inaudible	Traffic (34), birds & insects (28), ACP inaudible	2.5 / ESE	n/a	n/a
Horadam	5.05 pm	52	Inaudible	Traffic (52), birds (40), ACP inaudible	2.3 / ESE	n/a	n/a
Moss	5.23 pm	71	Inaudible	Traffic (71), ACP inaudible	2.0 / ESE	1.1	n/a
ACP Noise Monitoring Results – 11 May 2009 – Evening							
Location	Time	dB(A) Leq	ACOL dB(A)	Comments	WS and Direction	Inversion °C/ 100m	ACP Noise Sources
Richards	8.00 pm	39	Inaudible	Other mines (38), insects (30), ACP inaudible	1.9 / E	7.7	n/a
Stapleton	8.40 pm	45	Inaudible	Traffic (45), ACP inaudible	1.3 / ESE	7.9	n/a
Clarke	8.23 pm	39	Inaudible	Traffic (39), birds & insects (30), ACP inaudible	1.3 / ESE	8.8	n/a
Horadam	9.01 pm	50	Inaudible	Traffic (50), ACP inaudible	1.5 / S	7.0	n/a
Moss	9.17 pm	68	Inaudible	Traffic (68), ACP inaudible	0.9 / S	7.2	n/a
ACP Noise Monitoring Results – 11 May 2009 – Night							
Location	Time	dB(A) Leq	ACOL dB(A)	Comments	WS and Direction	Inversion °C/ 100m	ACP Noise Sources
Richards	10.02 pm	40	Inaudible	Other mines (40), ACP inaudible	1.3 / S	6.3	n/a
Stapleton	10.40 pm	42	Barely audible	Traffic (42), ACP barely audible	1.4 / SSE	7.7	Revs, dozer tracks
Clarke	10.23 pm	40	Barely audible	Traffic (40), train (30), ACP barely audible	1.1 / S	7.7	Revs, dozer tracks
Horadam	10.59 pm	49	Inaudible	Traffic (49), ACP inaudible	0.8 / SW	6.6	n/a
Moss	11.18 am	66	Inaudible	Traffic (66), ACP inaudible	0.8 / SW	7.7	n/a

During the survey period the winds were light from the south east. A strong inversion was present for the evening and night time periods. Throughout the monitoring survey ACOL operations were inaudible. There were no exceedances of noise criteria recorded.

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Table 38. 4TH QUARTER NOISE RESULTS AUGUST 2008 (6 AUGUST 2009):

ACP Noise Monitoring Results – 6 August 2009 – Day							
Location	Time	dB(A) Leq	ACOL dB(A)	Comments	WS and Direction	Inversion °C/ 100m	ACP Noise Sources
Richards	10.00 am	39	32	Birds & insects (37), ACP (32) , traffic (31)	2.2 WNW	n/a	Mine hum
Stapleton	10.40 am	48	38	Traffic (45), birds & insects (42), ACP (38) , domestic noise (37)	1.7 WNW	n/a	Mine hum, Engine revs, drill?
Clark	10.23 am	45	38	Traffic (41), birds & insects (40), ACP (38)	1.5 WNW	n/a	Mine hum, Engine revs, drill?
Horadam	11.20 am	54	Barely audible <30	Traffic (54), birds & insects (34), ACP barely audible (est. <30)	2.3 WNW	n/a	Mine hum
Moss	10.59 am	70	inaudible	Traffic (70), ACP inaudible	1.9 WNW	n/a	n/a
ACP Noise Monitoring Results – 6 August 2009 – Evening							
Location	Time	dB(A) Leq	ACOL dB(A)	Comments	WS and Direction	Inversion °C/ 100m	ACP Noise Sources
Richards	7.10 pm	43	inaudible	Other mines (36), insects (34), traffic (30), ACP inaudible	2.0 ENE	+5.9	n/a
Stapleton	7.47 pm	46	40	Traffic (44), ACP (40) , insects (39)	0.5 ESE	+7.3	Engine revs, dozer, haul trucks, drill
Clark	7.30 pm	44	38	Traffic (42), ACP (38) , insects (37)	1.2 NE	+4.8	Engine revs, dozer, haul trucks, drill
Horadam	8.22 pm	53	est. <35	Traffic (53), insects (33) ACP (est. <35)	0.3 SSE	+8.4	Engine revs,
Moss	8.04 pm	65	est. <35	Traffic (65), frogs & insects (45), ACP (est. <35)	0.4 SSE	+7.0	Engine revs
ACP Noise Monitoring Results – 6 August 2009 – Night							
Location	Time	dB(A) Leq	ACOL dB(A)	Comments	WS and Direction	Inversion °C/ 100m	ACP Noise Sources
Richards	10.30 pm	43	inaudible	Birds & insects (41), train (37), other mines (32), traffic (30), ACP inaudible	0.3 WSW	+8.6	n/a
Stapleton	11.07 pm	48	36	Traffic (47), frogs & insects (40), ACP (36)	1.1 WNW	+9.1	Mine hum
Clark	10.50 pm	43	35	Insects (39), traffic (38), ACP (35)	1.3 WNW	+7.7	Mine hum
Horadam	11.43 pm	53	Barely audible <30	Traffic (51), frogs & insects (48), ACP barely audible (est. <30)	1.3 WNW	+8.8	Mine hum
Moss	11.25 pm	66	inaudible	Traffic (66), frogs & insects (43), ACP inaudible	1.0 WNW	+9.0	n/a

During the survey period winds were light and from the north west during the day and night periods. During the evening period however winds became calm and emanated from the south east. A strong inversion was present during the evening and night periods. During the evening survey noise from ACOL was recorded at 40dBA at the Stapleton residence. At this time however an inversion strength of +7.3°C/100m was recorded. As discussed above ACOL noise criteria do not apply when an inversion strength of 3°C/100m or greater is present.

3.11 VISUAL, STRAY LIGHT

Lighting issues on site are managed through the Lighting Management Plan (LMP).

Three types of lighting are utilised on site. They are:

- Fixed lighting utilised to illuminate the areas arrange the CHPP and open cut workshop;
- Mobile lighting plants utilised to illuminate the open cut, the overburden dump, the tailings disposal area and some maintenance operations; and
- Lighting equipped on mobile plant.

Fixed lighting is generally high pressure sodium vapour lights, which minimise the glare usually associated with “white” lights.

Historically mobile lighting plants have been the source of lighting complaints, particularly those stationed on the Eastern Emplacement Area (EEA). During the reporting period one complaint regarding the positioning of lights on the EEA was received. The placement of the light was changed once the complaint was received. One enquiry was also received regarding a light left on after 10pm on the EEA. The light had been left on for refuelling of equipment. Once this had been completed the light was turned off. Positioning of lighting plants to reduce off-site impacts is included in ACOL’s induction process to ensure employees and contractors are aware of potential impacts to Ashton’s neighbours.

3.12 ABORIGINAL HERITAGE

In December 2007 Ashton Coal received a Heritage Impact Permit under *Section 90* of the *NPW Act 1974* for the area above Longwall 1-4. The Section 90 permit application was submitted with a detailed management plan that aimed to where possible preserve and manage artefacts and only collect where necessary. While preservation is the ongoing aim of ACOL, due to the nature of subsidence impacts and the potential for emergency remediation works being required due to safety related issues the submission was for a blanket S90 over the entire UG area.

The management plan was developed in conjunction with relevant community groups, Ashton Coal and Angela Besant of Insite Heritage. The plan will be revised at the end of mining of each seam, by all parties and any subsequent adjustments made to the management plan will be lodged with the DECC. The plan aims to minimise impact on Aboriginal relics and the integrity of sites while retaining the maximum possible site/s in situ.

The management plan may result in the surface collection of some artefacts which may be impacted by ripping of cracks due to subsidence. There may also be some limited excavation of

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sub surface deposits where necessary. The artefacts collected as part of this process will be redeposited within the relevant site and an updated site card lodged with DECC.

This management plan is applicable to the subsidence zone for longwall panels 1-4 only. Sites and areas of potential archaeological deposits located outside of the subsidence zone are not covered by this management plan.

The implementation of the management plan is considered to have been effective to date. The process of assessing the potential impacts on artefact sites based on predictions of crack locations, and only disturbing sites where necessary, has lead to only a single artefact being disturbed during the mining of longwall 1, 2, 3 and 4. Ongoing monitoring of crack positions has shown little impact from cracking at other sites and the need for destructive remediation measures has not been required.

Consultation with the Indigenous Community

The Wonnarua Liason Committee met twice during the reporting period. Discussion included the implementation of the deed of agreement between ACOL and the Wonnarua people and potential for employment of Wonnarua people at ACOL.

Consultation with Indigenous community groups was also undertaken as part of the SMP application process for LW/MW 5 to 9.

3.13 NATURAL HERITAGE

No items of natural or European heritage were identified during the EIS process as being likely to be disturbed by mining operations.

During the reporting period a commitment was made to the St Clements Church to assist with the structural improvements to the church to be undertaken during the repair of the Church following the arson attack. This includes the attachment of the roof structure to the walls of the church which had previously not been completed.

3.14 SPONTANEOUS COMBUSTION

A Spontaneous Combustion Management Plan has been prepared and implemented on site.

ACOL have taken on the responsibility of an area of Macquarie Generations Ravensworth Void 4 area for the disposal of Tailings. This area has significant spontaneous combustion instances and is managed under the Tailings Emplacement Operations Plan. Part of this management includes regular monitoring by CHPP personnel and detailed survey of the area to record the location and severity of spontaneous combustion points. Photographic records of each area are also included in the report. The first survey was undertaken in July 2007 and identified 36 separate instances of spontaneous combustion within ACOL's area of responsibility. During the reporting period a survey of the area was conducted on the 9 August 2009. This indicated

- 52 existing active sites,
- 36 previously active sites where spon com was not visible, and
- 29 new sites.

The reduction in previously active spon com sites is due to the effect of sealing the sides of Void 4 through tailings deposition. This process removes the oxygen supply from the spontaneous combustion sites within the spoil.

New sites recorded were predominantly the result of subsidence cracking from underground longwall mining being undertaken by a neighbouring operation beneath the area.

3.15 BUSHFIRE

A Bushfire Management Plan (BMP) has been developed and implemented on site. This BMP requires that a risk assessment be undertaken in consultation with the Singleton Rural Fire Service to assess the risks of fire breaking out, or entering on to the site, as well as the development of risk reduction measures. This risk assessment was completed prior to the commencement of the 2003 / 2004 fire season and all agreed actions have been implemented. The BMP is currently being reviewed in consultation with the Singleton Rural Fire Service.

There were no outbreaks of bushfire on the project lands during this reporting period.

3.16 MINE SUBSIDENCE

The Pikes Gully Seam section mined along the length of Longwalls 1 to 3 at Ashton Underground Mine is approximately 2.4m high. The seam dips to the southwest at a grade of up to 1 in 10. The overburden ranges in thickness from 35m at end of Longwall 1 to 130m at the start of Longwall 3. The final extraction void is nominally 216m with chain pillars 25m rib-to-rib at 100m cut-through centres.

Longwall operation commenced in February 2007 and Longwall 3 was completed in March 2009 and Longwall 4 was in the process of being extracted at the end of the reporting period. The progress of longwall extraction is shown in **Figure 16**.

3.16.1 Monitoring

Ashton Coal has monitored the subsidence movement on the surface during the extraction of Longwalls 1-3 using longitudinal subsidence lines over the start and finish of each panel and a main cross line extending over all three panels. Several other subsidence lines have been used to monitor the slope leading down to Glennies Creek, closure across the New England Highway, and subsidence across a dyke.

A plan showing the location of the subsidence lines is included as **Figure 17**.

The following table outlines the maximum subsidence parameters recorded during regular survey of subsidence lines as the longwall passed each location.

Additional monitoring was undertaken of fixed stations on a 132kV power line crossing the longwall panel near the start of Longwall 1, but the next two panels have not mined under this power line. Survey monitoring was supplemented with visual monitoring of subsidence areas, powerlines and the adjacent steep slope. Subsidence information was reported and distributed to DPI Minerals, Energy Australia, and an adjacent land owner.

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Table 39. SUBSIDENCE LEVELS				
	Maximum Predicted	Maximum Measured		
North End of LW1		CL2	XL8	
Subsidence (mm)	1800	1528	1500	
Tilt (mm/m)	244	100	103	
Horizontal Movement (mm)	>500	476	500	
Tensile Strain (mm/m)	73	40	15	
Compressive Strain (mm/m)	98	28	27	
Remainder of LW1		CL1	XL5	
Subsidence (mm)	1700	1318	1436	
Tilt (mm/m)	141	60	75	
Horizontal Movement (mm)	300-500	480	503	
Tensile Strain (mm/m)	42	49	17	
Compressive Strain (mm/m)	56	23	24	
Longwall 2		CL1	CL2	XL5
Subsidence (mm)	1600	1296	1513	1266
Tilt (mm/m)	102	40	82	78
Horizontal Movement (mm)	300-500	440	298	390
Tensile Strain (mm/m)	30	17	16	11
Compressive Strain (mm/m)	41	16	32	28
Longwall 3		CL1	CL2	XL5
Subsidence (mm)	1600	1420	1354	1429
Tilt (mm/m)	78	41	48	97
Horizontal Movement (mm)	300-500	463	345	394
Tensile Strain (mm/m)	23	10	17	22
Compressive Strain (mm/m)	31	7	18	24

3.16.2 Impacts

Surface subsidence cracks have developed along each edge of the longwall panels. These cracks are particularly evident on the up hill side of each panel. In most places, these cracks have been rehabilitated by ripping the surface to reduce surface water ingress and reduce the risk of injury to stock. Cracks through the Voluntary Conservation Area above Longwall 1 were rehabilitated using a small excavator and skid steer loader. Cracked areas in open fields were remediated using a D6 dozer with ripping tines. The extent of subsidence remediation at the goaf edge is outlined in **Figure 18**.

Initial caving above Longwall 3 was typical of the caving behaviour observed elsewhere and consistent with predicted subsidence behaviour.

The Access Road to Property 130 was cracked and a diversion was put in place during the impact period until the road was repaired. Small farm dams in areas of shallow cover were dewatered before the longwall passed beneath and following subsequent rain events were observed to refill and hold water.

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The buried Telstra cable that overlies Longwall 3 goaf area was subsided and remained in service for the duration of Longwall 3 mining. There was some damage to the northern most branch of the buried Telstra line which occurred during crack remediation by a D6 Dozer and was repaired shortly after the Dozer had completed the surface crack repairs.

There are three farm sheds above the northern end of the Longwall 3 panel and they were undermined with no damage to them caused by subsidence.

In general, the maximum subsidence movements detected were less than those predicted. There is no indication of any significant lateral movement of the steep slope adjacent Glennies Creek or of the New England Highway cutting.



Figure 14. Subsidence cracks, Longwall 3



Figure 15. Subsidence crack remediation

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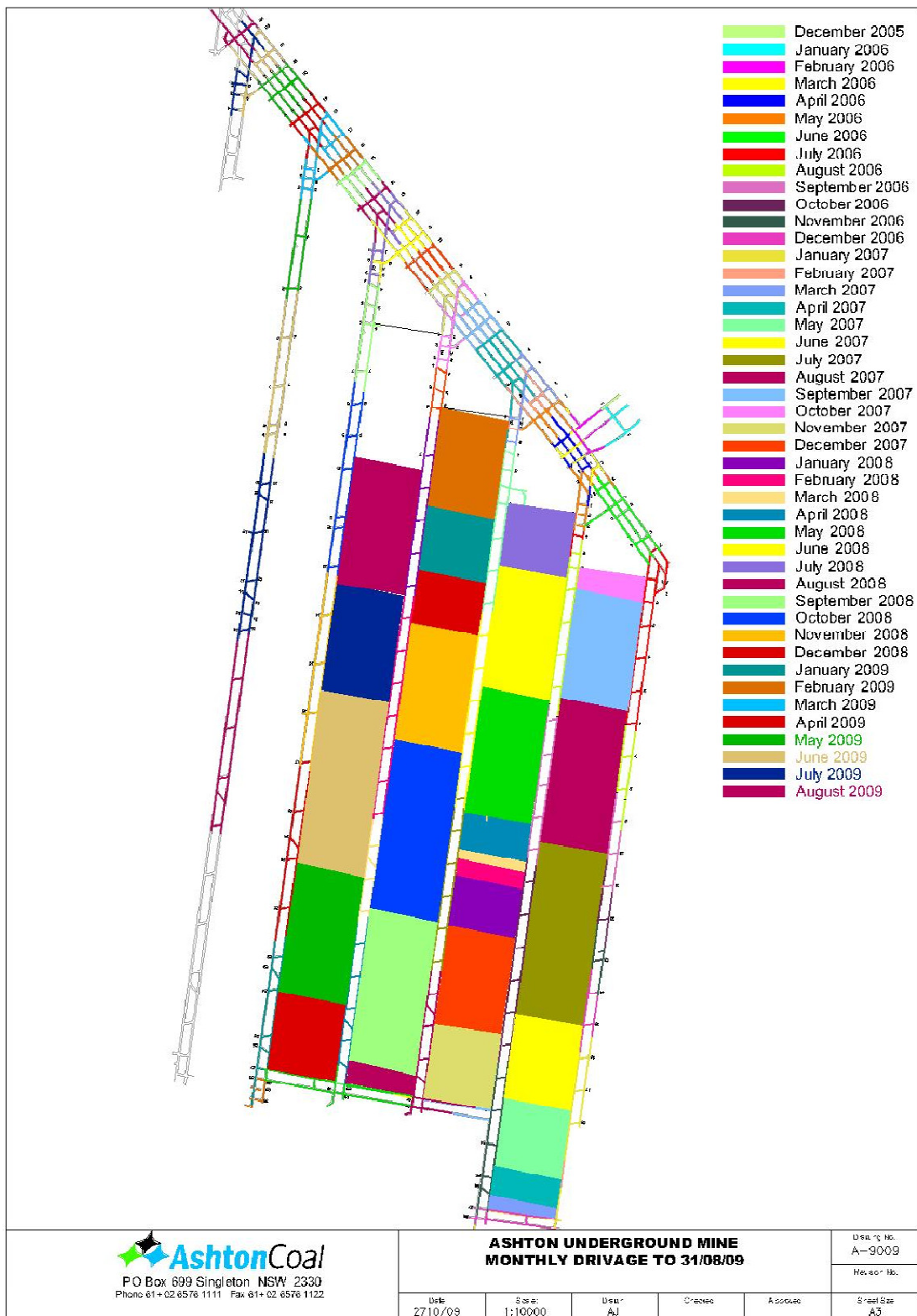


Figure 16. Progression of Longwall Extraction

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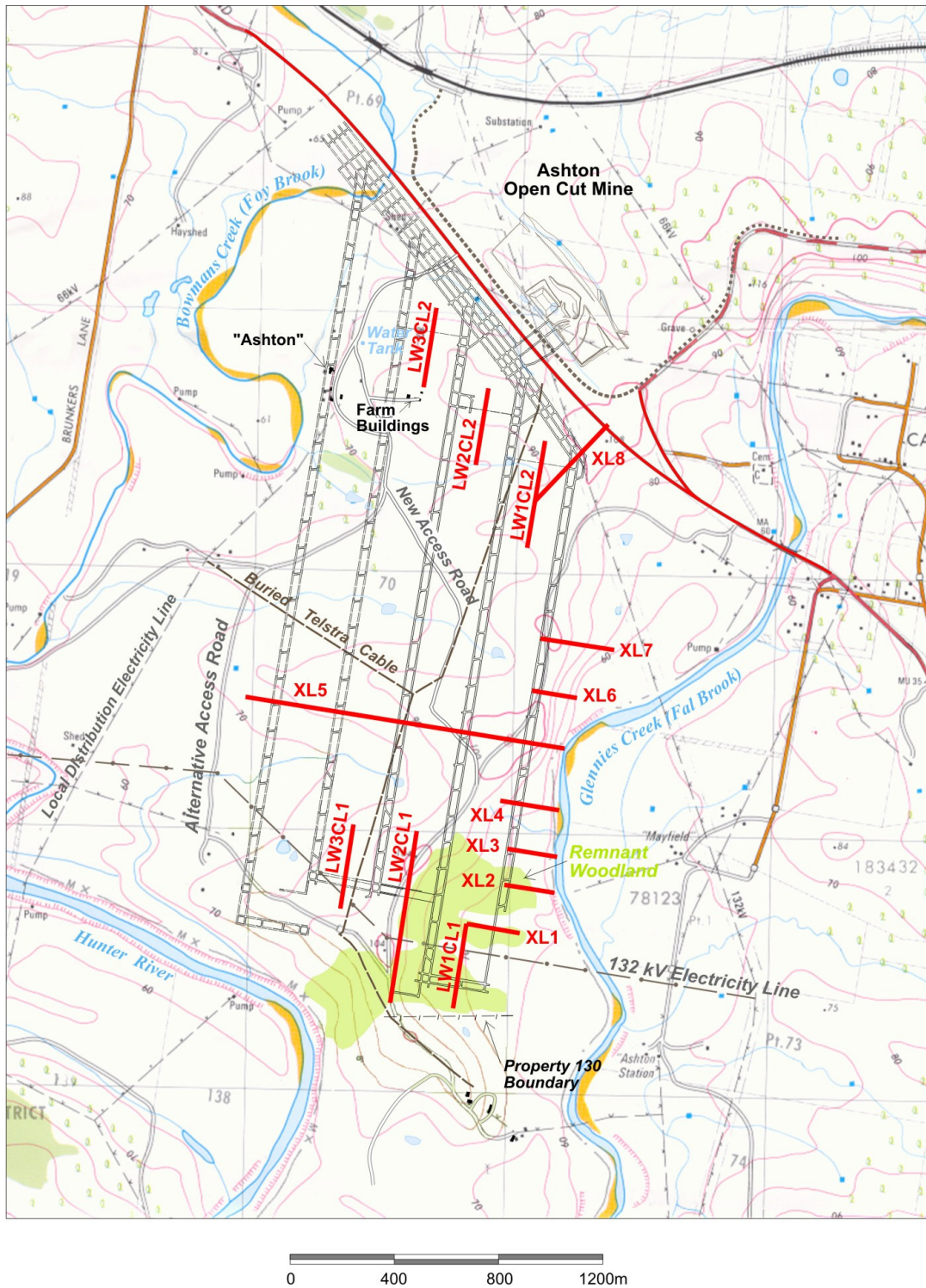


Figure 17. Subsidence Monitoring Cross Lines

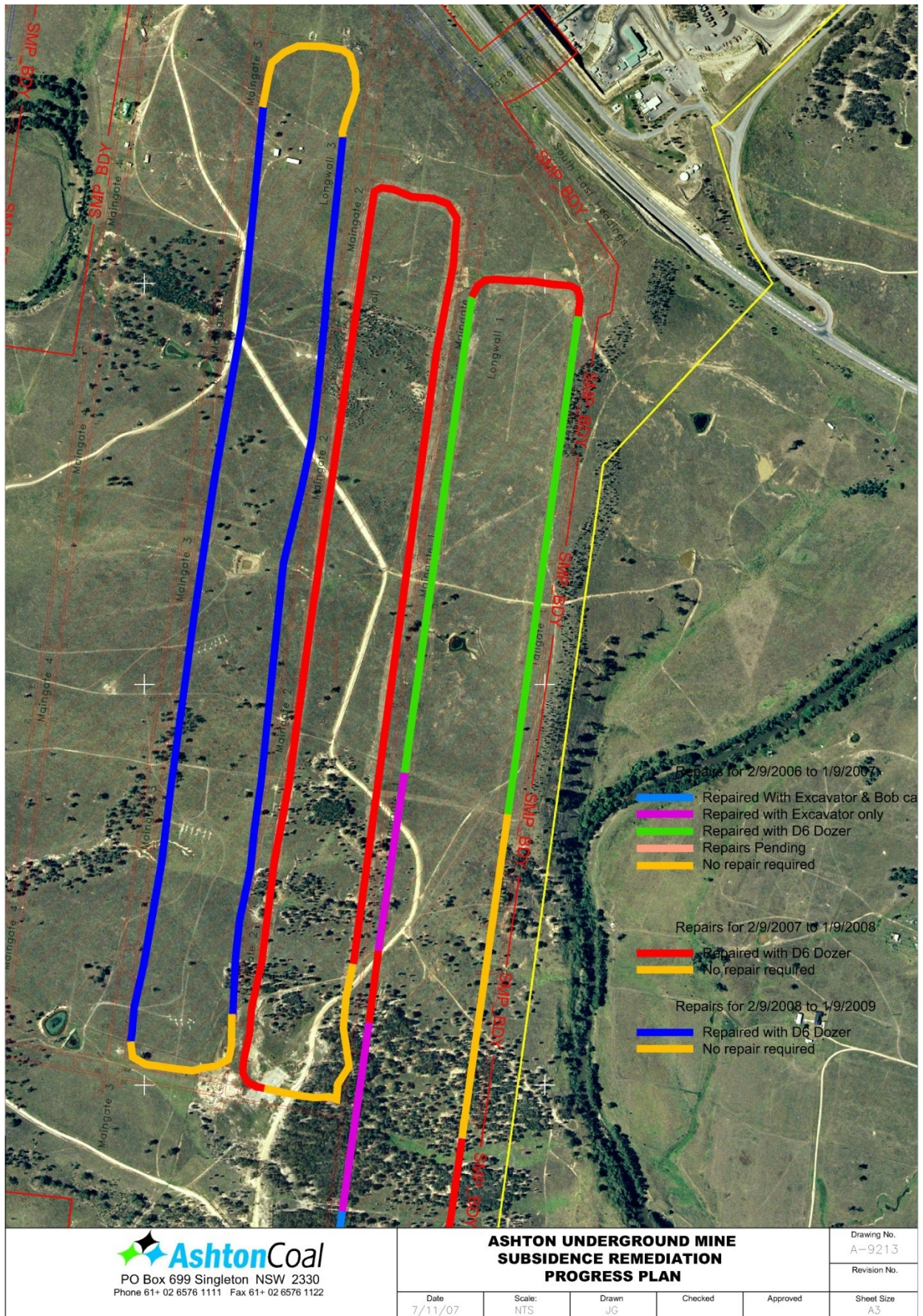


Figure 18. Subsidence Remediation Progress

3.17 HYDROCARBON CONTAMINATION

There have been some minor hydrocarbon spillages during the reporting period. All spillages were contained and promptly collected with appropriate absorbent products prior to any hydrocarbons moving offsite or out of immediate work areas.

3.18 METHANE DRAINAGE/VENTILATION

Mine ventilation began in May 2006 and has continued throughout the period. The ventilation quantity is currently approximately 155 cubic metres per second. Total emissions from the underground ventilation were:

- Methane (CH₄) – 11,543 tonnes,
- Carbon Dioxide (CO₂) – 1666 tonnes, and
- Carbon monoxide (CO) – 8t tonnes.

Nil methane drainage activities are in place or planned in the next 12 months.

3.19 PUBLIC SAFETY

There is a boundary fence around the open cut operations with signs warning that the area is subject to mining. Only one access road to the site is in general use and all visitors are directed to the ACOL office for further directions on the roads that they are permitted to access. All other vehicular access points are locked. A gate system that remains closed outside normal office hours has been installed to prevent ad hoc public access.

The safety of public travelling on trains or along the access roads alongside the railway has also been an area of focus. Procedures are in place to ensure the Main Northern Railway is clear of trains before blasting within 500 metres of the rail line, and to take possession of the rail line if blasting within 200 metres. This has occurred for every relevant blast in the reporting period.

The safety of public travelling along the New England Highway has been of major consideration when blasting within 500m. Due to the progression of Open Cut mining to the western portion of the pit a number of highway closures were undertaken during the reporting period. Highway closures are designed to impact on motorists for a maximum of 2 – 3 minutes.

The safety of public travelling along Glennies Creek Road has also been a major consideration during the reporting period, with numerous closures of the road when blasting occurs within 500 metres. The Glennies Creek Road Environmental Bund has further isolated mining activities from the public's view increasing safety levels along the road.

Since the commencement of subsidence over the longwall area signage has been erected on the Right of Way (ROW) leading to property 130 on Ashton Property. An alternate access road has also been established and road closure signs are placed when possible subsidence impact

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may be experienced on the ROW. As detailed in the approved SMP Road Management Plan and Property 130 Management Plan, the tenants and owner of Property 130 are notified when any such impacts are expected to be experienced.

3.20 OTHER ISSUES AND RISKS

No other risks or issues have been identified during the reporting period.

4.0 COMMUNITY RELATIONS

4.1 ENVIRONMENTAL COMPLAINTS

A total of 69 complaints were received directly to Ashton Coal during the reporting period and 65 complaints received through the Department of Environment and Climate Change (DECC). Of the 69 complaints received directly to Ashton Coal, 51 were received from resident 18. This is a continuing trend with a high proportion of complaints coming from a single complainant. ACOL have approached the resident and offered purchase or the opportunity to establish an agreement however this offer has not been accepted. The majority of complaints received through the DECCW corresponded to a complaint received directly to Ashton Coal. A full list of complaints is provided in **Appendix 4**.

Complaints increased during the winter months corresponding with the onset of strong north westerly winds and consistent temperature inversions. Ashton Coal commit to reducing the impact of noise from the Open Cut operations by restricting dumping after 6:00pm to lower or northern dumps. On several occasions Open Cut operations were shutdown to reduce both dust and noise impacts on Camberwell Village. These operational changes were both proactive following inspections from ACOL staff and reactive following complaints from residents.

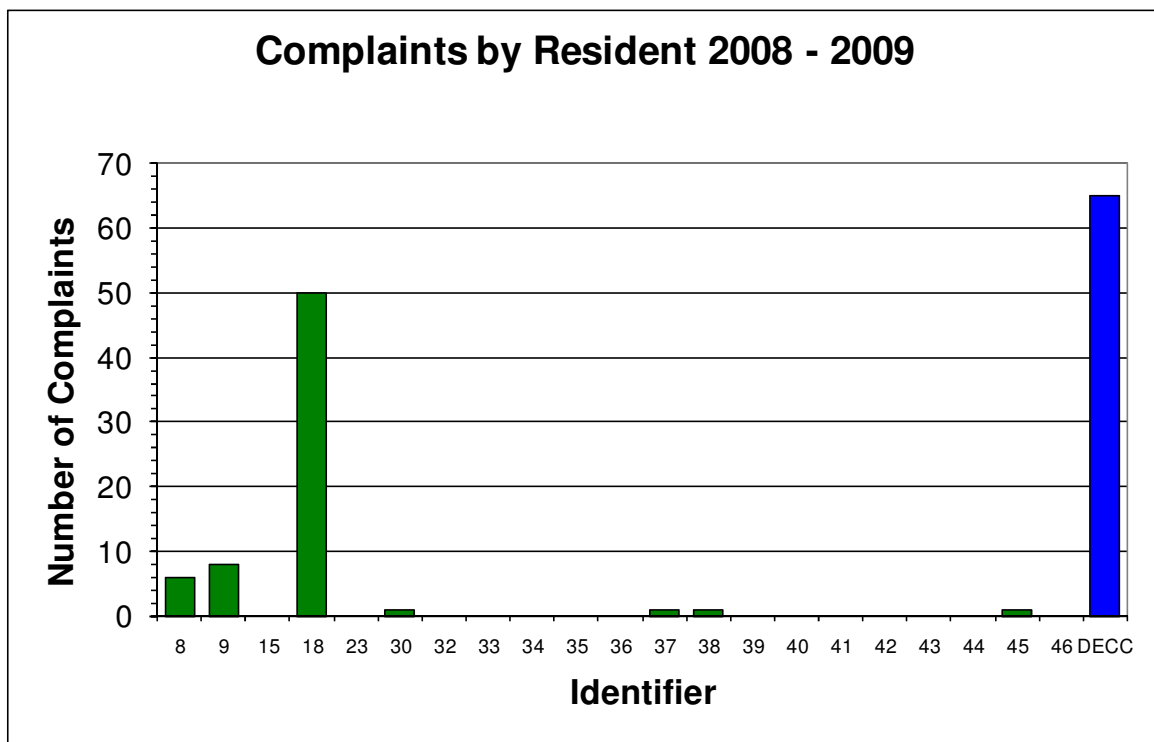
The historic trend of complaints (**Figure 19**) shows a similar number of complaints over the past 18 months. This is being driven by complaints received from resident 18 making up a total of 73% of complaints received by Ashton over the reporting period. Overall there has been a decrease in complaints since the beginning of the project.

Complaints received during the reporting period were as follows:

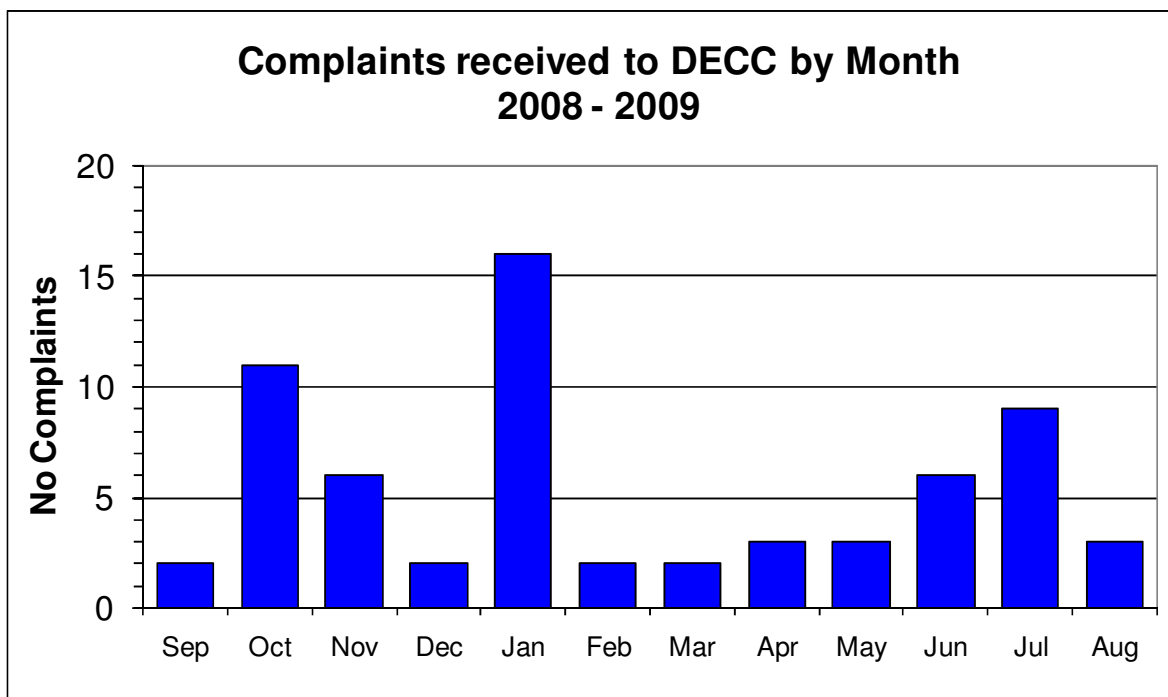
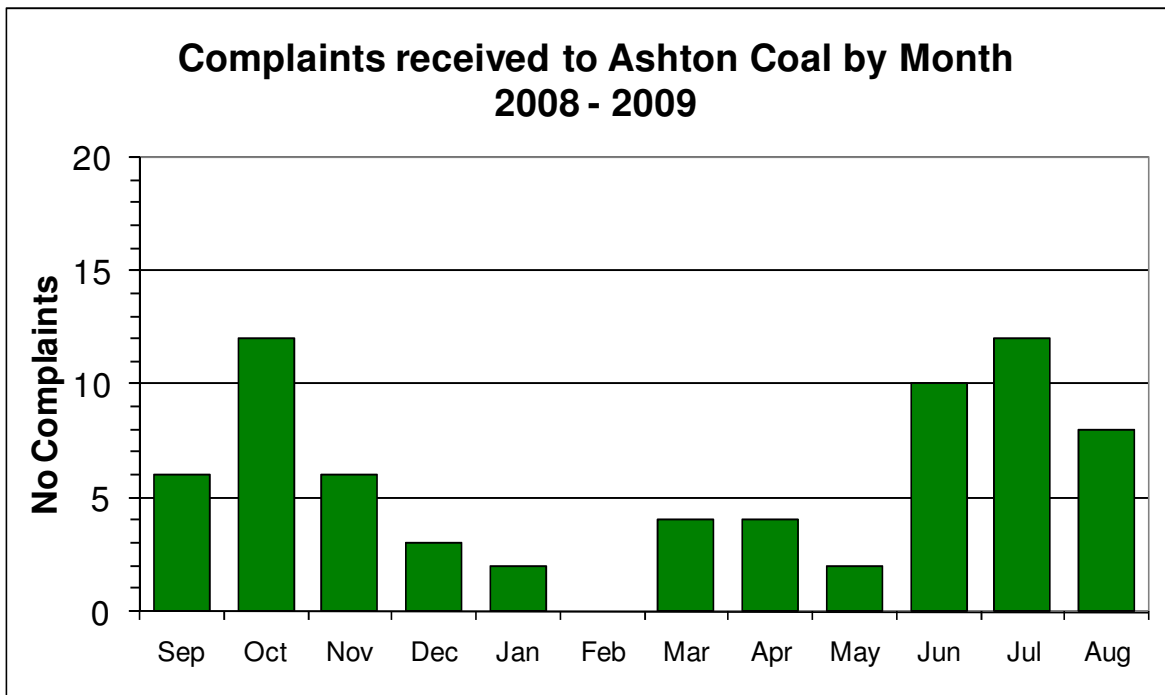
Table 40. SUMMARY OF COMPLAINTS RECEIVED TO ASHTON COAL 2008 - 2009								
Month	Noise	Lights	Dust	Operating Time	Blast	Flora & Fauna	Other	TOTAL
Sep	3	1	1	0	0	0	1	6
Oct	4	0	7	0	1	0	0	12
Nov	2	0	3	0	0	0	1	6
Dec	2	0	0	0	1	0	0	3
Jan	0	0	1	0	1	0	0	2
Feb	0	0	0	0	0	0	0	0
Mar	2	0	2	0	0	0	0	4
Apr	3	0	1	0	0	0	0	4
May	0	0	1	0	1	0	0	2
Jun	2	0	1	0	5	0	2	10
Jul	6	0	3	0	2	0	1	12
Aug	1	0	5	0	1	0	1	8
TOTAL	25	1	25	0	12	0	6	69

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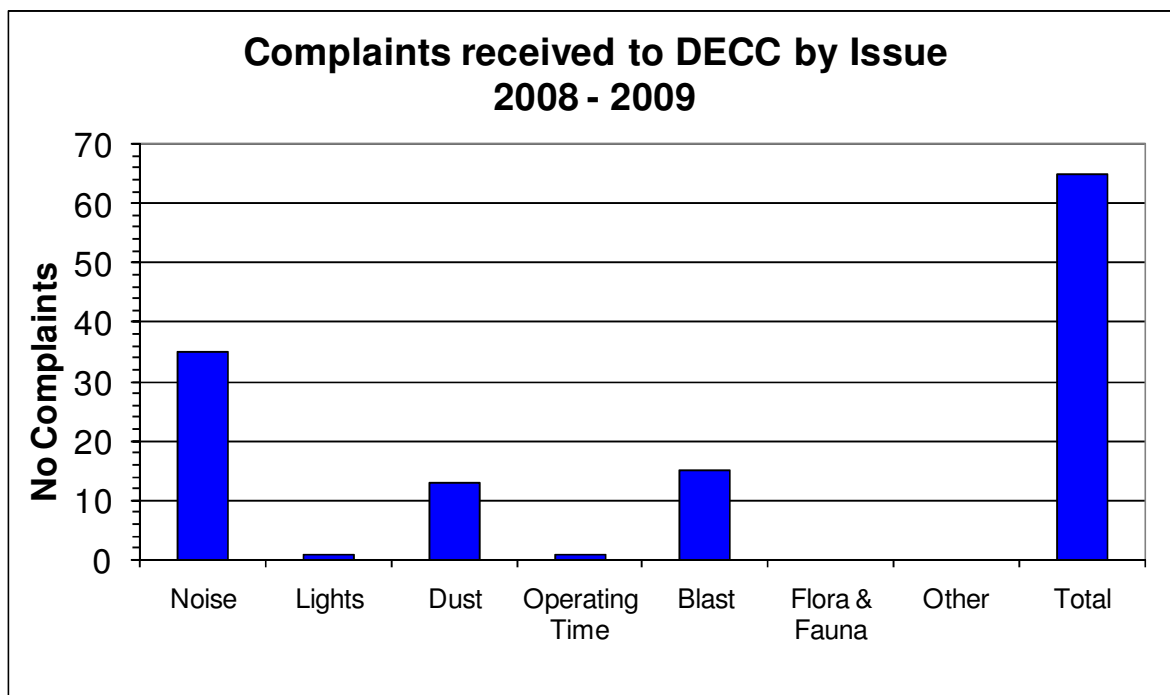
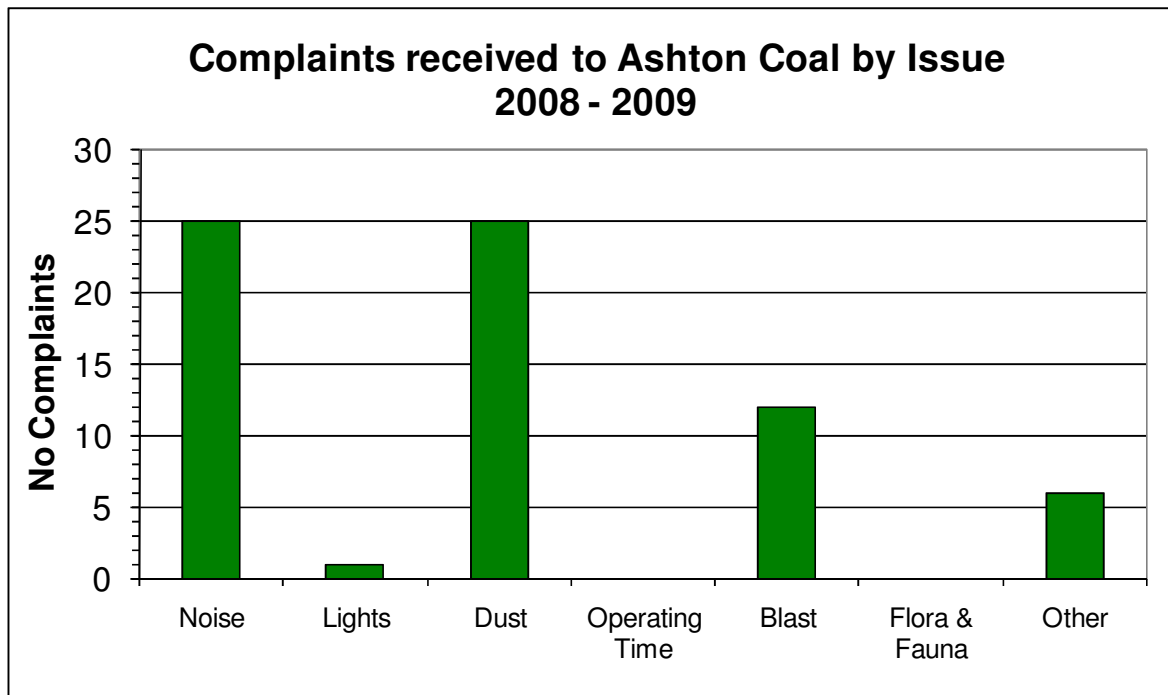
Table 41. SUMMARY OF COMPLAINTS RECEIVED FROM DECC 2008 - 2009								
Month	Noise	Lights	Dust	Operating Time	Blast	Flora & Fauna	Other	TOTAL
Sep	1	1	0	0	0	0	0	2
Oct	6	0	4	0	1	0	0	11
Nov	4	0	2	0	0	0	0	6
Dec	1	0	0	0	1	0	0	2
Jan	12	0	3	0	1	0	0	16
Feb	0	0	0	0	2	0	0	2
Mar	1	0	0	0	1	0	0	2
Apr	2	0	0	0	1	0	0	3
May	0	0	1	0	2	0	0	3
Jun	2	0	0	1	3	0	0	6
Jul	5	0	2	0	2	0	0	9
Aug	1	0	1	0	1	0	0	3
TOTAL	35	1	13	1	15	0	0	65



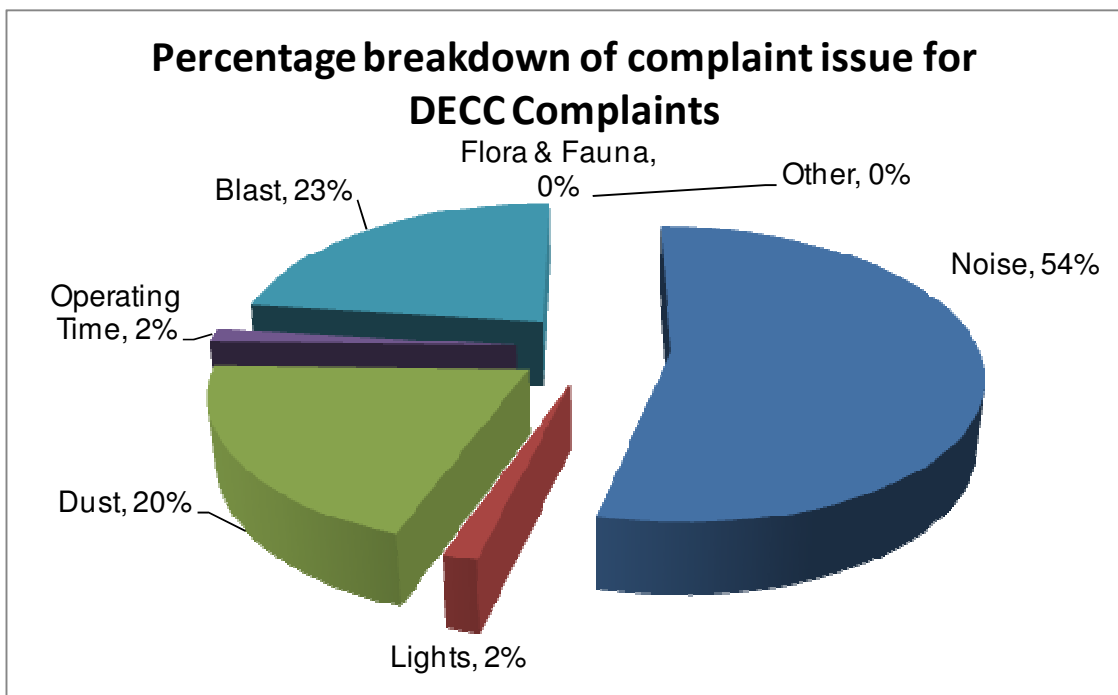
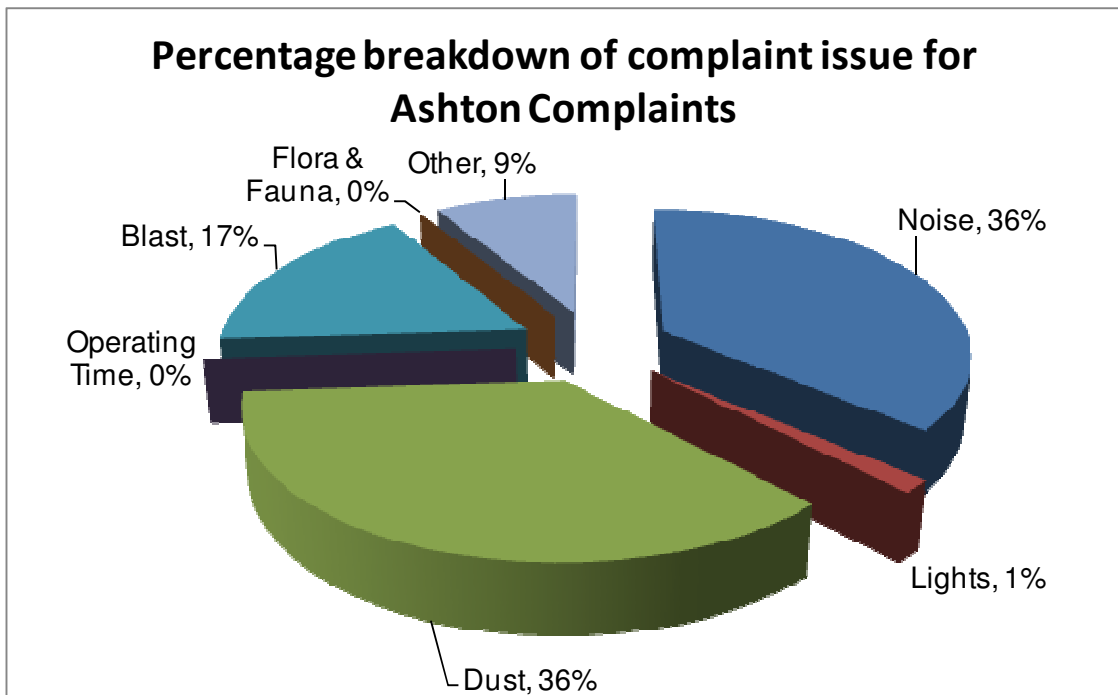
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The percentage breakdown of complaint issue for complaints received by Ashton and for complaints received by the DECC for the period are detailed below.



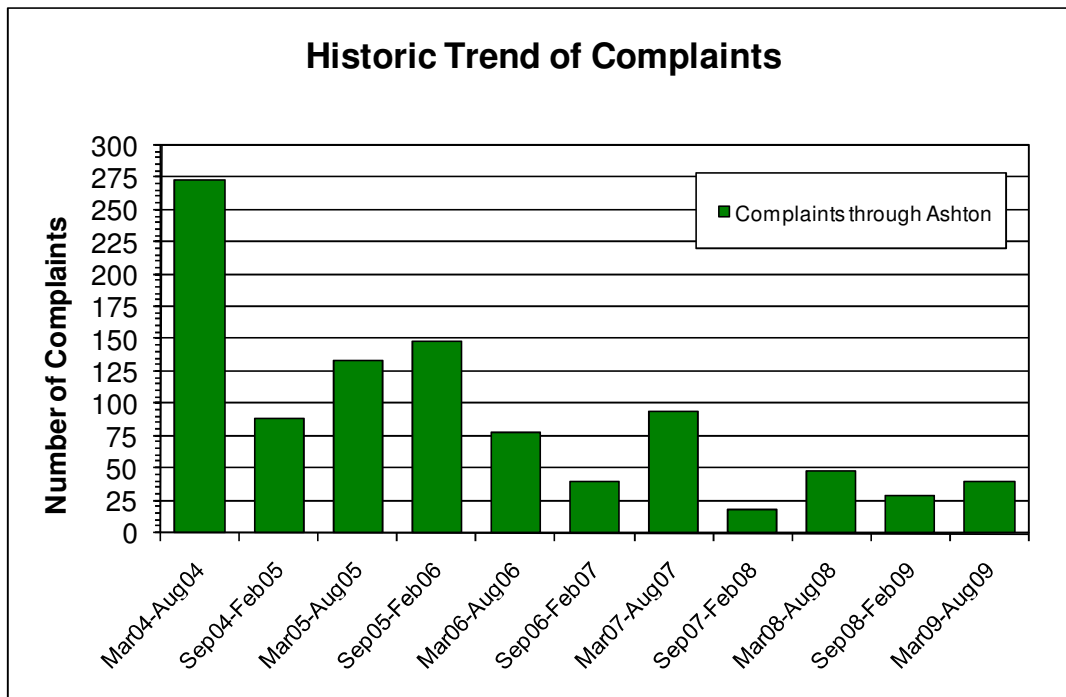


Figure 19. Historic Trend of Complaints

4.2 COMMUNITY LIAISON

On top of the community newsletters and Community Consultative Committee meetings Ashton Coal has committed to a community program that provides a budget for undertaking activities that aim to reduce the impact of mining on the residents of Camberwell. Feedback from previous surveys has indicated that dust impacts are the major concern of residents in Camberwell Village. Continuing from the work completed in the previous year Ashton conducted water tank cleaning on household water tanks for all residents in Camberwell who wished to receive the offer. This involved cleaning the sludge layer that builds up on the bottom of all tanks from plant matter and dust. Rainwater tank guidelines suggest that all tanks regardless of the area should be cleaned on a regular basis, generally every two years. Ashton also installed a number of whole house filters on water tanks to provide cleaner and clearer drinking water.

CCC meetings were conducted quarterly during the reporting period. CCC members were provided with information on the project as well as updates on environmental monitoring and any future projects.

The CCC met on the following dates:

Table 42. COMMUNITY CONSULTATIVE COMMITTEE	
Meeting Date	Items Addressed
30 th September 2008	Environmental monitoring, operations overview, SEOC presentation, section 94 contribution, DPI - Minerals overview.
2 nd December 2008	Environmental monitoring, operations overview, SEOC status report, section 94 contribution.
24 th March 2009	Environmental monitoring, project update, section 94 contribution, SEOC status report, Camberwell Village SEOC vision consultation.
10 th June 2009	Environmental monitoring, operations overview, rehabilitation report, section 94 contribution.

The CCC has been actively involved in questioning ACOL’s commitment to the village as well as asking questions on blast fume, stone dusting, water restrictions, rehabilitation, dust generation during blasts and the projects for the S94 contribution funds. It was agreed that the S94 funds would be used to erect entrance signs to Camberwell Village in line with the signage proposed by Singleton Council. The location of the signage has been chosen and Ashton are working with Singleton Shire Council to gain the relevant approvals to allow construction to begin.

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Two newsletters were also distributed amongst the local community detailing progress of operations at ACOL. The dates of these newsletters were as follows:

Table 43. COMMUNITY NEWSLETTERS		
Newsletter No	Issued	Contents
29	December 08	Open Cut and Underground update, Rehabilitation summary and SEOC proposal and information.
30	March 2009	Open Cut (including rehabilitation) and underground update, St Clements Church donation, CCC vacant position and SEOC progress update.

During the reporting period a commitment from ACOL was made to the diocese to provide funding for structural repairs to St Clements Church. Whilst the repairs have not yet been undertaken they will include the attaching of the roof to the walls which was not previously completed. This will improve the structural integrity of the building.

5.0 REHABILITATION

5.1 OPEN CUT

A total of 37ha were rehabilitated during the reporting period. This included 15ha of native tree seed for woodland vegetation establishment and 22ha of pasture. Organic growth medium (OGM) was spread across all rehabilitation areas at 100t/ha following the preliminary results of the 2007 trial. Maintenance works totalling 2.5ha were also conducted on areas of the rehabilitation that have not shown high enough groundcover or suffered heavy weed infestation. The different processes used during the reporting period are as follow:

- Woodland Rehabilitation – a total of 15ha of the Eastern Emplacement Area (EEA) was rehabilitated as woodland. This was achieved through direct seeding. All 15ha were situated on the gently undulating top of the EEA. Overburden was deep ripped followed by application of OGM at 100t/ha. A cover crop of rye corn was included in the seed mix to provide an initial stabilisation of the soil. Erection of stag trees, establishment of rock piles and scattering of woody debris to improve habitat value of
- Pasture Rehabilitation – a total of 22ha of pasture was seeded. Pasture seed was applied at 70kg/ha with fertiliser at 200 kg/ha. OGM was applied to all areas at 100t/ha.
- Maintenance Works – a total of 2.5ha of existing rehabilitation was re worked due to low establishment of desired species. Maintenance works involved applying OGM at approximately 100t/ha followed by seeding of tree and shrub or pasture species. Pasture seed included 200kg/ha of fertiliser.
- Tubestock Planting – approximately 2500 mixed eucalypt and acacia species were planted across Ashton Coal property during the reporting period.

5.2 REHABILITATION TRIALS AND RESEARCH

Two rehabilitation trials are now in progress at Ashton Coal. The OGM trial began in May 2007 followed by a biosolids trial in May 2008. Monitoring of the OGM trial has been ongoing over the past 12 months and has included assessment of tree growth, density and diversity, shrub density and diversity, ground cover, presence of weed species and soil chemical and physical properties. Analysis of monitoring suggests two treatments that provide greatest growth rate, establishment and groundcover in woodland and pasture rehabilitation. These being:

1. Pasture rehabilitation - 100mm of topsoil with 100t/ha OGM
2. Woodland rehabilitaton – 60t/ha OGM applied to overburden with no topsoil.

The biosolids trial is a simple comparison investigation to determine the different effects biosolids and OGM have on vegetation growth. The trial is also assessing the feasibility of spreading the two materials together to gain the benefits of both. To date there has been no visual difference from the two treatments.

5.3 FURTHER DEVELOPMENT OF THE FINAL REHABILITATION PLAN

In the previous reporting period ACOL received approval from the Department of Primary Industries of a new Mine Operations Plan. As part of the submission a new final rehabilitation plan was submitted which incorporated slight changes to the eastern emplacement area topography allowing undulation and relief across the landscape. No further changes have been made to this plan.



Figure 20. Pasture rehabilitation seeded Autumn 2008



Figure 21. Woodland rehabilitation seeded Autumn 2007

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Figure 22. Woodland rehabilitation on the top of the EEA including habitat augmentation seeded Autumn 2008

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5.4 REHABILITATION SUMMARY

Table 44. REHABILITATION SUMMARY 2008– 2009			
	Area Affected / Rehabilitated (hectares)		
	End of this reporting period	Last Report	Next Report (estimated)
A: MINE LEASE AREA			
Mine Lease 1529	128.7	128.7	128.7
Mine Lease 1533 (part overlies ML 1529)	883.4	883.4	883.4
Mine Lease 1623	26.17	N/A	26.17
B: DISTURBED AREAS			
B1 Infrastructure area	49.2	47.8	49.2
B2 Active Mining Area (Excluding B3 – B5)	19	32.1	20
B3 Waste Emplacement (Active / unshaped)	38.8	75.1	35
B4 Tailings emplacements (active / uncapped)	2	2	3
B5 Shaped waste emplacement (awaiting final vegetation)	21.8	3.6	10
B6 Ravensworth Void 4 area of responsibility (Active / unshaped / partially rehabilitated)	41	41	41
ALL DISTURBED AREAS	171.8	201.6	158.2
C. REHABILITATION PROGRESS			
C1 Total Rehabilitated Area (except for maintenance)	104	66.9	119
D. REHABILITATION ON SLOPES			
D1 10 to 18 degrees	79.4	62.3	80
D2 Greater than 18 degrees	0	0	0

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Table 45. REHABILITATION SUMMARY 2008- 2009

	Area Affected / Rehabilitated (hectares)		
	End of this reporting period	Last Report	Next Report (estimated)
E. SURFACE OF REHABILITATED LAND			
E1 Pasture and grasses	62	40	70
E2 Native woodland / ecosystems	36	21	43
E3 Plantations and crops	0	0	0
E4 Other (includes non-vegetative outcomes)	3 (Dams and drainage)	1.5 (Dams and drainage)	5

Table 46. MAINTENANCE ACTIVITIES ON REHABILITATED LAND

NATURE OF TREATMENT	Area Treated (ha)		Comment / control strategies / treatment detail
	Report Period	Next Period	
Additional erosion control works (drains re-contouring, rock protection)	3	4	Contour drains of the eastern emplacement area were reworked to provide more stable structures and an increased water capacity.
Re-covering (detail – further topsoil, subsoil sealing, etc)	0	0	No areas were re-covered during the period.
Soil treatment (detail – fertiliser, lime, gypsum, etc)	60	75	Following results of trials on site, OGM applied across site at 100t/ha.
Treatment / Management (detail – grazing, cropping, slashing, etc)	0	0	
Re-seeding / Replanting (detail – species density, season, etc)	6.2	6.2	Reseeding of native tree and pasture areas with a pasture mix to provide greater groundcover.
Adversely Affected by Weeds (detail – type and treatment)	3	7	No weed spraying on the rehabilitation areas was undertaken during the reporting period.
Feral animal control (detail – additional fencing, trapping, baiting, etc)			No feral animal control within rehabilitation areas was undertaken during the reporting period

6.0 ACTIVITIES PROPOSED IN THE NEXT AEMR PERIOD

6.1 EXPLORATION

Anticipated Exploration for period to Aug 2010

Mining Lease 1533

- Open cut - No activity planned.
- Underground - It is expected that between 20 and 30 holes are likely to be drilled predominantly to the Lower Barrett Seam to establish geological control and to assist in structural interpretations. They will consist of a mix of open and cored holes.

Exploration Licences 5860 & 4918

- Exploration continuing with 10 holes planned (3 cored and 7 open holes).

6.2 REHABILITATION

A further 15ha of rehabilitation is expected to be undertaken during 2009 - 2010. This area will include pasture rehabilitation on the slopes of the EEA and woodland rehabilitation on the top of the EEA. A second dam will also be constructed on the top of the EEA along with the third drop structure.

Replanting of failed tubestock will be conducted particularly along tree screens. Some restoration works will be undertaken in the Voluntary Conservation Area.

6.3 WATER MANAGEMENT

Ongoing investigations are being undertaken regarding the installation of a fine coal recovery system within the CHPP. This system will allow more effective recovery of fine coal, and reduce water and power usage in the tailings circuit.

6.4 MAJOR PROJECTS

6.4.1 Development Consent Modification – Longwall 9

During the reporting period ACOL submitted a development consent modification for DA 309-11-2001. The proposed modification involves:

- Authorising the development and mining of an additional longwall/miniwall panel;
- Increasing overall production of coal from the ACP underground mine by an additional 250,000 tonnes per annum of run of mine (ROM) coal;
- Deleting Conditions 3.18, 3.24, 3.25, 3.26, 3.27 and 3.28 of Schedule 2 of the existing development consent.

The primary aim of the development consent modification is to allow extraction of coal from Longwall/Miniwall 9, previously not included in the original mine plan. The resource will provide replacement coal for the coal left insitu by not mining those parts of the approved longwalls to support the surface in the location of Bowmans Creek in order to maintain the aquaclude required by Condition 3.9 of Schedule 2 of DA 309-11-2001.

6.4.2 Development Consent Modification – Bowmans Creek Diversion

ACOL are seeking to modify the development consent to provide for:

1. Underground mining operations which may result in a direct hydraulic connection between the Bowmans Creek alluvium and the underground workings occurring due to subsidence cracking;
2. The relocation of sections of Bowmans Creek to mitigate subsidence impacts resulting from 1. above; and
3. Extraction of coal from the Upper Liddell seam, Upper Lower Liddell seam and the Lower Barrett seam in the western most area of the approved underground mine.

Based on the information that was available at the time of the 2002 development consent, it was thought that direct hydraulic connection between the Bowmans Creek alluvium and the underground workings occurring through connective cracking would allow upward migration of saline groundwater following completion of mining and result in an increase in the salinity of the Hunter River.

Further monitoring of groundwater, subsidence and surface water has provided a significantly greater understanding of the of the interactions between Bowmans Creek and associated alluviums and the potential impacts from underground mining. The recent data and analysis shows that:

- The quality of water in the alluvial aquifer ranges from moderately to highly saline (up to 6,400 $\mu\text{S}/\text{cm}$ EC). The alluvial groundwater is not a high quality resource and provides only limited environmental and economic value;
- Prior to mining there is a natural upwards seepage of saline groundwater from the coal measures to the alluvium;
- The alluvium has relatively low hydraulic conductivity and only makes a very small contribution to baseflow to Bowmans Creek;
- Contrary to the 2002 EIS prediction there will be a decrease in Hunter River salinity post mining; and
- The existing creek provides a range of aquatic and riparian ecosystem services but has been degraded as a consequence of past land use practices.

6.5 OTHER ACTIVITIES

Other activities planned for the next AEMR (2009 – 2010) period include:

- Formalise Closure Criteria for the Open Cut rehabilitation utilising analogue sites within Ashton Coals buffer lands.
- Receive final signoff of the Conservation Agreement with NPWS for the Southern Woodland.
- Submit the Mine Closure Management Plan.

DISTRIBUTION

Ashton Coal Operations Pty Limited
Annual Environmental Management Report 2008 - 2009

10 November 2009

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