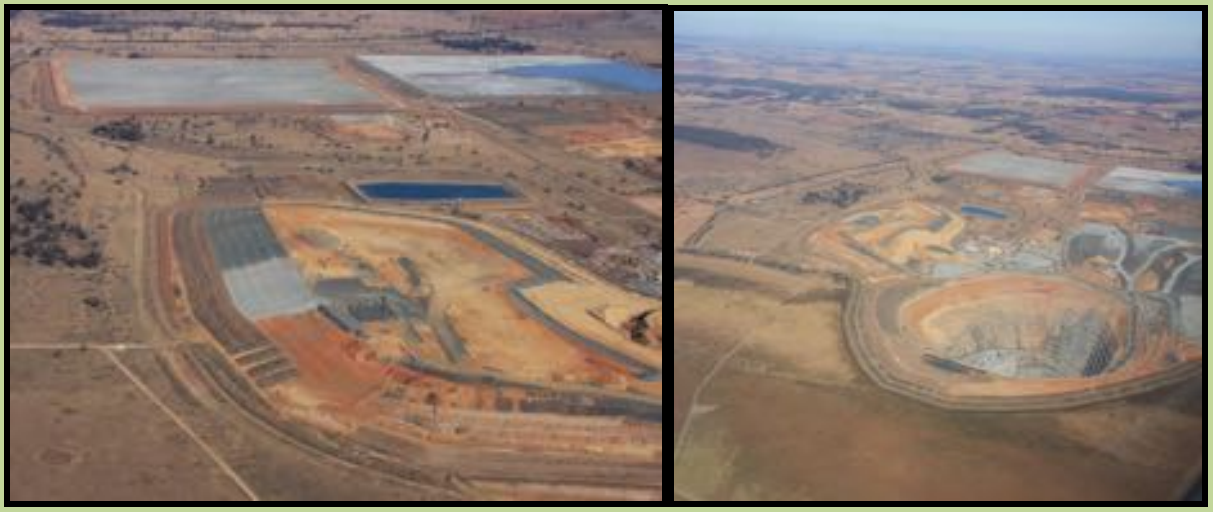
Cowal Gold Mine

2014 Annual Review Report



Name of Mine:	**COWAL GOLD MINE**
Titles/Mining Leases:	**ML 1535**
MOP Commencement Date:	**1 August 2014**
MOP Completion Date:	**31 August 2016**
AR Commencement Date:	**23 DECEMBER 2013**
AR End Date:	**22 DECEMBER 2014**
Name of Leaseholder:	**BARRICK (COWAL) PTY LIMITED**
Name of Mine Operator (if different):	**AS ABOVE**
Reporting Officer:	**GARRY PEARSON**
Title:	**ENVIRONMENTAL MANAGER**
Signature:	.....
Date:	**31 July 2015**

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DATE: **31 July 2015**

Plate 1: Lake Cowal dry again (21 February 2015)

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PLANS

In accordance with Section 3 of the *Guidelines and Format for the Preparation of an Annual Environmental Management Report:* (NSW Department of Primary Industries – Mineral Resources, 2006) a number of plans (including a land preparation plan, proposed mining activities and rehabilitation plan and proposed final rehabilitation plan) are required to be prepared for the Annual Review. These plans are described below and are consistent with the currently approved CGM Mining Operations Plan (August 2014 – August 2016) (**MOP**) approved by the NSW Department of Trade and Investment, Regional Infrastructure and Services – Division of Resources and Energy (**DTIRIS-DRE**) on 09 October 2014.

Land Preparation Plan

Disturbance areas associated with the CGM and soil stockpile areas are shown on Figure 2. Plans showing proposed land preparation areas for the next reporting period are provided as Figures 23 and 24 of this AR.

Proposed Mining Activities and Proposed Rehabilitation Plan

Mining and rehabilitation activities for the next reporting period have been addressed in the MOP. A summary of operations for the next reporting period is provided in Paragraph 6 of this report. Figures 23 and 24 also show proposed mining and rehabilitation activities for the next reporting period.

Current and Final Rehabilitation Plans

Areas where rehabilitation activities have occurred up to and including the reporting period are shown on Figure 4. Plans showing proposed rehabilitation activities for the next reporting period are included in the 2014-2016 MOP and are shown on Figures 23 and 24. A conceptual view of the proposed final landform and final land use areas is shown on Figure 25.

Landform Conceptual Cross-Sections

Conceptual cross-sections of key CGM final landforms (including the Perimeter Waste Emplacement and Lake Isolation System, Northern Waste Rock Emplacement and Northern Tailings Storage Facility) are provided on Figures 20, 21 and 22.

Figures 1 to 19 provide additional plans and supporting information relevant to this AR.

1 INTRODUCTION

This Annual Review (**AR**) has been prepared by Barrick (Cowal) Pty Limited (**Barrick**) for the Cowal Gold Mine (**CGM**) in accordance with the requirements of Condition 9.1(b) of the Development Consent DA 14/98 for the CGM (granted on 26 February 1999) (**Development Consent**) and Condition 26 of the Conditions of Authority for Mining Lease (**ML**) 1535 (granted on 13 June 2003). This AR has been prepared for the period 23 December 2013 to 22 December 2014.

This AR has been prepared in consultation with relevant stakeholders. A meeting regarding the 2013 AR was held on 10 September 2014 at the CGM**.** Attendees included representatives from the Environmental Protection Authority (**EPA**), the DTIRIS-DRE, Independent Monitoring Panel (**IMP**), Barrick (Perth) and Barrick site personnel. In addition, Barrick has been in contact with the DTIRIS-DRE and Department of Planning and Environment (**DP&E**) regarding the development of this AR. No additional requirements in relation to the AR were requested by the DTIRIS-DRE or the DP&E.

This AR will be provided to the Secretary of the DP&E, EPA, NSW Office of Water (**NoW**), DTIRIS-DRE, the NSW Dams Safety Committee (**DSC**), Department of Primary Industries-Fisheries (DPI-Fisheries), the Bland Shire Council (**BSC**) and the Community Environmental Monitoring and Consultative Committee (**CEMCC**). In accordance with Development Consent Condition 9.4(a)(vii), a copy of the AR will be available on the company's website.

1.1 CONSENTS, LEASES, LICENCES AND PERMITS

1.1.1 Current List of Consents, Leases, Licences and Permits

The key consents, leases, licences and permits under which CGM operates are presented in Table 1.

Table 1: Key Consents, Leases, Licences and Permits

Instrument	Relevant Authority	Date of Grant	Duration of Approval
Development Consent (DA 14/98)	DP&E	26/02/1999	Mining operations may take place until the end of 2024. "Mining operations" includes the removal and emplacement of waste rock; the processing, handling and storage of ore on site; and the transport of ore concentrate offsite. The Development Consent then continues to be in force until Barrick rehabilitates the site in accordance with the conditions of the Development Consent.
Development Consent (DA2011/64) (Eastern Saline Borefield)	Forbes Shire Council	20/12/2010	20 December 2015 Valid for the operation of the Eastern Saline Borefield
Eastern Saline Borefield Water Access Licence (WAL) 36569 Water supply work approval 70WA614933	NOW	14/09/2014	9 June 2016. Zero ML allocation. Up to 750 ML/ annum/ bore.
Mining Lease (ML 1535)	DTIRIS-DRE	13/06/2003	21 years (2024).
Environment Protection Licence (EPL 11912)	EPA	23/12/2003	Until the licence is surrendered, suspended or revoked. The licence is subject to review every three years, and was last varied on 10 October 2014.
Permit #1361 under section 87(1) of the NPW Act	EPA	23/05/2002	Valid for period of exploration drilling on the lots covered by the permit.
Consent #1467 under section 90 of the NPW Act	EPA	27/11/2002	The approval lapses when the Minister for Environment acknowledges that satisfactory rehabilitation work has been completed under ML1535 or 18 years after completion of constructions works, whichever occurs first.
Permit #1468 under section 87(1) of the NPW Act	EPA	27/10/2003	Same as Consent #1467.

Table 1 (Continued): Key Consents, Leases, Licences and Permits

Instrument	Relevant Authority	Date of Grant	Duration of Approval
Consent #1680 under section 90 of the NPW Act	EPA	28/07/2003	The approval lapses when the Minister for Environment acknowledges that satisfactory rehabilitation work has been completed under ML1535 or 18 years after completion of construction works, whichever occurs first.
Permit #1681 under section 87(1) of the NPW Act	EPA	28/07/2003	Same as Consent #1680.
Bland Creek Palaeochannel borefield WAL 31864 Water supply work approval 70WA614076	NoW and EPA	14/09/2012	14 September 2015.
Saline groundwater supply borefield within ML 1535 WAL 36615 Water supply works approval 70WA614090	NoW and EPA	21/03/2014	14 September 2015. Upper 10% (366 units. Lachlan Alluvial Zone 7). Valid for the operation of three lake floor saline production bores when not inundated by Lake Cowal.
Pit dewatering bores WAL 36615 Water supply works approval 70WA614090	NoW and EPA	21/03/2014	14 September 2015. Upper 10% (366 units. Upper Lachlan Alluvial Zone 7). Replacement de-watering bore licenses as exchanged for decommissioned bores.
Pit dewatering bores WAL 36617 Water supply works approval 70WA614090	NoW and EPA	21/03/2014	14 September 2015. Lower 90% (3,294 units. Upper Lachlan Fold MDB). Replacement de-watering bore licenses as exchanged for decommissioned bores.
Monitoring and test bore licences	NoW and EPA	Various	Various.
High Security Title WAL13749	LPI and NoW	21/12/2006	Title for allocation from Regulated River Source.
High Security Title WAL14981 (80 Units)	LPI and NoW	15/09/2011	Title for allocation from Lachlan River Regulated Source- Water Sharing Plan.
General Security WAL13748	LPI and NoW	21/12/2006	Title for allocation from Regulated River Source.
Lake Cowal pipeline and Temporary Isolation Bund and Lake Protection Bund structures Water Supply Works Approval 614805	NoW	14/09/2012	13 September 2015. Water supply work approval for TIB-LPB and buried borefield pipeline under Lake Cowal.
NSW Dangerous Goods Acknowledgement (NDG037143)	WorkCover	2005	Ongoing – upon change basis since 2015.

DP&E: NSW Department of Planning and Environment

DTIRIS: NSW Department of Trade and Investment, Regional Infrastructure and Services – Division of Resources and Energy

EPA: NSW Environmental Protection Authority

FSC: Forbes Shire Council

LPI: NSW Land and Property Information

NoW: NSW Office of Water

NPW Act: NSW *National Parks and Wildlife Act 1974*

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Mining Operations Plan (MOP)

Two MOPs were applicable to the CGM during the reporting period and are described below.

2012 to 2014 MOP and the 2014 to 2016 MOP

The October 2012 to January 2014 MOP (approved by the DTIRIS-DRE on 19 December 2012, and extended by the Director-General of the DTIRIS-DRE on 4 October 2013), applied until 9 October 2014 when the DRE approved the Cowal Gold Mine Mining Operations Plan (August 2014 – August 2016).

During the current reporting period (2014 to 2016 MOP), the footprints of the Perimeter Waste Emplacement (**PWE**), Northern Waste (rock) Emplacement (**NWE**) and Southern Waste (rock) Emplacement (**SWE**) remained unchanged. E42 Pit continued to deepen in Stages F and G. The fourth lift (fourth augmentation) of the Northern Tailings Storage Facility (**NTSF**) was constructed and tailings deposition re-commenced in late-August 2014 after the fourth lift of the Southern Tailings Storage Facility (**STSF**) was filled to a safe level. STSF fifth lift (fourth augmentation) earthworks commenced late-December 2014.

With the commencement of the 2014 to 2016 MOP, construction of the rock buttressing on the lower embankments of the NTSF began. Works involved removal of the existing rock-topsoil cover prior to rock buttressing. This material was directly transferred to cover the inner batters of the PWE (Paragraph 5.4).

The Lake Protection Bund (**LPB**) outer bund and the Temporary Isolation Bund (**TIB**) were maintained in a weed free state during the reporting period. There was no attempt to raise the TIB by 0.5 metres given that there was wet mud along the foreshore for much of the year. The medium term weather forecast was not conducive to earthworks on the TIB.

In late-August 2014, after the native pasture hay and clean wheaten hay was spread, 2,000 shrub and tree tube stock of local provenance were planted in the Pond D1 north rehabilitation trial area. These trees have been hand watered when required due to the relatively dry and hot weather experienced at Cowal during the summer of 2014/2015. (Paragraph 5.4).

1.1.2 Approval Variations Applicable to the Subject Area

Environment Protection Licence

Three s58 variation requests resulted in EPL11912 variations which are available at:

http://www.epa.nsw.gov.au/prpoeoapp/

By the notice 1522063 (21 May 2014), the EPA varied EPL11912 to reflect that Lake water monitoring could cease below 204.5 m Australian Height Datum (AHD). By the notice 1523564 (24 July 2014), the EPA varied EPL11912 to reflect the removal of BM06 and addition of BM08. By the notice 1525458 (10 October 2014), the EPA varied EPL11912 to reflect temporary suspension of Lake centre monitoring due to unsafe access conditions for dust, blast monitoring and operational noise monitoring locations (muddy, snags).

Development Consent

The CGM's Development Consent modification application to the Secretary DP&E under s75W of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) for a 5-year extension to mine life was lodged by Barrick on 23 September 2013. The Minister for Planning approved the modification (MOD11) on 22 July 2014.

Amendments and Revisions to Environmental Strategies and Management Plans

As a result of the MOD11 approval, Barrick commenced the revision of relevant CGM environmental strategies and management plans (EMPs) to reflect the approved CGM and modified Development Consent conditions.

Revision of the following EMPs commenced during the reporting period:

- Noise Management Plan (**NMP**);
- Blast Management Plan (**BLMP**);

- Air Quality Management Plan (**AQMP**) (formerly the Dust Management Plan [**DMP**[);
- Rehabilitation Management Plan (**RMP**) (formerly the Rehabilitation and Offset Management Plan [**ROMP**]);
- Biodiversity Offset Management Plan (**BOMP**);
- Flora and Fauna Management Plan (**FFMP**);
- Soil Stripping Management Plan (**SSMP**);
- Erosion and Sediment Control Management Plan (**ESCMP**);
- Water Management Plan (WMP) (formerly the Site Water Management Plan [**SWMP**]);
- Surface Water, Groundwater, Meteorological and Biological Monitoring Programme (**SWGMBMP**);
- Monitoring Programme for Lake Protection Bund, Water Storage and Tailings Structures and Pit/Void Walls (**LPB MP**);
- Land Management Plan (**LMP**); and
- Indigenous Archaeology and Cultural Heritage Management Plan (**IACHMP**).

Details regarding the revised EMPs will be provided in the next AR, once the revised EMPs are approved.

In addition to the above, a new Environmental Management Strategy was prepared during the reporting period in accordance with Development Consent Condition 9.1(a) and was approved by the DP&E on 28 November 2014.

1.2 MINE CONTACTS

Contact details for the CGM are provided below:

General Manager
Alan Fearon
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Environmental Manager
Garry Pearson
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Please note, as of 24th July 2015, the following email addresses will apply due to the change of ownership of the Cowal Mine from Barrick to Evolution Mining:

- Alan Fearon – Alan.Fearon@evolutionmining.com.au
- Garry Pearson – Garry.Pearson@evolutionmining.com.au

1.3 ACTIONS REQUIRED AT THE PREVIOUS AR REVIEW

The *2013 Annual Environmental Management Report* (2013 AEMR) meeting was held on 10 September 2014 at the CGM. Actions arising from this meeting are included in Table **2**. No additional directions were given during site visits within the reporting period.

Table 2: 2013 AEMR Meeting Actions

Action	Responsibility	Status	Document Reference
Next Cowal MOP to be prepared in accordance with ESG3: Mining Operations Plan (MOP) Guidelines (DRE, 2013)	Barrick/ DRE	**Completed** – Barrick prepared the 2014 to 2016 MOP in accordance with ESG3 MOP Guidelines in consultation with DRE. DRE approved the 2014-2016 MOP on 9 October 2014.	CGM MOP (August 2014 – August 2016)
Monitor Pond D1 rehabilitation trial for weed competition impacts on tubestock	Barrick	**Ongoing** – annual independent survey of rehabilitation success.	DnA (2013, 2014)

Table 2 (Continued): 2013 AEMR Meeting Actions

Action	Responsibility	Status	Document Reference
In Section 5 of next Annual Review, provide more emphasis on the events in the year, and remove historical chronology to date). Section 5 should also include a description of McKenzie Soil Management's (2013) Soil Stockpile Characterisation Assessment.	Barrick	**Completed** – refer Paragraph 5 of this 2014 AR.	CGM 2014 AR
Update Groundwater Monitoring Programme (Table 20) in 2014 AR to include Cu, Se and CN WAD (as per EPL11912 Points 44 and 45).	Barrick	**Completed** –Table 20 of this AR has been updated to include Cu, Se and CN WAD at sites MON01 A, MON01 B, MON02 A and MON02 B.	CGM 2014 AR
It was suggested Barrick review the approved decommissioning/rehabilitation strategy for TIB, in recognition of current biodiversity between TIB and LPB	Barrick	**Ongoing** – future revisions of RMP may consider value of ecotone of LPB-TIB.	CGM EMPs, IMP reports

1.4 CGM BACKGROUND

The CGM is owned and operated by Barrick and is located approximately 38 kilometres (km) north-east of West Wyalong, New South Wales (NSW) (Figure 1). Figure 2 shows the land tenure of properties in the vicinity of the CGM. Figure 3 provides a satellite image of the CGM (as at February 2014) and shows the general arrangement of the CGM components and landforms.

North Limited (**North**) commenced exploration along the western side of Lake Cowal in 1981. From 1981 to 1994, exploration was concentrated on the Endeavour 42 (E42) ore body to increase the size and confidence of the resource by infill and deep drilling.

North received Development Consent for the Cowal Gold Project in February 1999. North was later acquired by Rio Tinto which subsequently sold the Cowal Gold Project to Homestake Australia Limited (**Homestake**). Homestake commenced advanced drilling on E42 in late 2001. In December 2001, Barrick acquired Homestake and its operating subsidiary. Barrick continued the drilling programme. Additional drilling of the E42 ore body was undertaken between 2001 and 2005. During 2003 and 2004, the CGM underwent a detailed design phase and construction commenced on 12 January 2004. Mining operations commenced in April 2005 followed by operation of the final stage of the open pit dewatering system in June 2005.

Construction was carried out in accordance with the Development Consent. Vegetation clearance and soil stripping activities were undertaken prior to the commencement of construction of mine infrastructure. All clearance areas were subject to Development Consent Condition 3.10(B) which required Barrick to minimise the removal of trees and other vegetation to specified approved areas. Vegetation clearance activities were conducted in accordance with the Vegetation Clearance Protocol and Threatened Species Management Protocol. Details of these are provided in the FFMP and Implementation of the Threatened Species Management Protocol (**TSMP**).

The CGM was the first non-operational gold mine using cyanide in the world to be certified to the International Cyanide Management Institute Code (**ICMI Code)** for Cyanide Management (17 April 2006). The CGM was also the first gold mine using cyanide in the world to be pre-operationally and operationally certified to the ICMI Code (2 August 2007). An independent third-party re-certification occurred during February 2010 and May 2012. Cowal operations were found to have maintained full compliance to the ICMC Cyanide management Code during the previous three years.

A further independent re-certification audit occurred during 18-21 November 2013. Barrick (Cowal) Pty Limited was again officially re-certified to the ICMI Code for a fourth time on 28 May 2014. Details regarding the re-certification audit are provided on the ICMI's website *http://www.cyanidecode.org/media-room/press-releases*.

1.5 INDEPENDENT ENVIRONMENTAL AUDIT

Condition 9.2(a) of the CGM Development Consent requires that an independent environmental audit be undertaken every three years to assess the performance of the CGM against conditions of the Development Consent and other licences and approvals and the results included in the AR. The CGM's IMP recommended in their 2007 Annual Report that "*Barrick consider continuing use of the template-based approach established by aemc for environmental auditing of operations in order to regularly and systematically update progress on each of the environmental management and monitoring components*". Accordingly, in consideration of the IMP's recommendation, Barrick has continued to conduct an Independent Environmental Audit on an annual basis.

An Independent Environmental Audit (**IEA**) of the CGM was conducted during 28-30 April 2014 by Trevor Brown and Robert Drury of Trevor Brown & Associates. The IEA was conducted in accordance with the Australian/New Zealand Standards AS/NZS ISO 19011:2014 – *Guidelines for auditing* management systems. The scope of the IEA included the following:

- review of the implementation of the requirements of the Development Consent, licences and approvals for the CGM;
- conduct a site inspection and review of on-site documentation and monitoring data relevant to the audit;
- discussions with CGM staff in relation to the requirements of the Development Consent;
- assessment of the CGM against the requirements of the Development Consent; and
- assessment of compliance against each condition of the Development Consent.

A copy of the 2014 IEA is provided as Appendix A and is also available on the company's website. A summary of the 2014 IEA results is provided in Paragraph 3.

2 OPERATIONS DURING THE REPORTING PERIOD

Paragraphs 2.1 to 2.10 below describe the operations undertaken at the CGM during the reporting period. Activities included exploration, land preparation, infrastructure construction, mining, mineral processing, waste management, ore and product stockpiling, water management, hazardous material management and other infrastructure management.

2.1 EXPLORATION

A summary of the exploration, drilling and other geology related activities undertaken within ML1535 during the reporting period is provided below.

Exploration activities within ML1535 undertaken during 2014 included exploration drilling immediately north of E42 Open Pit and, resource infill drilling within E46 East prospect, and 1 reverse circulation (RC) hole within E41 prospect. In addition, two geotechnical drill holes were completed during the period. The geotechnical drilling included a piezometer hole (406.2m) and an inclinometer hole (100m).

Total drilling completed within ML1535 during 2014 amounted to approximately 10,806m (2,430m RC and 7,870m diamond drilling). The geotechnical program consisted of two holes totaling 506.20m. Deeper drilling was conducted on the E46 prospect within Lake Cowal within the boundary of ML 1535 where nine holes with depths ranging between 700m-1000m were completed

All drill holes completed during the program as well as those drilled on the lake bed were concrete grouted throughout the entire length after the completion of each hole.

Land disturbance within ML1535 was minimal as a result of the exploration activities. Lake drilling was conducted from purpose built track mounted platform rigs designed to reduce impact on the ground. The rig has a self-contained fluid retention system and drip trays that prevent spillage of fluids into the lake/ground surface. Rehabilitation of the drilling areas is described in the Cowal Gold Mine Mining Operations Plan (August 2014 – August 2016).

2.2 LAND PREPARATION

Land preparation activities during the reporting period involved the clearance of vegetation and stripping of soil within an area to the north of the SWE for the temporary ore stockpile and subsoil stockpile (Figure 23) (Paragraph 3.7.3.1). Two new small temporary soil stockpiles (Topsoil Stockpiles 24 and 25) (Figure 17) were also constructed immediately west of the NWE (within the approved surface development footprint for the NWE expansion).

In preparation for soil stripping to be undertaken at the north SWE area, the CGM Vegetation Clearance Protocol (**VCP**), Threatened Species Management Protocol and Aboriginal Heritage Clearance requirements were implemented.

ML1535 stripped soils are either re-used or delivered directly to soil stockpiles for use in rehabilitation as shown on Figure 4. The date, location, soil type, volume and description of any ameliorants added to stockpiled materials were recorded in the CGM soils database.

Other land preparation activities undertaken during the reporting period were associated with rehabilitation works and included:

- shaping and cross-ripping of the northern outer batters and berms of the NWE;
- re-working, re-shaping and cross-ripping of the outside and inside batters and berms of PWE;
- planting the Pond D1 trial area with shrub and tree tube stock; and
- shaping and cross-ripping between three and five lifts of the SWE.

The Pond D1 rehabilitation trial area, including the 80 metre trial extension area of 2013, was planted with 2,000 endemic native shrubs and trees tube stocks on 29 August 2014. Hand watering has been necessary due to the dry year.

2.3 INFRASTRUCTURE CONSTRUCTION

The construction details and the construction status of infrastructure components at the end of the reporting period are provided in Table 3. The infrastructure components are shown on Figure 3.

Table 3: Infrastructure Construction Components during the Reporting Period

Infrastructure Component	Construction Status
Temporary Isolation Bund and Pond D1	Lake Cowal receded from the Temporary Isolation Bund (TIB) for the first time since August 2010. Lake Cowal completely dried in December 2014. Post-flood natural regeneration of native species, particularly Lignum, River Red Gum and River Cooba has been visibly significant along the length and crest of the TIB and LPB valley. Waterbird, raptor, bush bird, reptile and frog numbers have remained noticeably high. Works are proposed to raise the TIB by 0.5m now that Lake Cowal has receded to a safe distance for earthworks to occur. These works will be detailed in the next relevant AR/ MOP reporting period.
Southern Tailings Storage Facility (STSF)	The 4th lift became operational from mid-June 2013 and was operational until end-August 2014. Construction works on the 5th lift (4rd augmentation) earthworks were commenced at the end of the 2014 reporting period. Simple bench drainage trench structures were installed during the 2013 reporting period. Additional piezos showed that the phreatic water responded immediately. Lift engineering design review has resulted in a lift construction change for the 4th and subsequent lifts of the STSF. Geotechnical monitoring will continue into the next reporting period.
Northern Tailings Storage Facility (NTSF)	Planning for the 4th lift commenced in early-2014. A saline seep developed in the north-east toe area of NTSF in mid-December 2012 and is linked to the old black-clay creek bed that runs towards the north east. The 4th lift of the NTSF became operational at the end of August 2014. Simple bench drainage trench structures were installed during 2013 and 2014. Additional piezos showed that the phreatic water responded immediately. Lift engineering design review has resulted in a lift construction change for the 4th and subsequent lifts of the NTSF. Geotechnical monitoring will continue into the next reporting period. Preparation works for the first stage of rock buttressing the lower NTSF embankments occurred during mid-November 2014. The existing rehabilitation material was stripped and used in the re-working of the inner batters of the PWE (see Paragraph 5.2).
Southern Waste Emplacement (SWE)	The SWE has been operational during 2014 to store waste rock from Pit stages F and G. Monitoring of the rehabilitation trials on the southern batters of the SWE was continued. The recent wet and now dry three years have not resulted in any significant erosion on the treated areas. Additional, substantial shaping and outer batter rehabilitation of the southern, western and northern lift slopes has occurred using the waste rock, gypsum treated topsoil method during the reporting period.
Perimeter Waste Emplacement (PWE)	Rehabilitation of the eastern and southern inside batters occurred using the waste rock, gypsum treated topsoil method during the reporting period. The southern inside lifts of the PWE were treated by the same rehabilitation method during the latter part of 2014 using the existing rehabilitation material stripped from the NTSF lower embankments.
Northern Waste Emplacement (NWE)	The NWE continued to receive waste from the Pit stages F and G. Native pasture hay and clean wheaten straw covers were added to the D1 trial extension area in mid-July 2014 and planting of 2,000 native endemic shrubs and trees tube stock occurred on 29 August 2014. Hand watering has been required due to ongoing dry conditions. The seven lower north facing (western end) outer batters and berms were re-shaped, cross-ripped and gypsum applied in late-2014. Any trees that had grown in the north face were avoided during the dozing works. At the end of the reporting period there was just one small rocked area (<1ha) above Topsoil Stockpile 19 that required topsoil spreading and cross-ripping. No straw has been applied to the north face based on independent specialist advice. There has been no rain to trigger ground cover growth.
Lake Cowal Monitoring Equipment	By the end of 2014, the Lake Cowal floor was dry and safe to travel again by light vehicle. The Cowal Gold Mine EPL11912 was varied twice at the start and the middle of the reporting period, to address access safety concerns when it was initially not possible to get a shallow draft vessel (below 204.5 m RL), and later for safe all-wheel drive vehicle access to the sampling sites along Lake Cowal centre. Barrick-owned farmland and ML1535 firebreaks have recently been re-instated due to concerns about the ongoing dry conditions.
Cyanide isotainer on-site storage	Almost two years after WorkCover NSW acknowledgement, five spare isotainers now sit inside the mixing compound bunded fence area. Should Lake Cowal flood again, or should any other rail or road transport issues arise there will be up to two weeks of buffer stocks available for use onsite.
Pond D6 thickener silt dredging	Pond D6 was dredged for the second time since operations commenced. This took approximately three weeks whereby the dredge pumped the recovered silts into the final tailings thickener.
Tailings Storage Facility (TSF) bird deterrent system	Components of the TSF bird deterrent system were upgraded/replaced during the reporting period due to lightning strike impacts.

2.4 MINING

Mining operations continued throughout the reporting period. Material types mined included sulphide ore and waste (including mineralised material). A total of 11,183,821 tonnes of ore and 15,528,336 tonnes of waste rock was mined during the reporting period. A further 1,421,386 tonnes of mineralised material was also mined with no oxide material extracted during 2014.

No expansions occurred on the NWE, SWE or PWE during the reporting period.

Waste rock mined from the open pit was stockpiled for the STSF and NTSF wall raising works and outer slope rehabilitation on the waste emplacements. Clay obtained from 2013 Pit phase E works remains stockpiled near the TSF Depot for future works (adjacent to Subsoil Stockpile 06). The process of TSF lifts will continue on an annual basis. The first rock buttress works for NTSF commenced in late-2014. The first rock buttress works for STSF will follow from mid-March 2015. The outer batter rehabilitation cover materials stripped from the TSFs will be taken to the inner batters of south-eastern PWE to re-work the existing rehabilitation on those areas with the new approved method (i.e. cross-ripped rock/topsoil). The subsoil in the wall of the original PWE rehabilitation will be left re-shaped in-situ under the new cover.

Mining of the open pit during the reporting period occurred in two separate areas, Stage G and Stage F.

Mining occurred in the Stage F2 pit from RL 912m to RL 885m, representing a vertical advance of 27m. Mining occurred in the Stage G pit from RL 1,065m to RL 984m, representing a vertical advance of 81m.

Vertical and horizontal dewatering systems were maintained throughout the reporting period. Occasional additional horizontal holes were drilled as mining progressed through Stage G in order to de-pressurise specific areas. New de-watering bores placed outside the Open Pit perimeter continued to be used for de-watering of the Open Pit wall.

2.5 MINERAL PROCESSING

Processing continued throughout the reporting period. The processing plant recovered 267,448 ounces of gold during the reporting period. The maximum ore processing rate during the reporting period was approximately 7.4 Mtpa (Table 4).

Table 4: Production and Waste Summary

	Cumulative Production		
	Start of Reporting Period	**At End of Reporting Period**	**End of Next Reporting Period (estimated)**
Stockpiled Soil (m^3)	3,486,543	3,437,733	3,410,000
Waste Rock (Mt) (excluding mineralised material)	182.44	197.97	203.97
Mineralised Material (Mt)	14.42	15.84	16.49
Ore (Mt)	73.46	84.64	92.60
Processing Waste (Tailings) (Mt)	52.16	59.52	66.74
Product (oz)	1,918,063	2,185,511	2,433,100

Tailings were deposited into the fourth lift (3rd augmentation) of the STSF until 29 August 2014, after which tailings were deposited into the fourth lift of the NTSF for the remainder of the year. Construction works began on the fifth lift (fourth augmentation) of the STSF in December 2014 and will continue well into the 2015 reporting period.

The August 2014 – August 2016 MOP provides further detail regarding minerals processing undertaken at the CGM.

2.6 WASTE MANAGEMENT

Waste Rock (including mineralised material), Ore and Processing Waste

The CGM produced waste rock (including mineralised material), ore, processing waste and product during the reporting period. The volume of ore and waste rock (including mineralised material), ore, processing waste and product produced is set out in Table 4 above. . Topsoil continued to be stripped, used and spread during the reporting period in accordance with the SSMP as described in Paragraph 2.2. Table 4 details the quantity of stockpiled soil during the reporting period.

Non-Mining Waste

Non-mining waste generated at the CGM during the reporting period was transported, handled and disposed of in accordance with the Hazardous Waste and Chemical Management Plan (**HWCMP**). Wastes generated during the reporting period consisted of:

- administration area domestic and packaging waste;
- sewage effluent;
- waste hydrocarbons including lubricating oils, hydraulic oils, degreasing fluids, distillate and petroleum fuels;
- used oil filters, grease and fuel/oil contaminated rags;
- vehicle batteries and light vehicle tyres;
- general waste/obsolete operational and maintenance chemicals;
- process plant trash screen oversize plastic mulch;
- scrap metals including electrical off-cuts and undersized grinding media magnet rejects; and
- spill kit recovery/ clean-up materials.

Any hazardous material or dangerous good not used or obsolete for site use is disposed of to the appropriate off-site disposal facilities by a licensed waste management contractor.

Table 5 provides a summary of operational waste types generated during the reporting period.

Table 5: Operational Phase Wastes – Transport, Handling and Disposal

Waste	Handling	Transport/Disposal
General inert construction waste (e.g. concrete, and timber)	Waste stockpiled on-site and progressively removed/disposed.	Disposal in West Wyalong landfill/refuse facility by arrangement with BSC.
Office and packaging waste	Waste collected on-site.	Removed by contractor or BSC truck or disposal on-site in waste rock emplacements only. Disposal to West Wyalong landfill/refuse facility by arrangement with BSC or recycling depot (e.g. cardboard, aluminium cans, plastics and paper). Cardboard bailer installed and operational since 2009 was decommissioned in 2012. Cardboard is now taken loose to recycler in West Wyalong.
Food waste	Domestic solid waste held in specific storage containers.	Removed by contractor or BSC covered vehicle. Disposal to West Wyalong landfill/refuse facility by arrangement with BSC.
Scrap metal streams	Waste was segregated and held on-site in designated areas.	Removed from site by contractor for recycling.
Used lead acid batteries	Used batteries were stored in a bunded area.	Periodically removed from site by a licensed contractor. Recycled by licensed contractor.
Degreasing fluids, distillate and petroleum fluids	Used and flammable petroleum liquid wastes stored in dedicated storage vessel(s).	Removed from site by licensed contractor for recycling/disposal.
Lubricating oils and hydraulic oils	Used and waste oils stored in dedicated storage vessel(s).	Removed from site by licensed contractor for recycling/disposal.
Used/rejected tyres	Tyre store was maintained in designated area.	On-site disposal at surveyed locations in waste rock emplacements.
Hydrocarbon tainted soils/ rock.	Treated in on-site bioremediation facility.	Treated in on-site bioremediation facility.
Used oil/fuel filters	Filters stored in dedicated bins prior to removal.	Removed by licensed contractor. Disposal or recycling at licensed waste facility (material is inert by EPA Guidelines for waste classification).
Processing Plant trash screen oversize plastic mulch	Dried and boxed for disposal in WRE layer.	Not used 2008 through 2011. Commenced early 2012 to address build-up of plastic in carbon stripping circuit.
Drained/crushed oil/fuel filters	Filters stored in dedicated bins prior to removal.	Removed from site for recycling disposal via licensed contractor.
Used absorbents – free liquid	Clearly marked to avoid mixing of incompatible substances. Transferred to clearly labelled drums or similar containers.	Removed by licensed contractor. Disposal at licensed waste facility.
Liquid waste from sewage system	Contents of septic systems pumped out as required (currently). Portaloo units maintained by contractor.	Treated effluent from site sewage treatment facility disposed of via above ground pipeline to tailings storage. Solids from site sewage treatment facility pumped out and collected as required via licensed contractor. Grey water used for watering of Geology garden beds and landscaping or as TSF make-up water.

The August 2014 – August 2016 MOP provides further detail regarding waste management activities undertaken at the CGM.

2.7 ORE AND PRODUCT STOCKPILES

The volume of CGM ore and waste rock (including mineralised material) produced during the reporting period is set out in Table 4.

As described in the 2014 - 2016 MOP, an area north of the SWE has been cleared and stripped of soil for the temporary stockpiling of high grade ore (and associated topsoil and subsoil stockpiles). The area is within the approved surface development footprint for the extension of contained water storage D8B, however construction of the extension to the contained water storage has not commenced. The location of the proposed temporary ore stockpile (and topsoil and subsoil stockpile) is shown on Figure 23.

The August 2014 – August 2016 MOP provides further detail regarding ore and product stockpile management undertaken at the CGM.

2.8 WATER MANAGEMENT

Groundwater

The quantity of water approved to be extracted from the Bland Creek Palaeochannel (**BCPC**) is limited by:

a) Development Consent Condition 4.1(b) which states:

(a) The maximum daily extraction of water from the Bland Creek Palaeochannel shall not exceed 15 ML/day, or 3,650 ML/year.

and

b) the NoW bore water licences.

A summary of the volume of water extracted from the BCPC borefield during 2014 is summarised in Paragraph 3.4.3.2 (see Table 22). A total of 1,319 megalitres (ML) of water was extracted from the BCPC borefield during the reporting period (Table 22).

The groundwater level associated with the BCPC borefield is monitored on a continuous basis by the NoW groundwater monitoring bore on Burcher Road (GW036553) (Figure 8). Contingency measures have been developed for implementation when water levels reach either RL 137.5m AHD or RL 134m AHD. These trigger levels were developed in consultation with the NoW and other water users within the BCPC including stock and domestic users and irrigators. The trigger levels were not reached during the reporting period.

In addition, as agreed with the NoW and BCPC Water Users Group, Barrick conducted regular surveys to monitor 11 monuments on the east side of Lake Cowal for any evidence of soil compaction. Movement is not significant and monitoring to date shows no specific trends that would be of concern.

Development Application No. 2011/0064 was granted by the Forbes Shire Council on 20 December 2010 for the construction and operation of the Eastern Saline Borefield (ESB), located approximately 10 km east of Lake Cowal's eastern shoreline (Figure 8), for a period of five years (until 20 December 2015). Water extraction from the ESB is licensed under WAL 36569. ESB bores SB01and SB02 (Figure 8) were only used briefly during the 2014 reporting period due to dry regional conditions (and to assist in commissioning the new Cowal Mine Reverse Osmosis Plant). A total of 181.88 ML of water was extracted from the ESB during the 2014 reporting period.

The saline groundwater supply borefield on the floor of Lake Cowal within ML 1535 (Figure 12) was commissioned in mid-2009. Water extraction from the saline groundwater supply borefield within Lake Cowal is licensed under WAL 36615. However, no extraction has occurred since April 2010 due to access restrictions resulting from the inundation of Lake Cowal. The production and monitoring bores on the floor of Lake Cowal remain capped. Access via a gravel track to these bores will be reinstated during 2015. Bore head works to enable reuse of these bores may be re-established during 2015.

An open pit dewatering borefield has been established external to the perimeter of the open pit. A total of 4.7 ML was extracted from the open pit borefield, and a further 270 ML extracted from the open pit dewatering sumps (which collect water from rock wall seepage and rainfall) during the reporting period. Water extraction from the open pit dewatering borefield is licensed under WAL 36615 and WAL 36617.

Extracted water was used mainly for ore treatment within the processing plant, dust suppression on haul roads and soil conditioning to achieve optimal compaction rates during TSF lift construction works.

At the end of the reporting period, Pond D9 (Figure 3) held approximately 297 ML of groundwater (from the BCPC, open pit dewatering borefield, ESB and rainfall) and surface water (i.e. Regulated Lachlan River water).

Surface Water

A total of 1841ML was pumped from the Jemalong Irrigation Channel during the reporting period due to the relatively drier conditions. The Jemalong Irrigation Channel water was purchased from the regulated Lachlan River trading market.

Water access from the Lachlan River Regulated Water Source is licensed under Barrick's High Security WALs 14981 and 13749 (80 Units) and General Security (zero allocation) WAL 13748. Licenced water from the Lachlan River is supplied via a pipeline from the Jemalong Irrigation Channel to the BCPC Bore 4 pumping station (Figure 8).

Table 6 provides the volume of water contained in the water storages at the beginning and end of the reporting period. The CGM water management system is conceptually shown in Figure 5.

Table 6: Stored Water

	Volumes Held (ML)		
	Start of Reporting Period	**End of Reporting Period**	**Storage Capacity**
Contained Water Storage (D1, D2, D3, D4, D5 and D8B)	22	17	375
Process Water Storage (D9)	405	297	700
Process Water Storage (D6 + TSF Decant[s])	52	47	250

The CGM's SWMP and MOP (2014 – 2016) provide further detail regarding water management at the CGM.

The CGM's revised SWMP (August 2013) was awaiting approval by the DP&E during the reporting period. The SWMP (August 2013) included a long-term strategy for decommissioning water management structures and a strategy for the long-term management of the final void (in accordance with requirements of the MOD10 Development Consent). However, subsequent to approval of the modified Development Consent, Barrick commenced preparation of a Water Management Plan (WMP) during the reporting period to reflect the approved CGM. The long-term strategy for decommissioning water management structures (within the WMP) was also updated to include the new water management components associated with the approved CGM (i.e. the new contained water storage D10 and the modified design of contained water storage D5).

2.9 HAZARDOUS MATERIAL MANAGEMENT

Hazardous Materials and Dangerous Goods were managed in accordance with the HWCMP during the reporting period.

Emergency response spill kits are provided at all fuel storage locations. Licensed waste contractors remove all waste oil and used engine coolant from site for recycling.

In accordance with the Chemical Management Strategy (**CMS**) described in the HWCMP, all raw materials/consumables brought on-site for use at the CGM are recorded in an Inventory Register which is updated and available for inspection by the appropriate authorities. Manufacturer's Safety Data Sheets (**SDS**) for these substances are also included in the Inventory Register. Substances that are designated as hazardous and/or dangerous goods (**HSDG**) are also included in the Hazardous Substances Dangerous Goods Register (**HSDGR**). Fuels and oils in the Inventory Register are also included in the Fuels and Oils Register (**FOR**).

The HWCMP was approved by the Director-General of the DP&I on 6 March 2006. In 2009 an addendum to the HWCMP was prepared to: revise the waste classifications in accordance with the *Waste Classification Guidelines* (EPA, 2008); revise the waste tracking requirements in accordance with the amended *Protection of the Environment Operations (Waste) Regulation, 2005;* revise the proposed management measures for waste tyres generated at the CGM; and include proposed management measures for the area of historic contamination. The addendum to the HWCMP was approved by the DP&I on 15 May 2009. The HWCMP was updated in May 2011 to reflect changes in operational practices since the commencement of the CGM. The DP&E approved the revised HWCMP on 12 May 2011.

The application and approval process for the introduction of new substances at the CGM is conducted via the ChemAlert web-based management system. The Manufacturer's SDS information for approved chemicals, lubricants and fuels is available to all employees via the CGM intranet using the ChemAlert 3 software package. Laminated field hardcopy information folders are also available.

Any surplus chemical substances from the operations are removed by licensed contractors to approved locations for re-use/disposal.

Hazard Audit

In accordance with the Development Consent Condition 5.4 (c), a Hazard Audit is required to be conducted 12 months after the commencement of operations and three yearly thereafter.

The first Hazard Audit was conducted by an independent qualified person (Dean Shewring of Pinnacle Risk Management) using DP&I Hazard Audit Guidelines (Advisory Paper No 5) in 2007. No significant findings were made. Barrick prepared a Progress Report detailing the status of the Hazard Audit's 14 recommendations during the 2010 reporting period.

The first triennial Hazard Audit occurred on 19 to 23 April 2010 and was conducted by an independent qualified person (Dean Shewring of Pinnacle Risk Management). Eleven recommendations were made, which were tracked in the CGM's Environmental Obligations Register and addressed in a timely manner.

The second triennial Hazard audit occurred on 8 to 10 April 2013 and was conducted by an independent qualified person (Dean Shewring of Pinnacle Risk Management), in compliance with the Department of Planning and Infrastructure's (DP&I's) HIPAP No. 5. Eighteen recommendations were made and have been tracked in the CGM's Environmental Obligations Register.

The next Hazard Audit is scheduled for April 2016.

The HWCMP and August 2014 - August 2016 MOP provide further detail regarding hazardous material management at the CGM.

2.10 OTHER INFRASTRUCTURE MANAGEMENT

This Paragraph is not applicable to the CGM for this reporting period. Mobile fleet and fixed plant assets are self-maintained on-site.

3 ENVIRONMENTAL MANAGEMENT AND PERFORMANCE

Environmental management at the CGM during the reporting period has been conducted under the guidance of and in accordance with the numerous EMPs prepared for the CGM required under the CGMs Development Consent.

Overall Performance against Licences, Approvals and Environmental Management Plans and Effectiveness of Environmental Management

The 2014 IEA was conducted between 28 April – 1 May 2014 by Trevor Brown and Robert Drury of Trevor Brown & Associates to assess compliance with the requirements of the CGM's relevant approvals, licences and environmental management plans (EMPs). The IEA results generally confirmed a high degree of compliance with the Development Consent conditions, Environment Protection Licence conditions and requirements of the Conditions of Authority for ML 1535. The 2014 IEA is provided in Appendix A of this AR.

Barrick has complied with the commitments of the 2012 – 2014 MOP and the currently approved August 2014 – August 2016 MOP to the extent that site conditions permitted.

The Environment Protection Licence No. 11912 (EPL) Annual Return for the 23 December 2013 to 22 December 2014 reporting period was submitted to the EPA on 20 February 2015. The Annual Return provides the EPA with (amongst other things) a Statement of Compliance by Barrick in relation to its monitoring obligations under Environment Protection Licence No. 11912. In its 2014 Annual Return, Barrick identified non-compliances related to monitoring not being undertaken at some surface water, dust, groundwater and blast monitoring points. The reasons for the non-compliances were inaccessibility of monitoring points due to weather, dry bore, no seepage point, scheduling errors or logger equipment failure. A summary of the EPL non-compliances is provided on the EPA website at: http://www.environment.nsw.gov.au/prpoeoapp/

Expected Performance of Licences, Approvals and Environmental Management Plans

Barrick has all the relevant Project Management systems, staffing and consultancy arrangements in place to enable it to be in a position of confidence regarding compliance with all relevant licences, approvals and EMPs. Barrick expects to undertake CGM activities for the next reporting year in accordance with all relevant licences, approvals and EMPs. Paragraph 6 discusses the management objectives and targets for the CGM during the next reporting period.

Environmental Risk Identification

A Preliminary Hazard Analysis (**PHA**), Transport of Hazardous Materials Study (**THMS**), *Hazard and Operability Study Report, Cowal Gold Project* (**HAZOP**) (Pinnacle Risk Management, 2004), *Fire Safety Study, Cowal Gold Project* (**FSS**) (Pinnacle Risk Management, 2005), HWCMP, Final Hazard Analysis (**FHA**), Bushfire Management Plan (**BMP**), CMP, Safety Management System (**SMS**) and Emergency Response Plan/Pollution Incident Response Management Plan (**ERP/PIRMP**), have been completed and relevant measures implemented for the CGM. Relevant measures continue to be implemented for the CGM, as appropriate.

Annual Review Reporting Requirements

Development Consent Condition 9.2(i)(c) requires:

> *By the end of July each year, or as otherwise agreed with the Secretary, the Applicant shall review the environmental performance of the development to the satisfaction of the Secretary. This review must:*
>
> *(i) describe the development that was carried out in the previous calendar year, and the development that is proposed to be carried out over the next year;*
>
> *(ii) include a comprehensive review of the monitoring results and complaints records of the development over the previous calendar year, which includes a comparison of these results against the:*
>
> - *the relevant statutory requirements, limits or performance measures/criteria;*
> - *the monitoring results of previous years; and*
> - *the relevant predictions in the EIS;*

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

(iv) identify any trends in the monitoring data over the life of the development,

(v) identify any discrepancies between the predicted and actual impacts of the development, and analyse the potential cause of any significant discrepancies; and

(vi) describe what measures will be implemented over the next year to improve the environmental performance of the development.

Accordingly, in accordance with the DRE's guidelines for preparation of an AEMR (now the Annual Review), Paragraphs 3.1 to 3.22 provide a review of the reporting requirements, environmental management measures, environmental performance (i.e. review of monitoring results), reportable incidents and further improvements for each environmental risk relevant to the CGM.

Overall, due to Barrick's substantial compliance with the EMPs, environmental management for the CGM during the reporting period has been highly effective.

The Development Consent and the EPL require implementation of a complaints mechanism. All complaints received during the reporting period are discussed in Paragraph 4.1.

The EPL requires that Barrick notify the EPA of incidents causing or threatening material harm to the environment. There have been no such incidents during the reporting period.

3.1 AIR QUALITY

3.1.1 Reporting Requirements

3.1.1.1 Development Consent

Development Consent Condition 6.1(a) sets the air quality impact assessment criteria against which air quality monitoring results are compared. The air quality impact assessment criteria are outlined in Paragraph 3.1.3.1.

In accordance with the DMP, the following air quality related issues are required to be reported in the AR:

- Annual average dust deposition results (plotted in g/m^2/month) and comparison to the Development Consent air quality impact assessment criteria;
- Total suspended particulates (**TSP**) monitoring results and comparison to the Development Consent air quality impact assessment criteria;
- Measures employed to minimise/prevent excessive dust emissions;
- Dust related complaints and amelioration measures undertaken in the event of any confirmed exceedances of the Development Consent air quality impact assessment criteria;
- Review of the performance of dust control measures and the monitoring program;
- Interpretation and discussion of the air quality monitoring program results and management measures by a suitably qualified person; and
- CEMCC decisions relating to CGM dust issues.

As required by Development Consent Condition 6.2(c) an Air Quality Management Plan has been prepared and will supersede the DMP once approved by the DP&E.

Meteorological monitoring was undertaken during the reporting period as required by Development Consent Condition 6.2. Meteorological monitoring results are summarised in Paragraph 3.1.3.1.

3.1.1.2 Environmental Protection Licence

The EPL requires Barrick to undertake dust and TSP monitoring at points identified in EPL Condition P1.1. The licence also requires Barrick to undertake weather monitoring at the location identified in EPL Condition M4.1.

Condition R1 of the licence requires the completion of an Annual Return comprising of a Statement of Compliance and a Monitoring and Complaints Summary at the end of each annual reporting period. Barrick submitted an Annual Return for the period 23 December 2013 to 22 December 2014 to the EPA on 20 February 2015.

Additionally, Condition R2 of the EPL requires Barrick to notify the EPA of incidents causing or threatening material harm to the environment as soon as practicable after Barrick becomes aware of the incident.

3.1.1.3 Any Other Relevant Approvals

Barrick reported to the Greenhouse Challenge, Energy Efficiency Opportunities Program (**EEO**), National Greenhouse and Energy Reporting (**NGER**) Scheme and National Pollutant Inventory (**NPI**) during the reporting period.

3.1.2 Environmental Management

3.1.2.1 Control Strategies

Air quality safeguards and control strategies were implemented at CGM during the reporting period to minimise dust emissions from mining activities and exposed areas in accordance with the Development Consent, DMP and EPL. These control strategies are summarised in Table 7.

Table 7: Air Quality Safeguards and Control Strategies Implemented During the Reporting Period

Source	Control Strategies
Disturbed Surfaces	• Disturbed surfaces were watered using water trucks to suppress dust. • Areas for soil stripping were minimised to reduce the area of exposed ground at any one time.
Access Roads	• Access roads were watered and regularly maintained. • A dust suppressant chemical (PetroTac) was applied to 5 km of unsealed Mining Lease roads around the general Administration and Plant area to reduce dust generation. • Site access routes are clearly marked and workplace inductions specify routes. • The speed of vehicles travelling on unsealed surfaces is restricted.
Soil Stripping	• Access tracks used for soil stripping during the loading and unloading cycle were watered. • Soil stripping was limited to areas required for future mining operations.

Dust control equipment was maintained in accordance with the site maintenance schedule based on equipment manufacturer's specifications. Data provided by the Cowal Automatic Weather Station (**AWS**) and the new Kattron system is monitored continually for potential storm activity. The CGM pit and exploration geology supervisor vehicles are equipped with lightning warning alert meters in the event of approaching storm front which have historically generated considerable local dust. Such information is utilised to make decisions regarding dust control strategies. The dust management procedures decision-making flowchart from the DMP is provided on Figure 6.

In order to improve access and reliability in collecting samples due to the effects of adverse weather conditions, wet weather access roads have been constructed and/or repaired where possible.

A change in method for laboratory dust analysis from ICP-AES to ICP-MS was implemented in mid-2012 based on recommendations by Dr Cattle (University of Sydney). This has resulted in greater consistency of results and lower detection limits thus improving the quality of results. The EPA and IMP have been previously notified of the change in method.

3.1.2.2 Effectiveness of Control Strategies

In accordance with the DMP, implementation of the control strategies at the CGM minimised dust emissions from mining activities. The control strategies implemented during the reporting period are considered effective as demonstrated by the environmental performance outcomes described in Paragraph 3.1.3.2.

As described in Paragraph 3.1.3.1, Barrick augmented the dust monitoring programme during the 2013 reporting period which involved installation of duplicate dust gauges adjacent to existing dust gauges to assist with the verification of results from the CGM's existing dust monitoring programme. Samples from the trial duplicate gauges are collected at extended intervals (i.e. 3 monthly, rather than monthly for existing gauges) in an effort to obtain an increased sample size which is more adequate for laboratory analysis. The initial results of this trial are described in Appendix B. Barrick will continue to conduct this trial throughout 2015 with results reported in the next AR.

3.1.2.3 Variations from Proposed Control Strategies

There were no other variations from the proposed control strategies during the reporting period.

3.1.3 Environmental Performance

3.1.3.1 Monitoring

Meteorological Monitoring

The Cowal AWS meteorological station located near the south Mining Lease boundary collected meteorological data throughout the reporting period. The station measures real-time wind speed and direction, standard deviation of wind direction, temperature (2m, 10m), barometric pressure, humidity, solar radiation and rainfall. The Cowal AWS is supported by quarterly independent maintenance and calibration as well as production of monthly data reviews by Sentinel Pty Ltd. Review of the AWS by Sentinel Pty Ltd in 2006 resulted in upgrades to the station to ensure uninterrupted collection of weather data.

Annual and monthly wind roses from the Cowal AWS are presented in Figures 7a and 7b.

Monthly total rainfall measured at the Cowal AWS is shown in Table 8. Total annual rainfall for the reporting period was 328.8 mm, with the highest total rainfall recorded during March (71 mm) and the lowest recorded in November (1.6 mm) as shown in Table 8. Lake Cowal water levels declined over the Summer period. Lake Cowal was observed to be dry during early-mid Summer (December 2014). The Cowal AWS continued to operate during the reporting period and was calibrated in March, November and December 2014. The correlation of real time data to the reference station has been very accurate with minimal error found.

Table 8: Monthly Rainfall (mm) Measured at CGM 2010 – 2014

Month	Rainfall in 2010 (mm)	Rainfall in 2011 (mm)	Rainfall in 2012 (mm)	Rainfall in 2013 (mm)	Rainfall in 2014 (mm)
January	2.8	24.4	26.6	5.20	32.0
February	95.6	138.6	129.2	26.0	23.2
March	44.6	146.2	78.0	45.4	71.0
April	50.6	20.2	15.6	3.4	20.2
May	40.0	22.0	32.6	30.4	21.2
June	22.8	29.4	29.6	87.8	59.4
July	62.2	11.8	49.8	33.4	9.0
August	34.0	41.8	19.0	18.8	10.8
September	64.2	13.8	25.0	60.4	16.8
October	94.0	31.0	16.0	7.2	15.2
November	60.2	130.4	36.4	9.0	1.6
December	111.7	135.0	27.0	14.6	48.4
TOTAL	**682.7**	**744.6**	**484.8**	**341.6**	**328.8**

The remaining monthly Cowal AWS meteorological station data for the reporting period is presented in Table **9**.

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Table 9: Monthly Average Meteorological Data (2014)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Mean Humidity (%)	37.2	40.0	59.9	65.2	68.5	79.6	68.3	67.9	57.6	41.1	32.8	44.3
Mean Pressure (mbar)	986.4	985.0	991.5	991.0	994.3	997.6	994.4	999.8	993.3	990.5	988.3	984.6
Mean Wind Direction (°)	149.3	141.8	168.3	165.5	181.3	201.7	214.8	159.3	186.8	183.7	188.1	186.1
Mean Wind Velocity (m/s) 15min	3.7	3.5	2.8	2.4	2.2	2.9	3.2	2.9	3.1	3.41	3.9	4.0
2m Temp Max (°C)	43.4	44.3	34.8	33.0	27.5	20.7	20.9	24.2	31.4	40.0	45.2	41.7
2m Temp Min (°C)	10.0	9.9	9.1	2.2	2.3	0.4	-2.3	-2.9	0.4	3.4	3.6	10.4

Air Quality Monitoring

During the reporting period dust monitoring was carried out in accordance with the DMP utilising depositional (static or gravimetric) and high-volume TSP sampling equipment.

A network of 18 static dust deposition gauges were used throughout the reporting period to collect monthly dust samples. These dust gauges are located at varying distances from the CGM open pit, and in a range of directions from the pit (Figure 8). A number of the gauges are situated near homesteads of properties that adjoin the mine site and a number within Lake Cowal near bird breeding areas. A high-volume automatic sampler (HV1) at 'Coniston' Homestead to the north of the CGM collected suspended particle data throughout the reporting period, operating for 24 hour periods every 6 days.

A series of duplicate dust gauges were installed near pre-existing dust gauges (DG01, DG02, DG03, DG04, DG05 and DG 13) with dust samples collected and analysed quarterly for metal concentrations. Duplicate dust gauges allow for a longer sampling period and a larger sample size for analysis, and are used to compare and verify monitoring results against the monthly CGM dust monitoring programme.

Air Quality Impact Assessment Criteria

Table **10** details the long-term impact assessment criteria for deposited dust for any residence on privately-owned land as required by Development Consent Condition 6.1(a).

Table 10: Long-term Impact Assessment Criteria for Deposited Dust

Pollutant	Averaging Period	Maximum Increase in Deposited Dust Level	Maximum Total Deposited Dust Level
Deposited dust [a]	Annual	2 g/m²/month [b]	4 g/m²/month [a, c]

[a] Deposited dust is to be assessed as insoluble solids as defined by Standards Australia, AS/NZS 3580.10.1:2003: *Methods for Sampling and Analysis of Ambient Air – Determination of Particulate Matter – Deposited Matter – Gravimetric Method.*

[b] Incremental impact (i.e. incremental increase in concentrations due to the development on its own).

[c] Total impact (i.e. incremental increase in concentrations due to the development plus background concentrations due to all other sources).

Table **11** and Table **12** detail the long–term and short-term impact assessment criteria for TSP and particulate matter less than (<) 10 μm (i.e. PM_{10}) for any residence on privately-owned land as required under Development Consent Condition 6.1(a) respectively.

Table 11: Long-term Impact Assessment Criteria for Particulate Matter

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

[a] Excludes extraordinary events such as bushfires, prescribed burning, dust storms, fire incidents or any other activity agreed by the Secretary.

[b] Total impact (i.e. incremental increase in concentrations due to the development plus background concentrations due to all other sources).

Table 12: Short-term Impact Assessment Criteria for Particulate Matter

Pollutant	Averaging Period	Criterion [a]
Particulate matter < 10 μm (PM_{10})	24 hour	50 μg/m^3 [b]

[a] Excludes extraordinary events such as bushfires, prescribed burning, dust storms, fire incidents or any other activity agreed by the Secretary.

[b] Total impact (i.e. incremental increase in concentrations due to the development plus background concentrations due to all other sources).

Dust gauges DG1 (Coniston residence) and DG6 (Gumbelah residence) are located on privately-owned land proximal to the residences.

3.1.3.2 Performance Outcomes

Total Suspended Particulates (TSP)

On an annual average basis, the TSP data collected by the high-volume automatic sampler (HVAS) (HV1) is well below the Development Consent air quality impact assessment criterion for TSP matter (90 µg/m^3). Compared to previous years, the average TSP level in 2014 (46 µg/m^3) is higher than that of 2013 (44 µg/m^3), 2012 (34 µg/m^3), 2011 (28 µg/m^3), 2010 (39 µg/m^3) and 2008 (43 µg/m^3), but lower than that in 2009 (63 µg/m^3).

Consistent with trends of previous years of TSP measurements at CGM, there was moderately strong seasonality in the 2014 TSP data, and this seasonality matched quite closely that of the deposited dust amounts. For the summer and early autumn months of January, February and March, the average TSP was around 56 µg/m^3; for the mid-late autumn months and winter months of April, May, June, July and August the average TSP was around 23 µg/m^3; and for the spring months of September, October, November and December, the average TSP was around 70 µg/m^3.

Particulate matter < 10 µm (PM10)

As described in the Cowal Gold Mine Extension Modification Air Quality Impact Assessment undertaken by PEL (2013), PM_{10} can be calculated as 40% of measured TSP (NSW Minerals Council,2000). The annual average TSP collected by the high volume air sampler located at CGM's nearest residence was 46 μg/m^3 (University of Sydney, 2015). Accordingly the annual average PM_{10} is calculated at 18.4μg/m^3, well below the 30μg/m^3 long term impact assessment criteria (Table 11).

The short term impact assessment criteria for PM_{10} is 50 μg/m^3 (Table 12). There were two 24 hour periods during the reporting period that exceeded the short term criteria (Figure 9). These were 130 μg/m^3 TSP (calculated at 52 μg/m^3 PM_{10}) recorded on 12 February 2014 and 172 μg/m^3 (calculated at 69 μg/m^3 PM_{10}) recorded on 15 November 2014. Monitoring data records from the high volume sampler on 12 February 2014 and 15 November 2014 recorded influence from local environmental factors on these dates (i.e. strong winds), with a wheat harvest event occurring on lands adjacent to the high volume sampler on the 15 November 2014.

Deposited Dust

A summary of the dust deposition results for the reporting period is provided in Table 13 and plotted graphically in Figures 10a to 10e. A detailed discussion of the dust monitoring results (including laboratory analysis of dust results) is provided in the University of Sydney's (Dr Stephen Cattle) *Interpretation and Discussion of 2014 Air Quality Monitoring Results Cowal Gold Project*. A summary of Dr Cattle's report is provided below.

In accordance with Australian Standard 3580.10.1 - 2003 extraneous organic material has been removed, where possible, from insoluble solids reporting results. Verbal confirmation has also been gained from ALS Environmental that where possible, they remove any obvious foreign material from dust samples (e.g. sticks, grass etc.). Dust monitoring procedures are outlined in the CGM procedure titled 'Depositional Dust Monitoring PROCEDURE (DOC-ENV-PRO-228070)'. The procedure has been prepared in accordance with appropriate standards and guidelines.

Table 13: Monthly and Mean Dust (insoluble solids) Deposition Rates (2014)

Dust gauge site	Monthly deposition of insoluble solids in dust (g/m^2/month)												
	Jan	*Feb*	*Mar*	*Apr*	*May*	*Jun*	*Jul*	*Aug*	*Sep*	*Oct*	*Nov*	*Dec*	**Mean**
Private Receiver Locations													
DG1	0.8	0.7	1.4	0.8	0.6	0.6	0.4	0.8	1.2	1.9	1.1	1.2	**1.0**
DG6	1.4	2.4	7.3	2.2	2.2	4.2	1.2	2.2	3.9	3.7	3.3	7.0	**3.4**
Locations within Lake Cowal													
DG4	1.0	1.9	1.4	1.8	0.8	0.8	0.5	5.6	5.6	5.6	5.6	–	**2.8**
DG5	1.3	0.7	0.9	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	**0.6**
Locations within the ML													
DG11	6.1	1.2	4.2	2.4	2.0	2.2	1.9	2.5	11.5	2.6	2.4	10.0	**4.1**
DG12	4.7	2.3	3.3	5.7	1.4	3.4	1.7	3.9	17.6	11.3	2.0	7.8	**5.4**
DG13	1.1	0.8	0.8	0.9	1.1	0.8	1.0	0.3	1.1	3.0	1.6	13.5	**2.2**
Site 52	1.7	0.6	2.7	3.0	2.3	1.2	1.5	2.3	3.8	7.7	1.6	3.4	**2.7**
DG14	1.0	1.3	1.6	0.4	0.4	0.6	0.6	0.6	0.6	0.6	0.6	0.6	**0.7**
Other Locations													
DG2	4.9	3.0	2.9	0.9	0.6	0.9	0.4	0.9	1.2	1.6	2.9	2.0	**1.9**
DG3	1.4	2.0	4.1	0.6	0.6	0.6	0.5	1.4	1.1	3.0	2.2	6.2	**1.9**
DG7	4.1	13.7	13.1	5.9	4.2	17.5	0.9	1.1	1.9	5.6	1.5	7.3	**6.4**
DG9	0.5	1.6	7.8	7.0	4.8	9.1	1.8	0.8	0.8	0.9	2.4	10.2	**4.0**
DG10	0.8	1.4	0.8	0.4	0.6	0.5	3.6	0.2	0.7	1.0	1.7	0.8	**1.0**
I5	1.3	2.3	5.8	2.3	1.2	1.8	0.8	1.1	1.1	2.5	5.3	8.7	**2.9**
Lakeside (Barrick)	1.5	1.2	4.9	0.5	1.1	0.9	0.5	0.4	1.2	1.1	4.0	3.0	**1.7**
McLintock's Shed	5.2	1.6	2.6	3.2	7.5	4.3	1.9	1.6	1.9	5.8	3.2	7.8	**3.9**
Site Office	1.4	4.2	3.6	1.6	1.4	5.7	1.5	0.9	2.9	7.1	2.2	7.3	**3.3**
Mean	**2.2**	**2.4**	**3.8**	**2.2**	**1.9**	**3.1**	**1.2**	**1.5**	**3.3**	**3.6**	**2.4**	**5.6**	

^ The DG3 gauge could not be accessed in December, so the value given is half that of the total mass collected from the gauge at the end of January 2015.
* Between August and November, the DG4 gauge could not be accessed, so the values for those sampling periods are estimated as a quarter of the total mass collected in late November. Also, the DG4 gauge could not be accessed in December, so the value given is one-third of the total mass collected from the gauge at the end of February 2015.
# The DG5 gauge could not be accessed between August and the end of February 2015, so the value given for those sampling periods is one-seventh that of the total mass collected from the gauge at the end of February 2015.
£ The DG14 gauge could not be accessed between August and the end of February 2015, so the value given for those sampling periods is one-seventh that of the total mass collected from the gauge at the end of February 2015.

Tabulated results for all dust gauges are presented in Appendix B.

Compliance with the deposited dust air quality impact assessment criterion of 4 g/m^2/month (annual average) was achieved at each of the dust gauges located proximal to residences on privately-owned land (DG1 and DG6).

There is moderate seasonality associated with the 2014 dust deposition data (Table 13). Between the months of January and March (summer/early autumn) the average dust deposition rate across all gauges was 2.8 g/m^2/month, between April and August (autumn/winter) the average dust deposition rate across all gauges was 2.0 g/m^2/month, while between September and December (spring/summer) the average dust deposition rate across all gauges was 3.7 g/m^2/month. The greater dust deposition rates later in the year likely reflects the relatively dry spring experienced (only 82mm rain fell in the four months between September 2014 and December 2014) and the rising air temperatures at that time, which serves to dry the topsoil and make it more wind entrainable. The lower dust deposition rates of the winter period reflect the reduced availability of wind entrainable dust particles from the soil surface when it is moist.

Because the seasonality of the monthly dust deposition data is moderate, it seems likely that regional æolian processes generally played a more dominant role than localised æolian processes in determining deposited dust load in 2014. There was no substantial dust storm activity in central New South Wales during that year.

3.1.4 Reportable Incidents

At the start of 2015 during Annual Return report data compilation it was discovered that four 6-monthly depositional dust samples were not sent for metals Lab assay in June 2014. The NSW EPA has verbally acknowledged preliminary notification for four missed six-monthly metals analysis (20 January 2015). Further verbal confirmation was given by NSW EPA on 28 January 2015 that this single incident at Cowal, for which there is no prior occurrence and there is not a dust impact issue, is of no concern to the EPA and that the focus needs simply to be to find the causes behind the omission, record the finding in the 2014 Annual Return and prevent this from happening again. CGM has since rectified this issue by reviewing and improving administration processes. This 'systems review' looked at aspects of the process for example; samples sent to the lab (National Measurement Institute), procedural updates and sample scheduling.

The DMP requires that dust-related complaints and amelioration measures undertaken in the event of any confirmed exceedances of the Development Consent air quality impact assessment criteria be reported in the AR. No complaints were received relating to dust at the CGM during the reporting period and no exceedances of the Development Consent air quality impact assessment criteria occurred during the reporting period.

3.1.5 Further Improvements

As described in Paragraph 3, recommendations made in the 2013 IMP report (for ongoing analysis of dust samples) will continue to be actioned during the next reporting period.

Review and interpretation of the dust monitoring data for the reporting period was conducted by Dr Stephen Cattle of the University of Sydney (2015). The main recommendations of Dr Cattle's analysis relevant to dust deposition and TSP monitoring are summarised below.

- The efficient capture of all depositing dust remains a vexed question. Even the most efficient dust trap designs are estimated to capture only 30-40% of all depositing dust, with the majority of commonly-used traps or gauges having a collection efficiency of around 20%. A more aerodynamically efficient trap, such as the inverted frisbee trap, may have a better collection efficiency, but with the potential problem of contamination by birds being significant at a bird-breeding locality such as Lake Cowal, such efficiencies may be out-weighed by contamination. It is recommended that consideration be given to piloting the use of inverted frisbee dust traps, with anti-bird spikes affixed to the metal rims of the traps.

- Although the 3-, 4- and 5-monthly Duplicate samples collected in 2014 did not appear to eradicate errors in metal concentrations due to small sample size, it is nevertheless recommended that the practice of collecting three-monthly Duplicate samples be continued and that the masses of these three-monthly deposits be measured.

- It is further recommended that for each set of dust samples subjected to metal analysis, three local soil or dust source (e.g. crushed rock or tailings) samples should also be analysed at the same time, for the same suite of metals. It is recommended that the soil/dust source samples be provided and analysed both as a 'bulk sample' of several tens of grams mass and also as a sample of comparable mass to the dust samples. This way, any dilution effects caused by small sample size should become immediately obvious, and any systematic laboratory errors (e.g. consistently high Cd values) should also be apparent.

Other improvements to the air quality monitoring program that Barrick will continue to implement during the next reporting period to improve confidence in future analyses include:

- The continuing use of standardised sample collection procedures across the site monitoring program, whilst maintaining current Barrick site standards.
- Barrick will continue a QA/QC system utilising trip blanks and duplicate samples every 3-6 months, blanks and control samples during the next reporting period.
- All monitoring equipment is currently and will continue to be decontaminated each sample round using a solution of deionised water and Decon 90.
- NMI is intended to remain the as the primary supplier of laboratory data reporting for Barrick. This includes a report of analysis and quality assurance reporting.
- A review of laboratory testing procedures will continue during 2015 to ascertain the most accurate method of calculating results in accordance with Australian Standards and applicable conditions.

The University of Sydney will continue to liaise with Barrick sampling personnel on routine dust sampling methodology, as a means to reduce the likelihood of sample contamination during collection and dispatch stages.

To mitigate dust generated by vehicle movements within ML 1535, PetroTac (a water emulsified bitumen sealant) was first applied to 5km of unsealed Mining Lease roads during October 2006. PetroTac has since been routinely applied around the general administration and workshop areas, on roads within the processing plant and on the portion of Lake Cowal Road between the two 'Coniston' farm southern entry roads (BSC approved).

Barrick will apply further PetroTac dust suppressant to unsealed roads within ML 1535 that are subject to high-frequency light vehicle use during the next reporting period.

The use of saline pit water on heavy mobile equipment haul roads in the open pit mine and waste emplacement areas to reduce dust generation will continue throughout the next reporting period.

Other dust mitigation measures employed at CGM include water sprays at the primary crusher, covered conveyors within the processing plant and maintaining minimal dust levels at the crushed ore stockpile.

The CGM's CEMCC is kept informed of any public comment or complaint about dust, and external dust study updates during quarterly meetings. The CEMCC raised no concerns about dust during 2014.

3.2 EROSION AND SEDIMENT

3.2.1 Reporting Requirements

3.2.1.1 Development Consent

The ESCMP has been prepared for the CGM in accordance with Development Consent Condition 3.5(a) to provide erosion and sediment control strategies for works to be undertaken throughout the life of the CGM (i.e. construction and operations).

In addition, any proposed improvements to erosion and sediment control systems are required to be included in the AR (when monitoring indicates the need).

The ESCMP was amended to include the soil disturbance and management measures associated with the approved saline groundwater supply borefield within ML 1535. The addendum to the ESCMP was approved by the DP&I on 10 March 2010. Lake Cowal filled to the TIB by August 2010 and the Lake floor saline bore remained capped and inundated during part of the reporting period. By the end of the reporting period, Lake Cowal was dry.

Barrick commenced preparation of an Addendum to the ESCMP during the reporting period to incorporate the components of the approved CGM relevant to the ESCMP (i.e. the proposed new D10 contained water storage, the modified design of contained water storage D5 and to include the proposed new soil stockpiles). Details regarding approval of the ESCMP Addendum will be provided in the next AR.

3.2.1.2 Environment Protection Licence

Condition R2 of the EPL requires Barrick to notify the EPA of incidents causing or threatening material harm to the environment as soon as practicable after Barrick becomes aware of the incident.

3.2.1.3 Any Other Relevant Approval

There are no other relevant reporting requirements from approvals in relation to erosion and sediment management for the reporting period.

3.2.2 Environmental Management

3.2.2.1 Control Strategies

A summary of the control strategies/management measures implemented during the reporting period in accordance with the ESCMP is provided in
Table **14**. The erosion and sediment control systems for the reporting period are shown in Figure 11.

Table 14: Summary of Erosion and Sediment Control Strategies/ Management Measures

Project Development	Control Strategy/Management Measure
Temporary Erosion and Sediment Controls Systems	
Internal Mine Access Road	• Minimisation of disturbance to watercourses that cross the road. • Provision of culverts and diversion of runoff from undisturbed areas. • Erection of sediment control barrier downslope of small, disturbed areas. • Provision of sediment basins for concentrated runoff areas. • Stabilisation of the access road surface. • Rapid stabilisation and revegetation of road batters.
ML 1535 Fences	• Minimising the area disturbed and restricting access to non-disturbed areas.
Ore Stockpile and Process Plant Area	• Minimising the area disturbed and restricting access to non-disturbed areas. • Settlement/plant runoff storage. • Installation of sediment control barrier. • Installation of runoff collections drains. • Dewatering of settlement storage following rainfall events. • Ripping and rehabilitation of hardstand areas.
Soil Stockpiles	• Use of sediment control barrier and sediment traps to minimise soil movement. • Use of diversion banks, channels and rip-rap structures to divert surface water around disturbed areas and control runoff velocity.
Internal Mine Roads	• Constructing all access roads at an appropriated slope along the contour, where practicable. • The use of spoon drains, table drains and concrete culverts to control surface runoff from access roads. • Ripping and rehabilitation of roads no longer required for access.
Contractors' Area	• Minimising the area disturbed and restricting access to non-disturbed areas. • Erection of sediment control barrier downslope of small, disturbed areas. • Provision of sediment basins for concentrated runoff areas. • Ripping and rehabilitation of hardstand areas.
Earthworks Associated with Landscaping	• Use of sediment control barriers and sediment traps to minimise soil movement.

Table 14 (continued): Summary of Erosion and Sediment Control Strategies/ Management Measures

Project Development	Control Strategy/Management Measure
Internal Catchment Drainage System (ICDS)	• Construction of the ICDS as described in the ESCMP. • Construction of sediment retention storages to reduce non-colloidal fraction of sediment carried in runoff from large disturbed areas. Storages sized to provide flow detention and effective settlement during small to medium sized flood events (1 in 20 year 1 hour event). • Use of small-scale runoff controls comprising hay bales and rockfill bunds to control sediment loads in runoff from small areas. Silt control hay bale weirs installed downslope of all disturbed areas. • Rapid stabilisation of disturbed areas using contour banks and furrows, erosion-stable drainage paths and early revegetation or armouring of disturbed areas. Disturbed areas rapidly stabilised to reduce sediment fluxes.
Permanent Erosion and Sediment Controls Systems	
Lake Isolation System	• Construction of the Temporary Isolation Bund and Lake Protection Bund as described in the ESCMP. • Stabilisation and revegetation of the batters of the Temporary Isolation Bund and Lake Protection Bund.
Up-Catchment Diversion System (UCDS)	• Construction of the UCDS as described in the ESCMP to divert upper catchment water around the CGM. • Installation of rip-rap structures along UCDS and rock outfalls at confluences with existing natural drainage lines. • Vegetation stabilisation.
Earth Mounds (associated with the ICDS)	• Vegetative stabilization.
Monitoring and Maintenance	• Water quality monitoring in accordance with the SWGMBMP. • Maintenance of erosion and sediment control structure where necessary.

3.2.2.2 Effectiveness of Control Strategies

In accordance with the ESCMP the primary objectives of the control strategies are to:

- control the movement of sediment and salinity migration from areas disturbed by mining and construction activities; and
- maintain downstream (Lake) water quality.

The control strategies implemented during the reporting period were considered to be effective in meeting the above objectives as demonstrated by the environmental performance indicators. The environmental performance indicators are discussed in Paragraph 3.2.3 below.

3.2.2.3 Variations from Proposed Control Strategies

There were no variations to the Erosion and Sediment Control strategy during the reporting period.

3.2.3 Environmental Performance

3.2.3.1 Monitoring

In accordance with the ESCMP, inspections and maintenance of erosion and sediment control structures (e.g. silt fences, hay-bales, sediment ponds and diversion structures) occurred as required during the reporting period.

The ESCMP also requires the following to be reported in the AR:

- Surface and groundwater monitoring results.

- Comparison of surface water and groundwater monitoring results with criteria in the SWGMBMP. Interpretation and discussion of the surface and groundwater monitoring program results.
- CEMCC decisions relating to CGM ESCMP issues.

The surface and groundwater monitoring results for the reporting period are discussed in Paragraphs 3.3.3.2 and 3.4.3.2 respectively.

There were no CEMCC decisions relating to CGM erosion and sediment control issues.

There are no additional monitoring requirements relevant to erosion and sediment control issues in any other approval.

3.2.3.2 Performance Outcomes

The Cowal geotechnical department conducted monthly monitoring and assessment of structures such as all water holding facilities on site, waste emplacements and the lake protection bund for sediment movement and erosion control effectiveness in accordance with the CGM's *Monitoring Programme for the Detection of Movement of the Lake Protection Bund, Water Storage and Tailings Structures and Pit/Void Walls*.

Water quality results as discussed in Paragraph 3.3.3 have not indicated that any impact on Lake Cowal has occurred. At the end of the reporting period Lake Cowal was dry, however if the lake refills water quality monitoring results will continue to be monitored and evaluated.

As described in Paragraph 5.4, the new rock-topsoil rehabilitation treatment method for final landform slopes continues to demonstrate effective erosion control as evidenced by independent specialists DnA Environmental (DnA Environmental, 2015a).

Rehabilitation material stripped from the NTSF during the reporting period (for buttressing works) was utilised as rehabilitation material on the inner batters of the PWE. Reshaping and rehabilitation works on the NWE, SWE and PWE are described further in Paragraph 5.4

3.2.4 Reportable Incidents

No environmental incidents or complaints were reported or received relating to erosion and sediment control at the CGM during the reporting period. There were no CEMCC decisions regarding erosion and sediment issues for the reporting period.

3.2.5 Further Improvements

Rehabilitation monitoring and assessment will continue to be undertaken during the next reporting period to evaluate the performance of the rock-topsoil treatment method for CGM final landform slopes, including annual rehabilitation risk review workshops.

A Rehabilitation Risk Assessment peer review took place on site on 13 March 2014. The findings of this review are described in Paragraph 5.4.

Ongoing periodic inspection and maintenance of the UCDS and erosion control structures will continue to be undertaken and reported in the next AR.

3.3 SURFACE WATER

3.3.1 Reporting Requirements

3.3.1.1 Development Consent

The reporting of surface water monitoring is required by Development Consent Condition 4.5(b), which states:

> *The results and interpretation of surface and ground water monitoring (including biological monitoring) are to be published on the Applicant's website for the development on a regular basis, or as directed by the Secretary.*

A SWMP and the SWGMBMP have been prepared for the CGM to guide water management at the CGM and detail the CGM's water monitoring programme, respectively.

A revised SWMP and SWGMBMP Addendum were submitted to the DP&E for approval on 08 August 2013. Approval of the August 2013 SWMP and SWGMBMP Addendum by the DP&E remained pending up until approval of the modified Development Consent on 22 July 2014. Although formal approval of the SWMP and SWGMBMP by the DP&E remains pending, the DP&E has advised it is satisfied for the SWMP and SWGMBMP to be implemented in the interim.

Condition 4.4(a) of the modified Development Consent (MOD11) requires a Water Management Plan (WMP) to be prepared. Accordingly, Barrick commenced preparation of a WMP during the reporting period to reflect the approved CGM.

Similarly, Barrick commenced preparation of a revised SWGMBMP during the reporting period to reflect the approved CGM, in accordance with Development Consent Condition 4.5(b). The revised SWGMBMP will include monitoring programmes for the operational and post-mine operations phase of the CGM as required by Development Consent Condition 4.5(b).

In accordance with both the SWMP and the SWGMBMP the following surface water-related issues are required to be reported in the AR:

- surface water and lake sediment monitoring results;
- details of any trends observed in the monitoring data;
- details of investigations and consultation with regulatory agencies;
- review of the performance of control measures and the monitoring program; and
- interpretation and discussion of the monitoring program results and management measures by a suitably qualified person.

3.3.1.2 Environmental Protection Licence

The EPL requires Barrick to undertake storm water and ambient water quality monitoring at points identified in EPL Condition P1.3.

Condition R1 of the licence requires the completion of an Annual Return comprising a Statement of Compliance and a Monitoring and Complaints Summary at the end of each annual reporting period. Barrick submitted an Annual Return for the period 23 December 2013 to 22 December 2014 to the EPA on 20 February 2015. Storm water and ambient water quality of monitoring points identified in EPL Condition P1.3 were reported. The storm water and ambient monitoring points and frequencies required by the EPL are consistent with monitoring required by the Development Consent and SWGMBMP. Additionally, Condition R2 of the EPL requires Barrick to notify the EPA of incidents causing or threatening material harm to the environment as soon as practicable after Barrick becomes aware of the incident.

3.3.1.3 Any Other Relevant Approval

There are no other relevant reporting requirements for the reporting period.

3.3.2 Environmental Management

3.3.2.1 Control Strategies

The site water management system is designed to contain all potentially contaminated water and comprises the following major components as noted on Figure 11:

(i) UCDS;

(ii) Lake Isolation System (comprising the TIB, LPB and Perimeter Waste (rock) Emplacement (**PWE**));

(iii) Internal Catchment Drainage System (including the permanent catchment divide and contained water storages);

(iv) Integrated Erosion and Sediment Control System (refer to Paragraph 3.2); and

(v) E42 Open Pit Dewatering System.

3.3.2.2 Effectiveness of the Control Strategies

The site water management system is designed to contain all potentially contaminated water generated within the closed catchment of the ML 1535 area while diverting all other water around the perimeter of the site. The UCDS, Lake Isolation System and Internal Catchment Drainage System are designed to minimise the volume of surface water entering ML 1535 by isolating the site from Lake Cowal and the up-slope catchment above the UCDS. Surface water collected within ML 1535 is controlled using a number of water management structures which are designed to prevent discharge to Lake Cowal. No discharge to Lake Cowal has occurred to date or during the reporting period.

The control strategies implemented during the reporting period effectively met the above objectives as demonstrated by the environmental performance outcomes discussed in Paragraph 3.3.3.

3.3.2.3 Variations from Proposed Control Strategies

There were no variations from the proposed control strategies during the reporting period.

3.3.3 Environmental Performance

3.3.3.1 Monitoring

Surface water monitoring was conducted in accordance with the SWGMBMP and EPL. Details of the location, frequency and analytical requirements for each monitoring point are presented below in Table **15**. All monitoring results for the reporting period are provided in Appendix C with a summary discussion in Paragraph 3.3.3.2.

Table 15: Surface Water Monitoring Programme

CGM Component	Site	Monitoring Frequency	Parameter/Analyte
Up-catchment Diversion System	Up-catchment diversions north and south (UCD north and UCD south)	Weekly and following rainfall events of 20 mm or greater in a 24 hour period	Suspended Solids, EC, pH.
Internal Catchment Drainage System	Contained water storages D1 and D4	Weekly and following rainfall events of 20 mm or greater in a 24 hour period	Suspended Solids, EC, pH.
	Contained water storages D2, D3, D9 D6 and D8B	Quarterly	Oil and grease, EC, pH.
	Contained water storages D5 and D6	Monthly	EC, pH, turbidity, dissolved oxygen, temperature.
		Quarterly	Biological oxygen demand, faecal indicators, total hardness, total suspended solids, total dissolved solids. Ca, Mg, K, sodium, chloride, sulphate, Total As, Cd, Mo, Ni, Pb, Sb and Zn Dissolved As, Cd, Mo, Ni, Pb, Sb and Zn.
	Sediment control structures	Monthly and following rainfall events of 20 mm or greater in a 24 hour period	Structural integrity, Suspended Solids.
		Overflow event	Suspended Solids, pH, EC.
Open Pit/Void Water	Pit sumps	Monthly	Suspended Solids, EC, pH.
Lake Cowal Water Level	Lake Cowal gauge board	Monthly (when lake water is present)	Lake water level.
Lake Cowal Chemical Monitoring	B1, B5, P1, P2, P3	Weekly and following rainfall events of 20 mm or greater in a 24 hour period	Suspended Solids, EC, pH.
	Lake Cowal transect sampling sites (including the Lachlan floodway, irrigation channel, Bland Creek, east shore, Project and control transects [refer to Figure 8])	Monthly (when lake water is present)	EC, pH, turbidity, dissolved oxygen, temperature, and lake water level.
		Quarterly (when lake water is present)	Suspended Solids, Alkalinity, cations and anions. Total Fe, Ca, Mg, K, sodium, chloride, sulphate, total phosphate, ortho phosphate, ammonium, nitrogen as nitrate and nitrite. Total As, Cd, Mo, Ni, Pb, Sb and Zn Dissolved As, Cd, Mo, Ni, Pb, Sb and Zn.
Lake Cowal Inflow Sites	Lake inflow sites (including the Lachlan floodway, irrigation channel, Bland Creek and Sandy Creek inflow sites)	Monthly (when lake water is present)	EC, pH, turbidity, dissolved oxygen, temperature.
		Quarterly (when lake water is present)	Suspended Solids, Alkalinity, cations, anions Total Fe, Ca, Mg, K, sodium, chloride, sulphate, Total As, Cd, Mo, Ni, Pb, Sb and Zn Dissolved As, Cd, Mo, Ni, Pb, Sb and Zn.
Other Waters	Lachlan River - Jemalong Weir Stream Gauge	Continuous (data to be obtained from NoW every 6 months)	Flow.

Source: SWGMBMP Addendum (Barrick, 2013)

3.3.3.2 Performance Outcomes

A summary of the CGM and Lake Cowal surface water monitoring results is provided in Table **16** and Table 17 and respectively while detailed data is presented in Appendix D. Water quality monitoring at Lake Cowal Inflow Sites is summarised in Table 19. Lake Cowal sediment monitoring results are presented in Table 20. Unless otherwise noted, all analytical data was obtained by ALS Environmental Laboratory (Sydney, NSW).

Table 16: Summary of On-site Surface Water Monitoring Results for the Reporting Period

Weekly Surface Water Monitoring - D1, D4, UCD North, UCD South, Pit Sumps 1, 2 & 3				
Pond D1	**COUNT**	**MIN**	**MAX**	**MEAN**
pH - Field	52	8.09	9.58	8.79
Electrical Conductivity - Field (µS/cm)	52	6860	12400	9524
Total Suspended Solids (mg/L)	52	<5	74	19
Pond D4	**COUNT**	**MIN**	**MAX**	**MEAN**
pH - Field	43	7.16	8.73	8.21
Electrical Conductivity - Field (µS/cm)	43	2020	69030	12149
Total Suspended Solids (mg/L)	43	<5	583	54
UCD North	**COUNT**	**MIN**	**MAX**	**MEAN**
pH - Field	47	7.01	9.55	8.47
Electrical Conductivity - Field (µS/cm)	47	580	2830	1278
Total Suspended Solids (mg/L)	47	57	680	309
UCD South	**COUNT**	**MIN**	**MAX**	**MEAN**
pH - Field	51	7.27	9.35	8.79
Electrical Conductivity - Field (µS/cm)	51	298	8720	1623
Total Suspended Solids (mg/L)	51	26	343	131
Monthly Surface Water Monitoring – D5, D6 and Pit Sumps				
Pond D5	**COUNT**	**MIN**	**MAX**	**MEAN**
pH - Field	12	7.32	9.43	8.33
Electrical Conductivity - Field (µS/cm)	12	3680	59400	16812
Dissolved Oxygen - Field (mg/L)	10	5.59	9.69	7.69
Temperature (Deg C)	12	7.2	31.8	18.3
Turbidity (NTU)	12	3	79	17.6
Pond D6	**COUNT**	**MIN**	**MAX**	**MEAN**
pH - Field	12	7.48	8.22	7.97
Electrical Conductivity - Field (µS/cm)	12	4340	22100	11408
Dissolved Oxygen - Field (mg/L)	10	3.5	8.71	5.78
Temperature (Deg C)	12	12.8	29	22.2
Turbidity (NTU)	12	21.7	309	98.2
Pit Sump 1	**COUNT**	**MIN**	**MAX**	**MEAN**
pH - Field	11	6.72	8.17	7.65
Electrical Conductivity - Field (µS/cm)	11	30500	65500	49005
Total Suspended Solids (mg/L)	12	1	3300	281.4
Pit Sump 2	**COUNT**	**MIN**	**MAX**	**MEAN**
pH - Field	11	7.62	8.43	7.97
Electrical Conductivity - Field (µS/cm)	11	47900	65000	53102
Total Suspended Solids (mg/L)	12	1	878	154.3
Pit Sump 3	**COUNT**	**MIN**	**MAX**	**MEAN**
pH - Field	7	7.63	8.18	7.89
Electrical Conductivity - Field (µS/cm)	7	49800	57600	53157
Total Suspended Solids (mg/L)	8	1	399	68.9
Quarterly Surface Water Monitoring – D2, D3, D8B, D9, D6				
Pond D2	**COUNT**	**MIN**	**MAX**	**MEAN**
pH - Field	4	7.73	8.77	8.10
Electrical Conductivity - Field (µS/cm)	4	3250	53600	17220
Oil & Grease (mg/L)	4	5	5	5
Pond D3	**COUNT**	**MIN**	**MAX**	**MEAN**
pH - Field	4	8.06	8.92	8.42
Electrical Conductivity - Field (µS/cm)	4	13760	55300	26403
Oil & Grease (mg/L)	4	5	5	5

Table 17: Summary of On-site Surface Water Monitoring Results for the Reporting Period

Monthly Surface Water Monitoring – D5, D6 and Pit Sumps				
Pond D8B	**COUNT**	**MIN**	**MAX**	**MEAN**
pH - Field	4	6.67	8.64	8.07
Electrical Conductivity - Field (μS/cm)	4	3820	15680	9722
Oil & Grease (mg/L)	4	5	5	5
Pond D9	**COUNT**	**MIN**	**MAX**	**MEAN**
pH - Field	4	7.77	8.44	8.03
Electrical Conductivity - Field (μS/cm)^	4	7980	17980	12818
Oil & Grease (mg/L)	4	5	5	5
Pond D6	**COUNT**	**MIN**	**MAX**	**MEAN**
Antimony - Total	16	0.004	0.017	0.0089
Arsenic - Total	16	0.002	0.015	0.0062
Biochemical Oxygen Demand	4	2	2	2
Cadmium - Total	16	0.0001	0.0073	0.0017
Calcium - Dissolved	4	225	596	345.5
Chloride	4	3130	6740	4215
Coliforms	4	0	1	0.75
Copper - Total	16	0.005	3.66	1.2041
Enterococci	4	1	1	1
Escherichia coli	4	0	1	0.75
Faecal Coliform -Total	4	0	1	0.75
Iron - Total	16	0.05	5.81	0.9425
Lead - Total	16	0.001	0.017	0.003
Magnesium - Dissolved	4	143	541	298.5
Manganese - Total	16	0.101	0.645	0.2732
Mercury - Total	8	0.0001	0.0001	0.0001
Potassium - Dissolved	4	126	266	216
Selenium - Total	8	0.01	0.02	0.0125
Sodium - Dissolved	4	2150	4160	2672.5
Sulfates	4	1200	2900	2067.5
Total Dissolved Solids	4	7360	16100	10480
Total hardness as CaCO3	4	1150	3720	2092.5
Total Suspended Solids	12	25	356	128.7
Zinc - Total	16	0.005	0.609	0.0719

^ Pond D9 was used as storage for water collected from surface water runoff dams after heavy rain.

Table 18: Summary of Lake Water Monitoring Results for 2010 – 2014

Parameter	Lake Cowal Water Quality Results (November 2010) (Mean) #	Lake Cowal Water Quality Results (2011) Ranges (Mean)	Lake Cowal Water Quality Results (2012) Ranges (Mean)	Lake Cowal Water Quality Results (2013) Ranges (Mean)	Lake Cowal Water Quality Results (2014) Ranges (Mean)	Lake Cowal Baseline Water Quality Results (1991 - 1992)	Aquatic Ecosystems^ ~
Alkalinity (mg/L)	105	64 – 142 (100)	50 – 152 (87)	113 – 178 (157)	191 – 322 (269)	NA	NA
Suspended Solids (mg/L)	6 - 192	5 – 184 (38)	7 – 274 (67)	66 – 472 (216)	57 – 556 (233)	NA	NA
Acidity – Alkalinity scale (pH)	7.03 – 8.27	7.22 – 8.82 (8.14)	5.56 – 9.78 (7.81)	7.82 – 8.43 (8.19)	8.45 – 8.97 (8.72)	8.27 – 8.67	6.5 to 8.0
Electrical Conductivity (µS/cm)	100 – 701	190 – 727 (322)	107 – 433 (236)	351 – 572 (503)	882 – 1350 (1193)	222 – 1557[1]	20 to 30 µS/cm[1]
Turbidity (NTU)	8.2 – 211	11.5 – 144 (53.3)	7.8 – 829 (246.1)	271 – 755 (470)	189 – 671 (391)	22 - 224	1 to 20[2]
Dissolved Oxygen (mg/L)	0.84 – 8.89	1.64 – 14.74 (9.76)	2.24 – 17.89 (8.95)	1.84 – 12.7 (9.03)	5.65 – 13.83 (9.0)	7.3 – 11.5	90 to 110 (derived from daytime measurements)
Temperature (°C)	24.9	9.6 – 29.8 (18.4)	7.5 – 28.8 (16.7)	9.8 – 27 (17.4)	7.8 – 30 (18.6)	NA	Not applicable
Depth (m)	0.10 – 1.20	0.6 – 2.5 (1.7)	0.5 – 3.6 (2.0)	0.4 – 2.00 (1.2)	0.25 – 1.0 (0.54)	0.2 – 2.0	Not applicable
Lake Water Level (m RL)	204.5	205.25 – 205.75	205.40 – 206.88	204.33 - 205.24	203.5 - 204.78	205.1	Not applicable
Total Iron (mg/L)	6.50	0.36 – 11.00 (2.50)	0.92 – 22.6 (9.55)	2.54 – 33.6 (21.49)	4.76 – 21.7 (11.7)	NA	NA (insufficient data)
Calcium (mg/L)	17	10 – 26 (19)	8 – 28 (14)	22 – 32 (26)	20 – 50 (42)	NA	NA
Magnesium (mg/L)	10	6 – 12 (9)	4 – 14 (7)	9 – 17 (13.4)	16 – 32 (29)	NA	NA
Potassium (mg/L)	15	12 – 19 (15)	12 – 19 (14)	14 – 27 (21)	26 – 36 (31)	NA	NA
Sodium (mg/L)	19	13 – 35 (24)	12 – 38 (22)	35 – 59 (50)	105 – 168 (144)	NA	NA
Chloride (mg/L)	25	19 – 41 (28)	12 – 66 (22)	36 – 61 (51)	91 – 194 (155)	NA	NA
Sulphate (mg/L)	3	1 – 10 (2)	1 – 10 (4)	14 -38 (21)	29 – 37 (33)	NA	NA
Cations (mg/L)	2.81	1.98 – 3.77 (3.02)	1.56 – 3.82 (2.11)	3.74 – 5.85 (5.13)	8.85 – 12.6 (11.51)	NA	NA
Anions (mg/L)	2.83	1.93 – 3.67 (2.91)	1.45 – 3.77 (2.00)	3.76 – 5.78 (5.02)	1.1 – 13.2 (11.05)	NA	NA

Table 17 (continued): Summary of Lake Water Monitoring Results for 2010 – 2014

Parameter	Lake Cowal Water Quality Results (November 2010) #	Lake Cowal Water Quality Results (2011) Ranges (Mean)	Lake Cowal Water Quality Results (2012) Ranges (Mean)	Lake Cowal Water Quality Results (2013) Ranges (Mean)	Lake Cowal Water Quality Results (2014) Ranges (Mean)	Lake Cowal Baseline Water Quality Results (1991 -1992)	Aquatic Ecosystems^ ~
Arsenic (mg/L)	0.006 (total)	<0.001 – 0.007 (0.003[3]) (total)	0.002 – 0.007 (0.004[3]) (total)	0.006 – 0.014 (0.009) (total)	0.014 – 0.023 (0.018[3]) (total)	0.0026[3] (total)	0.008
	0.005 (dissolved)	<0.0003 – 0.006 (0.0026[3]) (dissolved)	0.001 – 0.006 (0.003[3]) (dissolved)	0.003 – 0.011 (0.007) (dissolved)	0.012 – 0.024 (0.017[3]) (dissolved)	0.0016[3] (dissolved)	
Cadmium (mg/L)	0.0001 (total)	<0.0001 - 0.001 (0.0001[3]) (total)	<0.0001 – 0.005 (0.0002[3]) (total)	0.0001 – 0.0002 (0.0001 (total)	0.0001 – 0.0001 (0.0001[3]) (total)	0.000055[3] (total)	0.0006
	0.0001 (dissolved)	<0.0001 – 0.0004 (0.0001[3]) (dissolved)	<0.00001 – <0.0001 (0.00001[3]) (dissolved)	0.0001 – 0.0002 (0.0001) (dissolved)	0.0001 – 0.0002 (0.0001[3]) (dissolved)	0.00005[3] (dissolved)	
Molybdenum (mg/L)	0.001 (total)	<0.001 – 0.006 (0.0012[3]) (total)	<0.001 – 0.004 (0.001[3]) (total)	0.001 – 0.003 (0.0014) (total)	0.002 – 0.005 (0.003[3]) (total)	NA	NA (insufficient data)
	0.001 (dissolved)	<0.001 - 0.001 (0.001[3]) (dissolved)	<0.001 – 0.001 (0.001[3]) (dissolved)	0.001 – 0.002 (0.0014) (dissolved)	0.003 – 0.004 (0.0035[3]) (dissolved)	NA	
Nickel (mg/L)	0.007 (total)	<0.001 – 0.009 (0.0036[3]) (total)	<0.001 – 0.018 (0.009[3]) (total)	0.006 – 0.025 (0.018) (total)	0.010 – 0.025 (0.016[3]) (total)	NA	0.008
	0.004 (dissolved)	<0.001 – 0.004 (0.0023)[3] (dissolved)	<0.001 – 0.004 (0.003[3]) (dissolved)	0.002 – 0.005 (0.0035) (dissolved)	0.004 – 0.007 (0.006[3]) (dissolved)	NA	
Lead (mg/L)	0.003 (total)	<0.001 – 0.004 (0.0013[3]) (total)	<0.001 – 0.009 (0.004[3]) (total)	0.003 – 0.015 (0.009) (total)	0.003 – 0.010 (0.006[3]) (total)	0.0029[3](total)	0.001
	0.001 (dissolved)	<0.001 - 0.001 (0.001[3]) (dissolved)	<0.001 – 0.003 (0.001[3]) (dissolved)	0.001 – 0.001 (0.001) (dissolved)	0.001 – 0.001 (0.001[3]) (dissolved)	0.0005[3] (dissolved)	
Antimony (mg/L)	0.001 (total)	<0.001 – 0.004 (0.0014[3]) (total)	<0.001 – <0.001 (0.001[3]) (total)	0.001 – 0.001 (0.001) (total)	0.001 – 0.050 (0.017[3]) (total)	NA	NA (insufficient data)
	0.001 (dissolved)	<0.001 - 0.001 (0.001[3]) (dissolved)	<0.001 – <0.001 (0.001[3]) (dissolved)	0.001 – 0.001 (0.001) (dissolved)	0.001 – 0.001 (0.001[3]) (dissolved)	NA	

Table 17 (continued): Summary of Lake Water Monitoring Results for 2010 – 2014

Parameter	Lake Cowal Water Quality Results (November 2010) #	Lake Cowal Water Quality Results (2011) Ranges (Mean)	Lake Cowal Water Quality Results (2012) Ranges (Mean)	Lake Cowal Water Quality Results (2013) Ranges (Mean)	Lake Cowal Water Quality Results (2014) Ranges (Mean)	Lake Cowal Baseline Water Quality Results (1991 -1992)	Aquatic Ecosystems^ ~
Zinc (mg/L)	0.012 (total)	<0.005 – 0.038 (0.0074[3]) (total)	<0.005 – 0.040 (0.016[3]) (total)	0.008 – 0.079 (0.036) (total)	0.009 – 0.047 (0.023[3]) (total)	0.012[3](total)	0.0024
	0.015 (dissolved)	<0.005 – 0.022 (0.0109[3]) (dissolved)	<0.005 – 0.264 (0.035[3]) (dissolved)	0.005 – 0.067 (0.018) (dissolved)	0.005 – 0.03 (0.011[3]) (dissolved)	0.00306[3] (dissolved)	

^ Guideline values in accordance with ANZECC and ARMCANZ (2000).

~ 99% protection level trigger values for toxicants – lakes and reservoirs.

NA – Not Available.

[1] ANZECC and ARMCANZ (2000) notes that conductivity in lakes is generally low, but will vary depending upon catchment geology.

[2] ANZECC and ARMCANZ (2000) notes that lakes in catchments with highly dispersible soils will have high turbidity.

[3] Mean value.

Table 19: Summary of Lake Cowal Inflow Water Monitoring Results for 2010 – 2014

Parameter	Lake Inflow Water Quality Results (November 2010 – Mean[#])	Lake Inflow Water Quality Results (2011) Ranges (Mean)	Lake Inflow Water Quality Results (2012) Ranges (Mean)	Lake Inflow Water Quality Results (2013) Ranges (Mean)	Lake Inflow Water Quality Results (2014) Ranges (Mean)	Lake Cowal Baseline Water Quality Results (1991 -1992)[#]	Aquatic Ecosystems^ ~
Alkalinity (mg/L)	50	16 – 79 (56)	39 – 101 (67)	95 – 170 (133)	NA	NA	NA
Suspended Solids (mg/L)	14	11 – 201 (53)	23 – 372 (124)	210 – 640 (425)	NA	NA	NA
Acidity – Alkalinity scale (pH)	7.3	7.17 – 7.73 (7.37)	7.55 – 7.90 (7.73)	7.73 – 7.87 (7.80)	NA	8.27 – 8.67	6.5 to 8.0
Electrical Conductivity (µS/cm)	178	126 – 348 (199)	89 – 871 (246)	365 – 551 (458)	NA	222 – 1557[1, 3]	20 to 30 µS/cm[1]
Turbidity (NTU)	116	31 – 807 (237)	18.6 – 693 (296)	337 – 2560 (1449)	NA	22 – 224	1 to 20[2]
Total Iron (mg/L)	6.5	0.9 – 42.8 (10.7)	2.09 – 36.7 (13.68)	20.8 – 180 (100)	NA	NA	NA
Calcium (mg/L)	9	3 – 15 (8)	5 – 23 (11.3)	10 – 29 (19.5)	NA	NA	NA
Magnesium (mg/L)	5.5	2 – 9 (5)	3 – 16 (6.9)	6 – 15 (10.5)	NA	NA	NA
Potassium (mg/L)	10.5	8 – 17 (12)	10 – 16 (12.6)	21 – 23 (22)	NA	NA	NA
Sodium (mg/L)	15.5	11 – 34 (17)	14 – 45 (22.4)	48 – 51 (49.5)	NA	NA	NA
Chloride (mg/L)	18	9 – 28 (18)	12 – 94 (31)	40 – 55 (47.5)	NA	NA	NA

Table 18 (Continued): Summary of Lake Cowal Inflow Water Monitoring Results for 2010 – 2014

Parameter	Lake Inflow Water Quality Results (November 2010 – Mean#)	Lake Inflow Water Quality Results (2011) Ranges (Mean)	Lake Inflow Water Quality Results (2012) Ranges (Mean)	Lake Inflow Water Quality Results (2013) Ranges (Mean)	Lake Inflow Water Quality Results (2014) Ranges (Mean)	Lake Cowal Baseline Water Quality Results (1991 -1992)#	Aquatic Ecosystems^ ~
Sulphate (mg/L)	4.5	1 – 13 (5)	2 – 11 (6.2)	23 – 28 (25.5)	NA	NA	NA
Cations (mg/L)	1.7	1.11 – 2.40 (1.71)	1.43 – 4.78 (2.46)	3.62 – 5.49 (4.55)	NA	NA	NA
Anions (mg/L)	1.6	1.26 – 2.27 (1.74)	1.27 – 4.64 (2.33)	3.61 – 5.43 (4.52)	NA	NA	NA
Arsenic (mg/L)	0.00353 (total)	0.001 – 0.007 (0.0033) (total)	0.003 – 0.007 (0.0043) (total)	0.008 – 0.026 (0.017) (total)	NA	0.00263 (total)	0.008
	0.00153 (dissolved)	<0.001 – 0.004 (0.0023) (dissolved)	0.001 – 0.003 (0.0023) (dissolved)	0.002 – 0.006 (0.004) (dissolved)	NA	0.00163 (dissolved)	
Cadmium (mg/L)	<0.00013 (total)	<0.0001 - <0.001 (<0.00013) (total)	<0.001 - <0.001 (0.0013) (total)	<0.0001 - <0.001 (<0.00013) (total)	NA	0.0000553 (total)	0.0006
	<0.00013 (dissolved)	<0.0001 – <0.0002 (<0.00013) (dissolved)	<0.001 - <0.001 (0.0013) (dissolved)	<0.001 - <0.001 (0.0013) (dissolved)	NA	0.000053 (dissolved)	
Molybdenum (mg/L)	<0.0013 (total)	0.001 – 0.004 (0.00153) (total)	<0.001 - <0.001 (0.0013) (total)	<0.001 - <0.001 (0.0013) (total)	NA	NA	NA (insufficient data)
	<0.0013 (dissolved)	<0.001 - <0.001 (<0.0013) (dissolved)	<0.001 - <0.001 (0.0013) (dissolved)	<0.001 - <0.001 (0.0013) (dissolved)	NA	NA	
Nickel (mg/L)	0.0073 (total)	0.001 – 0.026 (0.0083) (total)	0.005 – 0.021 (0.0113) (total)	0.017 – 0.077 (0.047) (total)	NA	NA	0.008
	0.002 – 0.003 (0.0025)3 (dissolved)	0.002 – 0.005 (0.0033) (dissolved)	0.003 – 0.005 (0.0043) (dissolved)	0.004 – 0.004 (0.004) (dissolved)	NA	NA	

Table 18 (Continued): Summary of Lake Cowal Inflow Water Monitoring Results for 2010 – 2014

Parameter	Lake Inflow Water Quality Results (2010) Ranges (Mean)[#]	Lake Inflow Water Quality Results (2011) Ranges (Mean)	Lake Inflow Water Quality Results (2012) Ranges (Mean)	Lake Inflow Water Quality Results (2013) Ranges (Mean)	Lake Inflow Water Quality Results (2014) Ranges (Mean)	Lake Cowal Baseline Water Quality Results (1991 -1992)	Aquatic Ecosystems^ ~
Lead (mg/L)	0.0035[3] (total)	<0.001 – 0.029 (0.006[3]) (total)	<0.001 – 0.021 (0.007[3]) (total)	0.007 – 0.097 (0.052) (total)	NA	0.0029[3](total)	0.001
	0.001[3] (dissolved)	<0.001 - 0.003 (0.002[3]) (dissolved)	<0.001 – 0.007 (0.002[3]) (dissolved)	<0.001 – 0.001 (0.001) (dissolved)	NA	0.0005[3] (dissolved)	
Antimony (mg/L)	<0.001[3] (total)	<0.001 – 0.004 (0.002[3]) (total)	<0.001 - <0.001 (0.001[3]) (total)	<0.001 - <0.001(<0.001 (total)	NA	NA	NA (insufficient data)
	<0.001[3] (dissolved)	<0.001 - <0.001 (<0.001[3]) (dissolved)	<0.001 - <0.001 (0.001[3]) (dissolved)	<0.001 - <0.001 (<0.001) (dissolved)	NA	NA	
Zinc (mg/L)	0.015[3] (total)	<0.005 – 0.074 (0.0022[3]) (total)	0.009 – 0.051 (0.024[3]) (total)	0.033 – 0.234 (0.134) (total)	NA	0.012[3](total)	0.0024
	0.03[3] (dissolved)	<0.005 – 0.219 (0.046[3]) (dissolved)	<0.005 – 0.068 (0.036[3]) (dissolved)	0.005 – 0.009 (0.007) (dissolved)	NA	0.00306[3] (dissolved)	

^ Guideline values in accordance with ANZECC and ARMCANZ (2000).

~ 99% protection level trigger values for toxicants – lakes and reservoirs.

Two readings only for December 2010

NA – Not Available.

[1] ANZECC and ARMCANZ (2000) notes that conductivity in lakes is generally low, but will vary depending upon catchment geology.

[2] ANZECC and ARMCANZ (2000) notes that lakes in catchments with highly dispersible soils will have high turbidity.

[3] Mean Value

During the March 2012 high rainfall events and subsequent floods the lake rose from a relatively static level of around 205.3m AHD to a peak of 206.88 on 21 March. The lake stayed at a relatively high level for approximately one month before steadily receding back to 205.3m by the end of 2012. The general trend for the majority of 2014 has followed on from June 2012, with the exception of some above average rainfall in June 2013 which held lake levels steady at a depth of 204.8 AHD. Lake levels remained steady until October 2013, before receding at a steady rate once more. Due to the warmer summer weather and hot, dry winds, Lake Cowal completely dried out during the third week of December 2014. Large numbers of dead European carp and some waterbirds congregated in the Lake's centre where the last ponds of water lingered.

Plate **2** shows lake water level heights since April 2012 to late November 2014.

Plate 2: Lake Cowal Water Level Height (2010 – 2014)

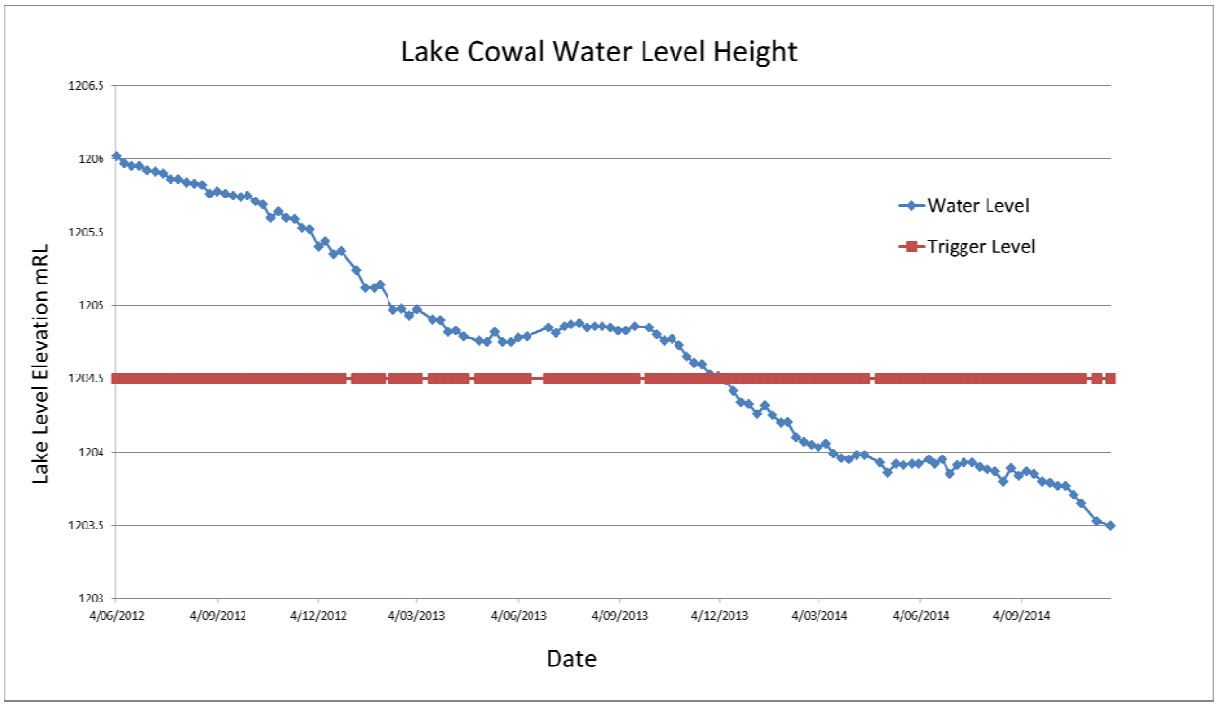


Plate 3 below is a photograph showing Lake Cowal and the Cowal open pit. Lake Cowal retreated from the Lake Protection Bund to total dryness during the last months of 2014.

Plate 3: Aerial Photograph of the Lake Protection Bund May 2015

Interpretation Summary

A full summary of surface water monitoring results is provided in Appendix C. A comparison of surface water results with the Australian and New Zealand Environmental Conservation Council (**ANZECC**) and Agriculture and Resource Management Council of Australia and New Zealand (**ARMCANZ**) (2000) guidelines has not been undertaken on on-site surface water ponds as they are contained inside a closed catchment in the mining lease area. The closed catchment is engineered to contain all runoff on the mining lease and physically separates mine water from offsite waters in the upstream diversion drains and Lake Cowal**.** A summary of the on-site water quality monitoring results and a comparison of all lake water and sediment monitoring results against relevant ANZECC and ARMCANZ (2000) guideline values (detailed in the SWGMBMP) is provided below.

Up Catchment Diversion North (**UCD North**) and Up Catchment Diversion South (**UCD South**) are stilling basins at the edges of Lake Cowal which collect upstream water flowing through diversion channels around the perimeter of the closed catchment.

UCD North pH and Electrical Conductivity remained within acceptable limits and fluctuated slightly during the 2014 reporting period. pH fluctuated slightly but overall remained fairly stable. Electrical Conductivity showed a minor upward trend towards the end of the reporting period as pond levels receded.

UCD South pH values remained fairly stable in 2014. Electrical Conductivity showed a minor upward trend towards the end of the reporting period as pond levels receded.

Pond D1 pH and Electrical Conductivity remained fairly stable throughout the reporting period. Fluctuations in pH and Conductivity were due to rainfall affecting dam volume.

Pond D4 pH and Electrical Conductivity remained fairly stable throughout the reporting period. D4 collects runoff from the SWE, therefore spikes in Electrical Conductivity are dependent on rainfall runoff and dam volume.

In summary, throughout the 2014 reporting period, pH values seen in on-site water quality monitoring data has remained fairly stable. Electrical Conductivity of all sites reflected rainfall affecting dam volume.

Pit sump monitoring points are continuously removed and reinstalled due to the vertical advancement of the pit floor. When they exist, sumps continue to be sampled on a monthly basis.

Lake Cowal Surface Water Monitoring Results

A summary of the 2014 Lake Cowal surface water monitoring results compared with the baseline surface water monitoring results conducted during 1991 – 1992, the 2010, 2011, 2012 and 2013 monitoring results and the ANZECC and ARMCANZ (2000) default trigger values is provided in Table **17**. Detailed monitoring data is provided in Appendix D. Due to dry conditions, no Lake Cowal inflow sites were able to be sampled during the reporting period. Notwithstanding, Table 19 provides a summary of the lake inflow monitoring results to date.

Surface water and sediment monitoring of Lake Cowal commenced during November 2010. Monitoring has been undertaken from 2010 to 2014 by David McMahon of DM McMahon Earth Science. 2011 was the first full year of Lake Water monitoring since mining production commenced in 2006.

A summary of the surface water and sediment monitoring results from DM McMahon Earth Science (2014) *Surface Water and Sediment Sampling and Analysis Lake Cowal, NSW 2014* is provided below. Of the 34 lake surface water sample sites (plus the four lake inflow sites) only 22 were able to be sampled in January 2014. Sites L4 to L13, I3, I4, B6, Sandy Creek inflow site and Bland Creek inflow site were too shallow to access safely at that time. In April an additional 7 sites (E4, E5, L1, L2, L3, I1 and UCD North) were inaccessible due to further decline in lake water levels. Site I4 became inaccessible in July, again due to a further decline in lake water levels. As of August 2014, no further sampling was carried out on Lake Cowal as it was deemed too dangerous for personnel to safely access Lake monitoring points.

pH and Electrical Conductivity

pH results ranged from 8.45 to 8.97 with a mean of 8.72. This is higher overall than the baseline water quality data collected in 1991 – 1992**,** and slightly above the ANZECC and ARMCANZ (2000) upper level of 8.0 yet is consistent with the range of pH results to date, refer to Table **17**.

Electrical Conductivity results ranged from 882 to 1350 μS/cm with a mean of 1193 μS/cm which is within the range of the baseline monitoring data (Table **17**). Although this range is higher than the ANZECC and ARMCANZ (2000) level of 30 μS/cm for slightly disturbed ecosystems (lakes), the ANZECC and ARMCANZ (2000) guidelines note that conductivity in lakes will vary depending on catchment geology. The Conductivity results are higher than those recorded since 2010 which is considered due to the declining lake level and subsequent concentration of salts.

Turbidity and Suspended Solids

Turbidity results ranged from 189 to 671 mg/L NTU with a mean of 391 mg/L (Table **17**). These results are within the turbidity ranges from the 2012 and 2013 monitoring rounds. Although the turbidity results are above the ANZECC and ARMCANZ (2000) level of 20 mg/L for slightly disturbed ecosystems (lakes), the ANZECC and ARMCANZ (2000) guidelines note that lakes in catchments with highly dispersive soils, such as Lake Cowal, will have high turbidity.

The suspended solids results ranged from 57 to 556 mg/L with a mean of 233 mg/L which is marginally above but generally similar to the suspended soilds range of results during 2013. The ANZECC and ARMCANZ (2000) recommended guideline trigger values for toxicants do not include a trigger value for suspended solids.

Dissolved Oxygen

Dissolved Oxygen results ranged from 5.65 to 13.83 mg/L with a mean of 9.0 mg/L which is similar to the dissolved oxygen range results during 2011 – 2013 monitoring rounds. The ANZECC and ARMCANZ (2000) recommended a guideline range between 90% and 110% saturation which is a different scale (Table 3.3.2 ANZECC and ARMCANZ, 2000) to what was directly measured at Lake Cowal.

Heavy Metals

The mean 2014 results for dissolved heavy metals are generally lower or consistent with the results from the 2013 monitoring round, with mean Arsenic, Molybdenum and Nickel marginally higher than the 2013 monitoring results. Mean dissolved Cadmium, Nickel, and Lead results were lower or equivalent to ANZECC and ARMCANZ (2000) 99% protection level default values. Mean Arsenic and Zinc values were marginally above the default values, as were mean Arsenic and Zinc results from lake inflow sites in 2013.

The mean 2014 monitoring results for total heavy metals were also generally lower or consistent with the results from the 2013 monitoring round, with mean Arsenic, Molybdenum and Antimony marginally higher than the 2013 monitoring results. Mean total Cadmium results were lower or equivalent to ANZECC and ARMCANZ (2000) 99% protection level default values. Mean Arsenic, Nickel, Lead and Zinc values were marginally above the default values, as were mean Arsenic, Nickel, Lead and Zinc results from lake inflow sites in 2013.

Lake Cowal Sediment Monitoring Results

A summary of 2014 Lake Cowal sediment data is presented in Table 20.

Of the 34 lake sediment sample sites specified only 22 were able to be sampled in January 2014. Sites L4 to L13, I3, I4, B6, were too shallow to access safely at that time. In April an additional 7 sites (E4, E5, L1, L2, L3 and I1) were inaccessible due to further decline in lake water levels. Site I4 became inaccessible in July, again due to a further decline in lake water levels. As of August 2014, no further sampling was carried out on Lake Cowal as it was deemed to be too dangerous for personnel to safely access Lake monitoring points.

The mean sediment heavy metals results for 2014 were very similar to the mean heavy metals results for 2010 – 2013 with some minor variation noted. Mean heavy metals results were below the ANZECC and ARMCANZ (2000) sediment trigger values for extractable metals. All total Antimony results were reported as <5mg/L (the laboratory method detection limit (MDL)), which is above the ANZECC and ARMCANZ (2000) sediment trigger value (2 mg/L). However, as shown in Table 20, the 2014 mean extractable Antimony results are below the ANZECC and ARMCANZ (2000) sediment trigger value and are consistent with the 2010, 2011, 2012 and 2013 mean extractable Antimony results.

Table 20: Summary of Lake Cowal Sediment Monitoring Results for 2010 – 2014

Parameter	Lake Cowal Sediment Results (November 2010)	Lake Cowal Sediment Results (2011) Range (Mean)	Lake Cowal Sediment Results (2012) Range (Mean)	Lake Cowal Sediment Results (2013) Range (Mean)	Lake Cowal Sediment Results (2014) Range (Mean)	Aquatic Ecosystems^
Arsenic (mg/L)	2.6[1] (total)	0.02 – 5.6 (3.1)[1] (total)	1 – 6 (3.2)[1] (total)	1.9 – 5.8 (3.2)[1] (total)	2.2 – 6.0 (3.62)[1] (total)	20
	1.5[1] (extractable)	<0.1 – 1.8 (1.25)[1] (extractable)	1 – 3.1 (1.4)[1] (extractable)	1 – 3.1 (1.2)[1] (extractable)	1 – 2.2 (1.38)[1] (extractable)	
Cadmium (mg/L)	1[1] (total)	<1 - <1 (1)[1] (total)	1 – 1 (1)[1] (total)	1 – 1 (1)[1] (total)	1 – 1 (1)[1] (total)	1.5
	0.1[1] (extractable)	<0.1 - <0.1 (0.1)[1] (extractable)	0.1 – 0.1 (0.1)[1] (extractable)	0.1 -0.1 (0.1)[1] (extractable)	0.1 – 0.1 (0.1)[1] (extractable)	
Lead (mg/L)	15[1] (total)	8 – 20 (13.7)[1] (total)	7 – 20 (12.6)[1] (total)	8 – 23 (14.2)[1] (total)	9 – 20 (13.53)[1] (total)	50
	8.7[1] (extractable)	3.8 – 15 (8.8)[1] (extractable)	4.3 – 14.5 (8.6)[1] (extractable)	3.5 –13.3 (7.33)[1] (extractable)	5.3 -13.5 (8.51)[1] (extractable)	
Zinc (mg/L)	31.5[1] (total)	14 – 57 (32.5)[1] (total)	11 – 43 (23.3)[1] (total)	13 – 63 (33.2)[1] (total)	16 – 100 (36.87)[1] (total)	200
	3.5[1] (extractable)	1 - 14.8 (3.9)[1] (extractable)	1.1 – 7.7 (3.6)[1] (extractable)	1 – 11.4 (3.4)[1] (extractable)	3.3 – 52 (27.19)[1] (extractable)	
Antimony (mg/L)	5[1] (total)	<5 - <5 (5)[1] (total)	5 – 5 (5)[1] (total)	<5 -<5 (5)[1] (total)	<5 – <5 (5)[1] (total)	2
	1[1] (extractable)	<1 – 6.9 (1.1)[1] (extractable)	1 – 7.6 (1.1)[1] (extractable)	1 - 4.8 (1.18)[1] (extractable)	1- 2 (1.03)[1] (extractable)	

After: NSR Environmental Consultants (1995).

^ Guideline values in accordance with ANZECC and ARMCANZ (2000) recommended sediment quality guidelines.

[1] Mean value.

3.3.4 Reportable Incidents

In accordance with procedures in the SWGMBMP, should monitoring results indicate values in excess of the ANZECC and ARMCANZ (2000) default 99% protection level triggers, an investigation/review shall be conducted to assess the need to implement additional management measures.

As described in Paragraph 3.3.3.2, a comparison of the 2014 Lake Cowal surface water quality results against the ANZECC and ARMCANZ (2000) default trigger values for surface water (lakes) indicated the mean 2014 monitoring results (totals and dissolved) were below or marginally above the default trigger values, and are generally consistent with the results from the previous monitoring rounds. Although no lake inflow monitoring results were available during the 2014 monitoring period (due to unsafe access and/or dry conditions), the 2014 monitoring results were generally consistent with lake inflow monitoring results from 2013. Further, lake sediment monitoring results were also below the ANZECC and ARMCANZ (2000) default trigger values for sediment and were consistent with the result ranges from previous monitoring rounds. As described in Paragraph 3.3.2.2, no discharge to Lake Cowal has occurred to date or during the reporting period from the CGM. Further, in Appendix N of the *Cowal Gold Project Environmental Impact Statement* (EIS) (North Limited, 1998), observance was made of the hydrological cycles of Lake Cowal which can produce variations in water quality as a function of flush effects.

No environmental incidents or complaints were received relating to surface water at the CGM during the reporting period. There were no CEMCC resolutions regarding surface water quality during the reporting period.

3.3.5 Further Improvements

Correspondence dated 15 May 2014 was provided from the EPA to CGM stating the variation to EPL condition M2.4 had been processed. The variation to this condition now states that at Lake monitoring points 14, 15, 16, 17, and 18, monitoring is not required when the monitoring site is dry or if the water level of Lake Cowal is at or below 204.5 m AHD).

3.4 GROUNDWATER

3.4.1 Reporting Requirements

3.4.1.1 Development Consent

The reporting of groundwater monitoring is required by Development Consent Condition 4.5(b), which states:

> *The results and interpretation of surface and ground water monitoring (including biological monitoring) are to be published on the Applicant's website for the development on a regular basis, or as directed by the Secretary.*

As described in Paragraph 3.3, a SWMP and the SWGMBMP have been prepared for the CGM to guide water management at the CGM and detail the CGM's water monitoring programme, respectively. As required by the modified/approved Development Consent, Barrick commenced preparation of a new WMP and revised SWGMBMP during the reporting period to reflect the approved CGM.

In accordance with both the SWMP and the SWGMBMP the following groundwater related issues are required to be reported in the AR:

- groundwater monitoring results;
- details of any trends observed in the monitoring data;
- details of investigations and consultation with regulatory agencies;
- review of the performance of control measures and the monitoring program; and
- interpretation and discussion of the monitoring program results and management measures by a suitably qualified person.

3.4.1.2 Environmental Protection Licence

The CGM EPL requires Barrick to undertake groundwater quality monitoring at the points identified in EPL Condition P1.3.

Condition R1 of the licence requires the completion of an Annual Return comprising a Statement of Compliance and a Monitoring and Complaints Summary at the end of each annual reporting period. Barrick submitted an Annual Return for the period 23 December 2013 to 22 December 2014 to the EPA on 20 February 2015. The groundwater quality of monitoring points identified in EPL Condition P1.3 was reported. The groundwater monitoring points and frequencies required by the EPL are consistent with monitoring required by the Development Consent and SWGMBMP.

No groundwater bores were installed or decommissioned during the monitoring period.

3.4.1.3 Any other Relevant Approval

Barrick holds various licences for monitoring bores, open pit dewatering bores and CGM supply water/production bores.

Each of the four BCPC production bore licences require Barrick to provide the NoW with a return showing the meter readings of hours pumped and the extraction rate for each month during the previous 12 months. There is also an obligation to provide pumping and non-pumping levels at least quarterly (or on request to the NoW). Barrick has met all NoW reporting requirements during the reporting period. The BCPC licences a daily limit of 15 ML/day or 3,650 ML/year which was not exceeded during the reporting period (Paragraph 3.4.3.2).

The ESB is located approximately 10 km east of Lake Cowal's eastern shoreline (Figure 8). The Forbes Shire Council (FSC) approved the development application for the ESB on 20 December 2010. NoW summarily issued two presently unused production bore and monitoring bore piezometer licenses. The ESB licensing is described in Paragraph 2.8.

3.4.2 Environmental Management

3.4.2.1 Control Strategies

The SWMP establishes the following objectives for the CGM site water management system including groundwater:

- Prevent the quality of any surface water (including waters within Lake Cowal) and groundwater being degraded, through the containment of all potentially contaminated water (contained water) generated within the project area and diversion of all other water around the perimeter of the site;
- Manage the quantity of surface water and groundwater within and around the mine site through appropriate design (i.e. sizing), construction and operation of water management structures; and
- Establish a monitoring, review and reporting programme that facilitates the identification of potential surface water and groundwater impacts and the development of ameliorative measures as necessary, including provision of appropriate compensation measures for landholders affected by changes to the flood regime of Nerang Cowal.

The review procedure relevant to groundwater monitoring detailed in the SWGMBMP provides:

> Groundwater Monitoring: Groundwater quantity and quality data will be compared to relevant baseline data, data collected since the commencement of operations and assessment presented in the Project EIS. Where the data analysis indicates that an adverse impact is occurring to the efficiency of surrounding bores an investigation will be undertaken to determine the need and type of ameliorative measures. The scope and timeframe of the investigation will be developed in consultation with the relevant authorities. The results of the investigation will be presented to the relevant authorities and the CEMCC within the agreed timeframe.

In order to monitor important background and predicted future water level draw-downs, monitoring bores and piezometers have been installed within ML 1535 and within aquifers potentially affected by the CGM (i.e. surrounding the BCPC Borefield and ESB) (Figures 8 and 12).

In accordance with the SWGMBMP, groundwater monitoring includes:

- monitoring of bores in aquifers potentially affected by the CGM (drawdown levels); and
- feedback from private groundwater users regarding adverse changes in groundwater quantity.

3.4.2.2 Effectiveness of the Control Strategies

The control strategies implemented during the reporting period effectively met the objectives described in Paragraph 3.4.2.1 as demonstrated by the environmental performance outcomes discussed in Paragraph 3.4.3.2.

3.4.2.3 Variations from Proposed Control Strategies

There were no variations from the control strategies during the reporting period.

3.4.3 Environmental Performance

3.4.3.1 Monitoring

During the reporting period groundwater monitoring was conducted in accordance with the SWGMBMP and EPL. Details of the location, frequency and analytical requirements for each monitoring point are presented in Table**20**. Groundwater monitoring locations within ML 1535 are shown in Figure 12a and regional groundwater monitoring locations shown on Figure 12b. All monitoring results for the reporting period are provided in Appendix C with a summary discussion in Paragraph 3.4.3.2.

Table 21: Groundwater Monitoring Program

Site	Monitoring Frequency	Parameters
Open pit area (PDB1A & PDB1B, PBD3A & PDB3B, and PDB5A & PDB5B).	Daily.	Bore water level.
	Monthly.	SWL, EC, pH.
	Quarterly.	Total hardness, Alkalinity, total suspended solids and anions. Chloride, sulphate, Ca, Mg, K and Na. Dissolved metals – As, Cd, Mo, Ni, Pb, Sb, Zn.
Processing plant area (PP03 & PP04).	Monthly.	SWL, EC, pH.
	Quarterly.	Total hardness, Alkalinity, total suspended solids and anions. WAD and total cyanide. Chloride, sulphate, Ca, Mg, K and Na. Dissolved metals – As, Cd, Mo, Ni, Pb, Sb, Zn.
Northern Tailings Storage Facility Area (P561A & P561B, P418 A & P418 B, MON01A & MON01B, TSFNA, TSFNB & TSFNC).	Monthly.	SWL, EC, pH.
	Quarterly.	Total hardness, Alkalinity, total suspended solids and anions. Chloride, sulphate, Ca, Mg, K and Na. Dissolved metals – As, Cd, Cu, CN_{WAD}, Mo, Ni, Pb, Sb, Se, Zn.
Southern Tailings Storage Facility Area (P412 A-R & P412 B, P414 A & P414 B, P417 A & P417 B, MON02A & MON02B).	Monthly.	SWL, EC, pH.
	Quarterly.	Total hardness, Alkalinity, total suspended solids. and anions. Chloride, sulphate, Ca, Mg, K and Na. Dissolved metals – As, Cd, Cu, CN_{WAD}, Mo, Ni, Pb, Sb, Se, Zn.
Up-gradient of the northern and southern tailings storage facilities (P558A-R, P555A-R & P555B).	Monthly.	SWL, EC, pH.
	Quarterly.	Total hardness, Alkalinity, total suspended solids. and anions. Chloride, sulphate, Ca, Mg, K and Na. Dissolved metals – As, Cd, Mo, Ni, Pb, Sb, Zn.
Northern, Southern and Perimeter Waste Rock Emplacement (External toe drain).	Monthly.	SWL, EC, pH.
	Quarterly.	Total hardness, Alkalinity, total suspended solids. and anions. Chloride, sulphate, Ca, Mg, K and Na. Dissolved metals – As, Cd, Mo, Ni, Pb, Sb, Zn.
BLPR1, BLPR2, BLPR3, BLPR4 BLPR5, BLPR6, and BLPR7.	Monthly.	SWL, EC, pH. Quantity of water extracted.
	Quarterly.	Total hardness, Alkalinity, total dissolved solids. Chloride, sulphate, Ca, Mg, K and Na. Dissolved metals: Fe, Mn.
Private registered bores 29094, 57974, 29574, and 31341.	As provided by private groundwater users.	Bore water level.
NoW piezometers 36551, 36552, 36553, 36523, 36524, 36528, 36594, 36595, 36596, 36597, 36609, 36610, 36611, 36613, 36700, and 90093.	Monthly.	Bore water level.
Above ground sections of the pipeline.	Monthly.	Visual inspection.
Tailings seepage (see above - northern and southern tailings storage facility monitoring bores).	See above -northern and southern tailings storage facility.	See above -Northern and southern tailings storage facility monitoring bores.
Saline Groundwater Supply Borefields ML 1535 saline groundwater borefield WB01, WB39 (and WB12 (monitoring bore) Eastern Saline Borefield SB1, SB2 (and monitoring bores PZ09, PZ10 and PZ11)	Monthly.	SWL, EC, pH. Quantity of water extracted.
	Quarterly.	Total Hardness, Alkalinity, total dissolved solids, chloride, sulphate, calcium, magnesium, potassium, sodium, iron, manganese.
Water Supply Pipeline from Saline Borefield (Above ground sections of the pipeline).	Monthly.	Visual Inspection.

3.4.3.2 Performance Outcomes

Groundwater Monitoring Data and Annual Monitoring Report

Stiff plots of water quality results for the BCPC, Processing Plant Area bores, Pit Area bores and Tailings Storage Area bores are provided in Figures 13a and13b. Detailed monitoring data is provided in Appendix C. A *Groundwater Monitoring Review 2014* report has been prepared by Coffey Geotechnics (2015) which provides a detailed description and interpretation of the groundwater monitoring results. Key summaries of the groundwater monitoring results presented in Coffey Geotechnics (2015) report are provided in the subsections below.

Groundwater Production Bores

Groundwater extraction from the BCPC commenced in August 2004 at bore PB4 (Bore 4 Figure 12b). Extraction from production bores PB1, PB2 and PB3 (Bores 1, 2 and 3 Figure 12b) commenced in June 2005.

A summary of monthly extraction volumes from the BCPC bores during the reporting period is presented in Table **21**. The total volume extracted during the reporting period was 1,319 ML. This equates to an average of 3.61 ML/day over the 12 month period which is within the licence limit of 15 ML/day.

Table 22: Bland Creek Paleochannel Production Bores - Extraction Volumes (2014)

Month	Extraction Volume (ML)				
	PB1	PB2	PB3	PB4	Total
January	0	0.5	0	0	**0.5**
February	33.1	33.2	33.0	0	**99.3**
March	51.1	51.4	51.0	0	**153.5**
April	6.0	17.9	12.9	8.6	**45.4**
May	28.1	68.9	66.7	39.5	**203.2**
June	53.3	48.6	51.7	0	**153.6**
July	61.1	22.9	58.6	1.3	**143.9**
August	6.7	79.9	90.1	71.1	**247.8**
September	0	69.3	82.0	62.9	**241.2**
October	0	19.0	18.6	17.2	**54.8**
November	0	0.5	0	0	**0.5**
December	0	0.8	0	0	**0.8**
ANNUAL TOTAL	**240**	**413**	**465**	**201**	**1319**

As described in Paragraph 2.8, the saline groundwater supply borefield within ML 1535 was commissioned in mid-2009 (licensed under WAL36615 until 14 September 2015). The saline groundwater supply borefield has been estimated to supply up to 0.5 ML/day. Due to ongoing inundation by Lake Cowal waters, no water was extracted from the saline groundwater supply borefield within ML 1535 during the reporting period (Paragraph 2.8).

As discussed in Paragraph 3.4.1.3, Development Application No. 2011/0064 was granted by the FSC on 20 December 2010 for the operation of the ESB for a period of five years (until 20 December 2015) (Paragraph 2.8).

From January 2012, monitoring piezos PZ01, PZ02 and PZ05 were in operation in the ESB. Since these bores were constructed with slotted pipe over their full depth, their water levels are not representative of any individual hydrogeological unit. Bores PZ09, PZ10 and PZ11 were constructed with different screen intervals (see Table 23 below). These bores were monitored for standing water levels and water quality in place of PZ01, PZ02 and PZ05 from September 2012. Bore PZ01 was decommissioned in October 2012 while bores PZ02 and PZ05, in which standing water levels have been measured (but groundwater samples are not taken), remained operational.

Table 23: ESB Monitoring Bores

Bore	Screened Stratum	Depth (mbgl)	Screen interval (mbgl)
PZ01 (decommissioned)	Upper & Lower Cowra	80	20-80
PZ02	Upper & Lower Cowra	78	18-78
PZ05	Upper & Lower Cowra	78	18-78
PZ09	Upper Cowra	16	13-16
PZ10	Upper Cowra	51	48-51
PZ11	Upper Cowra	64	60-64

mbgl - meters below ground level

The following observations have been made for the ESB bores:

- A decrease in groundwater levels at three bores representing a period of groundwater extraction between June and September 2014. Drawdown of up to 20m was recorded at monitoring bores PZ10 and PZ11, with 14 m of drawdown recorded at monitoring bore PZ02.
- No drawdown was observed at monitoring bores PZ05 and PZ09, where groundwater levels remained around 7.9m and 6.9m below ground level respectively during 2014.

Hydrogeological Setting

The geological setting of the Cowal area is dominated by Gilmore Fault Zone (**GFZ**), a structurally and lithographically complex feature which trends north-south though ML 1535 approximately 500 m west of E42 pit. It separates Late Ordovician igneous units of the Lake Cowal Volcanic Complex to the east from Siluro-Devonian sedimentary basement to the west. Siluro-Devonian sedimentary rocks also occur east of Lake Cowal Volcanic Complex on the eastern side of Lake Cowal where the basement has been deeply incised and lays host to Palaeochannel deposits of the Bland Creek Unit (part of the Lachlan Formation, inferred to be Miocene to Pliocene in age).

The entire area is covered by varying thicknesses of Tertiary and Quaternary regolith deposits, including Pleistocene Cowra alluvium across the CGM ML and thick Quaternary lacustrine sediments underlying Lake Cowal. The Cowra Formation consists of interbedded clays and sandy clays. It contains two minor clayey sand aquifers, separated and confined by clay aquitards (Hawkes, 1998; Lyons *et al*., 2000). Early work by Hawkes (1998) and Coffee Partners International (1995) identified five aquifer units across the mining lease and BCPC area as summarised in Table 24.

Table 24: Preliminary Groundwater Model for the Cowal Mining Lease

Aquifer Unit	Sub-Unit and Occurrence	Hydrochemical Facies Characteristics	Intersecting Bores
Cowra Formation (Tertiary-Quaternary)	Upper Alluvial Aquifer - across mining lease and Cowal area.	Na-Mg:Cl pH: Circum-neutral TDS: 17,000 – 41,000 mg/L mg/L Low Fe: <0.5 mg/L Moderate Mn: 0.01 – 1.7 mg/L	P412B, P414B, P417B, P418B, P555B, P561B, TSFNC.
	Lower Alluvial Aquifer and saprolitic units - across mining lease and Cowal area (the saprolite-saprock is probably a distinct aquifer unit but the facies includes both).	Na-Mg:Cl Na-Mg:Cl-SO_4 pH: Circum-neutral TDS: 20,000 – 42,000 mg/L Low Fe (generally <0.5 mg/L) Moderate Mn, (generally <0.5 Mg/L) which increases with depth and intersection with saprolitic units e.g. P555A-R, P331	P558A-R, P555A-R, P412A, P414A, P417A, P418A, P555A, P561A, TSFNB, MON02A, MON02B, PDB1B, PDB3B, PDB4B, PDB5B.
Siluro-Devonian Sedimentary Basement	Includes Burcher Greywacke & Ootha Group Sandstone.	Na-Mg:Cl-SO_4 pH: Circum-neutral Moderate to high Mn and Fe	MON01A, P412A-R, P555A-R.

Table 23 (continued): Preliminary Groundwater Model for the Cowal Mining Lease

Aquifer Unit	Sub-Unit and Occurrence	Hydrochemical Facies Characteristics	Intersecting Bores
Lake Cowal Volcanic Complex (Late Ordovician)	Volcanic and intrusive lithologies and the overlying saprolitic horizon immediately east of the GFZ underlies alluvial sediments in the open pit area beneath Lake Cowal.	Na-Mg:Cl-SO_4 pH: Circum-neutral TDS: 31,000 – 43,000 mg/L. Moderate Fe: <0.5 – 1.5 mg/L High Mn: 0.2 – 8.0 mg/L High trace element composition due to mineralisation history	TSFNA, PDB1A, PDB2A, PDB3A, PDB4A, PDB5A.
Bland Creek Paleochannel		Na:Cl-HCO3 TDS: 900 – 3000 mg/L pH: Circum-neutral Fe: 0.3 – 0.7 mg/L Mn: 0.07 – 0.16 mg/L	BLPR1, BLPR2, BLPR3, BLPR4, BLPR5, BLPR6, BLPR7, GW36553, GW36609.

Source: Hawkes (1998) and Coffey Partners International (1995).

Groundwater Levels and Quality

Detailed groundwater monitoring data for the reporting period is presented in Appendix C. The 2014 data set was analysed by Coffey Geotechnics (2015) as summarised below.

A number of dry bores exist in the vicinity of the tailings storage facilities where the piezometers do not intersect the groundwater piezometric surface. Bores P555A, P555B and P412B continued to be dry during the reporting period and are expected to remain dry unless groundwater levels rise. Seven additional piezometers were installed around the tailings storage facilities in late 2004 (P412A-R, P555A-R, P558A, MON01A, MON01B, MON02A, and MON02B).

The Cowal groundwater system generally shows limited response to rainfall. The main groundwater level response is to pumping for water supply and pit dewatering. From 2004 to 2014, water supply pumping has resulted in a maximum drawdown of approximately 60m in the BCPB borefield, and pit dewatering has resulted in a maximum drawdown of approximately 76m in the pit area monitoring bores. In general, vertical hydraulic gradients within the groundwater system surrounding the mine pit are downward. Measured piezometric levels within the Transported material tend to change more slowly than those for the Saprolite and Saprock (Coffey Geotechnics, 2015).

A localised increase in groundwater levels has been observed in the vicinity of the TSF area. A separate groundwater level investigation was conducted by Coffey Geotechnics to further assess the change in groundwater level in this area (Coffey Geotechnics, 2009). A model of the groundwater system adjacent to the southern TSF was developed and calibrated to provide reasonable agreement with the measured groundwater levels in the area. It was concluded that increasing groundwater levels south of the southern TSF at bores MON02A and MON02B, and northeast of the southern TSF at P412A-R, are related to the movement of seepage from the TSF (Coffey Geotechnics, 2009). The direction of seepage flow towards the open pit is consistent with the seepage flow direction predicted in the EIS and in recent hydrogeological assessments (Coffey Geotechnics, 2011 and 2013). It was also assessed that groundwater level rises associated with the TSF are not expected to reach the ground surface (Coffey Geotechnics, 2009).

The following observations have been made relating to the groundwater levels surrounding the TSF (Coffey Geotechnics, 2015):

- Most of the bores show small but continuing increases in groundwater level, possibly associated with tailings dam activities (such as loading or movement of tailings water); and
- The paired monitoring bores MON02A and MON02B south of the southern TSF show increasing groundwater levels since October 2006. Increases of 9.6 m (MON02A) and 9.8 m (MON02B) have been recorded between May 2006 and December 2014.

In their evaluation of the 2014 groundwater monitoring data, Coffey Geotechnics concluded (Coffey, 2015):

- The zone of influence after ten years of mine dewatering is small (around 1 km in radius), indicating low lateral permeability;
- There has been a localised increase in groundwater levels south of the southern TSF that is related to the movement of seepage from the TSF. Groundwater chemistry has remained relatively stable at monitoring bores MON02A and MON02B. The direction of seepage flow towards the open pit is consistent with the seepage flow direction predicted in the EIS and recent hydrogeological assessments (Coffey Geotechnics, 2011b and 2012); and
- Water management control measures appear to have successfully prevented groundwater contamination.

Groundwater contour surfaces for December 2013 and December 2014 are presented in Figures 15a and 15b for the Transported (Shallow) and Saprock/Saprolite (Deep) aquifers. Pumping from new pit dewatering bores in the vicinity of PDB3A is likely to have affected groundwater levels on the eastern side of the pit particularly for the Saprock aquifer (Figure 16).

The groundwater quality results and trends reported in Coffey Geotechnics (2015) assessment illustrate that the water management control measures for full containment of mine site water and control of runoff from the TSF and waste rock emplacements appear to have successfully prevented groundwater contamination.

BCPC Settlement Monuments

Barrick has installed twelve settlement monitoring monuments on and adjacent to the BCPC borefield. The inaugural survey of the monuments commenced in August 2007. Additional surveys have been conducted in April and October 2008, June 2009, March and December 2010, June 2011, February and August 2012, September 2013, May and December 2014. The monuments have shown no significant trending movement since surveys began.

3.4.4 Reportable Incidents

No environmental incidents or complaints were received relating to groundwater at the CGM during the reporting period. There were no CEMCC issues regarding groundwater during the reporting period.

3.4.5 Further Improvements

As described in Paragraph 3.4.1.1, Barrick commenced preparation of a new WMP and a revised SWGMBMP for the approved CGM during the reporting period in accordance with approved/modified Development Consent. Details regarding approval of the WMP and revised SWGMBMP will be provided in the next AR.

The monitoring and management measures as described in the existing SWMP and SWGMBMP will continue to be implemented during the next reporting period, until approval of the WMP and revised SWGMBMP.

3.5 CYANIDE MANAGEMENT

3.5.1 Reporting Requirements

3.5.1.1 Development Consent

Cyanide monitoring is required by Development Consent Condition 5.3(d), which states:

> *The Applicant shall prepare and implement a cyanide monitoring program for the development to the satisfaction of the Secretary. The plan is to be prepared in consultation with OEH and DRE, and shall include but not be limited to, provision for:*

- *monitoring of CN_{WAD} levels of the aqueous component of the tailings slurry stream at the discharge point to tailings dams twice daily or as otherwise directed by the Secretary, with any increases above 20mg CN_{WAD}/L to be assessed daily to ensure compliance and reported monthly to the DRE and OEH, unless otherwise agreed by the Secretary. If the CN_{WAD} levels of 30mg/L are exceeded in the liquid at any time, discharge to the tailings dams shall cease until CN_{WAD} levels can be achieved below the levels stated in condition 5.3(a) and such exceedance shall be reported to the OEH within 24 hours;*
- *monitoring CN_{WAD} levels in the decant water of the tailings dams twice daily or as otherwise directed by the Secretary;*
- *an onsite laboratory for quickly establishing CN_{WAD} levels in the liquid at the discharge point to tailings dams and in the decant ponds for monitoring purposes;*
- *on-line monitoring of CN (FREE) at locations where employees are operating; and*
- *establishing a monitoring regime for detection of cyanide movement beneath and adjacent to the tailings impoundments.*

A summary of the cyanide monitoring results shall be provided on the Applicant's website for the development on a regular basis, or as directed by the Secretary.

A cyanide monitoring programme has been developed for the CGM and is incorporated into the CGM's Cyanide Management Plan (CMP), which has been prepared in accordance with Development Consent Condition 5.3(b). The original CMP was prepared prior to commissioning of cyanide use on-site and was approved by the DP&I on 9 January 2006. In 2008, both the FFMP and CMP were amended to reflect changes to the Development Consent related to reporting of fauna deaths.

An amendment to the CMP was prepared in October 2010 to reflect the June 2009 Modification which allowed the addition of a cyanide destruction method (i.e. the INCO process) as an alternative to Caro's Acid and the associated introduction of sulphur dioxide (SO_2) as Sodium Metabisulphite (SMBS). The addendum to the CMP was approved by the DP&I on 24 March 2010.

Barrick commenced negotiations with the EPA and DRE in September 2010 regarding a proposed change to the location at which monitoring of weak acid dissociated cyanide (CN_{WAD}) levels of the aqueous component of the tailings slurry stream is undertaken at the CGM. An addendum to the CMP was subsequently prepared and approved by the Director-General of the DP&I on 20 October 2010. A variation of the EPL was also issued by EPA on 24 June 2011 to reflect this change in monitoring location to the final tailings hopper (Point 48).

Barrick has continued to report monthly weak acid dissociable (CN_{WAD}) cyanide results on the company's website during the reporting period. Barrick also reported and discussed these results with the CEMCC at quarterly meetings.

3.5.1.2 Environment Protection Licence

The CGM EPL requires Barrick to undertake cyanide monitoring at the points identified in EPL Condition P1.3.

Condition R1 of the licence requires the completion of an Annual Return comprising a Statement of Compliance and a Monitoring and Complaints Summary at the end of each annual reporting period (i.e. the Annual Return). Barrick submitted an Annual Return for the period 23 December 2013 to 22 December 2014 to the EPA on 20 February 2015. Cyanide monitoring at points identified in EPL Condition P1.3 were reported. The cyanide monitoring points and frequencies required by the EPL are consistent with monitoring required by the Development Consent and CMP. Additionally, Condition R2 of the EPL requires Barrick to notify the EPA of incidents causing or threatening material harm to the environment as soon as practicable after Barrick becomes aware of the incident.

The DSC inspected the TSFs, various bunds and the Pond D9 structure in June 2007 and approved their use. Barrick continues to engage the services of Dr Neil Mattes (AECOM formerly URS Corporation) to advise in various matters of inspection, maintenance and construction of the TSF walls and dams.

3.5.1.3 Any Other Relevant Approval

There are no other relevant reporting requirements for the reporting period.

3.5.2 Environmental Management

3.5.2.1 Control Strategies

A summary of the control strategies maintained during the reporting period in accordance with the CMP is provided below:

- Containment of all tailings waters within the tailings storage facility, processing plant and processing plant dams. Maintenance of the LPB and upper catchment diversion drain systems;
- Provision of emergency containment channels alongside tailings storage pipelines to and from the tailings storage facility. Maintenance of process pipe work, equipment and leak detection equipment;
- Terrestrial fauna protection fencing and avifauna deterrent methods to minimize the potential for impacts of tailings operations;
- Use of SMBS to destruct cyanide in tailings slurry to permissible levels before the processing plant slurry discharge is pumped to the tailings storage facility (with standby Caro's Acid circuit);
- Routine monitoring and reporting of tailings facility flows, ground and surface waters, and employee work areas for cyanide levels;
- Maintenance of emergency preparedness of employees and supply chain in reporting and response capability; and
- Routine patrols of tailings and process areas to ensure the potential for spillage, dust or native fauna and flora impacts are minimised.

3.5.2.2 Effectiveness of Control Strategies

Monitoring and reporting was conducted in accordance with the CMP and resulted in the effective maintenance of WAD cyanide levels below 20 mg/L (90 percentile over six months) and below 30 mg/L at all times.

On 17 April 2006, the CGM became the first cyanide-using gold operation in the world to gain Pre-Operational Plant Certification under the ICMI Code for Cyanide Management. The ICMI required certification to Operational requirements within 12 months after first delivery of cyanide stock. An external independent ICMI Operational Phase Code for Cyanide Management Certification Audit was undertaken from 23 to 30 March 2007. The operation was found to be in full compliance with the Code's Principles and Standards of Practice. On 2 August 2007, the CGM became the first gold operation using cyanide to be certified pre-operationally and operationally compliant with the ICMI Code. Cowal Gold was audited for 3-yearly re-certification in September 2009 and was confirmed as fully compliant with the Code.

An independent third-party re-certification occurred previously during February 2010 and May 2012. Cowal operations were found to have maintained full compliance to the ICMC Cyanide management Code during the previous three years.

A further independent re-certification audit occurred during 18-21 November 2013. Barrick (Cowal) Limited was again officially re-certified to the ICMI Code for a fourth time on 28 May 2014. Details regarding the re-certification audit are provided on the ICMI's website *http://www.cyanidecode.org/media-room/press-releases*.

3.5.2.3 Variations from Proposed Control Strategies

There were no variations from the proposed control strategies during the reporting period.

3.5.3 Environmental Performance

3.5.3.1 Monitoring

In accordance with the CMP and Development Consent Condition 5.3(d), results of WAD cyanide monitoring of tailings discharge (at the processing plant) and decant water were reported monthly, in writing by the Environmental Manager, to the NSW Office of Environment and Heritage (OEH) and DRE, and by quarterly presentation to the CEMCC throughout the reporting period.

Monitoring results have remained low and within licence conditions and are summarised in Table 25.

In accordance with Consent Condition 5.3(d)(i), CN_{WAD} levels of the aqueous component of the tailings slurry stream have been maintained so that they do not exceed 20 mg CN_{WAD}/L (90 percentile over six months) and 30 mg CN_{WAD}/L (maximum permissible limit at any time) at the process plant.

As described in Paragraph 3.5.1.2, the CMP was revised following approval of the section 75W modification to the Development Consent (i.e. the E42 Modification - Modified Request) to incorporate relocation of the automated sampler from the discharge point to the tailings storage facilities to the process plant. The revision of the CMP was approved by the DP&E on 20 October 2010.

Table 25: WAD and Total Cyanide Monitoring Data for Tailings Discharged to the STSF (23/12/2013 to 31/08/2014) & NTSF (01/09/2014 to 22/12/2014) and STSF & NTSF Decant Ponds

NTSF	WAD Cyanide (mg/L)			Total Cyanide (mg/L)		
	Site Lab	SGS, WWy	NATA, Syd	Site Lab	SGS, WWy	NATA, Syd
No. Samples Taken	227	229	16	17	49	16
Minimum	0.74	0.23	0.004	7.56	3.32	0.34
Mean	5.44	4.38	2.47	13.17	7.83	2.98
Maximum	16.24	14.2	5.80	20.28	22.4	6.16
STSF	**WAD Cyanide (mg/L)**			**Total Cyanide (mg/L)**		
	Site Lab	SGS, WWy	NATA, Syd	Site Lab	SGS, WWy	NATA, Syd
No. Samples Taken	528	538	38	36	110	38
Minimum	0.02	0.06	0.56	3.07	1.49	0.70
Mean	6.94	5.50	4.79	10.51	14.61	5.42
Maximum	17.18	14.5	10.0	24.65	45.6	10.1
STSF Decant Pond	**WAD Cyanide (mg/L)**			**Total Cyanide (mg/L)**		
	Site Lab	SGS, WWy	NATA, Syd	Site Lab	SGS, WWy	NATA, Syd
No. Samples Taken	504	504	36	36	36	36
Minimum	0.23	0.16	0.56	2.41	1.03	0.70
Mean	4.90	3.96	4.59	8.47	47.4	5.23
Maximum	17.29	14.1	10.00	18.9	10.89	10.70
NTSF Decant Pond	**WAD Cyanide (mg/L)**			**Total Cyanide (mg/L)**		
	Site Lab	SGS, WWy	NATA, Syd	Site Lab	SGS, WWy	NATA, Syd
No. Samples Taken	223	226	17	17	17	17
Minimum	0.06	0.17	0.00	3.80	1.97	0.34
Mean	4.35	3.21	2.47	12.65	8.85	2.98
Maximum	29.49	29.05	5.80	34.35	34.80	6.16

The current recognised international safe limit for tailings storage facility fauna usage protection is 50 mg/L WAD cyanide. Barrick internal environmental management controls and the ICMI Code for Cyanide Management requires signatories to ensure that any spillage outside a bunded area above 0.5mg/L WAD cyanide is recorded as an incident and treated as an emergency requiring immediate surface clean up. As per the CMP, on and off-site laboratories are used to monitor reagent levels inside the fenced TSF. Approval was granted during the 2007 reporting period for use of the Picric Acid method for on-site WAD cyanide level determinations in the Plant Laboratory for cyanide destruction monitoring purposes.

3.5.3.2 Performance Outcome

Process Plant

As described in Paragraph 3.5.3.1 above, monitoring results at the process plant did not exceed 20 mg CN_{WAD}/L (90 percentile over six months) or 30 mg CN_{WAD}/L (maximum permissible limit at any time) (Table 25).

Groundwater

A detailed summary of groundwater monitoring results is provided in Appendix C.

All groundwater results for cyanide in the monitoring period remained below the laboratory detection limit.

3.5.4 Reportable Incidents

There were no deaths to fauna due to cyanosis during the reporting period.

There have been no deaths of animals by cyanide in the CGM Tailings Storage Facilities area since operations began in April 2006.

3.5.5 Further Improvements

No additional management measures are proposed for the current reporting period. The cyanide management measures as described in the CMP will continue to be implemented during the next reporting period. As such, no further improvements are intended for the management of cyanide.

3.6 CONTAMINATED LAND

An area of historic contamination (i.e. a disused sheep dip area) was identified within ML 1535, in the southern waste emplacement footprint area. The primary contaminant identified within the contaminated soil of the disused sheep dip area in the area was arsenic. It was proposed that the sheep dip area would be left in-situ and buried beneath approximately 30m of waste rock and the base drainage control zone of the southern waste emplacement.

Barrick commissioned Coffey Environmental Pty Ltd (Coffey Environment) to review a contamination assessment and proposed remedial strategy for the disused sheep dip area in July 2008. In their review, Coffey Environment (2008) concluded that:

…following implementation of a remedial strategy based on containment of arsenic contaminated soil beneath the planned southern waste emplacement, the contamination in the sheep spray area would not pose a significant risk of harm to human health or any other aspect of the environment (Coffey Environment, 2008).
No areas of contaminated land were identified during the reporting period. Hazardous waste and chemical management at the CGM is described further in Paragraph 3.18.

3.7 FLORA

3.7.1 Reporting Requirements

3.7.1.1 Development Consent

The reporting of flora monitoring is required by Development Consent Condition 3.2(d), which states:

> *The Applicant shall monitor the effectiveness of measures outlined in the Flora and Fauna Management Plan and Threatened Species Protocol to the satisfaction of the Secretary. A summary of these monitoring results shall be published annually on the Applicant's website for the development.*

The FFMP has been prepared for the CGM in accordance with Development Consent Condition 3.2(b). In accordance with the FFMP, the following flora related issues are required to be reported in the AR:

- vegetation clearance activities;
- weed and pest management;
- results of the flora monitoring program; and
- the progress of remnant vegetation and wetland enhancement programmes.

A TSMP has also been prepared for the CGM in accordance with Development Consent Condition 3.2(c), which is detailed in the CGM's Implementation of the Threatened Species Management Protocol.

In addition to the FFMP, a ROMP was prepared for the CGM in accordance with former MOD10 Development Consent Condition 3.6(d) and is relevant to on-site rehabilitation and the management of remnant vegetation within the CGM's offset areas. Formal approval of the ROMP by the DP&E remained pending during the reporting period. Although formal approval of the ROMP by the DP&E remains pending, the DP&E has advised it is satisfied for the ROMP to be implemented in the interim.

Notwithstanding, the modified Development Consent (MOD11) granted on 22 July 2014 now requires a Biodiversity Offset Management Plan (BOMP) to be prepared (specific to the offset areas only) and a separate Rehabilitation Management Plan (RMP) (relevant to on-site rehabilitation only). Preparation of the BOMP and RMP commenced during the reporting period. Details regarding submission and approval of the RMP and BOMP will be provided in the next AR.

A detailed description of implementation of rehabilitation works at the CGM during the reporting period is provided in Paragraph 5.

The remainder of this section outlines the results of on-site flora monitoring and offset monitoring. However given approval of the ROMP remains pending, Barrick has not commenced implementation of the offset strategy described in the ROMP.

3.7.1.2 Environment Protection Licence

Condition R2 of the EPL requires Barrick to notify the EPA of incidents causing or threatening material harm to the environment as soon as practicable after Barrick becomes aware of the incident.

3.7.1.3 Any Other Relevant Approvals

There are no other relevant reporting requirements from other approvals in relation to flora for the reporting period.

3.7.2 Environmental Management

3.7.2.1 Control Strategies

Flora control strategies are described in the FFMP. The following control strategies were implemented at the CGM during the reporting period:

- implementation of Compensatory Wetland Management Plan (**CWMP**) initiatives and the remnant vegetation enhancement program;
- incorporation of flora management initiatives during operational design;
- implementation of the VCP (Figure 18);
- implementation of the TSMP;
- rehabilitation of disturbance areas;
- implementation of rehabilitation monitoring report;
- assessment of rehabilitation performance indicators and completion criteria;
- weed management and pest control;
- flora monitoring programme;
- observance of the Threatened Species Management Strategies (TSMSs) for the relevant Endangered Ecological Communities (**EEC**s):
  - Inland Grey Box Woodland – approved 31 August 2007;
  - Myall Woodland – approved 24 September 2007; and
  - Aquatic Ecosystems (lower Lachlan River) – approved 12 October 2007; and
- provision of information relevant to the management of native flora during employee and contractor inductions;
- development of a RMP (including mine site rehabilitation performance and completion criteria and a mine site rehabilitation monitoring programme relevant to the approved CGM) – to be submitted during the next reporting period; and
- development of a BOMP (including an offset performance and completion criteria and an offset monitoring programme relevant to the approved CGM offset areas) – to be submitted during the next reporting period.

Mine Site Rehabilitation Monitoring Programme

In accordance with the former MOD10 Development Consent Condition 3.6(d)(v), a rehabilitation monitoring programme has been developed to monitor the effectiveness of the short, medium and long-term mine site rehabilitation measures and progress against performance and completion criteria and is presented in the ROMP.

The performance of the mine site rehabilitation will be monitored annually against the performance and completion criteria provided in the ROMP. The performance criteria have been developed to reflect the measures for mine site rehabilitation. This monitoring will therefore assess the effectiveness of these measures and determine the need for additional measures. The performance of revegetation will be monitored using Ecosystem Function Analysis (**EFA**), or a similar systems-based monitoring approach. EFA is a method developed by the Commonwealth Scientific and Industrial Research Organisation (**CSIRO**) which provides indicators of revegetation/rehabilitation success and allows the assessment of ecosystem sustainability through the plotting of development trajectories.

EFA monitoring of rehabilitated areas will be used to measure the progression of the rehabilitation towards a self-sustaining ecosystem. The mine site rehabilitation monitoring programme also includes monitoring of the:

- New Lake Foreshore;
- waste rock emplacements and tailings storage facilities;

- effectiveness of the erosion and sediment control systems; and
- fauna usage of rehabilitated areas and compensatory wetland.

As described above, preparation of a RMP commenced during the reporting period and will replace the ROMP upon approval during the next reporting period.

Biodiversity Offset Strategy

In accordance with the former MOD10 Development Consent Condition 3.6 an offset strategy has been developed for the CGM and is detailed in the ROMP. The offset strategy involves the conservation and management of two designated areas located on land owned by Barrick, herein referred to as the northern and the southern offset areas (Figure 19). A 230 ha extension was added to the southern offset area as a result of the MOD11 Development Consent approval (Figure 19). As described earlier, Barrick commenced preparation of a BOMP during the reporting period to reflect the approved offset strategy which will replace the ROMP upon approval during the next reporting period.

The current ROMP offset strategy includes:

- a description of the offset;
- objectives;
- short, medium and long-term management measures;
- performance and completion criteria; and
- a monitoring programme.

Management Areas

Two types of management areas have been defined in order to facilitate the management of remnant vegetation and habitat in the offset areas, namely, Offset Enhancement Areas and an Offset Revegetation Area (Table 26). The management areas are shown on Figure 19.

Table 26: Offset Management Areas

Offset Management Area	Description	Minimum Size (hectares [ha])
Offset Enhancement Area (Southern Offset Area)	Enhancement through natural regeneration and management for conservation.	110
Offset Revegetation Area (Northern Offset Area)	Re-establishment of woodland in cleared agricultural land by revegetation.	100
Offset Enhancement Area (Southern MOD11 extension)	Enhancement through natural regeneration and management for conservation.	230
Total Area Conserved (ha)		440

Offset Objectives

The objectives for the offset areas are to:

- secure the tenure of the offset areas for long-term conservation purposes;
- enhance flora and fauna habitats within the offset areas, including increasing the area of Myall Woodland through regeneration and revegetation; and
- establish native vegetation characteristic of a Eucalypt Woodland in cleared agricultural land.

Short, medium and long-term measures will be implemented within the different management areas and are detailed in the ROMP. The flora and fauna characteristics, vegetation communities, habitat complexity and condition and threatened flora and fauna characteristics of the offset areas are described in the ROMP.

Offset Monitoring Programme

In accordance with the former Development Consent MOD10 Condition 3.6(d)(v), an offset monitoring programme has been developed to monitor the effectiveness of the short, medium and long-term measures proposed to implement the offset strategy and to monitor the progress against performance and completion criteria, and is presented in the ROMP. The offset monitoring programme (and on-site rehabilitation monitoring programme) has been developed by independent specialists DnA Environmental.

The performance of the offset will be monitored regularly (and at least annually) against the performance and completion criteria provided in the ROMP. The performance criteria have been developed to reflect the offset strategy measures. This monitoring will therefore assess the effectiveness of these measures and determine the need for additional measures.

The offset monitoring programme will be conducted within both the Offset Revegetation Area (Northern Offset Area) and Offset Enhancement Areas (Southern Offset Area) and will include:

- a preliminary site inspection;
- visual monitoring;
- photographic monitoring; and
- permanent flora quadrats.

Consistent with the currently approved MOD11 Development Consent, an offset monitoring programme will be included in the BOMP.

No revisions to the biodiversity offset area monitoring programmes were made in 2014. Also, no changes to the performance indicators or completion criteria relevant to mine site rehabilitation and the biodiversity offset areas were made in 2014.

Offset Area Long-term Security

In accordance with MOD11 Development Consent Conditions 3.4(b) and 3.4(d), Barrick (Cowal) has been working with the DP&E to establish a Voluntary Planning Agreement (VPA) which will provide long-term security and protection of the CGM offset areas. As a component of the VPA, Barrick (Cowal) will commit to providing a bank guarantee, which would fund implementation of the CGM offset strategy management measures. Barrick commissioned Greening Australia in 2013 to independently calculate the full cost of implementation of the CGM Offset Strategy.

As per Development Consent Conditions 3.6(b) and 3.6(c), Barrick (Cowal) submitted a draft VPA to the then DP&I on 28 April 2014. Subject to DP&E approval the draft VPA and the proposed value for the VPA bank guarantee, the offset VPA will be finalised.

3.7.2.2 Effectiveness of Control Strategies

Development Consent Condition 3.2(d) requires the effectiveness of the TSMP and FFMP to be reported in the AR and published on the Applicant's website annually. The control strategies implemented during the reporting period were considered to be effective in minimising impacts to threatened flora. In accordance with the CGM VCP (Figure 18), mining activities were confined to approved and delineated areas. Vehicle movements within ML 1535 were restricted to designated roads to limit the impact on any potential threatened flora. The TSMP identifies threatened flora populations and management strategies were implemented accordingly.

The results of the rehabilitation and offset monitoring programme currently implemented to assess the effectiveness of mine site rehabilitation measures and offset strategy measures is provided in Paragraph 5.

3.7.2.3 Variations from Proposed Control Strategies

Following submission and approval of the revised RMP and BOMP in 2015, an assessment of rehabilitation monitoring results against approved performance and completion criteria will be provided in the next AR.

There are no other anticipated variations to the proposed control strategies.

3.7.3 Environmental Performance

3.7.3.1 Monitoring

Monitoring and management of flora continued in accordance with the requirements of the FFMP (Paragraph 3.7.1) and the ROMP, during the reporting period. Measures undertaken are discussed below.

Vegetation Clearance

Vegetation clearance activities conducted during the reporting period were monitored and undertaken in accordance with the VCP (Figure 18).

In 2013 the VCP was applied to 438 trees located within an approved surface disturbance area north-east of the SWE between the Processing Plant HV Yard and Pond D9 in June 2013 – August 2013. Approximately 0.6 ha in wet gilgai land at the eastern end of the VCP area could not be accessed safely for Wiradjuri Cultural Company cultural heritage inspection works and as a result, these trees were cleared via the VCP process in 2014. Seven nest trees (in use during 2013) at the SWE VCP area were not cleared until May 2014 in accordance with the VCP. There were no other vegetation clearance activities undertaken during the reporting period.

Weed Management

The annual weed survey of all Barrick-owned property was undertaken in December 2014 by NGH Environmental. Weed management measures resulting from the survey will continue to be implemented during 2015.

There were no other alterations to any weed management requirements during the reporting period.

Weed management is discussed further in Paragraph 3.9.2.

Flora Monitoring Program

Flora monitoring was undertaken during the reporting period in the following areas:

- Compensatory Wetland;
- Rehabilitation areas and rehabilitation trial areas;
- Offset management areas;
- *Pilularia novae-hollandiae* (Austral Pillwort) habitat; and
- Remnant Vegetation Enhancement Programme areas (Figure 19).

Monitoring of re-vegetated and rehabilitated areas within ML1535 and the offset areas was conducted during the reporting period in accordance with the ROMP, and is discussed below.

3.7.3.2 Performance Outcomes

DnA Environmental is engaged by Barrick to conduct annual monitoring of the above listed areas.

Compensatory Wetland (CW)

Monitoring of regeneration in the CW was undertaken by DnA Environmental between the 3 to 12 November 2014. Monitoring during spring aims to capture a more accurate representation of species present in the area. Future monitoring of the CW will continue to be undertaken in spring, subject to the area not being inundated.

During 2014, Lake Cowal had receded significantly with nine of the 12 sites monitored this year. Sites RW1, RW2 and RW3 located further into the lake bed were inaccessible but may not necessarily have been inundated (i.e. were too muddy to access safely).

Results of the 2014 monitoring of the CW included (DnA Environmental, 2015b):

- Sites situated on or near the lake shore were well colonised with grasses and some scattered tree and shrub regeneration, while those further into the lake bed were typically dominated by native grasses and exotic annual weeds;
- There was a significantly higher density of shrubs and juvenile trees recorded across most wetland sites as a result of the floods and inundation of the lake followed by recession of the water. While only one shrub was recorded in CW4 there were significantly more in the other sites with 171 seedlings recorded in GW4;
- The vast majority of plant species were *Glycyrrhiza acanthocarpa* (Native Liquorice) across most sites, however CW3 retained a significant number of *Eucalyptus camaldulensis* (River Red Gum);
- Floristic diversity was the lowest ever recorded this year with 68 species recorded across the nine wetland sites and this included 21 exotics (31%). The low diversity can largely be attributed to four years inundation, combined with the prolonged dry which tended to exclude many annual species;
- No threatened species have been recorded in any wetland monitoring site since monitoring began in 2005;
- *Phyla canescens* [*Phyla nodiflora* var. *canescens]* (Lippia), which is often falsely misnamed *Phyla nodiflora* is regarded as a serious environmental weed in New South Wales and Queensland. It was recorded in low densities in site GW1 and along the temporary bund revegetation areas.

Monitoring of the CW regeneration will continue annually.

In order to limit disturbance to the CW, vehicular access continued to be limited to authorised personnel.

Rehabilitation Monitoring Report

A detailed rehabilitation report for the reporting period is described in Paragraph 5.

Offset Management Areas

Two monitoring sites were established at each of the Offset Management Areas (Northern Offset Area and Southern Offset Area) in 2010. The Offset Areas are discussed in Paragraph 5 along with the results of the monitoring program during the reporting period.

Pilularia novae-hollandiae (Austral Pillwort) Habitat

A survey of potential habitat for the threatened species *Pilularia novae-hollandiae* (Austral Pillwort) was undertaken within ML 1535 and nearby properties by DnA Environmental from 3 to 12 November 2014. Undisturbed areas of ML 1535 and nearby properties were searched, targeting areas of potentially suitable habitat such as gilgais, farm dams, lake foreshore, areas free of water or recently receded water and areas previously surveyed.

Lake Cowal had significantly receded during 2014 due to the prolonged dry conditions with all gilgais being significantly dry during the survey period. There were dense swards of native and introduced grasses which provided very high levels of dead litter cover with most of the vegetation having died off. While ground cover levels were very high and limited visual opportunities, they had also provided high competition levels when they were actively growing and continued to limit habitat opportunities for Austral Pillwort.

Due to the exceptionally dry conditions the survey effort was reduced in 2014, with only the larger and more intact gilgais being surveyed. The reduced grazing pressure on many of the gilgais, Lake Foreshore and other ephemeral habitat sites has typically promoted an increase in vegetation density, including many wetland species and exotic annual species. The combination of increasing vegetation and extended dry conditions is likely to be impacting on populations of Austral Pillwort but the extent that this has occurred is presently unknown (DnA Environmental, 2015c).

Remnant Vegetation Enhancement Program (RVEP)

RVEP monitoring was been undertaken during the reporting period from 3 to 12 November 2014.

In line with the Land Management Plan (**LMP**) permanent monitoring sites have been established to measure changes occurring within the remnant vegetation as part of the RVEP. In the LMP, there are four main RVEP areas (Figure 19) requiring livestock exclusion and the establishment of permanent monitoring sites, including:

- RVEP1: *Eucalyptus dwyeri* (Dwyer's Red Gum) – *Callitris glaucophylla* (White Cypress Pine) woodland on Fellman's Hill, "Hillgrove";
- RVEP 2: *Muehlenbeckia florulenta* (Lignum) area in the lake bed on "Lakeside";
- RVEP 3: *Eucalyptus camaldulensis* (River Red Gum) woodland on the northern section of "Lake Cowal" foreshores and;
- RVEP 4: *Eucalyptus camaldulensis* woodland on the southern section of "Lake Cowal" foreshores.

In 2006, four monitoring sites were established within targeted areas of remnant vegetation in RVEP 1 which have been free from livestock since 2004. RVEP2 is situated in the middle of the lake bed at "Lakeside" and fencing requires careful consideration and no monitoring has yet been undertaken as this area was still being grazed by livestock and since 2010 it has been under water. RVEP areas 3 and 4 were fenced off in mid-2007 and monitoring sites were established in each of these areas since 2007.

Six RVEP sites were assessed this year and these were Hill01, Hill02, Hill03, Hill04, RVEP3 and RVEP4. The monitoring of the RVEP sites have been a simplified version of the annual rehabilitation monitoring program and did not include Landscape Function Analyses (LFA) or soil analyses but has been consistent since 2008.

Since RVEP1 has been excluded from grazing by domestic livestock, there has been an increasing number of macropods using this site, in particular a growing population of Eastern Grey Kangaroos. Due to the potentially high grazing pressure, four Kangaroo-proof enclosures were constructed in 2008 and monitoring sites were also established within these to assess the impact of the macropod grazing, if any, on the health and diversity of the remnant vegetation.

In total, there have been ten permanent monitoring quadrats established within the RVEP areas 1, 3 and 4. In six sites, the survey quadrats are 50m x 20m and are surveyed annually to monitor changes in vegetation cover, species diversity and to determine the extent of regeneration occurring within these conservation sites. In the remaining four exclosure sites in RVEP1 (Fellman's Hill), the size of the monitoring quadrats needed to be reduced to a 20x20m quadrat to fit within the enclosures.

There has been no consistent trend in changes in total ground cover since 2008 but typically most sites have demonstrated an overall improvement since then up until this year where a slight decrease was typically recorded. Most changes have occurred as a result of the fluctuations in seasonal conditions and grazing pressure and all sites maintained high total ground cover levels. All RVEP sites contained a shrub population, although this was limited in Hill01 and Hill04.

The seasonal conditions continue to have a profound effect on the composition and structure of the remnant vegetation in and around Lake Cowal. There have been numerous ecological attributes which have improved in the protected RVEP areas since the exclusion of domestic livestock, with an increase in the extent of shrub regeneration and improvement in ground cover and general condition in the health of the woodlands. Macropods continue to graze the vegetation on Fellmans Hill with the extent of this grazing also fluctuating with the seasonal conditions. At the time of monitoring, cattle had access to RVEP3 and RVEP4 monitoring points due to fencing requiring repair.

Monitoring of the RVEP areas will continue during the next reporting period.

3.7.4 Reportable Incidents

The FFMP requires the reporting of any incidents relating to threatened flora. No environmental incidents or complaints were reported or received at the CGM relating to threatened flora during the reporting period.

3.7.5 Further Improvements

Fencing at the RVEP3 and RVEP4 monitoring sites will be repaired during the next reporting period to ensure grazing does not take place in the enhancement areas.

No further improvements to threatened flora management measures are proposed for the next reporting period.

3.8 FAUNA

3.8.1 Reporting Requirements

3.8.1.1 Development Consent

The reporting of fauna monitoring is required by Development Consent Condition 3.2(d), which states:

> *The Applicant shall monitor the effectiveness of measures outlined in the Flora and Fauna Management Plan and Threatened Species Protocol to the satisfaction of the Secretary. A summary of these monitoring results shall be published annually on the Applicants website for the development.*

The AR is also required to include the results of fauna monitoring and records of any wildlife/fauna deaths or other incidents due to mining operations in accordance with Development Consent Condition 3.2(b)(ii).

The FFMP has been prepared in accordance with the Development Consent Condition 3.2(b). In accordance with the FFMP, the following fauna related issues are required to be reported in the AR:

- a summary of deaths or other incidents involving native fauna;
- fauna usage of tailings storages;
- results of any native fauna autopsies;
- vegetation clearance activities (discussed in Paragraph 3.7.3);
- weed and pest management (discussed in Paragraph 3.9.2);
- results of the flora and fauna monitoring programs; and
- the progress of remnant vegetation and wetland enhancement programs (discussed in Paragraph 3.7.3.2).

A TSMP has been prepared in accordance with Development Consent Condition 3.2(c). In accordance with the TSMP, TSMSs were prepared in consultation with the EPA for the following fauna species:

- Inland Forest Bat;
- Sloane's Froglet;
- Woodland birds including:
  - Little Eagle;
  - Spotted Harrier;
  - Square-tailed Kite;
  - Varied Sitella; and
  - White-fronted Chat.

The above TSMSs were submitted to the DP&I on 28 February 2011. The DP&I provided comment on 14 August 2012, however no amendments to the TSMSs were required. The TSMSs are currently awaiting DP&E formal approval, however the DP&E has advised it is satisfied for the TSMSs to be implemented in the interim.

In accordance with Development Consent Condition 3.2(d) a summary of the effectiveness of the measures outlined in the FFMP and TSMP is required to be included in the AR (published annually on the Applicant's website).

3.8.1.2 Environment Protection Licence

Condition R2 of the EPL requires Barrick to notify the EPA of incidents causing harm or threatening material harm to the environment as soon as practicable after Barrick becomes aware of the incident.

3.8.1.3 Any Other Relevant Approvals

There are no other relevant reporting requirements from other approvals in relation to threatened fauna for the reporting period.

3.8.2 Environmental Management

3.8.2.1 Control Strategies

The relevant control strategies for the management of threatened fauna species are described in the FFMP and the ROMP and include:

- implementation of CWMP initiatives and the remnant vegetation enhancement program (discussed in Paragraph 3.7.3.2);
- incorporation of fauna management initiatives during operational design;
- implementation of the VCP (Figure 18) (including pre-clearance surveys) (discussed in Paragraph 3.7.3.1);
- implementation of the TSMP;
- implementation of the Plan to Protect Fauna from Interactions with the Tailings Storage Facilities;
- management of impacts on terrestrial and aquatic fauna;
- rehabilitation of disturbance areas;
- weed management and pest control (discussed in Paragraph 3.7.3 and 3.9.2);
- fauna monitoring program;
- maintaining a clean, rubbish free environment to discourage scavenging;
- prohibition for the introduction of animals including domestic pets on ML 1535;
- imposing speed limits within ML 1535 to reduce the risk of fauna mortality via vehicular strike; and
- provision of information relevant to the management of native fauna during employee and contractor inductions.

3.8.2.2 Effectiveness of Control Strategies

In accordance with the FFMP, implementation of the control strategies minimised impacts on threatened fauna species during the operation of the CGM. No native fauna deaths occurred as a result of the VCP activities undertaken during the reporting period as described in Paragraph 3.7.3.

Paragraph 3.8.3.2 lists the fauna deaths and incidents that have occurred on ML 1535 over the reporting period. The majority of native fauna deaths that occurred during the reporting period were associated with interactions with vehicles.

Several members of the Barrick Environmental team and some local community members (sponsored by Barrick) are trained NSW Wildlife Information Rescue & Education Service (**WIRES**) members. Many Barrick employee members have been trained in handling venomous snakes by Wildlife Australia. Having locally trained snake handlers and registered WIRES members has improved the care that can be given to injured native wildlife on ML 1535 and within the local community. The Barrick Cowal Environmental Manager has been the WIRES Riverina Reptiles Coordinator since 2010.

3.8.2.3 Variations from proposed Control Strategies

There were no variations from the proposed control strategies.

3.8.3 Environmental Performance

3.8.3.1 Monitoring

In accordance with the FFMP, monitoring in relation to fauna was conducted during the reporting period. Activities conducted during the reporting period relating to fauna monitoring included:

- continuation of long-term monitoring of bird breeding (Table 27);
- twice daily fauna usage of the tailings storage facilities;
- regular checking of the main diesel tank and hydrogen peroxide tank concrete bund sumps after rainfall events to rescue and relocate frogs; and
- daily and weekly fauna incident inspections and field patrols.

Table 27: Bird Breeding Monitoring Conducted During the Reporting Period

Monitoring Component	Summary
Birds	Continuation of long-term bird breeding monitoring, including: 1. Waterbird breeding surveys at waterbrid survey transects (Figure 26). 2. Collection of environmental data including lake depth, changes in depth, Southern Oscillation Index (SOI), season, and rainfall. 3. Statistical analysis to examine variation in the abundance of breeding birds, and the number and survival of fledglings and the mean number of breeding bird species between years, seasons, lake water cycle and climatic conditions.

Twice daily monitoring of fauna usage of the tailings facilities has been undertaken since the commissioning of the facilities in April 2006. One patrol is conducted after dawn and the other in the late afternoon. The patrol includes inspection of the tailings dam fence for evidence of fauna usage (e.g. tracks or breaks in the fence) and to determine the need for any maintenance measures (e.g. fence repair). Any maintenance measures are undertaken, as soon as practicable. The fauna monitoring results are utilised to determine the requirement for modifications to the mechanisms being utilised to deter fauna from the tailings dams.

The following details and observations are recorded:

- observer details (i.e. name and position);
- date and time of inspection;
- type of species present;
- number of individuals of each species;
- location within the tailings dam (e.g. on tailings dam, beach or embankment, etc);
- behaviour and habits of individuals (e.g. flying over tailings and/or wading in the tailings facility, etc);
- visually observed fauna effects; and
- any fauna incidents and/or fauna deaths.

Weekly boundary inspections of ML 1535 were conducted by environmental and/or security personnel to identify any native fauna incidents and/or deaths.

Fauna '*incidents*' are considered to occur where the observed behaviour of native fauna indicates that a negative impact on individual(s) is occurring as a result of the presence or operation of the mine (e.g. fauna is observed trapped within the ML 1535 fence). In the event that fauna incidents are observed, the following details and observations are recorded:

- observer details (i.e. name and position);

- date and time of inspection;
- type of species;
- number of individuals of each species;
- location; and
- any other relevant details of the native fauna incident.

Any native fauna found dead in the ML 1535 area are reported to environmental personnel who coordinate collection. Dead fauna are collected for autopsy to enable the cause of death to be determined. The details and observations listed above are recorded, as well as condition of the species and surface water conditions of the Lake and surrounding area (when inundated, if relevant). Where practicable, photographs or video footage are taken (e.g. of landscape, stance of clinically affected animal, place of death) to provide additional information for veterinarian and site investigation. If cyanide is suspected or known to be a contributor to the death of a native or feral animal, the West Wyalong Veterinarian is contacted immediately and special preservation techniques followed for the sampling process.

No cyanide related animal deaths were recorded during the reporting period, however in November/December 2014 over a two week period a total of nine welcome swallows were retrieved from the leach tails thickener. The autopsy results were inconclusive and the birds may have died from drowning within the tank. Notwithstanding this, netting was installed on the leach tails thickener tank in response to these incidents.

There have been no deaths of animals by cyanide in the CGM Tailings Storage Facilities area since operations began in April 2006.

Pest Management

Pest Management is described in Paragraph 3.9 of this AR.

3.8.3.2 Performance Outcomes

There were sixty-eight WIRES rescues and relocations of native fauna that have been undertaken during the reporting period, when mining activities have been a threat to their safety.

The following list of injured animals were taken into WIRES home care and later released at suitable habitat once rehabilitated. The rescues and relocations to immediately adjacent suitable habitat for the reporting period included:

1	Barn Owl	5	Bearded Dragon
1	Blue Bonnet	1	Black Snake
1	Emu	14	Brown Snake
1	Freckled Duck	1	Tiger Snake
1	Masked Lapwing Plover	19	Snake-necked Turtle
1	Nankeen Kestrel	4	Spotted Marsh Frog
1	Silver Gull	4	Feral Cat (18.4 kg total)
7	Welcome Swallow	2	Echidna
2	Grey Kangaroo	1	Microbat
1	Bush Wallaby		

All native animals rescued at the CGM are entered into the WIRES database (www.wires.org.au).

A summary of all the reported fauna deaths during the reporting period is provided in Table 28.

Table 28: Records of Fauna Deaths and Other Incidents for the Reporting Period

Date/Time of Incident	**02 January 2014 / 06:50 EST**	
Location	Bitumen access road, Mining Lease.	
Species and number of individuals	Galah	1
Description of Incident	Employee noted and reported a deceased Galah on verge of entry road by Main car park.	
Outcome	Injuries consistent with MV impact.	
Date/Time of Incident	**29 January 2014 / 06:40 EST**	
Location	E42 Pit Crest east side gravel access track near Pond D3, Mining Lease.	
Species and number of individuals	Brown Snake	1
Description of Incident	Employee called Env Manager on mobile phone at start of shift. Routine patrol noted a freshly deceased adult Brown on edge of track. Covered in meat ants.	
Outcome	Eviscerated body injuries consistent with MV impact.	
Date/Time of Incident	**30 January 2014 / 08:25 EST**	
Location	TSF gravel access track, Mining Lease.	
Species and number of individuals	Myall (Curl) Snake	1
Description of Incident	Employee noted a deceased small brown coloured snake on TSF gravel access road between Orica Depot and Main Admin. Called Env Manager. Employee bagged and delivered deceased snake to Env Superintendent waiting at the end of the Admin access road.	
Outcome	Minor head crush injury was consistent with MV impact near the dry swamp area.	
Date/Time of Incident	**31 January 2014 / 06:30 EST**	
Location	CV201 Reclaim tunnel, Mining Lease.	
Species and number of individuals	Brown Snake	1
Description of Incident	Employee noted a deceased juvenile snake in CV201 Tunnel when checking around Bobcat machine.	
Outcome	Injuries to middle body consistent with MV impact.	
Date/Time of Incident	**03 February 2014 / 08:15 EST**	
Location	Gold Room Furnace floor, Mining lease.	
Species and number of individuals	Gould's Wattled Microbat	1
Description of Incident	Employee reported finding a recently deceased microbat on concrete floor just after starting up the smelting furnace.	
Outcome	Injuries consistent with misadventure of bat roosting inside furnace during one of recent consecutive heatwave events.	
Date/Time of Incident	**04 February 2014 / 12:05 EST**	
Location	Mining Maintenance Bulk Lubes south apron, Mining Lease.	
Species and number of individuals	Brown Snake	1
Description of Incident	Employee reported a deceased, desiccated juvenile snake in a dried saline puddle at the south side of the Mining Maintenance Bulk Lubes storage bund area to his Workshop Supervisor. Env Manager immediately attended with CR Officer on patrol.	
Outcome	Injuries consistent with dehydration by misadventure during prolonged heatwave.	
Date/Time of Incident	**14 February 2014 / 08:15 EST**	
Location	Bitumen access road, Mining Lease.	
Species and number of individuals	Blue-bellied Black Snake	1
Description of Incident	Medium sized adult Blue-bellied noted and bagged by employee entering site. Handed to Env Manager in office for chilling and later delivery to WWy Vet Clinic.	
Outcome	Injuries consistent with MV impact.	

Table 27 (Continued): Records of Fauna Deaths and Other Incidents for the Reporting Period

Date/Time of Incident	**18 February 2014 / 08:00 EST**	
Location	Northern Go-Line E42 Pit, Mining Lease.	
Species and number of individuals	Long-necked Turtle	1
Description of Incident	Employee noted a deceased turtle at Northern Haul Trucks Go-Line.	
Outcome	Injuries consistent with being run over by a Haul Truck.	
Date/Time of Incident	**27 February 2014 / 15:00 EST**	
Location	Process Plant Bulk Oxygen Truck Delivery Bay, Mining Lease.	
Species and number of individuals	Stubble Quail	1
Description of Incident	Employee noted a whole, maggot riddled Quail on ground.	
Outcome	Likely fallen off bulk goods B-Double delivery truck grill.	
Date/Time of Incident	**10 March 2014 / 08:00 EST**	
Location	Exploration Geology Core Shed No 2, Mining Lease.	
Species and number of individuals	Welcome Swallow	1
Description of Incident	Employee noted a deceased Swallow on concrete floor of locked shed below window.	
Outcome	Injuries consistent with flight error into glass window.	
Date/Time of Incident	**12 March 2014 / 10:00 EST**	
Location	Boart Longyear Boat Jetty, Mining Lease.	
Species and number of individuals	Brown Falcon	1
Description of Incident	Employee noted a deceased bird on Lake foreshore whilst inspecting the Jetty area.	
Outcome	Suspected natural causes – heat wave, low mouse numbers.	
Date/Time of Incident	**03 April 2014 / 10:15 EST**	
Location	Middle south toe of STSF, Mining Lease.	
Species and number of individuals	Australian Magpie	1
Description of Incident	Employee on routine patrol noted a deceased Magpie in wet tailings near toe of wall.	
Outcome	Exhaustion, drowning during previous afternoon. Low WAD CN levels at Decant.	
Date/Time of Incident	**03 April 2014 / 12:00 EST**	
Location	Bitumen access road, Mining Lease.	
Species and number of individuals	Brown Snake	1
Description of Incident	Employee noted and bagged a deceased 2.0 m Brown on way into site from LCCC.	
Outcome	Injuries consistent with motor vehicle impact.	
Date/Time of Incident	**22 April 2014 / 17:05 EST**	
Location	Main Diesel Bund, Mining Lease.	
Species and number of individuals	Spotted Marsh Frogs	10
Description of Incident	Employee noted ten deceased frogs lying in diesel tainted film of sump hosing up water.	
Outcome	Consistent with diesel contact with frog skin.	
Date/Time of Incident	**30 April 2014 / 12:15 EST**	
Location	Bitumen access road, Mining Lease.	
Species and number of individuals	Grey Kangaroo	1
Description of Incident	Night Duty ERO reported deceased kangaroo on edge of bitumen access road during rounds.	
Outcome	Injury consistent with impact by motor vehicle.	

Table 27 (Continued): Records of Fauna Deaths and Other Incidents for the Reporting Period

Date/Time of Incident	**05 May 2014 / 10:00 EST**	
Location	Fixed Plant Workshop front concrete apron, Mining Lease.	
Species and number of individuals	Welcome Swallow	1
Description of Incident	Employee reported finding a deceased small bird on ground near the edge of the processing plant access road.	
Outcome	Injury consistent with flying into and falling from a wall or fixed structure.	
Date/Time of Incident	**06 May 2014 / 05:37 EST**	
Location	Bitumen access road, Mining Lease.	
Species and number of individuals	Grey Kangaroo	1
Description of Incident	Duty ERO reported a deceased kangaroo on side of bitumen access road.	
Outcome	Injury consistent with impact by motor vehicle.	
Date/Time of Incident	**06 May 2014 / 11:00 EST**	
Location	Fixed plant Warehouse, Mining Lease.	
Species and number of individuals	Welcome Swallow	2
Description of Incident	Employee reported finding two deceased, juvenile, partially fledged birds on floor.	
Outcome	Injuries consistent with fallen, separated from parent juvenile mortality.	
Date/Time of Incident	**29 May 2014 / 13:30 EST**	
Location	Sulphuric Acid bund sump, Mining Lease.	
Species and number of individuals	Spotted Marsh Frogs	4
Description of Incident	Employee noted four recently deceased frogs in freshly re-grouted/ re-concreted sump after recent rainfall.	
Outcome	Injuries consistent with misadventure. Likely elevated salt in rainwater from fresh concrete.	
Date/Time of Incident	**09 June 2014 / 12:00 EST**	
Location	Lake Cowal foreshore road to alternate boat ramp (south), Mining Lease.	
Species and number of individuals	Pelican	1
Description of Incident	Employees inspecting boat access track during long weekend break noted a deceased, heavily predated body.	
Outcome	Env Mgr buried remains of body nearby after photo. Was a	
Date/Time of Incident	**19 June 2014 / 10:30 EST**	
Location	Isotainer sump at rear of Bulk Lube Tank, Mobile Mtce Workshop, Mining Lease.	
Species and number of individuals	Welcome Swallow	1
Description of Incident	Employee noted a deceased bird in oily water at rear of Bulk Lubes Tanks Bay.	
Outcome	Oil coated bird likely to have fallen in and expired from shock after misadventure.	
Date/Time of Incident	**25 June 2014 / 13:30 EST**	
Location	Mining Maintenance Workshop, Mining Lease.	
Species and number of individuals	Welcome Swallow	1
Description of Incident	Employee noted and reported a deceased Swallow on the concrete floor.	
Outcome	Number of prior occasional similar finds. Natural causes is suspected.	
Date/Time of Incident	**01 July 2014 / 08:00 EST**	
Location	Processing Plant bulk oxygen storage tanks area, Mining Lease.	
Species and number of individuals	Welcome Swallow	1
Description of Incident	Employee noted and reported a deceased Swallow on the concrete floor.	
Outcome	Number of prior occasional similar finds. Natural causes is suspected by predatory bird.	

Table 27 (Continued): Records of Fauna Deaths and Other Incidents for the Reporting Period

Date/Time of Incident	**03 July 2014 / 10:00 EST**	
Location	Processing Plant carbon regeneration kiln deck, Mining Lease.	
Species and number of individuals	Stubble Quail	1
Description of Incident	Employee noted and reported a deceased Swallow on the grid mesh floor.	
Outcome	Number of prior occasional similar finds. Natural causes is suspected by predatory bird.	
Date/Time of Incident	**07 July 2014 / 23:15 EST**	
Location	Bitumen access road, Mining Lease.	
Species and number of individuals	Barn Owl	1
Description of Incident	Employee noted and reported a deceased Owl on verge of bitumen road on Site.	
Outcome	Injuries consistent with night flight path error resulting in vehicle impact.	
Date/Time of Incident	**16 July 2014 / 13:00 EST**	
Location	Processing Plant Quicklime Silo bunded area, Mining Lease.	
Species and number of individuals	Gould's Wattled microbat	1
Description of Incident	Employee noted and reported a deceased bat on the concrete bund floor under the Silo.	
Outcome	Number of prior occasional similar finds. Natural causes is suspected by predatory bird.	
Date/Time of Incident	**16 July 2014 / 13:00 EST**	
Location	Processing Plant bulk oxygen storage tanks area, Mining Lease.	
Species and number of individuals	Welcome Swallow (right wing)	1
Description of Incident	Employees collected bird bits on the concrete floor around the bulk oxygen tanks.	
Outcome	Number of prior occasional similar finds. Natural causes is suspected by predatory bird.	
Date/Time of Incident	**16 July 2014 / 13:00 EST**	
Location	Processing Plant bulk oxygen storage tanks area, Mining Lease.	
Species and number of individuals	Stubble Quail (head)	1
Description of Incident	Employees collected bird bits on the concrete floor around the bulk oxygen tanks.	
Outcome	Number of prior occasional similar finds. Natural causes is suspected by predatory bird.	
Date/Time of Incident	**16 July 2014 / 13:00 EST**	
Location	Processing Plant bulk oxygen storage tanks area, Mining Lease.	
Species and number of individuals	Duck head (juvenile)	1
Description of Incident	Employees collected bird bits on the concrete floor around the bulk oxygen tanks.	
Outcome	Number of prior occasional similar finds. Natural causes is suspected by predatory bird.	
Date/Time of Incident	**24 July 2014 / 16:05 EST**	
Location	Main administration car parking area, Mining Lease.	
Species and number of individuals	Crested Pigeon	1
Description of Incident	Employee noted and bagged deceased Pigeon found on bitumen in Main car park.	
Outcome	Injuries consistent with vehicular impact.	
Date/Time of Incident	**25 July 2014 / 11:05 EST**	
Location	Pond D5 haul road near ROM Pad entry, Mining Lease.	
Species and number of individuals	Hoary-headed Grebe	1
Description of Incident	Employee noted Raven pecking at white object on Haul Road verge between ROM3 and Primary Crusher ROM Pad adjacent Pond D5 whilst driving back from Lake foreshore cat traps patrol. Bagged deceased Grebe.	
Outcome	Injuries consistent with being run over by a heavy vehicle.	

Table 27 (Continued): Records of Fauna Deaths and Other Incidents for the Reporting Period

Date/Time of Incident	**25 July 2014 / 14:00 EST**	
Location	Exploration Geology Core Sjed No. 1, Mining Lease.	
Species and number of individuals	Welcome Swallow	1
Description of Incident	Employee noted and reported a deceased bird on the concrete floor of Exploration Core Shed No 2. Employee delivered bird bagged to Env Mgr's office.	
Outcome	Possibly natural causes (lack of insects) if not flight path error.	
Date/Time of Incident	**27 July 2014 / 05:30 EST**	
Location	Bitumen access road, Mining Lease.	
Species and number of individuals	Eastern Grey Kangaroo	1
Description of Incident	Employee driving into work in fog in own 4WD at about 60 kph connected with large, male Grey Kangaroo moving across road in dark adjacent to quadruple gate Oversize Loads access entry.	
Outcome	Injuries consistent with vehicular impact.	
Date/Time of Incident	**27 July 2014 / 11:50 EST**	
Location	TSF Depot maintenance area, Mining Lease.	
Species and number of individuals	Feral tabby tom cat	1
Description of Incident	Feral tabby tom cat rescued from TSF Maintenance Workshop wire cage trap and taken immediately to Sunday Vet Clinic surgery for inspection. Previous best rescue was 5 kg.	
Outcome	Humane lethabarb injection at WWy Vet Clinic and disposal at BSC Depot.	
Date/Time of Incident	**30 July 2014 / 07:00 EST**	
Location	Bitumen access road, Mining Lease.	
Species and number of individuals	Australian Magpie	2
Description of Incident	Two deceased magpies were noted on the bitumen access road by an employee. The Environmental Department was notified. The birds were collected and delivered to the West Wyalong Vet Clinic shortly after.	
Outcome	Injuries consistent with vehicular impact.	
Date/Time of Incident	**13 August 2014 / 10:30 EST**	
Location	Processing Plant	
Species and number of individuals	Welcome Swallow Stubble Quail	1 1
Description of Incident	Employee reported deceased Welcome Swallow on dry concrete inside bund by Leach Tank No 7. Attending Env Mgr noted a congregation of the left leg of Stubble Quail, some Quail feathers and two fresh Owl casings below the bulk oxygen tanks adjacent the Quicklime Silo.	
Outcome	Predation of body parts by a resident raptor.	
Date/Time of Incident	**19 August 2014 / 07:25 EST**	
Location	Concrete bunded floor between leach tanks 3 and 7, Mining Lease.	
Species and number of individuals	Welcome Swallow	1
Description of Incident	Employee noted and reported a deceased Swallow on floor between leach tanks 3 and 7. Env Mgr bagged an adult bird in a very advanced state of decay on the concrete floor near Leach tank 3.	
Outcome	No external signs of injury. Flight path error likely. Raptor in area.	
Date/Time of Incident	**19 August 2014 / 09:00 EST**	
Location	End of Flotation Circuit under feed pipe to tailings thickener, Mining Lease.	
Species and number of individuals	Stubble Quail	1
Description of Incident	Employee reported freshly beheaded Stubble Quail to Supervisor. Native predator feeding in tail end of Flotation Circuit.	
Outcome	Predator raptor bird resident in area.	

Table 27 (Continued): Records of Fauna Deaths and Other Incidents for the Reporting Period

Date/Time of Incident	**29 August 2014 / 07:00 EST**	
Location	Processing Plant SAG Mill deck, Mining Lease.	
Species and number of individuals	Galah	1
Description of Incident	A deceased Galah was found on a work platform above the SAG mill. The bird was collected, bagged and taken to WWy Vet clinic for autopsy	
Outcome	Possible flight path error. Deceased juvenile fallen and rescued in that area previously.	
Date/Time of Incident	**01 September 2014 / 06:50 EST**	
Location	Bitumen access road, Mining Lease.	
Species and number of individuals	Tawny Frogmouth	1
Description of Incident	Employee noted a freshly deceased Tawny Frogmouth in centre of south land of bitumen access road near the Armco railing bend. Noctural bird of prey, flight path error swooping for prey or startled, on sunrise as vehicles leaving site.	
Outcome	Injuries consistent with vehicular impact.	
Date/Time of Incident	**02 September 2014 / 10:30 EST**	
Location	Stop sign at South Dump gravel road to Lake Cowal, Mining Lease.	
Species and number of individuals	Myall (Curl) Snake	1
Description of Incident	Employee noted a deceased Myall (Curl) Snake (12' long brown colour), in a rain water puddle at the Stop sign at South Dump gravel road to Lake Cowal.	
Outcome	Injuries consistent with vehicular impact. Small brown coloured snake on gravel road.	
Date/Time of Incident	**08 September 2014 / 16:00 EST**	
Location	Exploration Geology Core Shed, Mining Lease.	
Species and number of individuals	Welcome Swallow	1
Description of Incident	Employee noted and reported deceased Swallow on concrete floor of Exploration Geology Core Shed.	
Outcome	No external signs of injury. Flight path error likely.	
Date/Time of Incident	**16 September 2014 / 08:35 EST**	
Location	Pond D1 North Trial slopes, Mining Lease.	
Species and number of individuals	Brown Snake	1
Description of Incident	Employee noted a deceased snake in loose rocks of slope whilst watering tubestock plants.	
Outcome	Injuries consistent with vehicular impact crushing.	
Date/Time of Incident	**18 September 2014 / 11:35 EST**	
Location	TSF gravel access road, Mining Lease.	
Species and number of individuals	Myall (Curl) Snake	1
Description of Incident	Employee noted a deceased small snake in gravel road centre outside STSF entry gate.	
Outcome	Injuries consistent with vehicular impact.	
Date/Time of Incident	**29 September 2014 / 15:00 EST**	
Location	LPB blue rock access road, Mining Lease.	
Species and number of individuals	Barn Owl	1
Description of Incident	Employee noted and handed in a desiccated top half of a Barn Own.	
Outcome	Injuries consistent with an off-site high speed impact – fallen from car radiator grill.	
Date/Time of Incident	**30 September 2014 / 10:00 EST**	
Location	Main Admin smoker's hut area, Mining Lease.	
Species and number of individuals	Welcome Swallow	1
Description of Incident	Employee reported a deceased, maggot impacted bird at main Admin smoker's hut.	
Outcome	Possible flight path error, or natural causes.	

Table 27 (Continued): Records of Fauna Deaths and Other Incidents for the Reporting Period

Date/Time of Incident	**30 September 2014 / 10:00 EST**	
Location	Process Plant reagent mixing laneway, Mining Lease.	
Species and number of individuals	Welcome Swallow	1
Description of Incident	Employee reported a desiccated, deceased bird on ground in reagent mixing laneway.	
Outcome	Possible flight path error, or natural causes.	
Date/Time of Incident	**01 October 2014 / 15:45 EST**	
Location	Armco railing bitumen access road bend adjacent STSF south, Mining Lease.	
Species and number of individuals	Australian Raven	1
Description of Incident	Employee noted a freshly deceased raven on road verge. Broken wing.	
Outcome	Injuries consistent with vehicular impact.	
Date/Time of Incident	**14 October 2014 / 09:30 EST**	
Location	Process Plant Laboratory area, Mining Lease.	
Species and number of individuals	Welcome Swallow	1
Description of Incident	Juvenile noted by laboratory employee – died in WIRES care.	
Outcome	Separated from parent – natural cause.	
Date/Time of Incident	**24 October 2014 / 14:52 EST**	
Location	Fixed Plant Maintenance Workshop concrete apron, Mining Lease.	
Species and number of individuals	Brown Snake	2
Description of Incident	Employee noted two juvenile Brown Snakes expired on concrete out front of Fixed Plant Maintenance Workshop on a very hot day. No external signs of injury.	
Outcome	Likely dehydration, heat stress from natural causes.	
Date/Time of Incident	**31 October 2014 / 07:00 EST**	
Location	Bitumen access road, Mining Lease.	
Species and number of individuals	Apostlebird	1
Description of Incident	Employee noted and bagged a deceased bird on road verge. Taken to Vet Clinic later same morning.	
Outcome	Injuries consistent with vehicle impact.	
Date/Time of Incident	**31 October 2014 / 10:00 EST**	
Location	Bitumen access road, Mining Lease.	
Species and number of individuals	Brown Snake	1
Description of Incident	Employee noted and reported deceased snake on road. Env Mgr collected, bagged and took to Vet Clinic soon after.	
Outcome	Injuries consistent with vehicle impact.	
Date/Time of Incident	**07 November 2014 / 07:10 EST**	
Location	Bitumen access road, Mining Lease.	
Species and number of individuals	Apostlebird	1
Description of Incident	Employee noted and bagged a deceased bird on road verge.	
Outcome	Injuries consistent with vehicle impact.	
Date/Time of Incident	**10 November 2014 / 06:55 EST**	
Location	Bitumen access road, Mining Lease.	
Species and number of individuals	Australian Magpie	1
Description of Incident	Employee noted and bagged a deceased juvenile Magpie on road verge.	
Outcome	Injuries consistent with vehicle impact.	

Table 27 (Continued): Records of Fauna Deaths and Other Incidents for the Reporting Period

Date/Time of Incident	**10 November 2014 / 10:30 EST**	
Location	Bitumen access road, Mining Lease.	
Species and number of individuals	Galah	1
Description of Incident	Employee noted and bagged a deceased bird on road centre. Taken to Vet Clinic soon after on same day.	
Outcome	Injuries consistent with vehicle impact.	
Date/Time of Incident	**14 November 2014 / 10:00 EST**	
Location	Processing Plant Sesame Street access road, Mining Lease.	
Species and number of individuals	Welcome Swallow	2
Description of Incident	Planned maintenance Mill Shutdown employees noted two deceased, adult birds on roadway. No external signs of injury. Hot days, no rains or insects about.	
Outcome	Likely natural causes – heat and maybe some roost disturbance.	
Date/Time of Incident	**14 November 2014 / 19:45 EST**	
Location	Processing Plant road adjacent SMBS mixing area/ Flotation Circuit bund, Mining Lease,	
Species and number of individuals	Welcome Swallow	1
Description of Incident	Employee on night shift noted deceased adult bird on road adjacent SMBS mixing area/ Flotation Circuit bund.	
Outcome	Likely natural causes – heat and maybe some roost disturbance.	
Date/Time of Incident	**15 November 2014 / 08:00 EST**	
Location	Processing Plant near Tk290, Mining Lease.	
Species and number of individuals	Welcome Swallow	1
Description of Incident	Employee noted deceased adult bird near Tk290 during Shutdown patrol walk.	
Outcome	Likely natural causes – heat and maybe some roost disturbance.	
Date/Time of Incident	**17 November 2014 / 15:25 EST**	
Location	E42 open pit crest (east), Mining Lease.	
Species and number of individuals	Grey Kangaroo	1
Description of Incident	Employee noted a deceased roo stuck about 10 metres out from muddy bank of east edge of Pond D3 HDPE lined stormwater dam.	
Outcome	Most likely natural cause stress – heat, dried out foreshore of Lake Cowal.	
Date/Time of Incident	**20 November 2014**	
Location	Leach Circuit Tails Thickener, Mining Lease.	
Species and number of individuals	Welcome Swallow	4
Description of Incident	Employee reported four deceased Swallows inside Leach Tails Thickener tank.	
Outcome	Inconclusive. Drowning of small bird covered by mud in WAD CN area. Commenced review of a bird netting covering project for Leach Tails Thickener.	
Date/Time of Incident	**24 November 2014**	
Location	Bitumen access road, Mining Lease.	
Species and number of individuals	Zebra Finch	1
Description of Incident	Employee reported a deceased bird on bitumen access road.	
Outcome	Injuries consistent with vehicle impact.	
Date/Time of Incident	**25 November 2014**	
Location	Bitumen access road, Mining Lease.	
Species and number of individuals	Australian Magpie	1
Description of Incident	Employee reported a deceased bird on bitumen access road.	
Outcome	Injuries consistent with vehicle impact.	

Table 27 (Continued): Records of Fauna Deaths and Other Incidents for the Reporting Period

Date/Time of Incident	**26 November 2014**	
Location	Processing Plant concrete bunded area floor, Mining Lease.	
Species and number of individuals	Cuckoo Shrike (juvenile fallen)	1
Description of Incident	Fallen separated from parent. Birds nesting up at height between leach Tanks.	
Outcome	Recent hot weather. Parents often reduce number of siblings during adverse weather.	
Date/Time of Incident	**27 November 2014**	
Location	Reagent Mixing Area road way, Mining Lease.	
Species and number of individuals	Welcome Swallow	1
Description of Incident	Employee reported a deceased bird on gravel roadway.	
Outcome	No external sign of injury.	
Date/Time of Incident	**27 November 2014**	
Location	E42 Mine Pit haul road, Mining Lease.	
Species and number of individuals	Long-necked Turtle	1
Description of Incident	Employee reported a deceased turtle on road.	
Outcome	Injuries consistent with vehicular impact.	
Date/Time of Incident	**29 November 2014**	
Location	Leach Circuit Tails Thickener, Mining Lease.	
Species and number of individuals	Welcome Swallow	4
Description of Incident	Employee reported four deceased Swallows inside Leach Tails Thickener tank.	
Outcome	Inconclusive. Drowning of small bird covered by mud in WAD CN area. Bird netting covering project for Leach Tails Thickener was commenced week prior.	
Date/Time of Incident	**06 December 2014**	
Location	Leach Circuit Tails Thickener, Mining Lease.	
Species and number of individuals	Welcome Swallow	1
Description of Incident	Employee reported a deceased Swallow inside Leach Tails Thickener tank.	
Outcome	Inconclusive. Drowning of small bird covered by mud in WAD CN area. Bird netting covering project for Leach Tails Thickener presently half completed. Slow work due to size and complexity of task. 100% soon.	
Date/Time of Incident	**10 December 2014**	
Location	TSF access road (Wombat Drive), Mining Lease.	
Species and number of individuals	Long-necked Turtle	1
Description of Incident	Employee reported a deceased turtle on gravel road.	
Outcome	Injuries consistent with vehicular impact.	
Date/Time of Incident	**18 December 2014**	
Location	E42 Mine Pit haul road, Mining Lease.	
Species and number of individuals	Australian Wood Duck	1
Description of Incident	Employee reported a freshly flattened brown feathered bird on Western Haul Road adjacent Excavator Maintenance area.	
Outcome	Injuries consistent with vehicular impact.	
Date/Time of Incident	**18 December 2014**	
Location	Southern Lowflow diversion Channel sediment stilling basin, Mining Lease.	
Species and number of individuals	Galah	1
Description of Incident	Employee reported a deceased Galah stuck out in middle of sticky clay dried water puddle (Lake Cowal is dry).	
Outcome	Natural causes. Bird has become stuck in natural clay mud and exhaustion drowned.	

Plate 4: An Eastern Hooded Scaly-foot Lizard (Pygopus schraderi) from concrete bund sump

(8 grams. 20 March 2015 NSW WIRES Call No. GP/RIV2648).

Lake Cowal Waterbird Monitoring

Bird breeding monitoring has been conducted at Lake Cowal since 1989. The long-term monitoring of bird breeding was continued by Peter Gell from the University of Ballarat during January, August and October 2014 (potential bird breeding periods) with the results summarised in Table 29.

A summary of Professor Peter Gell's monitoring results from the reporting period is provided below.

January 2014

The first survey for 2014 was carried out on the 2 and 3 January by Peter Gell and Paul Peake. Recent climatic conditions were very dry and so the lake level had declined even further than the October 2013 survey. Despite this, the lake waters were deep enough for all transects to be surveyed. The reduced depth increased the extent of shallows around the margins of the lake reducing further habitat for birds typical of deeper waters (e.g. Eurasian Coot and diving birds such as grebes). There was little surface water across the surrounding hinterland and Lake Nerang Cowal was mostly dry.

In October 2013 there was no evidence of breeding activity in the areas where colonial nesting typically occurs. This continued into January 2014 with no evidence of breeding activity observed during the transect surveys.

Again, the highest species count was recorded on the mine site transect (T1) (Figure 26). This ongoing feature of the transect may arise as the bund wall extends out into the lake, while the northern and southern ends of the transect represent typical littoral habitat. It is acknowledged that the bund wall habitat is unusual relative to that typical to the lake and it is recommended that, from August 2014, the T1 transect commence at the Sanctuary, and continue for 3km southward to better represent the usual habitat of the lake margin.

A total of 33 species were observed along transects, totalling 8349 birds, the highest tally this filling cycle. This continues a rise in abundance since the low of January 2013. Transect T1 again supported the greatest number of species while transect T7 (Figure 26) again hosted the greatest number of birds, and among the greatest recorded on any transect in any survey (Gell, 2014a).

August 2014

Lake Cowal was visited on August 25th 2014. Water levels were low enough for the north-east transect (T7) (Figure 26) to be dry. All remaining transects were surveyed on the same day. No breeding activity was taking place owing to the stranding of the lignum and red gum stands to the north of the Lake. There was little surface water across the surrounding hinterland and Lake Nerang Cowal was dry.

The area of shallows remained extensive despite the contracting lake margins. The habitat suitable for birds typical of deeper waters (e.g. Eurasian Coot and diving birds such as grebes) had reduced. The overall bird species richness was low, which is typical of the winter surveys.

A total of 20 species were observed along transects, totalling 3627 birds, the highest August tally since 2011, but considerably lower than the 8349 in January. The high richness of wading species continued including unusual records of Latham's Snipe, Spotted Crake, Banded Lapwing and Red-capped Plover. The most common species observed was Grey Teal (2540), and whilst only five duck species were recorded they represented 84% of all birds (Gell, 2014b).

October 2014

The final survey of Lake Cowal for 2014 took place on 19 and 20 October. Climatic conditions were very dry so the level of Lake Cowal had fallen even further since the August survey. While the lake margins were quite distant (~1km) from the usual lake edge, three of the four transects were surveyed. Colonial breeding typically commences by October each year and often extends into January, however with such low water levels, no colonial breeding was observed.

A total of 23 species were observed along transects, totalling 6161 birds. Many species comprising Yellow-billed Spoonbill, Sharp-tailed Sandpiper, Red-necked Stint, Masked Lapwing, Red-capped Plover, Black-winged Stilt, Red-necked Avocet and Gull-billed Tern were recorded in higher numbers than any previous survey across this filling cycle reinforcing observations from previous cycles of the contrasting nature of assemblages in terminal lake phases. This survey was also unique among previous surveys this cycle in the lack of records of any grebes, cormorants, Eurasian Coot or Australian Wood ducks (Gell, 2014c).

Table 29: Bird Breeding Monitoring Results for the Reporting Period

Species	2014 Survey Period												Total
	January				August				October				
	T1	T2	T7	T8	T1	T2	T7	T8	T1	T2	T7	T8	
Australian Pelican	110	222		78	6			2		52		38	**508**
Pied Cormorant	1												**1**
Little Pied Cormorant	1												**1**
Great Cormorant					7								**7**
Little Black Cormorant				1				2					**3**
Hoary-headed Grebe	8												**8**
Black Swan						2							**2**
Pacific Black Duck	26	6	8	4				4				6	**54**
Grey Teal	112	24	4195	113	511	1490		539	215	245		534	**7978**
Australasian Shoveler			3			15		2				2	**22**
Pink-eared Duck			2502	3	4	25		434		202		674	**3844**
Australian Wood Duck	8		119	69				27					**223**
Australian Spotted Crake						2			2				**4**
Black-tailed Native hen				53									**53**
Purple Swamphen	4												**4**
Eurasian Coot	9	19		8									**36**
Eastern Great Egret		9				1				5			**15**
White-necked Heron	1									1			**2**
White-faced Heron	5	8	4	1						1			**19**
Glossy Ibis	2		3							32			**37**
Australian White Ibis	3		8							2			**13**
Straw-necked Ibis	3		2										**5**
Royal Spoonbill									1				**1**
Yellow-billed Spoonbill	44	2		28		41		25	112	25		58	**335**
Lantham's Snipe						2							**2**
Sharp-tailed Sandpiper		5	5						500	288		77	**1385**
Australian Pratincole			4										**4**
Red-necked Stint									6				**6**
Masked Lapwing	7		43	6	4	9			16	109		10	**204**
Banded Lapwing			19			2							**21**
Red-capped Plover			8			2		1	14	2			**27**
Black-winged Stilt	2	6	74		1	350			235	300		140	**1108**
Red-necked Avocet	1		56			81		14	416	1		6	**575**
Black-fronted Dotterel	2		15	1		4		2					**24**
Red-kneed Dotterel	4		12						1				**17**
Silver Gull	5	16	5	6	14	2			6			3	**57**
Whiskered Tern	12	133	70						1008	295		515	**2033**
Gull-billed Tern			1						16				**17**
Total	**370**	**450**	**7156**	**371**	**547**	**2028**	**0**	**1052**	**2548**	**1560**	**0**	**2063**	**18655**
Total Species	**22**	**11**	**21**	**13**	**7**	**15**	**0**	**11**	**14**	**15**	**0**	**12**	**38**

Fauna monitoring of tailings storages and ML 1535 boundary

Fauna monitoring of the tailings storages was initiated at the time of commissioning of the TSF facilities with the twice daily fauna inspections continued during the reporting period as described in Paragraph 3.8.3.1. Both the southern TSF and the northern TSF were active during the course of the reporting period. The STSF was active until 31 August 2014, at which time tailing deposition switched over to the NTSF. The STSF was decommissioned in September 2014 to allow for annual upstream lift project work. This included an upstream embankment raise, seepage cut-off through the Stage 3 decant causeway, and seepage cut-off down pipes around the STSF embankment. Rock buttressing of the lower embankments of the NTSF also commenced during the reporting period.

Donato Environmental Services (DES) conducted a refresher training course on 12 March 2014 for the CGM Processing Plant technicians that are responsible for conducting wildlife surveys. The CGM personnel were presented with information on field survey techniques and systematic procedures for reporting observations into field data sheets. Training also included in-field observations of wildlife at active TSF and a wildlife guild identification test.

Additional to the fauna observation monitoring, bat monitoring using Anabat detectors was undertaken most evenings each month during the reporting period at the active tailings facility and also at the Control site (i.e. the farm homestead stock dam at 'Hillgrove' residence).

Data collected from the monitoring is stored in a database, with the information being used to assess the seasonal usage of the tailings dam, the effectiveness of hazing/deterrent techniques and to record any effects that the tailings may be having on native fauna. Data is reviewed on a six monthly basis by independent consultants.

Two tailings storage areas fauna usage reports were prepared by Donato Environmental Services (DES) during the reporting period being, 1 January 2014 to 30 June 2014 and 1 July 2014 to 31 December 2014, respectively.

The main findings of the reports included:

- The cyanide discharge concentrations were below those required by the Development Consent;
- Monitoring of cyanide concentrations within the active TSF and other water bodies has been conducted frequently and at a high standard consistent with industry best practice;
- No cyanide-related wildlife mortality or effect was recorded at the TSFs;
- Considering currently accepted knowledge of cyanide toxicosis in the gold industry, the range of concentrations reported at CGM are considered benign to wildlife;
- No insectivorous bat deaths were recorded at the TSF during the current monitoring period or since systematic wildlife monitoring commenced in April 2006;
- Nocturnal surveys indicate that insectivorous bats were consistently present in the airspace above the active TSF and the control site;
- Monthly nocturnal surveying conducted at CGM represents a proactive approach to environmental monitoring and it is clearly best practice methodology employed by a gold mining operation in Australia and internationally;
- Birds were the only diurnal vertebrate wildlife recorded to visit and interact with the active TSF;
- The low cyanide concentrations recorded at the active TSF significantly reduced the risk of cyanide toxicosis to avifauna;
- The frequency of systematic wildlife surveys makes it very unlikely that cyanide-related wildlife deaths were occurring undetected;
- Rainfall patterns were not the sole influence on wildlife patterns during the reporting period; and
- Lake Cowal is considered to be a vital influence in the composition and abundance of species occurring at the CGM TSFs.

Six-monthly monitoring reports on fauna usage of the TSFs will be continued and results included in future ARs.

Hazing techniques were employed during the reporting period at the tailings facilities. The following different methods are utilised to deter different bird species:

- one to two radar lobe systems that detect avifauna presence at the tailings facilities;
- up to nine bird deterrent stations, activated remotely by either the radar or timer mode which broadcast bird distress calls, barking dogs, gun shots etc.;
- one to six gas cannons linked to the radar or timer-mode control station/s;
- car horns;
- a bird scaring kite;
- solar powered scattered laser light tripod station (held in safe storage to be used if required); and
- human presence.

These hazing techniques will continue to be used and monitored over the next reporting period, with new methods trialled if required.

The management measures as described in the TSMP were implemented during the reporting period. Weekly visual inspections of the ML 1535 boundary fence were conducted and fence maintenance completed as necessary.

3.8.4 Reportable Incidents

In accordance with Development Consent Condition 3.2(b)(ii), any deaths or other incidents involving native fauna (except those attributable to physical trauma such as vehicle strike) on ML 1535 have been reported to the DTIRIS-DRE, OEH AND CEMCC (and the EPA) within 24 hours (or the next working day), or the DPI (Fisheries) in the case of fish. All deaths or other incidents attributable to physical trauma are summarised in this report. The CEMCC requested at the meeting in December 2006 that in future they would like a summary of native fauna deaths to be provided on a quarterly basis at each meeting, rather than individual letters for each incident.

A summary of the reported native fauna deaths that occurred on ML 1535 in 2014 is provided in Table 28. Incident reports and investigations are undertaken for all native fauna deaths occurring on ML 1535 and are recorded on a site database.

There were no alterations to any threatened fauna species reporting requirements during the reporting period.
No complaints were received relating to threatened fauna at the CGM during the reporting period.

There have been no cyanide related animal deaths at the CGM TSFs since operations commenced in April 2006.

3.8.5 Further Improvements

On-going annual training of Emergency Response and Security staff including any interested WIRES rescuers and carers from West Wyalong will occur as required in the next reporting period. This will maintain or increase the number of staff on-site that can respond to native fauna incidents.

Further improvements in best practice avifauna deterrence will be investigated and implemented as new methods become available.

Approximately 50 mammal and bat boxes are already in position at ‘Lakeside’ and ‘Hillgrove’ and, a further 10 boxes are located on ML 1535 in the fenced forest areas. Usage of these boxes by possums, spiders, bats, galahs and other birds was observed during checks throughout 2014. A further 50 nesting/habitat boxes (manufactured locally in 2012) were installed by elevated work platform in mid-2014 at the Lakeside and Hillgrove properties.

“Beep for Birds” warning signs were installed along the bitumen access roads to the CGM in October 2010. The signs are intended to reduce the number of bird deaths on ML 1535 due to the increased number of birds in the vicinity of the ML as a result of the wet conditions experienced since mid-2010. Bird deaths on the bitumen access road of the ML remain lower than prior since the installation of the eight road signs.

3.9 WEEDS AND PESTS

3.9.1 Reporting Requirements

3.9.1.1 Development Consent

The LMP has been prepared in accordance with Development Consent Condition 3.7 which outlines the land management activities that will be undertaken for all of Barrick's landholdings. The LMP includes the control of noxious weeds as required by the Lachlan (Riverina & Central West) Local Land Services (**LLS**) (formerly the Livestock Health and Pest Authority), BSC and DTIRIS-DRE. The LMP has also been prepared to be consistent with the FFMP as required under Development Consent Condition 3.7. The ROMP is also required to describe measures for controlling weeds and feral pests (including both terrestrial and aquatic species) within ML 1535 and the offset areas.

In accordance with the LMP, the FFMP and the ROMP, general weed and pest management activities within ML 1535 and the offset areas will be reported in the AR. As a component of the AR reporting, the weed control program will be assessed for performance annually, and amended where necessary (e.g. to implement new control measures as advised by BSC or DPI [Agriculture]). Any proposed significant amendments to weed monitoring and management will be discussed with BSC and LLS.

As described in Paragraph 3.7, Barrick commenced preparation of the RMP and BOMP during the reporting period in accordance with modified/approved Development Consent. The RMP and BOMP will include measures for weed and pest measures relevant to on-site rehabilitation and the offset areas, respectively.

3.9.1.2 Environment Protection Licence

Condition R2 of the EPL requires Barrick to notify the EPA of incidents causing or threatening material harm to the environment as soon as practicable after Barrick becomes aware of the incident.

3.9.1.3 Any Other Reporting Requirement

There are no other relevant reporting requirements from other approvals in relation to weeds for the reporting period.

3.9.2 Environmental Management

3.9.2.1 Control Strategies

In accordance with the LMP, FFMP and the ROMP, the control strategies for weed management on Barrick-owned land (including the offset areas) include the following:

- identification of weeds by regular and annual site inspections;
- communication with other landholders/leaseholders and regulatory authorities to keep weed management practices in line with regional weed control activities;
- mechanical removal of identified noxious weeds and/or the application of approved herbicides in authorised areas (herbicide use in wetland areas will be strictly controlled);
- implementing follow-up site inspections to determine the effectiveness of the weed control measures;
- where practicable, prevention of the establishment of new weeds on Barrick-owned land by minimising seed transport of weed species to and from the CGM through the use of a vehicle wash bay (primarily for use on agricultural and earthmoving equipment that are likely to carry weed seeds); and
- pest control activities.

The implementation of weed management strategies typically occurs according to seasonal and climatic requirements.

The pest control activities within ML 1535 and the offset areas described in the LMP, FFMP and the ROMP include the following measures:

- regular property inspections to assess the status of pest populations within Barrick-owned land;
- mandatory pest control for declared pests (i.e. rabbits, pigs and wild dogs) in accordance with Pest Control Orders under the *Local Land Services Act, 2013*; and
- inspections to assess the effectiveness of control measures implemented and review these if necessary.

Barrick undertakes pest control activities in conjunction with adjacent landholders for more effective pest control. This process is facilitated via consultation with local landholders and landholder groups through the CEMCC process.

The *Threat Abatement Plan for Predation by Feral Cats* (Commonwealth Department of the Environment, Water, Heritage and the Arts [**DEWHA**], 2008a) and the *Model Code of Practice for the Humane Control of Feral Cats* (Sharp and Saunders, 2004) will be used as a guide for the humane control of feral cats within ML 1535. The *Threat Abatement Plan for Predation by the European Red Fox* (DEWHA, 2008b) will be used to guide fox control within ML 1535.

In accordance with the LMP, the FFMP and the ROMP, the control strategies for pest management on Barrick-owned land (including the offset areas) include those in Table 30.

Table 30: Summary of Vertebrate Pest Control Measures

Species	Status	Method of Control[2]
[1]European Rabbit (*Oryctolagus cuniculus*)	Declared pest	• baiting rabbits with 1080 and pindone poisoned carrot; and • ripping of rabbit warrens.
[1]European Red Fox (*Vulpes vulpes*)	Nuisance animal	• fox baiting; and • implementing a shooting programme.
[1]Feral Cat (*Felis catus*)	Nuisance animal	• feral cat baiting and Veterinarian euthanasure via WIRES.
Feral Pig	Declared pest	• feral pig trapping.
Wild Dog	Declared pest	• wild dog trapping; • wild dog baiting with 1080; and/or • implementing a shooting programme.

1 Recorded in the surrounding area by Cenwest Environmental Services (2009).

2 NSW Livestock Health and Pest Authority (2010).

Suitable pest controls are determined in consultation with surrounding landholders, Riverina & Central West LLS and DTIRIS-DRE prior to implementation of the pest control programme on Barrick-owned land. This assists in integrating the controls implemented on Barrick-owned land with other pest control in the local area/region.

3.9.2.2 Effectiveness of Control Strategies

The implementation of control strategies adequately suppressed the spread of noxious weeds and pests during the reporting period within ML 1535 and on Barrick-owned land. Notwithstanding, weed control campaigns will continue to be undertaken in accordance with the LMP, FFMP and ROMP to control noxious weed presence.

1080 Fox baiting and pindone rabbit baiting occurred on the mining lease and surrounding Barrick owned land between September – November 2014.

Approximately 440 mouse bait stations have been placed in and around all buildings and perimeter fences on the mining lease and Barrick-owned properties around Lake Cowal due to the mouse population increasing to plaque proportions in early-2011. Rentokil (Albury) are contracted to restock bait stations on a fortnightly basis.

3.9.2.3 Variations from Proposed Control Strategies

There were no variations from the proposed control strategies during the reporting period.

Spider spray fogging by local contractors in the large mining maintenance and processing warehouse sheds and around operations has been an effective control since 2010. This has continued in order to manage Red-back, Black and Orb spider numbers and webs.

3.9.3 Environmental Performance

3.9.3.1 Monitoring

In accordance with the LMP and the ROMP, Barrick has implemented a weed monitoring program at the CGM. Barrick-owned land including the offset areas continues to be surveyed for weeds annually. Follow-up inspections are also to be made for specific areas following the implementation of weed control measures (to assess the success of the weed controls). Weed monitoring is to be conducted by suitably qualified personnel from a slow moving vehicle.

Weed monitoring includes identification of:

- extent of weed occurrence (noxious or otherwise);
- details of weed distribution (i.e. locations of infested areas) and possible reasons for any infestations (e.g. a change in land use practices);
- optimum herbicide application or physical removal timing (for implementation of controls);
- any resistance to a herbicide type or herbicide application technique (on the basis of success of previous controls); and
- identification of any new weed species that may be carried into the CGM area on vehicles accessing the site and become established near the vehicle wash-down area.

3.9.3.2 Performance Outcome

Weed Survey and Management

The annual weed survey was undertaken during December 2014 by NGH Environmental on behalf of Barrick. The survey involved recording the extent of weed occurrences, details of weed distribution and any new weed species infestations. Photographs, general descriptions and GPS coordinates were taken of each of the surveyed areas covering the extent of Barrick-owned land and ML 1535. Weeds of concern, those that are declared noxious in the BSC Local Government Area, and environmental weeds were targeted.

Control methods included chemical boom and spot spraying of the plants when conditions were suitable or their physical removal by manually chipping the weeds out. During all weed control operations a registered selective herbicide was used on land above the high water mark of Lake Cowal. Some control situations required use of non-selective (knockdown) herbicides where combinations of two or more weed types were present. For weed control on the lake bed itself, physical control is used where possible (e.g. slashing, minimal disturbance) or is restricted to use of herbicides registered only for use around waterways.

During the reporting period, CGM experienced a below average winter-early spring period with the lowest annual rainfall total in more than four years. Late spring and summer plant growth (including weed germination) was limited by below average rainfall with warm weather and windy conditions combining to reduce germination of annual species and growth of perennial species.

A summary of the monitoring results from the annual weed survey report (NGH Environmental, 2015) is provided below:

During the 2014 weed survey, a number of noxious weed species were encountered. *S. birchii* (Galvanised Burr) was the most abundant noxious weed and will require management and control. The abundance of *L. ferocissimum* (African Boxthorn) appears to be declining, which in previous weed management reports was described as the most abundant noxious weed species in the survey area.

Prior to the 2014 surveys Lippia (*Phyla canescens)* was observed on the bund between the lake and Cowal Gold Mine site. During the surveys Lippia was observed at waypoint POI018. Lippia is a class 4 Noxious Weed. Class 4 Plants pose a potentially serious threat to primary production, the environment or human health, and is likely to spread within the area or to other area or the property. The growth of the plant must be managed in a manner that continuously inhibits the ability of the plant to spread. This outbreak of Lippia should be sprayed when actively growing. With follow up observation particularly after rainfall and control via spraying and/or chipping if required. Areas of concern include disturbed areas and areas that were over grazed which require on going monitoring and spot spraying especially after suitable rainfall events to ensure outbreaks do not occur at these areas. Other areas of concern include sites where soil moisture is likely to be retained such as moist depressions and around dams.

Scattered individuals of *L. ferocissimum* (African Boxthorn) were observed in this survey and require attention and ongoing monitoring to ensure that outbreaks do not occur in the future. Other agricultural and environmental weeds are likely to appear in high abundances in future seasons due to high levels of disturbance and grazing in some areas.
Ongoing monitoring and an adaptive management approach and chemical controls are essential to ensure that weed numbers are kept under control. Limiting ground disturbance, avoiding overgrazing and maintain high levels of groundcover is the most effective long term solution for weed control.

Weed spraying will be undertaken during the next reporting period when suitable conditions arise. A targeted survey will take place to identify the extent of Lippia and it's location so that follow up control can be undertaken.

Pest Management

Control of mice via mouse bait stations continued to be contracted to Rentokil for the duration of the 2014 reporting period.

Feral Cats

A feral cat eradication program continued during the reporting period. Collapsible cat traps with crush end modifications (retrofitted by the West Wyalong TAFE) were purchased during 2009 and were continued to be used during the reporting period on Barrick-owned property.

Four feral cats were trapped on the mining lease in the reporting period and were taken to West Wyalong Veterinary Clinic to be assessed and euthanased.

Red Foxes

1080 Fox baiting occurred from 27 June 2011 to end-2011. Baiting resumed May 2012 until November 2012. Due to high feed levels in the vegetated surrounding areas, no baiting was conducted during 2013 but due to a visibly increasing number of Red Foxes, baiting recommenced from September - November 2014. This program is likely to continue in 2015.

Rabbits

Pindone treated poison carrots were placed out from September – November 2014 to control increasing numbers of rabbits within the mining lease area. This program will continue in the next reporting period.

Five Rabbits were opportunistically euthanased on site under WIRES Authority during the reporting period.

During the reporting period there were no alterations to any of the pest management requirements and the work carried out in the past few years has shown a the reduction of weeds and pests on the ML and also on the Barrick owned properties.

3.9.4 Reportable Incidents

The LMP and the ROMP require any incidents regarding weed and pest management to be reported in the AR. There were no complaints or incident reports required for weeds or pests.

3.9.5 Further Improvements

Review of fox, rabbit, mouse and feral cat control programs will continue during the next reporting period on ML 1535 and Barrick-owned land. Fox and rabbit baiting and warren ripping will be undertaken during the next reporting period if required, should populations be observed during regular monitoring programs.

Rentokil, Albury were contracted during the 2014 reporting period to assist Barrick in the control and eradication of pest rodent populations.

A targeted program to identify the occurrence and extent of Lippia *(Phyla canescens*) will take place in the next reporting period along with a spraying program to control this weed.

Current weed and pest monitoring will continue during the next reporting period as stated in the LMP, FFMP and ROMP along with weed eradication programs across ML 1535 and Barrick-owned land.

3.10 BLASTING

3.10.1 Reporting Requirements

3.10.1.1 Development Consent

A BLMP (December 2012) has been prepared for the CGM in accordance with the requirements of the former MOD10 Development Consent. Although formal approval of the BLMP (December 2012) by the DP&E remains pending, the DP&E has advised it is satisfied for the BLMP to be implemented in the interim. As a result of approval of the modified MOD11 Development Consent, Barrick commenced preparation of a revised BLMP to reflect the approved CGM during the reporting period. Details regarding the submission and approval of the revised BLMP will be provided in the next AR.

The reporting of blasting monitoring is required by Development MOD11 Consent Condition 6.3(e)(iii), which states:

> *(iii) include a monitoring program for evaluating and reporting on compliance with the blasting criteria and operating conditions of this approval*

Development Consent Condition 6.3(a) details the blast impact assessment criteria relevant to CGM operations (as reproduced in Table 31 in Paragraph 3.10.3).

The BLMP (December 2012) for the CGM requires that the AR reports on the following blasting related issues:

- a summary of all blast monitoring results;
- measures employed to minimise/prevent excessive blast emissions;
- blasting related complaints and amelioration measures undertaken in the event of any confirmed exceedances of blast criteria;
- review of the performance of blast control measures and the monitoring program by a suitably qualified person; and
- CEMCC decisions relating to CGM blast issues.

3.10.1.2 Environment Protection Licence

The EPL requires Barrick to undertake blast monitoring at the points identified in Licence Condition M7.

Condition R1 of the EPL requires the completion of an Annual Return comprising of a Statement of Compliance and a Monitoring and Complaints Summary at the end of each annual reporting period. Barrick submitted the Annual Return for the period 23 December 2013 to 22 December 2014 to the EPA on 20 February 2015. Condition R2 of the EPL requires Barrick to notify the EPA of incidents causing or threatening material harm to the environment as soon as practicable after Barrick becomes aware of the incident. Condition R1.9 of the EPL requires Barrick to report any exceedances of the EPL blasting limits to the regional office of the EPA as soon as practicable after the exceedance becomes known or to one of Barrick's employees or agents.

Condition R1.8 of the EPL requires the results of the blast monitoring required by EPL condition M7.1 to be submitted to the EPA at the end of the reporting period.

3.10.1.3 Any Other Relevant Approval

There are no other relevant reporting requirements from approvals in relation to blasting for the reporting period.

3.10.2 Environmental Management

In accordance with Development Consent Condition 6.3, the BLMP and EPL Conditions L5 and M7, six blast monitors have been installed at designated locations around the CGM to record ground vibration and airblast overpressure. In addition, a 'control' monitor is installed at BM10, located on the eastern edge of the open pit.

3.10.2.1 Control Strategies

In accordance with the BLMP, the control strategies for blasting during the operation of the open pit include the following:

- Reducing the Maximum Instantaneous Charge (**MIC**) to lowest possible level.
- Use of crushed aggregate material for stemming in blast holes to maximise confinement of the explosives in the blast hole thereby minimising the airblast effects.
- Design of drill patterns to ensure stemming heights in the blast holes are adequate to ensure confinement of the explosives.
- Delaying or postponing blast times in unfavourable weather conditions.

Additionally Barrick has adopted a practice of spacing Pre-split and Production blasts by one to two minutes to reduce the potential for cumulative overpressure impact on the immediate surrounds of Lake Cowal. Late 2012 trialling of the covering of detonation lines with fines material did not appear to significantly reduce measured overpressure.

In accordance with Development Consent Condition 6.3, the BLMP and EPL Condition M7, airblast overpressure and ground vibration levels must be measured at nearby residences BM01, BM02 and BM03, at bird breeding areas BM04.1 and BM05 and at the general monitoring site BM06. Figure 8 shows the locations of the monitors at distances of approximately 4.5 to 9 km from the open pit.

Monitoring units located in areas that have the potential to flood have been customised so that ground vibration sensors are waterproof and airblast overpressure sensors are above the high water mark (and remained so during the 2014 monitoring period). During early 2012, a rise of the Lake Cowal water level and inundation of three blast monitors situated in Lake Cowal. Improvements to the monitoring technology and height of the loggers were implemented during the 2013 and 2014 reporting periods.

Communication with the remote units is conducted via battery powered GSM modem fitted and recharged via solar panel. The units send data to Saros, Brisbane. All field monitoring stations are removed annually for independent off-site maintenance and calibration. Since 2012, Barrick has engaged Saros to bring calibrated replacement units to site blast monitoring locations and re-commission each station on the same day to minimise data loss.

3.10.2.2 Effectiveness of Control Strategies

The implementation of control strategies resulted in compliance with the blast impact assessment criteria (Table 31) during the reporting period. As a result, the control strategies are considered to be effective in minimising the potential impacts from blasting at the CGM. Although five complaints were received during the reporting period relating to blasting (Paragraph 4.1), monitoring results indicate that the CGM was operating in accordance with the blast impact assessment criteria defined in the Development Consent (Paragraph 3.10.3).

A license variation was approved on the 24th July 2014 to include a monitoring location at the Cowal North residence (BM8.1) and removal of the General Monitoring location (BM06). A roving unit was installed at BM08.1 on the 11th August 2014. Permanent changes were made to the monitors on the 24th September 2014 when the unit at BM06 was decommissioned and moved to BM08.1. With the inclusion of the monitor at the Cowal North property, the conditions applied to the two lake monitors (Northern Bird Breeding and Southern Bird Breeding) were no longer considered to be residential for the period 1st September until the 22nd December 2014.

Barrick engaged third party consultants in the 2012 and 2013 reporting period to undertake dilapidation surveys of relevant private residences. These surveys evaluated potential blasting impacts from the operation of CGM. It was deemed unnecessary to undertake this type of survey again in the 2014 reporting period.

Barrick considers the actions and measures taken by Barrick have been effective in minimising/mitigating impacts from blasting at the CGM and are in accordance with the requirements of the CGM's Development Consent.

3.10.2.3 Variations from Proposed Control Strategies

There were no variations from the proposed control strategies.

3.10.3 Environmental Performance

Given the updated licence conditions, monitoring data is now divided into *'residence on privately owned land'* and *'specified sensitive locations'*. Monitoring locations BM01 (Gumbelah), BM03 (Coniston) and BM08.1 (Cowal North) are categorised as *'residence on privately owned land'* and required to comply with the compliance limits specified in Condition 6.3 of the Development Consent (Table 31). All other monitoring locations are referred to as '*specified sensitive locations'*, with limits described in the BLMP.

Table 31: Blasting Impact Assessment Criteria

Location	*Time of Blasting*	*Airblast overpressure (dB(Lin Peak))*	*Ground vibration (mm/s)*	*Allowable exceedance*
Residence on privately owned land	*Any time*	*120*	*10*	*0%*
	Monday to Saturday during the Day	*115*	*5*	*5% of the total number of blasts over a period of 12 months*
	Monday to Saturday during the Evening	*105*	*2*	
	Monday to Saturday at Night, Sundays and Public holidays	*95*	*1*	

After extended independent monitoring and review identified no exceedances related to blasting activities at the CGM, the temporary Blast Monitor (BM08) at 'Cowal North' was decommissioned and returned to Saros (26 June 2012). During the 2014 monitoring period, due to changes in the EPL11912 license conditions, a roving unit was installed on 11th August 2014 at an additional sensitive receptor at the Cowal North Property. The fixed unit from the BM06 - General Monitoring location was moved to become a permanent fixed monitor at the Cowal North Property (BM08.1 – Cowal North) as of the 24th September 2014.

Administration Blast Monitor (BM07) has been moved to the east side of the open pit since 09 May 2013 and re-commissioned as BM10 on a dedicated concrete pad near Pond D3. This was recommended by Saros to more clearly define the blasting signature as the pit becomes deeper.

Blast monitor 09 (BM09) was installed on 14 June 2012 on a 4 metre tripod in Lake Cowal on the east-west transect line between BM07 (Admin) and 'Gumbelah' (BM01).
During 26 to 27 July 2012, as a result of the inundation of Lake Cowal monitoring locations BM04, BM05 and BM06 were fitted with new enhanced technology logger units atop the tripod mounts (taller mounts installed on the lake 14 - 15 June 2012).

All blast monitoring equipment underwent an annual calibration over the 24th and 25th September 2014, in accordance with Australian Standard specifications. Additional to the monitor and sensor calibrations, all batteries were replaced and routine maintenance was carried out on all units.

Ground Vibration

A total of 382 blasts were fired during the reporting period. Based on the monitoring data and blasting information available, recorded levels of ground vibration induced by blasting activities conducted at the CGM were compliant with respect to the ground vibration compliance limits.

The maximum blast induced vibration level at the nearest residence was 0.20 mm/s recorded at BM03 - 'Coniston' residence on the 4th August 2014 (Saros, 2015). This level is significantly lower than compliance limit of 10 mm/s at any time.

Air Overpressure

CGM achieved compliance in relation to the specified airblast overpressure impact assessment criteria for the reporting period.

Out of a total of 382 blasts:

- No blast related events exceeded the maximum compliance level of 120dB(L);
- No blast related events exceeded the 115dB(L) level on normal weekdays and Saturdays;
- Ten blast related events exceeded the 95dB(L) level on Sundays and Public Holidays; and
- However, the number of exceedences was not more than the 5% of the total number of blasts, as required by the blast impact assessment criteria defined in Development Consent Condition 6.3(a).

A summary of the peak overpressure levels from individual blasts exceeding the day, evening and compliance criteria, complete with likely cause, is presented in Table **31**. A detailed examination of the monitoring and blasting information was undertaken data by Saros (2015), to ascertain the peak overpressure levels recorded around the time of the specified blasts. A total of 31 events were identified as having a peak overpressure level exceeding the compliance criteria at privately-owned receivers during the reporting period.

The events have been analysed in detail to determine the likely source of overpressure. Of the 31 events that exceeded compliance levels, only 10 of these were independently determined to likely to be directly related to blasting practices and 21 of these were unable to be independently differentiated from the prevailing localised environmental factors such as wind. This has been identified by the extended durations of high overpressure readings within the 30 minute histogram blast window (Saros, 2015).

The majority of exceedances identified at blast times were related to the Sundays' and Public Holidays' compliance limit of 95dB(L). This is to be anticipated given the Sundays' and Public Holiday's overpressure level of 95dB(L) is a significant reduction to the normal weekday and Saturday limit of 115dB(L). It is important to note that this 20dB(L) reduction is equivalent to reducing the weekday and Saturday limit by 90% for Sunday and Public Holiday blasting.

A summary of the 31 events in which the peak overpressure level was exceeded, complete with likely cause, is presented in Table **31**.

Table 32: Summary of Individual Blasts Peak Overpressure Level Exceedances

Location	Date	Time	Time		Compliance Limit	Comments
			PPV (mm/s)	O'Press dB(L)		
BM03 - Coniston Residence	29/12/2013	12:35:17	0.11	103.5	95dB(L) - Sundays' and Public Holidays'	Local environmental factors, unable to differentiate from background levels.
BM05 - Southern Bird Breeding	29/12/2013	12:50:37	0.09	104.9	95dB(L) - Sundays' and Public Holidays'	Local environmental factors, unable to differentiate from background levels.
BM06 - General Monitoring Location	1/01/2014	12:32:52	0.12	98.8	95dB(L) - Sundays' and Public Holidays'	Likely blast related
BM02 - Hillgrove Residence	12/01/2014	12:32:53	0.16	100.0	95dB(L) - Sundays' and Public Holidays'	Local environmental factors, unable to differentiate from background levels.
BM01 - Gumbelah Residence	26/01/2014	12:24:53	0.10	101.0	95dB(L) - Sundays' and Public Holidays'	Likely blast related
BM01 - Gumbelah Residence	2/02/2014	12:40:16	0.15	95.9	95dB(L) - Sundays' and Public Holidays'	Likely blast related
BM04.1 - Northern Bird Breeding	9/02/2014	12:21:16	0.15	100.0	95dB(L) - Sundays' and Public Holidays'	Local environmental factors, unable to differentiate from background levels.
BM01 - Gumbelah Residence	9/03/2014	12:35:42	0.12	98.8	95dB(L) - Sundays' and Public Holidays'	Likely blast related
BM04.1 - Northern Bird Breeding	6/04/2014	12:30:33	0.32	97.5	95dB(L) - Sundays' and Public Holidays'	Likely blast related
BM03 - Coniston Residence	19/04/2014	12:32:55	0.10	103.5	95dB(L) - Sundays' and Public Holidays'	Likely blast related
BM01 - Gumbelah Residence	1/06/2014	12:36:26	0.09	95.5	95dB(L) - Sundays' and Public Holidays'	Likely blast related
BM03 - Coniston Residence	15/06/2014	12:26:49	0.14	97.5	95dB(L) - Sundays' and Public Holidays'	Local environmental factors, unable to differentiate from background levels.
BM02 - Hillgrove Residence	29/06/2014	12:29:07	0.12	104.9	95dB(L) - Sundays' and Public Holidays'	Local environmental factors, unable to differentiate from background levels.
BM02 - Hillgrove Residence	6/07/2014	12:27:29	0.14	103.5	95dB(L) - Sundays' and Public Holidays'	Local environmental factors, unable to differentiate from background levels.
BM03 - Coniston Residence	20/7/2014	12:40:47	0.12	100.0	95dB(L) - Sundays' and Public Holidays'	Likely blast related
BM05 - Southern Bird Breeding	10/08/2014	12:28:52	0.15	103.5	95dB(L) - Sundays' and Public Holidays'	Local environmental factors, unable to differentiate from background levels.
BM08.1 - Cowal North	10/09/2014	12:30:58	0.09	115.9	115dB(L)	Local environmental factors, unable to differentiate from background levels.
BM08.1 - Cowal North	14/09/2014	12:37:09	2.08	109.9	95dB(L) - Sundays' and Public Holidays'	Local environmental factors, unable to differentiate from background levels.
BM08.1 - Cowal North	21/09/2014	12:29:36	0.06	95.9	95dB(L) - Sundays' and Public Holidays'	Local environmental factors, unable to differentiate from background levels.
BM08.1 - Cowal North	21/09/2014	12:33:51	0.07	97.5	95dB(L) - Sundays' and Public Holidays'	Local environmental factors, unable to differentiate from background levels.
BM02 - Hillgrove Residence	28/09/2014	12:38:02	0.10	102.8	95dB(L) - Sundays' and Public Holidays'	Local environmental factors, unable to differentiate from background levels.
BM03 - Coniston Residence	26/10/2014	12:30:14	0.16	97.5	95dB(L) - Sundays' and Public Holidays'	Local environmental factors, unable to differentiate from background levels.

Table 31 (continued): Summary of Individual Blasts Peak Overpressure Level Exceedances (23/12/2013 - 22/12/2014)

Location	Date	Time	Time		Compliance Limit	Comments
			PPV (mm/s)	O'Press dB(L)		
BM08.1 - Cowal North	27/10/2014	12:28:47	0.25	118.3	115dB(L)	Local environmental factors, unable to differentiate from background levels.
BM02 - Hillgrove Residence	2/11/2014	12:25:56	0.09	100.0	95dB(L) - Sundays' and Public Holidays'	Local environmental factors, unable to differentiate from background levels.
BM02 - Hillgrove Residence	2/11/2014	12:28:24	0.09	104.9	95dB(L) - Sundays' and Public Holidays'	Likely blast related
BM08.1 - Cowal North	9/11/2014	12:53:33	0.05	95.9	95dB(L) - Sundays' and Public Holidays'	Likely blast related
BM08.1 - Cowal North	16/11/2014	12:39:28	0.08	110.9	95dB(L) - Sundays' and Public Holidays'	Local environmental factors, unable to differentiate from background levels.
BM05 - Southern Bird Breeding	23/11/2014	12:26:09	0.22	116.3	95dB(L) - Sundays' and Public Holidays'	Local environmental factors, unable to differentiate from background levels.
BM08.1 - Cowal North	23/11/2014	12:26:09	0.14	112.3	95dB(L) - Sundays' and Public Holidays'	Local environmental factors, unable to differentiate from background levels.
BM02 - Hillgrove Residence	30/11/2014	12:28:37	0.08	103.5	95dB(L) - Sundays' and Public Holidays'	Local environmental factors, unable to differentiate from background levels.
BM02 - Hillgrove Residence	16/12/2014	12:27:00	0.08	115.4	115dB(L)	Local environmental factors, unable to differentiate from background levels.

New EPL compliance limits with respect to residences on privately owned land, instated 24 June 2011:

- The PPV level of 5mm/s for ground vibration during the day may be exceeded for up to 5% of the total number of blasts for a period of 12 months. The level should not exceed 10mm/s at any noise sensitive location;
- The air blast overpressure level of 115dB (Linear Peak) during the day may be exceeded for up to 5% of the total number of blasts for a period of 12 months. The level should not exceed 120dB (Linear Peak) at any noise sensitive location; and
- The airblast overpressure level of 95dB (Linear Peak) on Sundays (24 hours) and Public Holidays (24 hours) may be exceeded for up to 5% of the total number of blasts for a period of 12 months.

3.10.4 Reportable Incidents

There were five community complaints received related to blasting during the reporting period. A summary of the complaints during the reporting period is provided in Paragraph 4.1.

No issues or resolutions related to blasting were raised by the CEMCC during the reporting period.

3.10.5 Further Improvements

Determination of hardware issues delayed the installation of anemometer devices in 2014. Anemometers and wind direction sensors are intended to be installed on the new enhanced loggers at each location, during the 2015 reporting period. Installation is intended to improve the determination of localised effects of weather conditions for blast monitoring.

Under the 2012 rental agreement with Saros, incoming units (for calibration) will continue to be swapped out with ‘duty’ units on the same day to further minimise data loss.

3.11 OPERATIONAL NOISE

3.11.1 Reporting Requirements

3.11.1.1 Development Consent

Noise management and reporting of noise monitoring is required by Development Consent Condition 6.4(e), which states:

Noise Management Plan

6.4(e) The Applicant shall prepare and implement a Noise Management Plan for the development to the satisfaction of the Secretary. This plan must:

(i) be prepared in consultation with EPA, and submitted to the Secretary for approval prior to carrying out any development under this approval, unless the Secretary agrees otherwise;

(ii) describe the measures that would be implemented to ensure compliance with the noise criteria and operating conditions in this approval; and

(iii) include a monitoring program that

- *evaluates and reports on:*
  - *compliance with the noise criteria in this approval; and*
  - *compliance with the noise operating conditions;*
- *Defines what constitutes a noise incident, and includes a protocol for identifying and notifying the Department and relevant stakeholders of any noise incidents.*

As described in Paragraph 1.1.2, the modification to the CGM Development Consent was approved by the Minister for Planning during the reporting period (on 22 July 2014). Subsequently, in accordance with Development Consent Condition 6.4, the NMP (November 2014) was revised during the reporting period to reflect the modified Development Consent conditions relevant to noise. The modified conditions include property acquisition rights for three adjoining farm properties, the requirement for quarterly ambient noise surveys, revised noise impact assessment criteria and the cessation of annual traffic noise monitoring. The revised NMP was prepared in consultation with the EPA and submitted for approval by the end of November 2014. Barrick received DP&E approval for the revised NMP on 5 March 2015.

As described above, the requirement to undertake traffic noise monitoring was removed from the modified Development Consent (MOD11). Notwithstanding, traffic noise monitoring was undertaken during the reporting period up until approval of the revised NMP in accordance with previous Development Consent Conditions 6.4(d) and (e) which state:

(d) The Applicant shall take all reasonable and feasible measures to ensure that traffic noise generated by the project does not exceed the traffic noise impact assessment criteria in Table 9.

Table 9: Traffic noise criteria dB(A) $L_{Aeq\ (1\ hour)}$

Road	Day/Evening	Night
Ungarie Road	*60*	*55*
Wamboyne Road, Blow Clear Road, Carrawandool-Warroo Road, Burcher Road, Condobolin Road, Lake Cowal Road	*55*	*50*

Note: Traffic noise generated by the project is to be measured in accordance with the relevant procedures in EPA's Environmental Criteria for Road Traffic Noise.

(e) Truck movements for material delivery purposes will be restricted as far as practicable to the day and evening periods.

SLR Consulting was engaged to conduct mine operational noise and traffic noise monitoring during the first half of the reporting period and in accordance with the former NMP.

Spectrum Acoustics completed the operational noise monitoring during the latter half of 2014.

Noise monitoring was undertaken during the reporting period to demonstrate compliance with the noise impact assessment criteria set out in the former MOD10 Development Consent Condition 6.4(c), which requires that noise generated by the CGM does not exceed the criteria in Table 33 below, at any residence on privately-owned land, or on more than 25 percent of privately owned land not located within Lake Cowal.

Table 33: Former MOD10 Development Consent Noise Impact Assessment Criteria dB(A) LAeq (15minute)

Location	Day/Evening/Night[1]
Bungabulla	39
Coniston	44
Cowal North	38
Gumbelah	39
Lake Cowal (non-Barrick)	38
Laurel Park	39
Mattiske	36
McLintock	41

Table 34 (Continued): Former MOD10 Development Consent Noise Impact Assessment Criteria dB(A) LAeq (15minute)

Location	Day/Evening/Night[1]
The Glen	38
West Lea	41
All other residences	35

Notes:

- To interpret the locations referred to in Table 33, see Figure 8.
- Noise generated by the project is to be measured in accordance with the relevant requirements, and exemptions (including certain meteorological conditions), of the NSW Industrial Noise Policy.
- The noise limits do not apply if the Applicant has an agreement with the relevant owner/s of these residences/land to generate higher noise levels, and the Applicant has advised the Department of Planning in writing of the terms of this agreement.
- [1]Mine noise emission criteria – applicable to condition 6.3(a) of the March 2010 modified development consent

Noise monitoring was also undertaken during the reporting period to demonstrate compliance with the modified noise impact assessment criteria required by MOD11 Development Consent Condition 6.4(c), which requires that noise generated by the CGM does not exceed the criteria in Table 35 at any residence on privately-owned land.

Table 35: Approved MOD11 Development Consent Noise Impact Assessment Criteria dB(A) L_{Aeq} (15minute)

Location (Figure 8)	Day/Evening/Night[1,2]
Laurel Park	37
Bramboyne, Bungabulla, The Glen and Gumbelah	36
All other privately-owned land	35

[1] Noise generated by the development is to be measured in accordance with the relevant requirements of the NSW Industrial Noise Policy (as may be updated from time to time). Appendix 5 of the MOD11 Development Consent sets out the meteorological conditions under which these criteria apply, and the requirements for evaluating compliance with these criteria.

[2] However, these criteria do not apply if the Applicant has an agreement with the owner/s of the relevant residence or land to generate higher noise levels, and the Applicant has advised the DP&E in writing of the terms of this agreement.

Consistent with the requirements of MOD11 Development Consent Condition 6.4(c), Barrick has entered into agreements with owners of the Laurel Park, Gumbelah and Cowal North properties, accordingly the noise impact assessment criteria do not apply at these properties.

3.11.1.2 Environmental Protection Licence

An application to vary the EPL to reflect the approved MOD11 Development Consent requirements relevant to noise was commenced during the reporting period. Submission and approval of the EPL variation application will be detailed in the next AR.

3.11.1.3 Any Other Relevant Approval

There are no other relevant reporting requirements from approvals in relation to noise for the reporting period.

3.11.2 Environmental Management

3.11.2.1 Control Strategies

In accordance with the former NMP, control strategies used at the CGM during the reporting period (for operational activities) utilised best management practices and the best available technology economically achievable.

Best Management Practice

Best management practices applied during the reporting period to minimise CGM noise emissions include:

- restricting movement of trucks on ridgelines and exposed haul routes where their noise can propagate over a wide area, especially at night. This means restricting night-time movement of material to areas shielded by barriers or mounds, and reserving large-scale material movement for daytime. The LPB provides noise shielding, thereby reducing noise levels that could propagate from the open pit across Lake Cowal;
- scheduling the use of any noisy equipment during daytime;
- sighting noisy equipment behind structures that act as barriers, or at the greatest distance from the noise-sensitive area, or orienting the equipment so that noise emissions are directed away from any sensitive areas, to achieve the maximum attenuation of noise;
- where there are several noisy pieces of equipment, scheduling operations so they are used separately rather than concurrently;
- keeping equipment well maintained;
- employing 'quiet' practices when operating equipment (e.g. positioning idling trucks in appropriate areas);
- educating staff on the effects of noise and the use of quiet work practices;
- specify maximum noise/sound levels when purchasing equipment; and
- including maximum noise/sound levels in tender documents and contracts.

Best Available Technology Economically Achievable

Best available technology economically achievable that may be applied to minimise CGM noise emissions during the reporting period include:

- adjusting reversing alarms on heavy equipment limiting acoustic range to the immediate danger area;
- minimising night time tracking of dozers on top of stockpiles;
- restricting working hours on faces closest to neighbours during wall lift project works;
- using equipment with efficient mufflers;
- damping or lining metal trays on Dump Trucks; and/or
- employing active noise control measures during normal and maintenance shutdown periods.

3.11.2.2 Effectiveness of Control Strategies

In accordance with the NMP, Barrick continued to implement the control strategies described above during the reporting period. These measures were considered effective in minimising noise emissions from the CGM, as demonstrated by the environmental performance results discussed in Paragraph 3.11.3 below.

Although one complaint was received during the reporting period relevant to operational noise (Paragraph 4.1), results of independent noise monitoring indicated that the CGM was operating in accordance with the relevant Development Consent noise criteria (Paragraph 3.11.3).

In addition to the control strategies implemented on-site, during the 2013 reporting period Barrick sought to enter Noise Mitigation Agreements with relevant landholders in accordance with procedures defined in the CGM's former MOD10 Development Consent. These Agreements involved Barrick agreeing to implement various measures at relevant residences to mitigate/minimise noise impacts associated with operation of the CGM. These measures included installation of air conditioning and/or double glazed windows at these residences.

Since the measures were implemented and the Agreements settled, complaints regarding operational noise have reduced.

Barrick considers the actions and measures taken by the company have been effective and are in accordance with the requirements of the CGM's Development Consent.

3.11.2.3 Variations from Proposed Strategies

There were no variations from the proposed control strategies during the reporting period.

3.11.3 Environmental Performance

3.11.3.1 Monitoring

The daytime, evening and night-time operator-attended mine operating noise surveys were conducted during the reporting period from 20th to 23rd January 2014 and 21 July to 23 July 2014 by SLR Consulting and, 23rd to 25th October 2014 by Spectrum Acoustics. Field assistance was also provided by the CGM Environmental Department. The survey results are presented together with the respective noise criteria in the NMP, determined in accordance with the NSW Industrial Noise Policy (INP).

No non-compliances of the noise impact assessment criteria specified in the both the MOD10 and MOD11 Development Consent were reported during the reporting period.

3.11.3.2 Daytime Operator-attended Noise Survey Results

Daytime operator-attended mine operating noise surveys were conducted in January 2014 and October 2014. Summaries of the survey results are presented in Table 36, Table 36 and Table 37, together with the respective noise criteria.

Table 36: January 2014 Daytime Noise Monitoring Results

	Monitoring conducted under MOD10 Development Consent Condition 6.4(c) in January 2014		
Location (Figure 8)	**Address**	**Mine Contributed $L_{Aeq(15minute)}$ A (dBA)**	**Noise Impact Assessment Criteria[4] $L_{Aeq(15minute)}$**
No.1	New Lake Foreshore	27, 28	N/A[3]
No.2	'Coniston' Residence	<29, <29	44 dBA
No.3	Bird Breeding Area (South)	31, 31	N/A[3]
No.4	Bird Breeding Area (North)	<30, <29	N/A[3]
No.5	'Gumbelah' Residence	<31, <27	39 dBA
No.6	'Lake Cowal' Residence	26, 26	N/A[5]
No. 7	'West Lea' Property	<18, <18	41 dBA
No. 8	'McLintock' Property	<24, <26	41 dBA
No. 9	"Cowal North" Residence	30, 31	38 dBA

Note:
N/A[1] - Mine noise emission not discernible.

N/A[2]- No Survey Conducted. Inaccessible and/or adverse weather during test period.
N/A[3] - Mine noise emission criteria apply to residences only
N/A[4] – Digital audio Recordings Analysis
N/A[5] – Mine owned property

Table 37: July 2014 Daytime Noise Monitoring Results

	Monitoring conducted under MOD10 Development Consent Condition 6.4(c) in January 2014		
Location (Figure 8)	**Address**	**Mine Contributed $L_{Aeq(15minute)}$** **A (dBA)**	**Noise Impact Assessment Criteria[4] $L_{Aeq(15minute)}$**
No.1	New Lake Foreshore	23, 22	N/A[3]
No.2	'Coniston' Residence	22, 22	44 dBA
No.3	Bird Breeding Area (South)		N/A[3]
No.4	Bird Breeding Area (North)	<22, <20	N/A[3]
No.5	'Gumbelah' Residence	<13, <11	39 dBA
No.6	'Lake Cowal' Residence	<18, <11	N/A[5]
No. 7	'West Lea' Property	30, 29	41 dBA
No. 8	'McLintock' Property	25, 25	41 dBA
No. 9	"Cowal North" Residence	<14, <13	38 dBA

Note:
N/A[1] - Mine noise emission not discernible.
N/A[2]- No Survey Conducted. Inaccessible and/or adverse weather during test period.
N/A[3] - Mine noise emission criteria apply to residences only
N/A[4] – Digital audio Recordings Analysis
N/A[5] – Mine owned property

Table 38: October 2014 Daytime Noise Monitoring Results

Location (Figure 8)	**Time**	**Total dB(A), Leq(15 min)**	**Wind speed/ direction**	**Temp Grad (°C/100m)**	**Identified Noise Sources**	**Noise Impact Assessment Criteria[4] $L_{Aeq(15minute)}$**
No. 1	3:11 pm	33	7.8/521	Lapse	Birds (30), wind (28), **CGM (26)**	N/A[1]
	3:26 pm	36	7.0/255	Lapse	Birds (33), wind (33), **CGM (28)**	N/A
Bramboyne (N10)	4:53 pm	44	6.3/237	+0.4	Birds (44), wind (33), **CGM inaudible**	36
	5:08 pm	36	5.6/242	+0.8	Birds (34), wind (31), **CGM inaudible**	36
Laurel Park (N11)	5:30 pm	40	5.3/239	Lapse	Cattle (38), birds/insects (35), **CGM inaudible**	37
	5:45 pm	41	6.0/221	0.0	Cattle (40), birds/insects (35), **CGM inaudible**	37
The Glen (N12)	4:06 pm	37	7.0/237	Lapse	Wind (35), birds/insects (32), **CGM inaudible**	36
	4:21 pm	38	7.5/234	Lapse	Wind (35), birds/insects (35), **CGM inaudible**	36
Gumbelah (N05)	4:48 pm	42	6.3/237	0.0	Birds (41), plane (31), wind (31), **CGM inaudible**	36
	5:03 pm	54	5.6/242	+1.5	Birds (54), wind (30), **CGM inaudible**	36
Bungabulla (N13)	5:24 pm	42	5.4/240	Lapse	Birds (41), motorbike (36), **CGM inaudible**	36
	5:39 pm	43	5.7/229	Lapse	Birds (42), motorbike (37), **CGM inaudible**	36

1 - Mine noise emission criteria apply to residences only

During the January 2014 and October 2014 monitoring periods, the measured daytime mine noise emissions at the residential dwellings were below the applicable daytime noise $L_{Aeq(15minute)}$ criteria.

3.11.3.3 Evening Operator-attended Noise Survey Results

Evening operator-attended mine operating noise surveys were conducted in January 2014 and October 2014. Summaries of the survey results are presented in Table 38, Table 39 and Table 40 together with the respective noise criteria.

Table 39: January 2014 Evening Noise Monitoring Results

	Monitoring conducted under MOD10 Development Consent Condition 6.4(c) in January 2014		
Location (Figure 8)	**Address**	**Mine Contributed $L_{Aeq(15minute)}$ A (dBA)**	**Noise Impact Assessment Criteria[4] $L_{Aeq(15minute)}$**
No.1	New Lake Foreshore	36, 39	N/A[3]
No.2	'Coniston' Residence	<24, <22	44 dBA
No.3	Bird Breeding Area (South)	N/A[2]	N/A[3]
No.4	Bird Breeding Area (North)	N/A[2]	N/A[3]
No.5	'Gumbelah' Residence	<31, <31	39 dBA
No.6	'Lake Cowal' Residence	<26, <16	N/A[5]
No. 7	'West Lea' Property	<19, <19	41 dBA
No. 8	'McLintock' Property	<30, <31	41 dBA
No. 9	"Cowal North" Residence	32, 34	38 dBA

Note:
N/A[1] - Mine noise emission not discernible.
N/A[2]- No Survey Conducted. Inaccessible and/or adverse weather during test period.
[3] - Mine noise emission criteria apply to residences only
[4] – Digital audio Recordings Analysis
[5] – Mine owned property

Table 40: July 2014 Evening Noise Monitoring Results

	Monitoring conducted under MOD10 Development Consent Condition 6.4(c) in January 2014		
Location (Figure 8)	**Address**	**Mine Contributed $L_{Aeq(15minute)}$ A (dBA)**	**Noise Impact Assessment Criteria[4] $L_{Aeq(15minute)}$**
No.1	New Lake Foreshore	21, 20	N/A[3]
No.2	'Coniston' Residence	<16, <17	44 dBA
No.3	Bird Breeding Area (South)		N/A[3]
No.4	Bird Breeding Area (North)		N/A[3]
No.5	'Gumbelah' Residence	<14, <15	39 dBA
No.6	'Lake Cowal' Residence	<10, <15	N/A[5]
No. 7	'West Lea' Property	15, 24	41 dBA
No. 8	'McLintock' Property	<22, <22	41 dBA
No. 9	"Cowal North" Residence	<10, <9	38 dBA

Note:
N/A[1] - Mine noise emission not discernible.
N/A[2]- No Survey Conducted. Inaccessible and/or adverse weather during test period.
[3] - Mine noise emission criteria apply to residences only
[4] – Digital audio Recordings Analysis
[5] – Mine owned property

Table 41: October 2014 Evening Noise Monitoring Results

Location (Figure 8)	Time	Total dB(A), Leq (15 min)	Wind speed/ direction	Temp Grad (°C/100m)	Identified Noise Sources	Noise Impact Assessment Criteria[4] $L_{Aeq(15minute)}$
No. 1	8:24 pm	43	3.2/204	+2.4	Frogs/insects (36), **CGM (35)**	N/A[1]
	8:39 pm	37	2.8/202	+1.8	Frogs/insects (34), **CGM (33)**	N/A
Bramboyne (N10)	6:45 pm	43	5.9/215	0.0	Birds (43), **CGM inaudible**	36
	7:00 pm	39	5.0/216	Lapse	Birds (39), **CGM inaudible**	36
Laurel Park (N11)	6:06 pm	40	6.4/223	Lapse	Cattle (40), **CGM inaudible**	37
	6:21 pm	39	5.9/228	0.0	Cattle (39), **CGM inaudible**	37
The Glen (N12)	7:35 pm	35	5.1/217	+0.6	Insects (35), **CGM inaudible**	36
	7:50 pm	39	4.8/216	+2.4	Insects (39), **CGM inaudible**	36
Gumbelah (N05)	6:07 pm	48	6.4/223	Lapse	Birds (48), motorbike (32), **CGM inaudible**	36
	6:22 pm	44	5.9/228	0.0	Birds/insects (44), wind (28), **CGM inaudible**	36
Bungabulla (N13)	6:44 pm	39	5.9/215	0.0	Birds (39), wind (25), sheep (22), **CGM inaudible**	36
	6:59 pm	46	5.0/216	Lapse	Birds (46), motorbike (25), **CGM inaudible**	36

1 - Mine noise emission criteria apply to residences only

During the January 2014 and October 2014 monitoring periods, the measured evening mine noise emissions at the residential dwellings were below the applicable evening noise $L_{Aeq(15minute)}$ criteria.

3.11.3.4 Night-time Operator-attended Noise Survey Results

Night-time operator-attended mine operating noise surveys were conducted in January 2014 and October 2014. Summaries of the survey results are presented in Table 41, Table 42 and Table 43 together with the respective noise criteria.

Table 42: January 2014 Night Time Noise Monitoring Results

	Monitoring conducted under MOD10 Development Consent Condition 6.4(c) in January 2014		
Location (Figure 8)	**Address**	**Mine Contributed $L_{Aeq(15minute)}$ A (dBA)**	**Noise Impact Assessment Criteria[4] $L_{Aeq(15minute)}$**
No.1	New Lake Foreshore	39, 39	N/A[3]
No.2	'Coniston' Residence	26, 26	44 dBA
No.3	Bird Breeding Area (South)	N/A[2]	N/A[3]
No.4	Bird Breeding Area (North)	N/A[2]	N/A[3]
No.5	'Gumbelah' Residence	<33, <34	39 dBA
No.6	'Lake Cowal' Residence	<22, <18	N/A[5]
No. 7	'West Lea' Property	<19, <19	41 dBA
No. 8	'McLintock' Property	<23, <28	41 dBA
No. 9	"Cowal North" Residence	34, 33	38 dBA

Note:
N/A[1] - Mine noise emission not discernible.
N/A[2]- No Survey Conducted. Inaccessible and/or adverse weather during test period.
[3] - Mine noise emission criteria apply to residences only
[4] – Digital audio Recordings Analysis
[5] – Mine owned property

Table 43: July 2014 Night Time Noise Monitoring Results

	Monitoring conducted under MOD10 Development Consent Condition 6.4(c) in January 2014		
Location (Figure 8)	**Address**	**Mine Contributed $L_{Aeq(15minute)}$ A (dBA)**	**Noise Impact Assessment Criteria[4] $L_{Aeq(15minute)}$**
No.1	New Lake Foreshore	23, 23	N/A[3]
No.2	'Coniston' Residence	<18, <17	44 dBA
No.3	Bird Breeding Area (South)		N/A[3]
No.4	Bird Breeding Area (North)		N/A[3]
No.5	'Gumbelah' Residence	<14, 21	39 dBA
No.6	'Lake Cowal' Residence	26, 26	N/A[5]
No. 7	'West Lea' Property	28, 30	41 dBA
No. 8	'McLintock' Property	<22, <22	41 dBA
No. 9	"Cowal North" Residence	<12, <12	38 dBA

Note:
N/A[1] - Mine noise emission not discernible.
N/A[2]- No Survey Conducted. Inaccessible and/or adverse weather during test period.
[3] - Mine noise emission criteria apply to residences only
[4] – Digital audio Recordings Analysis
[5] – Mine owned property

Table 44: October 2014 Night Time Noise Monitoring Results

Location (Figure 8)	Time	Total dB(A), Leq (15 min)	Wind speed/ direction	Temp Grad (°C/100m)	Identified Noise Sources	Noise Impact Assessment Criteria[4] $L_{Aeq(15minute)}$
No. 1	12:30 am	48	2.0/223	0.0	Car (46), birds (44), **CGM (28)**	N/A[1]
	12:45 am	34	1.9/217	+1.7	Birds (32), **CGM (30)**	N/A
Bramboyne (N10)	10:13 pm	33	3.0/218	+2.9	Frogs/insects (30), wind (30), **CGM inaudible**	36
	10:28 pm	30	3.4/223	+1.2	Frogs/insects (28), wind (25), **CGM inaudible**	36
Laurel Park (N11)	10:53 pm	34	2.9/227	+1.7	Cattle (34), **CGM inaudible**	37
	11:08 pm	29	2.7/217	+1.4	Cattle (29), **CGM inaudible**	37
The Glen (N12)	11:42 pm	34	2.5/204	+1.1	Frogs & insects (34), **CGM inaudible**	36
	11:57 pm	35	2.5/203	+2.3	Frogs/insects (35), **CGM inaudible**	36
Gumbelah (N05)	10:01 pm	40	2.7/218	+0.6	Frogs/insects (40), domestic (25), **CGM (<20)**	36
	10:16 pm	40	3.0/218	+2.9	Frogs/insects (40), domestic (24), **CGM (<20)**	36
Bungabulla (N12)	10:37 pm	42	3.3/228	+1.5	Frogs/insects (40), wind in trees (37), **CGM (21)**	36
	10:52 pm	42	2.9/227	+1.7	Frogs/insects (40), wind in trees (37), **CGM (22)**	36

1 - Mine noise emission criteria apply to residences only

During the January 2014 and October 2014 monitoring periods, the measured night-time mine noise emissions at the residential dwellings were below the applicable night-time noise $L_{Aeq(15minute)}$ criteria.

3.11.3.5 Unattended Continuous Operational Noise Logging

Unattended continuous noise loggers were positioned at all monitoring locations from 20 January to 5 February 2014. The loggers were used to quantify the overall noise amenity in the vicinity of CGM in accordance with former MOD10 Development Consent Conditions and the former NMP during the reporting period.

All operator unattended noise recordings in January 2014 and July 2014 were measured to be below the Development Consent criteria during all periods of the day at all locations monitored. As a result, the CGM was observed to be in compliance with the relevant noise requirements during all periods of the operator-attended noise monitoring (SLR, 2014).

3.11.3.6 Operator-attended and Unattended Traffic Noise

In addition to the operational noise monitoring, SLR Consulting were engaged during the reporting period to conduct mine traffic noise surveys in accordance with MOD10 Development Consent Conditions and the former NMP during the reporting period.

The following monitoring locations were selected in the (pre-construction) Baseline Traffic Noise Assessment. These locations described below were considered to be representative of the locality types which could have been potentially impacted along the access route between the CGM and West Wyalong.

- TN1 140 Ungarie Road, West Wyalong (near intersection with Dumaresq Street) Offset distance from the road – 30 m
- TN2 “Clairview”, 56 – 86 Wamboyne Road, Offset distance from the road – 45 m
- TN3“Windstone”, 648 Wamboyne Road Offset distance from the road – 150 m

To quantify overall ambient and traffic noise levels during mine operations, operator attended traffic noise measurements were conducted at the three monitoring locations, listed above, during the morning and afternoon peak-traffic periods from 21 to 22 January 2014 (Table 45, Table 46 and Table 47).

To quantify traffic volumes and determine peak traffic periods, three automatic traffic counters (ATCs) were deployed to determine overall traffic volumes, peak traffic periods as well as vehicle speeds. The ATCs were deployed for a one week period from 20 January 2014.

To accurately identify CGM vehicles, video cameras that enabled the capture of vehicle number plates were installed at five locations. The cameras were set to record videos of the pass-by traffic during morning and afternoon peak hours over 5 days (20 January to 24 January 2014). Cameras were located at the following locations:

- TN1 140 Ungarie Road;
- TN2 50 metres south of "Clairview", Wamboyne Road;
- TN3 "Windstone", 648 Wamboyne Road; and
- At the two CGM entry/ exit sites.

Analysis of the traffic count data shows that the night-time/early morning peak traffic period at TN1, TN2 and TN3 occurred from 0600 hours to 0700 hours and the evening peak traffic period occurred from 1700 hours to 1800 hours at TN1, TN2 and TN3.

Table 45: Operator-attended and ATC Traffic Noise Emission Survey Results (January 2014)
TN 1 - 140 Ungarie Road

Date	Mine[1] Traffic Criteria	Traffic Counts			Traffic Noise Levels (Calculated)[2,3]				Unattended (Overall)[1,2]
		Total	Non-Mine	Mine	Total	Non-Mine	Mine	Mine Exceedances	
Daytime Peak (1700 hours to 1800 hours)									
Monday 20-01-2014	65	124	68	56	60	58	56	-	62
Tuesday 21-01-2014	65	133	81	52	61	59	57	-	62
Wednesday 22-01-2014	65	125	79	46	62	60	58	-	62
Thursday 23-01-2014	65	113	66	47	62	60	57	-	62
Friday 24-01-2014	65	114	89	25	62	61	55	-	63
Five-Day Average	65	122	77	45	61	60	57	-	62
Night-time Peak (0600 hours to 0700 hours)									
Monday 20-01-2014	60	83	48	35	-	-	-	-	-
Tuesday 21-01-2014	60	97	51	46	60	58	56	-	61
Wednesday 22-01-2014	60	94	54	40	59	57	55	-	61
Thursday 23-01-2014	60	107	60	47	61	59	57	-	62
Friday 24-01-2014	60	74	37	37	60	56	56	-	60
Five-Day Average	60	91	50	41	60	58	56	-	61

Note 1: Negotiated Agreement Criterion (refer to **Section 2.1**).
Note 2: Includes facade correction
Note 3: Includes a distance correction

TN1 140 Ungarie Road

The five-day average calculated LAeq(1hour) mine generated traffic noise at TN1 during the daytime (1700 hours to 1800 hours) is 57 dBA (ie below the negotiated 65 dBA criterion). The five-day average calculated LAeq(1hour) mine generated traffic noise at TN1 during the night-time (0600 hours to 0700 hours) is 56 dBA which is below the negotiated 60 dBA criterion.

Furthermore, dwellings located within 13 m of Ungarie Road may potentially receive traffic noise levels in excess of the negotiated 60 dBA criterion during the night-time peak hour. Based on the NMP, there are no dwellings located within 13 m from Ungarie Road.

For those dwelling where there is no negotiated agreement, dwellings within 39 m of Ungarie Road may potentially receive noise levels in excess of the 55 dBA criterion during the night-time peak hour. Based on the NMP, there are no other dwellings located within 39 m from Ungarie Road.

Table 46: Operator-attended and ATC Traffic Noise Emission Survey Results (January 2014)
TN2 - 'Clairview' Residence

Date	Mine[1] Traffic Criteria	Traffic Counts			Traffic Noise Levels (Calculated)[2,3]				Unattended (Overall)[1,2]
		Total	Non-Mine	Mine	Total	Non-Mine	Mine	Mine Exceedances	
Daytime Peak (1700 hours to 1800 hours)									
Monday 20-01-2014	60	68	11	57	48	44	46	-	54
Tuesday 21-01-2014	60	74	14	60	48	43	46	-	54
Wednesday 22-01-2014	60	64	8	56	48	39	48	-	54
Thursday 23-01-2014	60	63	10	53	48	43	47	-	54
Friday 24-01-2014	60	36	9	27	48	41	47	-	53
Five-Day Average	60	61	10	51	48	42	46	-	54
Night-time Peak (0600 hours to 0700 hours)									
Monday 20-01-2014	55	41	3	38	-	-	-	-	-
Tuesday 21-01-2014	55	58	4	54	52	37	52	-	57
Wednesday 22-01-2014	55	64	9	55	51	43	51	-	57
Thursday 23-01-2014	55	68	13	55	53	45	53	-	58
Friday 24-01-2014	55	48	5	43	50	37	49	-	55
Five-Day Average	55	56	7	49	52	40	51	-	57

Note 1: Negotiated Agreement Criterion (refer to **Section 2.1**).
Note 2: Includes facade correction
Note 3: Includes a distance correction

TN2 'Clareview' Residence, Wamboyne Road

The five-day average calculated LAeq(1hour) mine generated traffic noise at TN2 during the daytime peak (1700 hours to 1800 hours) is 46 dBA (ie below the negotiated 60 dBA criterion). The five-day average calculated LAeq(1hour) mine generated traffic noise at TN2 during the night-time peak (0600 hours to 0700 hours) is 51 dBA (ie below the negotiated 55 dBA criterion).

Furthermore, dwellings located within 60 m of Wamboyne Road may potentially receive traffic noise levels in excess of 50 dBA during the night-time peak hour assuming similar exposures to the roadway. Based on the NMP, only one dwelling is located within 60 m from Wamboyne Road, that being "Clairview" (TN2) where the mine generated traffic noise is below the negotiated traffic assessment criterion during the night-time peak period.

Table 47: Operator-attended and ATC Traffic Noise Emission Survey Results (January 2014)
TN3 - 'Windstone' Residence

Date	Mine Traffic Criteria	Traffic Counts			Traffic Noise Levels (Calculated)[1]				Unattended (Overall)[1]
		Total	Non-Mine	Mine	Total	Non-Mine	Mine	Mine Exceedances	
Daytime Peak (1700 hours to 1800 hours)									
Monday 20-01-2014	55	66	10	56	-	-	-	-	-
Tuesday 21-01-2014	55	74	11	63	48	40	48	-	53
Wednesday 22-01-2014	55	63	6	57	41	27	41	-	46
Thursday 23-01-2014	55	64	10	54	45	35	45	-	53
Friday 24-01-2014	55	37	7	30	44	36	43	-	49
Five-Day Average	55	61	9	52	44	35	44	-	50
Night-time Peak (0600 hours to 0700 hours)									
Monday 20-01-2014	50	49	3	46	-	-	-	-	-
Tuesday 21-01-2014	50	65	5	60	44	31	44	-	50
Wednesday 22-01-2014	50	63	11	52	44	35	43	-	48
Thursday 23-01-2014	50	77	13	64	47	37	47	-	53
Friday 24-01-2014	50	47	4	43	46	36	46	-	53
Five-Day Average	50	60	7	53	45	35	45	-	51

Note 1: Includes facade correction

TN3 'Windstone' Residence, Wamboyne Road

The five-day average calculated LAeq(1hour) mine generated traffic noise at TN3 during the daytime peak (1700 hours to 1800 hours) is 44 dBA (ie below the 55 dBA criterion). The five-day average calculated LAeq(1hour) mine generated traffic noise at TN3 during the night-time peak (0600 hours to 0700 hours) is 45 dBA (ie below the 50 dBA criterion).

Traffic Noise Agreements

Barrick entered into Traffic Noise Agreements in August 2012 with residents who may potentially be affected by traffic noise attributable to the mine traffic with the following proposal.

The Agreement letters were signed by each of the landowners notified, and the Director-General of DP&I was notified of the terms of agreement on 3 September 2012.

3.11.4 Reportable Incidents

There was one community complaint received during the reporting period relating to operational or traffic noise. Details of the relevant complaints are provided in Paragraph 4.1.

3.11.5 Further Improvements

Traffic noise monitoring of CGM vehicles ceased when condition 6.4(c) 'Road Traffic Noise' of Development (MOD10) Consent was removed from the approved Development (MOD11) Consent in 2014.

3.12 VISUAL, STRAY LIGHT

3.12.1 Reporting Requirements

3.12.1.1 Development Consent

Development Consent Condition 6.5(b) requires:

The Applicant shall:

i. *implement all reasonable and feasible measures to minimise the visual and off-site lighting impacts of the development;*
ii. *ensure no fixed outdoor lights shine directly above the horizontal or above the building line or any illuminated structure;*
iii. *ensure no in-pit mobile lighting rigs shine directly above the pit wall and other mobile lighting rigs do not shine directly above the horizontal;*
iv. *ensure that all external lighting associated with the development complies with relevant Australian Standards including Australian Standard A54282 (INT) 1997 - Control of Obtrusive Effects of Outdoor Lighting, or its latest version; and*
v. *take all reasonable and feasible measures to shield views of mining operations and associated equipment from users of public roads and privately-owned residences,*

to the satisfaction of the Secretary.

In accordance with the modified Development Consent, a Landscape Management Plan is no longer required. Notwithstanding, the relevant components of the Landscape Management Plan (specifically in relation to landscaping and rehabilitation to minimise visual impacts)have been incorporated into the ROMP (and RMP once approved). In accordance with Development Consent MOD 11 Conditions 2.4 (a) and 6.5(b), the RMP will include a description of landscaping measures that will be undertaken to minimise visual impacts of the CGM.

3.12.1.2 Environment Protection Licence

Condition R2 of the EPL requires Barrick to notify the EPA of incidents causing or threatening material harm to the environment as soon as practicable after Barrick becomes aware of the incident.

3.12.1.3 Any other Relevant Approval

There are no other relevant reporting requirements from approvals in relation to landscaping and visual impact for the reporting period.

3.12.2 Environmental Management

3.12.2.1 Control Strategies

In accordance with Development Consent Condition 6.5(b), Barrick used the landscaping strategies/control measures outlined below to minimise visual impacts from the mine site.

Progressive Rehabilitation

Progressive rehabilitation of areas of the northern, southern and perimeter waste emplacements was undertaken during the reporting period to reduce the contrast between the CGM landforms and the surrounding landscape. This included progressive rehabilitation with selected grass, shrub and/or tree species.

The final void is screened from public views on Lake Cowal Road by the tailings storage facilities and waste emplacements.

Foreground Visual Screening/Vegetation Screens

Earth mounds and vegetation screening have been constructed on sections of the western and northern boundaries of ML 1535 to break up continuous views from Lake Cowal Road. These earth mounds and vegetation screen areas surrounding ML 1535 (including along Lake Cowal Road) have been planted with endemic plants that are compatible with the existing surrounding vegetation.

Maintenance of the vegetation screens (e.g. addition and replacement of plants, where required) will continue to be undertaken in these areas during the next reporting period. An increase in screening effect will result over time as plants continue to grow.

Visual impact mitigation measures that have been employed at CGM included landscaping and design specifically conducted for visual impact mitigation purposes. Specific landscaping strategies included:

- utilising existing vegetation as visual screens;
- planted vegetation screens around the ML 1535 boundary;
- construction of the waste emplacements, reducing visual impact of processing plant from the eastern side of Lake Cowal;
- placement of topsoil stockpiles on the southern and western sides of the STSF to break up the view from the relocated Travelling Stock Route;
- lighting design (such as directional lighting) to reduce any potential impacts of night lighting on wildlife and nearby residences; and
- selecting the colour of the processing plant buildings to blend with the adjacent landscape in accordance with the requirements of BSC.

Night Lighting

Barrick has employed one or more of the following measures to mitigate impacts from night-lighting, where practicable:

- Scheduling of mining operations, where practicable, so that evening and night-time operations on the waste emplacements will be located on the southern waste emplacement (i.e. the lower waste emplacement) to reduce the potential for direct lighting impacts to locations north of ML 1535.
- Restriction of night-lighting to the minimum required for operations and safety requirements, where appropriate.
- Use of unidirectional lighting techniques, where practicable.

3.12.2.2 Effectiveness of Control Strategies

The implementation of the control strategies above minimised visual impacts from mining activities of CGM.

3.12.2.3 Variations from Proposed Control Strategies

There were no variations from the proposed control strategies.

3.12.3 Environmental Performance

3.12.3.1 Monitoring

In accordance with Development Consent Condition 6.5, Barrick will take all reasonable and feasible measures, in consideration of Australian Standard AS 4282-1997 *Control of the obtrusive effects of outdoor lighting*, to mitigate visual and off-site impacts of the CGM.

Table 48 provides a summary of the landscape maintenance and monitoring programme that has been undertaken at the CGM during previous reporting periods and continued during the reporting period.

Table 48 : Landscape Maintenance and Monitoring Summary

Component	Monitoring Frequency	Monitoring Method	Typical Maintenance
Landscaping Works • General Inspections	Annually.	Visual assessment of moisture stress, plant survival, presence of weeds and erosion/ sedimentation.	• Supplementary watering if required. • Control of invasive weed species in accordance with the requirements of the LMP. • Supplementary planting of failed plants where necessary.
• Erosion Inspections	Following significant, high intensity rainfall events.	Visual assessment of earth mound screening to determine if significant erosion or washouts have occurred in accordance with the ESCMP.	• Repair any significant erosion or washout areas on earth mounds. • Stabilisation with Jute mesh or other materials as required. • Additional revegetation planting or sowing if required.
Buildings, Structures and Facilities	Annual	Visual assessment by a suitably qualified building inspector.	• Replace or repair items as necessary to maintain structural integrity. • Repaint any exterior surfaces where the finish has deteriorated. • Maintain fixed outdoor and in-pit mobile lighting.
Rehabilitation Works • General Inspections	Annual	Monitoring in accordance with the ROMP and MOP (with reporting in the AR).	• Repair any significant erosion or washout areas. • Control of invasive weed species in accordance with the LMP. • Supplementary planting or seeding of failed plants where necessary.
Erosion Inspections	Following significant, high intensity rainfall events.	Visual assessment of rehabilitation works to determine if significant erosion or washouts have occurred in accordance with the ESCMP.	• Repair any significant erosion or washout areas on earth mounds. • Stabilisation with Jute mesh or other materials as required. • Additional revegetation planting or sowing if required.

3.12.3.2 Performance Outcomes

Visual impact management and landscape maintenance and monitoring measures conducted during the reporting period included:

- inspections and maintenance of fixed outdoor lighting and in-pit mobile lighting;
- general inspections of landscaping (i.e. visual screens) and rehabilitation works;
- monitoring of tree and shrub survival rates of landscape plantings; and
- erosion inspections of landscaping and rehabilitation works following periods of significant, high intensity rainfall.

As a result of this visual landscape monitoring the following maintenance activities were undertaken:

- Weed control within landscaping and rehabilitation areas by manual removal or chemical application.
- Maintenance of erosion control structures.
- Placement of native pasture hay on newly constructed TSF slopes to minimise erosion potential.
- Construction of the permanent buildings remaining onsite was completed early in 2006 and they are now subject to regular monitoring and maintenance by Barrick employees and contractors.

3.12.4 Reportable Incidents

There were no reportable incidents for the period.

3.12.5 Further Improvements

Landscape maintenance and monitoring will continue as summarised in Table 48, during the next reporting period. Maintenance, addition and replacement (if required) of plants within the boundary screen plantings will continue to be of high importance.

3.13 ABORIGINAL HERITAGE

3.13.1 Reporting Requirements

3.13.1.1 Development Consent

The reporting of Aboriginal heritage issues is required by Development Consent MOD11 Condition 3.1(b), which states:

> *The Applicant shall monitor the effectiveness of measures outlined in the Heritage Management plan and Indigenous Archaeology and Cultural Management Plan to the satisfaction of thè Secretary. A summary of the monitoring results is to be published annually on the Applicant's website for the development.*

The IACHMP was prepared in accordance with Development Consent MOD11 Condition 3.1(a)(ii) to identify future salvage, excavation and monitoring of archaeological heritage within the CGM area prior to and during development and to address Aboriginal cultural heritage issues.

3.13.1.2 Environment Protection Licence

Condition R2 of the EPL requires Barrick to notify the EPA of incidents causing or threatening material harm to the environment as soon as practicable after Barrick becomes aware of the incident.

3.13.1.3 Any Other Relevant Approvals

Barrick and its consultant archaeologists have obtained permits and consents under s 87 and s 90 of the *National Parks and Wildlife Act 1974* (NSW) (**NPW Act**) for CGM which include:

- Permit 1468 authorising certain archaeological works in the ML 1535 area, water pipeline area and borefield area.
- Consent 1467 authorising the destruction of Aboriginal objects (in certain circumstances) in the ML 1535 area, water pipeline area and borefield area.
- Permit 1681 authorising certain archaeological works in the relocated Travelling Stock Route (TSR) area and road upgrade area.
- Consent 1680 authorising the destruction of Aboriginal objects (in certain circumstances) in the relocated TSR area and road upgrade area.

3.13.2 Environmental Management

3.13.2.1 Control Strategies

The IACHMP sets out the salvage, excavation, monitoring and other management measures that have been undertaken for each of the registered archaeological sites and other Aboriginal objects within the CGM area. The management measures include strategies for registered sites and other Aboriginal objects.

In general, the strategies include: protection; investigation; collection; excavation; documentation and storage of Aboriginal objects in an on-site temporary “Keeping Place”; and collection and storage of objects during topsoil stripping and stockpiling.

There are currently eight registered sites remaining within ML 1535. Registered sites (Exposures) B, C, D, E and H are subject to ongoing conservation works including covering by geo-textile blanket and sign posting to protect the site. Should the location of these sites be proposed to be utilised, the procedure detailed in Special Condition 8 of Permit 1468 would apply after notice is provided to the Director-General of the OEH and in consultation with the local Aboriginal community.

Sites LC2, LC3 and LC4 are managed in accordance with Special Conditions 6, 12 and 13 of Permit 1468.

Management measures are not limited to registered sites. Permit 1468 and Permit 1681 authorise a range of management measures proposed in the Research Design and Study Plan for other Aboriginal objects in the CGM area that are not contained within the Registered Sites. The details of the management and mitigation measures for other Aboriginal objects is contained in the Research Design and Study Plan (Pardoe, 2002) for the CGM as amended by Permit 1468 and Permit 1681.

Activities undertaken during the reporting period include the following:

- Wiradjuri monitors from the Wiradjuri Condobolin Cultural Heritage Company (**WCCHC**) have been employed during the year on archaeological works at CGM.
- The majority of cultural heritage work continues to be surface and subsurface monitoring for topsoil removal.

Cultural heritage work has been consistently carried out since the start of construction at the CGM. Work areas were examined previously (before CGM construction works) and collections of cultural material were made in accordance with relevant approvals. The 2009 revised Ground Disturbance Procedure has led to improvements in both assessing and tracking ground disturbance on-site.

Barrick employees and contractors undertake a Cultural Heritage Induction presented by the WCCHC. These inductions are held on an as needed basis. The site General Induction for all employees and contractors also includes a description of the site's Ground Disturbance Protocol.

3.13.2.2 Effectiveness of Control Strategies

The control measures for managing and monitoring Aboriginal heritage were implemented in accordance with the IACHMP and were effective during the reporting period.

3.13.2.3 Variations from Proposed Control Strategies

There were no variations from the proposed control strategies.

3.13.3 Environmental Performance

3.13.3.1 Monitoring

In accordance with the IACHMP, all areas within the Development Consent area where soil stripping and construction earthworks occur, surface and subsurface surveys are carried out by Wiradjuri monitors and, where appropriate, by archaeologists, to identify "datable materials".

During the reporting period, Wiradjuri monitors inspected the area proposed for the temporary ore and soil stockpiles north of the SWE prior to any soil stripping and VCP works being undertaken. No 'datable materials' were identified during the inspections or during the works.

3.13.3.2 Performance Outcomes

In accordance with Aboriginal heritage permits and consents and IACHMP, Aboriginal heritage objects were collected prior to the commencement of all construction earthworks under the supervision of a qualified archaeologist and representatives of the WCCHC. Objects collected were stored in the on-site temporary "Keeping Place" during the reporting period. Archaeological analysis of these objects is ongoing.

All construction earthworks during the reporting period were monitored by Wiradjuri monitors and/or an archaeologist. No non-compliance issues were reported. Areas where soil stripping has taken place were inspected under the supervision of representatives of the WCCHC.

During Native Title Deed Review discussions in 2012, the Wiradjuri Condobolin Corporation identified no need for any amendments to the IACHMP.

3.13.4 Reportable Incidents

No environmental incidents or complaints were reported or received relating to Aboriginal heritage at the CGM during the reporting period.

3.13.5 Further Improvements

A Cultural Heritage Practice Guide was developed in 2013 and forms part of an Indigenous Peoples Plan being implemented at the CGM. This guide provides plain English instruction to ensure all ground disturbances are managed in accordance with Aboriginal heritage permits and consents and the IACHMP.

3.14 EUROPEAN HERITAGE

3.14.1 Reporting Requirements

3.14.1.1 Development Consent

The reporting of European heritage issues is required by Development Consent MOD11 Condition 3.1(b), which states:

> *The Applicant shall monitor the effectiveness of measures outlined in the Heritage Management plan and Indigenous Archaeology and Cultural Management Plan to the satisfaction of the Secretary. A summary of the monitoring results is to be published annually on the Applicant's website for the development.*

The Heritage Management Plan (**HMP**) was prepared in accordance with Development Consent requirements.

In accordance with the HMP, the following non-indigenous heritage-related issues are required to be reported in the AR:

- new items of non-indigenous heritage significance identified by the Environmental Manager within ML 1535;
- new listings of non-indigenous heritage significance items on the Local Environment Plan (**LEP**) or NSW State Heritage Register within ML 1535;
- a brief overview of maintenance conducted on listed non-indigenous heritage items; and
- a summary of results from any monitoring, management and maintenance measures undertaken.

In 2006, the BSC granted Development Consent for the demolition of the 'Cowal West' Shearer's Quarters and Kitchen. Demolition was required for the construction of contained water storage D9. Demolition of the remainder of the 'Cowal West Homestead Complex' (**CWHC**) (i.e. the Homestead; Shearing [Wool] Shed and Hayshed) was approved via the March 2010 modification and was completed in October 2012.

3.14.1.2 Environment Protection Licence

Condition R2 of the EPL requires Barrick to notify the EPA of incidents causing or threatening material harm to the environment as soon as practicable after Barrick becomes aware of the incident.

3.14.1.3 Any Other Relevant Approval

There are no other relevant reporting requirements from approvals in relation to European heritage issues for the reporting period.

3.14.2 Environmental Management

3.14.2.1 Control Strategies

Dismantling and relocation of the 'Cowal West' Shearing Shed to the 'Hillgrove' Lake Cowal Conservation Centre (LCCC) occurred during April 2012.

Management measures that were implemented during the reporting period prior to demolition of the CWHC included:

- Reconstruction of the Cowal West Woolshed at the LCCC.

An interpretive display has been established at the LCCC in consultation with the Lake Cowal Foundation (**LCF**), BSC and Bland District Historical Society (**BDHS**). The display includes maps, photographs, narrative, and fragments/elements salvaged from the CWHC to illustrate its history. Other items containing a level of local heritage significance identified in the HMP will continue to be maintained in accordance with the HMP.

3.14.2.2 Effectiveness of Control Strategies

Reconstruction of the Cowal West Woolshed at the LCCC has been recognised by the BSC as a successful initiative in heritage protection.

3.14.2.3 Variations from Proposed Control Strategies

There were no variations from the proposed control strategies during the reporting period.

3.14.3 Environmental Performance

3.14.3.1 Monitoring

'Cowal West' information plaques for the CWHC were fabricated in early-2009 and stored at the 'Hillgrove' LCCC facility pending further planning works at the Homestead and Shearing Quarters. Barrick consulted with the prior land owners, and the West Wyalong Historical Society regarding the content of these plaques which will be installed adjacent to any exhibit material which is planned to be housed at the nearby 'Hillgrove' LCCC facility.

3.14.3.2 Performance Outcomes

The maintenance works carried out within the CWHC have been effective in preserving the integrity and heritage value of the buildings.

3.14.4 Reportable Incidents

No environmental incidents or complaints were reported or received relating to European heritage at the CGM during the reporting period. No CEMCC issues were raised during the reporting period relating to European heritage.

3.14.5 Further Improvements

No further improvements to European heritage management measures are proposed for the next reporting period.

3.15 SPONTANEOUS COMBUSTION

No carbonaceous rock/material occurs in the CGM open pit or in the waste rock emplacements. As a result, spontaneous combustion has not and is not likely to occur at the CGM. Therefore, spontaneous combustion is not applicable to the CGM.

3.16 BUSHFIRE

3.16.1 Reporting Requirements

3.16.1.1 Development Consent

Development Consent MOD11 Condition 3.6 requires:

The Applicant shall:

a) ensure the development is suitably equipped to respond to any fires on site; and
b) assist the Rural Fire Service (RFS) and emergency services as much as practicable if there is a fire in the vicinity of the site.

In addition, the PRIMP, RMP and BOMP will describe fire preventative measures and fuel management measures for the mine site, CGM rehabilitation areas and CGM offset areas.

A BMP was originally prepared in August 2003 to establish a bushfire management strategy for the CGM that complies with former MOD10 Development Consent Condition 3.8. However, the BMP is no longer a requirement of the Development Consent (MOD11) approved on 22 July 2014. Notwithstanding the BMP will be maintained as an internal management plan to guide bushfire management on Barrick-owned lands.

3.16.1.2 Environment Protection Licence

Condition R2 of the EPL requires Barrick to notify the EPA of incidents causing or threatening material harm to the environment as soon as practicable after Barrick becomes aware of the incident.

3.16.1.3 Any Other Relevant Approval

There are no other relevant reporting requirements from approvals in relation to bushfire for the reporting period.

3.16.2 Environmental Management

3.16.2.1 Control Strategies

In accordance with the ROMP, bushfire preventative control strategies for the CGM and the CGM offset areas include:

- educating employees and contractors on general fire awareness and response procedures;
- fire track (and fire break) maintenance for fire control;
- annual inspections to identify areas requiring bushfire control measures including assessment of fuel loads; and
- fuel management (e.g. hazard reduction burns) in consultation with the NSW Rural Fire Service.

In accordance with the ROMP, fuel management control strategies for the CGM and the CGM offset areas include:

- fuel management by means other than burning; including such methods as grazing, slashing, pruning, mulching or other operations (such as ploughing, herbicide application and rolling);

- fuel management via burning where conventional fuel management strategies are inappropriate, impracticable or not successful (undertaken in consultation with relevant authorities); and
- maintaining designated firebreaks.

3.16.2.2 Effectiveness of Control Strategies

The control strategies implemented during the reporting period are considered to be effective as demonstrated by the environmental performance outcomes (discussed in Paragraph 3.16.3 below).

3.16.2.3 Variations from Proposed Control Strategies

There were no variations from the proposed control strategies.

3.16.3 Environmental Performance

3.16.3.1 Monitoring

In accordance with Development Consent MOD11 Condition 6.2, data from the meteorological station maintained on-site was used to determine whether current weather conditions are suitable for fire management activities, and to assist in the management of bushfire fighting activities. Meteorological monitoring data is discussed in Paragraph 3.1.3.1 above.

The Kattron lightning tracking system was introduced to operations in early-2012 (replaced the obsolete Cowal Storm Vue system). The Mining Dispatch Control Room operators continually monitor and pass on alert levels between red, amber and yellow to other employee groups and the ERT until all clear conditions resume.

3.16.3.2 Performance Outcomes

The bushfire management measures as described in the ROMP, were implemented at the CGM and CGM offset areas during the reporting period. Fuel management activities carried out during the reporting period included:

- the creation of firebreaks around the ML 1535 boundary by slashing, weed control spraying and grading;
- slashing of large open areas within ML 1535 that had high fuel loads;
- sustainably crash grazing areas with neighbouring farms sheep and/or cows;
- mowing and grounds maintenance of borefield stations;
- keeping all operating areas neat and tidy and with low fuel loads; and
- conducting regular inspections of the ML 1535 area to identify any significant fire risks.

The Emergency Response Team (**ERT**) currently consists of about thirty members consisting of Barrick staff members, five of which are full time Emergency Response Officers (**EROs**). The CGM Emergency Response Coordinator is now an accredited trainer with approval to train the Suppress Wildfire course from mid-2010 (currently the crews are trained to Suppress Urban Fire level).

The ERT firefighting equipment currently consists of two Cat 7 equivalent 4WD fire tenders with a capacity of 1,000 L each, and two dedicated 1,000 L firefighting trailers. Barrick currently has two 70,000 L water trucks, fitted with water cannons, used in mining operations and a number of contracted water trucks during TSF Wall Lift Project construction which could be used to cart water in the event of a bushfire on ML 1535.

The fire trail register was maintained during the reporting period. All-weather access tracks were established in 2010 to the DG2, BM04.1 and NO4 location and to the lake floor saline bores system to assist in fire control. In August 2010 the majority of these tracks were completely inundated by Lake Cowal and began to re-emerge during late 2013 and 2014. The LPB was rock covered and became an all-weather access track from March 2013 which can be used for outer Pit perimeter fast response access during summer.

The CGM Rescue Station houses all the ERT equipment, a clean room for bottle refilling and clothes cleaning, training facilities (smoke chamber, car rescue, fire extinguisher, ropes, hoses, breathing apparatus, etc), offices, lockers and conference room for staff, volunteer trainees and visitors.

3.16.4 Reportable Incidents

There was one grassfire event that occurred on Barrick-owned land that required the use of CGM on-site fire control equipment during the reporting period. It was a temporary, small grass fire of about 15m x 4m caused by an unknown source, potentially sparks / hot metal from equipment brakes.

3.16.5 Further Improvements

No further improvements are proposed for the next reporting period.

3.17 MINE SUBSIDENCE

Mine subsidence is not applicable to the CGM.

The CGM is an open pit mine (i.e. it is not an underground mine), and therefore subsidence is not a relevant matter at the CGM.

3.18 HYDROCARBON CONTAMINATION

3.18.1 Reporting Requirements

3.18.1.1 Development Consent

A HWCMP has been prepared for the CGM in accordance with Development Consent MOD11 Condition 5.7. The HWCMP has previously been revised to reflect results of pre-commissioning studies and requirements of the CMP on 6 March 2006.

An amendment to the HWCMP was approved by the Director-General of the DP&I in January 2008 to reflect the proposed management procedures for two new waste streams generated at the CGM, viz.: trash screen oversize waste (classified as inert waste), and hydrocarbon-impacted material (classified as solid waste following treatment in a designated bioremediation facility). The EPL was varied to reflect these amendments in July 2008.

The HWCMP was amended to reflect the June 2009 Modification that approved the use of SMBS as an alternative cyanide destruction method. The December 2009 addendum of the HWCMP was approved by the DP&I on 10 March 2010.

In addition to the above, Barrick prepared a revised HWCMP during the 2011 reporting period. The HWCMP was updated in accordance with Development Consent MOD10 Conditions 3.2 and 5.7 and revised to reflect changes in operational practices since the commencement of the CGM. The DP&I approved the revised HWCMP on 13 May 2011.

No change to hazardous waste and chemical management was proposed for the modified CGM (approved on 22 July 2014) and no change occurred to the requirements for the HWCMP. Accordingly, no change the occurred during the reporting period.

The HWCMP contains provisions for the minimisation of hydrocarbon contamination. In accordance with the HWCMP, any major or emergency spills that occur during the reporting period as well as any remedial measures that have been implemented to reduce the risk of occurrence are required to be reported in the AR and are provided below.

In accordance with Development Consent MOD11 Condition 9.3(a):

> *The applicant shall immediately notify the Secretary and any other relevant agencies of any incident related to the development. Within 7 days of the date of the incident, the Applicant shall provide the Secretary and any relevant agencies with a details report on the incident, and such further reports as may be requested.*

The incident report should include the following information:

- location of the incident;
- person's name and contact number who discovered the incident;
- the best estimate of the time the incident occurred;
- the time the person reporting the incident and/or the organisation/company they represent became aware of the incident;
- a description of the incident;
- the suspected cause of the incident;
- the environmental harm or environmental nuisance caused, threatened or suspected to be caused by the incident; and
- actions taken to prevent further similar incidents and mitigate any environmental harm or environmental nuisance caused by the incident.

3.18.1.2 Environment Protection Licence

The EPA is required to be notified of any spills that cause "material harm" to the environment, whereby "material harm" is defined in section 147 of the POEO Act.

3.18.1.3 Any Other Relevant Approvals

The approval for onsite remediation of hydrocarbon contaminated waste and further reuse requires that soils are sampled and assessed by external consultants for waste classification in accordance with NSW EPA (2009) *Waste Classification Guidelines: Part 1: Classifying Waste*.

3.18.2 Environmental Management

3.18.2.1 Control Strategies

Based on the principles detailed in *Leading Practice Sustainable Development Program for the Mining Industry - Hazardous Materials Management* handbook (Department of Resources, Energy and Tourism, 2009), Barrick employees and contractors have adopted a CMS as part of the HWCMP. This strategy allows for the management of each chemical used at the CGM.

A discussion of the primary components of the CMS is provided in the following sub-paragraphs.

Control strategies include:

- Site wide inductions, awareness and training on Hazs Substs and Hydrocarbon spill response;
- Annual concrete bunding and tankage integrity audits;
- Area planned general inspections;
- Hazardous Substance and Dangerous Goods Register; and
- Incident reporting and follow up action items.

Inventory Register

In accordance with best practice and the CMS all raw materials/consumables brought on-site for use at the CGM are recorded in an Inventory Register which is updated and available for inspection by the appropriate authorities. SDSs for all chemicals will also be included in the Inventory Register. The CGM uses the ChemAlert 3 system for the management of SDSs of chemical/consumable on-site and to achieve site substance control.

Hazardous Substance and Dangerous Goods Register (HSDGR) and Fuel and Oils Register (FOR)

In accordance with Paragraph 6.4.1 of the EIS (North Limited, 1998) and the CMS, chemicals recorded on the Inventory Register that are designated as hazardous substances and/or dangerous goods and/or fuels and oils are included in the HSDGR and the FOR.

Personnel Training

Most if not all activities associated with hazardous consumables require the intervention or interaction of workers and management. In accordance with the CMS and HWCMP, Barrick employees and contractors are trained in:

- hazardous chemical/substance awareness;
- job hazard analysis preparation and use;
- use of Manufacturer's SDS information;
- measures to prevent accidental release;
- potential environmental impacts;
- ChemAlert 3 application and usage;
- use and maintenance of Personal Protective Equipment (**PPE**);
- emergency spill response and containment; and
- spill response and clean-up techniques.

Education and training programmes are used to instruct employees and contractors on the appropriate use of chemicals and requirement for "approved for use on-site" chemicals. The programme is also be used to distribute information on the occupational health and safety implications and potential environmental impacts of these consumables.

Employee and contractor education and training programmes continued to be provided during the reporting period. The training programmes include and are not necessarily limited to:

- induction of all company employees, contractors and first time visitors;
- training in the Job Hazard Analysis for the use of each chemical for those personnel whose work involves its use;
- specific emergency response training to suit individual work requirements; and
- ongoing refresher training programmes for key employees and contractors to improve skills and competencies as necessary.

Training also includes reinforcement by refresher courses, short 'toolbox' discussions, and/or routine discussion with supervisors. Records of all staff induction and environmental training are kept to assist in the identification of personnel who require 'refresher' training.

Operators moving or using any reagents are trained in the requirements of the material such as PPE, handling procedures and spill clean-up procedures in accordance with the HSDGR.

Specific HSDG training provided to employees during the reporting period included:

- The pocket-sized employee spill response handbook continues to be distributed across the site to all new employees or those not previously inducted.
- The Environmental Awareness Handbook also continues to be distributed to all employees and visitors during the year.

Auditing of Chemical Management

The CGM is subject to periodic audit and review. During the audit and review process CGM chemical management practices and procedures are assessed against the CMS and the HWCMP. Audit results are used to identify improvements that can be made to the site CMS procedures, if appropriate.

SAI Global conducted several days of audit training during 2011 and an internal audit program was conducted during the reporting period.

ChemAlert 3 employee training occurred 17 to 20 September 2012 and is intended to occur after the change from version 3.3 to 4.0 of ChemAlert 3 is commissioned.

3.18.2.2 Effectiveness of Control Strategies

A number of minor substance spillage incidents occurred during the reporting period, however the control strategies set out in the HWCMP are considered to be effective as the spills were minor in nature and were fully contained.

The number of internally reported spills reflects the effectiveness of site awareness training sessions undertaken with more intensive oil and chemical spill training sessions.

3.18.2.3 Variations from Proposed Control Strategies

There were no variations from the proposed control strategies during the reporting period.

3.18.3 Environmental Performance

3.18.3.1 Monitoring

There are no specific monitoring programmes for hydrocarbons relevant to the reporting period however there are a number of preliminary spill response procedures which are discussed below. Sampling of bioremediated soil is undertaken and confirmed to be suitable prior to reuse on rehabilitation locations on-site. In addition, hydrocarbon sampling is undertaken on a quarterly basis as per SGWMBMP.

Preliminary Spill Responses

A number of minor substance spillage incidents occurred during the reporting period and the spill response procedures outlined in the HWCMP were implemented at CGM. The CGM preliminary spill responses were implemented for the minor incidents. Impacted material was then transferred to the temporary hydrocarbon waste transfer station for bioremediation.

A Total Waste Management Service was maintained during the reporting period to handle, transport and dispose of all waste material streams generated at CGM. JR Richards & Sons, West Wyalong, have provided this service since the construction of the CGM. A number of licensed sub-contractors are coordinated by the JR Richards & Sons contract to appropriately recycle and/or dispose of the various waste streams.

3.18.3.2 Performance Outcomes

As described in Paragraph 2.6 above, on-site bioremediation of site-generated hydrocarbon contaminated soils commenced in early 2009.

3.18.4 Reportable Incidents

There were no government reportable incidents relating to hydrocarbon spillage management during the reporting period. Barrick maintains records of loss control incident reports on any unauthorised release of hazardous waste or managed substances beyond bunded areas or to the environment.

In accordance with the HWCMP, relevant emergency services/agencies will be contacted if:

- the spill has spread or has the potential to spread beyond the boundaries of the CGM;
- it is beyond the resources of the CGM to respond to the spill;
- the available protective equipment is inadequate for dealing with the situation; or
- staff, the public or the environment is, or could potentially be placed at risk.

In accordance with the ERP/PIRMP, relevant emergency services/agencies will be contacted immediately if material environmental harm results from an incident.

The incidents that occurred during the reporting period were minor in nature and therefore not required to be reported to relevant emergency services/agencies.

3.18.5 Further Improvements

Whilst only minor substance spillage incident occurred during the reporting period, Barrick has continued to make additional improvements to infrastructure, systems and employee awareness about substance management and spillage prevention:

- Obsolete substances continued to be appropriately disposed of and new substances are registered for use on-site. Spillage clean up materials were disposed of appropriately;
- Continued maintenance of spill response stations. A register of bins continues to be maintained during the reporting period to facilitate content stock auditing and usage reporting;
- The Mining Hardstand truck and vehicle wash facility including the associated oily water coalescing plate separator by-product collected for off-site recycling by licensed waste management contractors;
- The Bioremediation Facility has been operational since early-2009;
- Employee spill response and environmental awareness handbooks continue to be distributed to employees (includes contractors), government regulators, CEMCC, goods suppliers, various VIP visitors, etc;
- The fuel tracking system (Banlaw) hardware was installed at all diesel dispensing stations during the 2011 reporting period. The main diesel tank bund floor has continued to be maintained;
- Barrick Regional Office introduced a Regional OHS Standard for Hazardous Materials (May 2012);
- Barrick Cowal introduced a Site Standard for Hazardous Substances and Dangerous Goods (July 2012); and
- Barrick Cowal introduced a Site Standard for Hydrocarbon performance management (July 2012).

The HSDG and hydrocarbon management measures as described in the HWCMP will continue to be maintained during the next reporting period.

3.19 METHANE DRAINAGE/VENTILATION

Methane drainage/ventilation is not applicable to the CGM.

The CGM is an open pit mine (i.e. it is not an underground mine), and therefore does not require or involve the construction of ventilation or gas drainage infrastructure. As a result, methane drainage/ventilation is not a relevant matter to the CGM.

3.20 WASTE GEOCHEMISTRY

3.20.1 Reporting Requirements

During annual on-site AR performance review meetings in 2005 and 2006, the then DPI Mineral Resources requested confirmatory test-work of waste rock geochemistry be undertaken. In their 2007 report, the IMP also recommended that Barrick continue to monitor the waste rock being removed from the open pit, to facilitate identification of potentially acid-generating material (if present) and selective placement of that material within the waste emplacements.

A description of the testwork that has been undertaken since 2007 is provided in Paragraph 3.20.2.1, and a summary of regional and local geology is provided below.

The regional and local geology of the Endeavour 42 deposit (**E42 Deposit**) has been described by Miles, Brooker, McInnes, *et al* [1993-1998]). The complex consists of calc-alkaline to shoshonitic volcanic rocks and related sedimentary rocks deposited in a deep water environment and are unconformably overlain, in parts, by the Siluro-Devonian Manna Conglomerate. The auriferous quartz-carbonate-sulphide and carbonate-quartz-sulphide veins occur throughout the deposit and have a consistent dip of 305° and dip of 35° to the southwest.

McInnes *et al* describe the gold-bearing veins as generally being associated with one of two alteration styles: ankerite-quartz-pyrite-sphalerite-chalcopyrite-galena veins, which are associated with ankerite-quartz-sericite-carbonate alteration; and quartz, potassium feldspar, pyrite, sphalerite, and chalcopyrite veins associated with the chlorite-carbonate-pyrite alteration. Oxide blankets occur at the base of tertiary transported lacustrine cover, saprolite-saprock transition and at the base of oxidation (*pers. comm*, McInnes, Freer (2007)). These flat lying blankets can be up to several hundred metres wide and 1m to 15m thick and are interpreted to have formed as a result of remobilisation of gold during weathering processes in association with water table fluctuations.

3.20.2 Environmental Management

3.20.2.1 Control Strategies

Based on prior test work there is no indication that the E42 Deposit or the process tailings are acid forming (Environmental Geochemistry International Pty Ltd [**EGi**], 2004; and Geo-Environmental Management [**GEM**], 2009; 2013). Overall, the EGi (2004) results indicated a very low likelihood of Acid Rock Drainage (**ARD**) generation from waste rock, Carbon in Leach (**CIL**) tailings and combined primary tailings represented by the samples included in the testing programs. Therefore, no special handling requirements were indicated for ARD control at the CGM. However, operational monitoring and testing was recommended to be a carried out on an occasional and as needed basis to confirm the low ARD potential of all waste types with particular focus on any unexpected rock types or alteration types which may be exposed during mining.

Detailed geochemical investigations were conducted by EGi prior to commencing mining operations at the CGM. Subsequent geochemical investigations were also conducted by EGi in 2004 and by O'Kane Consultants Pty Ltd (**O'Kane**) in 2008. A Tailings and Waste Rock Geochemical Assessment was also conducted as part of the E42 Modification Modified Request Environmental Assessment (Barrick, 2010) by GEM (2009).

Chemical groundwater data will continue to be collected as part of the groundwater monitoring programme detailed in the SGWMBMP. Leachate water quality monitoring will continue to be undertaken at the NWE, SWE and PWE external toe drain points in accordance with the EPL.

As recommended by EGi in 2004 and GEM (2009), operational monitoring and testing was carried out on an occasional and as-needed basis to confirm the low ARD potential of all waste types with particular focus on any unexpected rock types or alteration types that may be exposed during mining.

As described in Paragraph 5, final cover material on the waste rock emplacement and tailings storage facility batters will be of low salinity to avoid the potential for saline runoff and enable satisfactory vegetation growth. It will comprise of benign rock mulch, covering the waste rock or process tailings, which will then be covered with the layer of low salinity topsoil.

In accordance with Recommendation 1 of the 2010 Sixth Annual Report of the IMP, the volume of benign, competent rock likely to be required for future rehabilitation and mine closure was calculated in 2011 based on the latest topsoil and subsoil inventory calculations; the Barrick Reclamation Cost Estimator (BRCE) model estimates; and proposed stockpiled soil resource characterisation. The volume of benign, competent waste rock anticipated to be available from future development of the open pit, is also proposed to be re-calculated during the next reporting period and used to update the materials inventory and evaluate the balance of materials available for future rehabilitation through to mine closure.

3.20.2.2 Effectiveness of Control Strategies

Any stormwater run-off from the waste rock emplacements is captured within the ICDS.

3.20.2.3 Variations from Proposed Control Strategies

There were no variations from the proposed control strategies during the reporting period.

3.20.3 Environmental Performance

The results of detailed geochemical investigations of waste rock and tailings were reported in the EIS and in subsequent environmental assessments undertaken for the CGM. The ongoing drilling and metallurgical testing carried out by Barrick during the reporting period provided the opportunity to update the geochemical database for the project and to verify the findings of previous studies by EGi (2004) and GEM (2009). Ongoing periodic field observations undertaken during the reporting period confirmed the low salinity potential of waste hard rock types mined during the reporting period.

As stated above, Barrick commissioned O'Kane in late-2007 to conduct repeat test work of the Waste (rock) Emplacement and the contents of the TSFs. O'Kane representatives visited site to obtain samples in January 2008. A report was delivered in June 2008 (O'Kane, 2008) and was provided to the DTIRIS-DRE. O'Kane (2008) concluded that the results are generally consistent with previous investigations, which predicated that waste rock would be predominantly non-acid forming. GEM (2009) also verified these findings.

Small seepages at the NWE and SWE are sampled for water quality on a monthly and quarterly basis. This was reports to the ICDS. There has been some localised stormwater run-off in areas that are yet to undergo final rehabilitation treatment.

3.20.4 Reportable Incidents

There were no reportable incidents relating to waste geochemistry during the reporting period.

3.20.5 Further Improvements

Chemical groundwater data will continue to be collected as part of the groundwater monitoring programme detailed in the SGWMBMP. Leachate water quality monitoring will be undertaken at the northern, southern and PWE external toe drain points in accordance with the EPL if and when any seepage is detected.

As recommended during repeat external reviews (2004 - 2009), operational monitoring and testing continued to be carried out on an occasional and as-need basis to confirm the low ARD potential of all waste types with particular focus on any unexpected rock types or alteration types that may be exposed during mining.

The waste rock-topsoil cross-rip methodology has been implemented since the 2nd Lifts of the NTSF and STSF, at NWE northern, the SWE south trials, PWE east re-works (2012 - 2013) and Pond D1 Trial plots. These areas have exhibited signs of improved reclamation performance (DnA Environmental, 2015a), which is a good outcome for salinity control on final slopes.

3.21 PUBLIC SAFETY

3.21.1 Reporting Requirements

The following control strategies have been implemented to ensure public safety is achieved on-site:

- general site induction programme (relevant to all personnel, contractors and visitors entering Barrick-owned land);
- specific area inductions (relevant to mining, processing and geology);
- visitors induction programme;
- all Barrick employees, contractors and visitors are issued with card access identification;
- appropriate Barrick employees including contractors have undertaken a First-Aid training course;
- the perimeter of ML 1535 is fenced restricting access to site (in accordance with Development Consent Condition 2.3);
- there is 24 hour security coverage at the Main Gate (including security cameras vision around the site);
- regular security patrols are performed of the external perimeter;
- off-site locations (e.g. borefields) are securely fenced;
- contained on-site is an Emergency Response Office equipped with a fully functional First-Aid room and a commissioned site based First-Aid vehicle;
- a fire break has been placed along the perimeter of ML 1535 and other structures of importance;
- the ERT was assembled and have been trained in fire-fighting, First-Aid response, vehicle trauma, HAZMAT, rope rescue and basic bushfire fighting;
- cyanide awareness sessions have been held for local Emergency Services groups and community groups; and
- Thirty yellow maritime special mark buoys with warning signage have been placed along the inundated ML boundary since mid-2011 to advise any potential members of the public of access restrictions.

Barrick has conducted quarterly meetings with the CEMCC during the reporting period. Hazardous substances and dangerous goods management and emergency preparedness are ongoing topics covered by updates.

3.21.1.1 Effectiveness of Control Strategies

There were no incidents relating to public safety during the reporting period, therefore the control strategies implemented during the reporting period are considered to be effective.

3.21.1.2 Variations from Proposed Control Strategies

No variations from proposed control strategies during the reporting period.

3.21.2 Environmental Performance

There were no reportable incidents relating to public safety during the reporting period (see Paragraph 3.21.3 below). Therefore it is considered that the control strategies implemented above have been performing adequately to ensure public safety within ML 1535 and immediate surrounds.

3.21.3 Reportable Incidents

There were no reportable incidents relating to public safety during the reporting period.

3.21.4 Further Improvements

The ERT will continue to be trained in public safety preventative measures including fire-fighting, First-Aid response, vehicle trauma, HAZMAT, rope rescue and basic bushfire fighting. The ERT will attend joint training sessions with the RFS, SES, St John Ambulance, Hospital and NSW Fire and Rescue.

3.22 NATURAL HERITAGE

Lake Cowal, a portion of which is located within ML 1535, is listed on the Register of the National Estate. The Lake is protected by numerous control strategies and management and mitigation measures required under the CGM's Development Consent approvals and relevant EMPs. A summary of the landscape values in the CGM area and management initiatives is provided below.

The general landscape of the CGM mining operations area is flat to very gently undulating land with occasional hills such as Wamboyne Mountain. The region supports mainly dryland agriculture with irrigation farming practised in the Jemalong/Wyldes Plains to the north-east of the Lake.

Land use surrounding the mine site is dominated by sheep and cattle grazing and grain cropping. Grazing and occasional cropping within the high water mark of the Lake has historically occurred when the lake was dry and market conditions were suitable. Irrigation farming is practised to the north-east of the Lake in the Jemalong-Wyldes Plains Irrigation District.

The game reserve previously located in ML 1535 was relocated to an area outside of ML 1535 in 2005. The travelling stock reserve was also previously relocated around the western and parts of the southern and northern boundaries of ML 1535 in 2005. The management of grazing and cropping associated with Barrick-owned lands potentially allows native plant communities to recover from 150 years of agricultural pressure. This is expected to provide enhanced terrestrial and wetland habitat opportunities for threatened herb and grass species for which grazing is a dominant threatening process, as well as fauna species. The enhancement initiatives associated within areas of Barrick-owned lands include a Remnant Vegetation Enhancement Programme, a Compensatory Wetland and the enhancement of remaining areas of wetland within ML 1535 (excluding the New Lake Foreshore). These enhancement initiatives are documented in the LMP, CWMP and ROMP. Two offset areas have also been designated on land owned by Barrick to the north and south of the CGM (Figure 19). In accordance with Development Consent Condition 3.4, the offset areas conceptually include offset enhancement areas and an offset revegetation area. A description of the offset areas and offset strategy is provided in Paragraph 3.7.

After decommissioning of the CGM, the modified Lake foreshore, waste rock emplacements and tailings storages are predicted to expand habitat opportunities for wetland and terrestrial flora and fauna species. The rehabilitation programme will include the revegetation of the new landforms with selected communities of native vegetation that are suitable to both the physiographic and hydrological features of each landform, whilst expanding the areas of remnant native vegetation that currently exist in the region and providing habitat opportunities for flora and fauna.

Subject to the outcomes of consultation, the BCPB bores and associated pump stations may be transferred to regional landholders upon agreement by Barrick and in consultation with the NoW. Alternatively, the BCPC bores and associated pump stations may be dismantled and the bores plugged and capped.

4 COMMUNITY RELATIONS

Barrick recognises developing and maintaining a positive relationship with the local community is essential to running a successful mining operation. Barrick has developed a "Community Relations Policy" designed to support the Barrick vision to:

"*…be the world's best gold mining company by operating in a safe, profitable and responsible manner.*"

Barrick strives to earn the trust of all with whom we interact, whether they be our employees, the communities where we live and work, the governments that host us, or other stakeholders with whom we engage in the sustainable development of mineral resources. The Community Relations Policy guides Barrick in its conduct of business around the world, including at the CGM.

In addition, Barrick has developed and implemented a Community Relations Management Standard (CRMS) to ensure a systemic and consistent approach to Community Relations is adopted throughout all of Barrick's operations. The CRMS is being implemented at the CGM.

4.1 COMMUNITY COMPLAINTS

A community complaints line was established on 9 December 2003 and operates 24 hours per day. Complaints and/or concerns can be made by dialling (02) 6975 3454 where an operator advises the caller that they have reached the CGM Complaints Line. This number is listed in the White Pages online. Details of the Complaints Hotline are also advertised quarterly in the following local newspapers; The West Wyalong Advocate, The Forbes Advocate, The Condobolin Argus, and The Lachlander. Finally, the Complaints Hotline is advertised twice-yearly within the Cowal Update community newsletter, released by Barrick and distributed to all households within West Wyalong, Forbes, and Condobolin and via the aforementioned local newspapers as inserts.

When a call is made to the Complaints Hotline, the operator requests the caller's name, the nature of their complaint/concern, and a return phone number. The information is logged along with the date and time that the call was made. A record of each call is immediately forwarded to the CGM Community Relations Department via the CGPComplaints@barrick.com email. For immediate notification of complaints logged outside of regular business hours, the Community Relations Manager receives a copy of the notice to their assigned mobile phone. Upon receiving an enquiry, the Community Relations Manager conducts necessary investigations and prepares a response. The caller is contacted within 24 hours of the complaint, and notified of any action taken or proposed by CGM.

From 13 July 2015 the Complaints Hotline number and Telstra operator service will continue with a new e-mail address community.cowal@evolutionmining.com.au

Complaints may also be submitted through regular stakeholder interactions that may occur between CGM personnel and community members from time to time. All employees and contractors receive information about the CGM's Complaints Management Process during General Induction.

A summary of the community complaints received during the reporting period (as required by the Development Consent) is provided in Table 49.

Table 49: Summary of Community Complaints during the Reporting Period

DETAILS	West Wyalong Community Member (Complainant A)
COMPLAINT / CONCERN	Complainant A contacted Barrick's Community Relations Team directly regarding a concern that Barrick personnel had acted inappropriately in their roles as office-bearers in a community organisation.
DATE and TIME	**11 February 2014 – 2:20pm**
OUTCOME	1. Complainant A contacted the Cowal Gold Mine's Community Relations Team via telephone at approximately 2:20pm on 11 February 2014. 2. The Complainant advised that they were dissatisfied with a decision made by the Board of a Community Sporting Organisation to reject the Complainant's request to hold a function at the organisation's clubhouse. 3. The Complainant advised that they were aware that some members of the Board were also Barrick employees so Barrick should take action to have the Club Board's decision reversed. 4. The Cowal Gold Mine's Senior Community Relations Advisor returned the Complainant's call at 2:25pm on 11 February 2014. 5. Barrick's representative advised the Complainant that the Community Sporting Organisation was not associated with Barrick and, while some Board members may be Barrick employees, they are not representing Barrick in their volunteer roles in that organisation. On this basis, Barrick would not be able to intervene. 6. The Complainant thanked Barrick's representative for returning the call.
DATE OF RESPONSE	11 February 2014

DETAILS	Anonymous Community Member (Complainant B)
COMPLAINT / CONCERN	Complainant B contacted the Cowal Gold Mine's Community Relations Team via telephone during the weekend commencing Friday evening, 11 April 2014. The Complainant left a detailed message however did not provide their name or contact details, so their call could not be returned. The Complainant left a detailed message regarding poor driving behaviour in the community of a mine-related vehicle.
DATE and TIME	**11 April 2014 – 5:00pm**
OUTCOME	1. Complainant B anonymously contacted the Cowal Gold Mine's Community Relations Team via telephone message over the weekend commencing Friday, 11 April 2014. The Complainant left a detailed message regarding poor driving behaviour in the community of a mine-related vehicle. 2. The Cowal Gold Mine's Community Relations Team took action to identify the responsible driver of the vehicle which had caused the Complainant's concern. 3. The driver was identified as an employee of a contractor to the Cowal Gold Mine. 4. Three meetings were held between responsible Barrick personnel and the driver, their immediate supervisor, and the director of the contracting company which employs the driver. 5. The driver, supervisor, and the director all received notice that a complaint had been received and a warning that any further complaints regarding poor driving behaviour could result in further action. The participants were reminded of Barrick's policies regarding driver behaviour and that these policies also apply to contractors. 6. Because the Complainant did not provide their details, Barrick personnel were unable to provide any updates on the status and resolution of this complaint.
DATE OF RESPONSE	11 April 2014

DETAILS	Bland Shire Council (Complainant C)
COMPLAINT / CONCERN	An Officer representing the Bland Shire Council (Complainant C) contacted Barrick's Community Relations Manager via email at 12:07pm on 21 May 2014. The Complainant advised that Bland Shire Council had raised concerns regarding mine-related traffic entering Ungarie Road failing to obey the Give Way sign at this intersection
DATE and TIME	**21 May 2014 – 12:07pm**
OUTCOME	1. Barrick's Community Relations Manager responded to Complainant C via email at 6:24pm on 22 May 2014 to acknowledge the complaint and advised that an Employee Notice would be distributed to the Cowal Gold Mine workforce to reinforce the requirement to obey road rules when driving in the community. 2. The Complainant responded to the Barrick representative's email at 8:33am on 23 May 2014 advising that they regarded an employee notice as sufficient action in response to the complaint. 3. An Employee Notice regarding road rules, particularly the Give Way requirement when entering Ungarie Road, was distributed to the Cowal Gold Mine workforce on 26 May 2014. 4. A copy of the Employee Notice was provided to the Complainant via email at 1:51pm on 26 May 2014. 5. A further notice regarding the requirement to follow road rules, particularly the Give Way requirement when entering Ungarie Road, will be included in the quarterly internal newsletter to be distributed to the entire Cowal Gold Mine workforce during July 2014.
DATE OF RESPONSE	22 May 2014

DETAILS	Lake Cowal Landowner (Complainant D)
COMPLAINT / CONCERN	The Complainant contacted the Cowal Gold Mine's Community Relations Manager via telephone at 1:36pm on 23 May 2014 and left a message. The Community Relations Manager returned the call at 1:38pm on 23 May 2014 and was advised by the complainant that they wished to lodge a complaint regarding the blasting activity which had taken place at the mine at approximately 1:18pm that day.
DATE and TIME	**23 May 2014 – 1:36pm**
OUTCOME	1. The Cowal Gold Mine's Community Relations Manager returned the Complainant's call at 1:38pm on 23 May 2014 and was advised by the Complainant that they wished to lodge a complaint regarding the blasting activity which had taken place that day at approximately 1:18pm which had caused vibrations at the Complainant's house. 2. The Community Relations Manager acknowledged the complaint and advised that they would contact the third-party blast monitoring consultants and request that the blast monitoring data for 23 May 2014 be provided. Barrick's representative undertook to provide the blast monitoring data to the complainant via email on Monday, 26 May 2014. 3. The Complainant acknowledged that the Barrick representative's proposed approach to responding to the complaint was appropriate. 4. Barrick's representative sent the abovementioned blast monitoring data via email to the Complainant at 2:40pm on 26 May 2014. The Data revealed that the blasting activity which had taken place on 23 May 2014 complied with the Blast Impact Assessment Criteria described in the Development Consent Conditions for the Cowal Gold Mine. 5. Barrick's representative also advised via email that if the Complainant remains concerned about the impact of blasting (or any other impact) on their property, they are able to seek independent mediation of their complaint via the Community Environmental Monitoring and Consultative Committee (CEMCC). Alternatively, the Complainant was also advised that they may elect to seek independent assessment of the Cowal Gold Mine's impact on their property via the NSW Government's Department of Planning and Infrastructure. Contact details for the Department of Planning and Infrastructure were provided.

	6. A Barrick representative called the Complainant at 9:26am on 28 May 2014 to confirm that the complainant had received the abovementioned email and blast monitoring data. The complainant confirmed that they had received the information and thanked Barrick's representative for the call.
DATE OF RESPONSE	23 May 2014

DETAILS	Resident of West Wyalong (Complainant E)
COMPLAINT / CONCERN	Complainant E contacted the Cowal Gold Mine via the Complaints Hotline at approximately 11:56am on 23 May 2014 regarding overgrown vegetation at a Barrick-owned residential property in West Wyalong.
DATE and TIME	**23 May 2014 – 11:36am**
OUTCOME	1. The Cowal Gold Mine's Community Relations Manager returned the Complainant's call at approximately 11:44am on 23 May 2014 however, there was no answer. Barrick's representative left a detailed message inviting the Complainant to return the call. 2. The Complainant contacted Barrick's Community Relations Manager at approximately 12:15pm on 23 May 2014. The Complainant explained that a large vine on a Barrick-owned property in West Wyalong was becoming overgrown and interfering with the neighbouring property. The Complainant said they were aware that a Barrick employee resides at the property but has not undertaken maintenance at the property to prevent the vine from becoming overgrown. 3. Barrick's representative advised that the employee would be contacted and instructed to rectify the problem as soon as possible. 4. Barrick's Acting Human Resources Manager met with the Barrick Employee who resides at the house on 26 May 2014. The Employee was instructed to arrange to have the overgrown vine removed. The employee agreed to rectify the problem as soon as possible. 5. Barrick's representative called the Complainant at 2:30pm on 26 May 2014 and provided an update on the action taken to ensure the employee arranges to rectify the problem at the Barrick-owned house. The Complainant thanked Barrick for the action taken and for following-up.
DATE OF RESPONSE	23 May 2014

DETAILS	Resident of Condobolin (Complainant F)
COMPLAINT / CONCERN	Complainant F contacted Barrick's Community Relations Manager directly via email at 9:34am on 2 June 2014 to complain about roadside litter which the Complainant believed was being dropped by Contractors to the Cowal Gold Mine.
DATE and TIME	**2 June 2014 – 9:34am**
OUTCOME	1. Barrick's Community Relations Manager responded to the Complainant via email at 10:04am on 2 June 2014 to acknowledge the complaint and advise that the entire Barrick workforce would be contacted to remind them of their responsibility to not dispose of any litter inappropriately in the community. 2. Barrick's representative also contacted the Contractor which had been identified by the Complainant to advise of the matter and seek the Contractor's advice as to how they intended to respond to the matter. 3. The Contractor contacted Barrick's representative at approximately 5:30pm on 2 June 2014 to advise that they had briefed their personnel on the complaint which had been received. The Contractor then arranged for their personnel to attend the site where the litter problem had been identified and undertake a clean-up of the area. The Chairman and CEO of the Contractor Company advised that they had also attended the location to inspect the clean-up and they were able to advise that the area had been cleaned to their satisfaction. 4. Barrick's representative contacted the Complainant via email at 7:53am on 3 June 2014 to advise of the action which had been taken to rectify the litter problem.

	5. The Complainant responded via email to thank Barrick's representative for the action taken to resolve the complaint and to advise that they didn't think any further action would be required.
DATE OF RESPONSE	6 May 2013 – 2:37pm

DETAILS	Resident of Lake Cowal, (Complainant G)
COMPLAINT / CONCERN	Local Landholder – called the CGM Community Relations Manager directly regarding blasting activities.
DATE and TIME	**23 July 2014 – 12:45pm**
OUTCOME	1. The Complainant contacted the CGM Community Relations Manager directly via telephone at 12:45pm on Wednesday, 23 July 2014. The Complainant advised that they were calling to lodge a complaint about the blast which had taken place that day at 12:36pm. 2. The Community Relations Manager thanked the Complainant for reporting the event and advised that the CGM's third-party blast monitoring advisors would be contacted and asked to provide blast monitoring data for the relevant blast to determine whether the blast had complied with the Blast Impact Assessment Criteria included within the Development Consent Conditions for the Cowal Gold Mine. Upon receipt, the Community Relations Manager undertook to provide the Blast Monitoring Data to the Complainant. 3. The Complainant also suggested that the Community Relations Manager should contact the third-party Operational Noise monitoring advisors and ask them to determine whether the blast would have created a noise impact in breach of the Noise Impact Assessment Criteria described in the Development Consent Conditions. 4. The Community Relations Manager said he would contact the third-party Operational Noise Monitoring Advisors as suggested by the Complainant and request that they include comments about the impact of the blast on Operational Noise Monitoring in their report which would be delivered in approximately six weeks. The Community Relations Manager undertook to provide a copy of the Operational Noise Monitoring Report to the Complainant upon receipt. 5. The Complainant also mentioned that a number of blasts the previous week had also caused higher vibration impacts than usual. 6. The third-party Blast Monitoring Advisors provided blast monitoring data for the blast which took place on 23/07/2014 at 12:18pm on Friday, 25 July 2014. 7. The Community Relations Manager emailed the Complainant at 1:34pm on Friday, 25 July 2014 and provided the blast monitoring data for the blast which took place on Wednesday, 23 July 2014. The Blast Monitoring Data indicated that the blast had complied with the Blast Impact Assessment Criteria described in the Development Consent Conditions for the Cowal Gold Mine (Peak Ground Vibration: 0.09mm/s and Peak Air Overpressure 104.2dB(L)). 8. The Community Relations Manager also advised the Complainant that if they remained concerned about the impact of blasting (or any other impact) on their property then they may elect to seek independent mediation of their complaint via the CEMCC. Alternatively, the Complainant was also advised that they may prefer to seek independent assessment of the Cowal Gold Mine's impact on their property via the NSW Government's Department of Planning and Environment. Contact details for the NSW Government's Department of Planning and Environment were provided. 9. The Community Relations Manager sent a further email to the Complainant at 10:23am on Monday, 28 July 2014 providing blast monitoring data for the period 12-20 July 2014 as the complainant had mentioned that there had been elevated effects of blasting during this period. 10. Again the blast monitoring data indicated that the blasting during this period had complied with the Blast Impact Assessment Criteria described in the Development Consent Conditions for the Cowal Gold Mine (Peak Ground Vibration: 0.12mm/s and Peak Air Overpressure 108.4dB(L)).

	11. The Community Relations Manager attempted to contact the Complainant via telephone at 12:18pm on Monday, 28 July 2014 however, there was no answer so a detailed message was left on the automated answering service. The Community Relations Manager advised that they were following up on the complaint received on Saturday, 26/07/2014 and on the earlier discussion regarding the blast on 23/07/0214. The Community Relations Manager advised that they had emailed relevant blast monitoring data for each of those blasts and they confirmed that the data reflected that the blast had complied with the Development Consent Conditions. The Community Relations Manager invited the Complainant to call directly via mobile or on the office numbers if they had any additional questions or concerns and contact details were provided.
DATE OF RESPONSE	23 July 2014

DETAILS	Resident of Lake Cowal, (Complainant H)
COMPLAINT / CONCERN	Local Landholder – called the CGM Community Relations Manager directly regarding blasting activities
DATE and TIME	**26 July 2014 – 12:32pm**
OUTCOME	1. The Community Relations Manager noted that they had missed a call from the Complainant at 12:32pm on Saturday, 26 July 2014. The Community Relations Manager checked for messages on the automated messaging service and noted that the Complainant had left a message explaining that they were calling to complain about the effects of blasting at the Cowal Gold Mine which had taken place at around 12:30pm that day. 2. The Community Relations Manager contacted the third-party blast monitoring advisors at 7:37am on Monday, 28 July 2014 to request blast monitoring data for the relevant blast which had triggered this complaint. The blast monitoring data was received at 10:07am. 3. The Community Relations Manager emailed the Complainant at 10:21am on Monday, 28 July 2014 and provided the blast monitoring data for the blast which took place on Saturday, 26 July 2014. The Blast Monitoring Data indicated that the blast had complied with the Blast Impact Assessment Criteria described in the Development Consent Conditions for the Cowal Gold Mine (Peak Ground Vibration: 0.10mm/s and Peak Air Overpressure 105.5dB(L)). 4. The Community Relations Manager also advised the Complainant that if they remained concerned about the impact of blasting (or any other impact) in their property then they may elect to seek independent mediation of their complaint via the CEMCC. Alternatively, the Complainant was also advised that they may prefer to seek independent assessment of the Cowal Gold Mine's impact on their property via the NSW Government's Department of Planning and Environment. Contact details for the NSW Government's Department of Planning and Environment were provided. 5. The Community Relations Manager attempted to contact the Complainant via telephone at 12:18pm on Monday, 28 July 2014 however, there was no answer so a detailed message was left on the automated answering service. The Community Relations Manager advised that they were following up on the complaint received on Saturday, 26/07/2014 and on the earlier discussion regarding the blast on 23/07/0214. The Community Relations Manager advised that they had emailed relevant blast monitoring data for each of those blasts and they confirmed that the data reflected that the blast had complied with the Development Consent Conditions. The Community Relations Manager invited the Complainant to call directly on via mobile or in the office numbers if they had any additional questions or concerns and contact details were provided.
DATE OF RESPONSE	28 July 2014

DETAILS	Resident of Lake Cowal, (Complainant I)
COMPLAINT / CONCERN	Local Landholder – called the CGM Community Relations Manager directly regarding employee driving behaviour.
DATE and TIME	**5 August 2014 – 6:20pm**
OUTCOME	1. Barrick Cowal's Community Relations Manager noted that they had missed a call from the complainant at 6:20pm on Tuesday, 5 August 2014. 2. The Community Relations Manager returned the Complainant's call at 6:21pm on the same day. 3. The Complainant advised that they had called to enquire whether the Bogeys Island Road was still not to be used by mine-related traffic as they had seen some mine employees using the road recently. 4. The Community Relations Manager explained that the recent approval by the NSW Government of Barrick Cowal's Modification Request did not remove Bogey's Island Road from the list of approved routes to site and therefore, Barrick was obliged to request its employees to use that route. 5. The Complainant understood this response and went on to ask that Barrick ensures its employees show courtesy when passing private vehicles on that route to avoid flicking loose stones into passing vehicles' windows. 6. The Community Relations Manager undertook to ensure this message was passed on to employees and the Barrick Cowal General Manager included a reminder to all employees about showing courtesy to other drivers in his weekly e-newsletter to employees and contractors. 7. The Complainant also enquired as to the status of a blast monitor which was to be installed at the Complainant's property. 8. The Community Relations Manager responded that the Environmental Protection Licence for the Cowal Gold Mine had very recently been changed to require the installation of a Blast Monitor at the Complainant's property and that Barrick was awaiting the delivery of equipment to be installed. 9. The Community Relations Manager attempted to call the Complainant again at 4:02pm on 6 August 2014 however there was no answer so a detailed message was left on the Complainant's automated answering service. The message explained that the Blast Monitoring equipment has been delivered and that Barrick personnel would attend the Complainant's property on the following day to install the equipment. 10. Barrick personnel attended the Complainant's property on 7 August 2014 and installed the Blast Monitoring Equipment. The Complainant's spouse greeted the Barrick personnel and agreed on the location of the Blast Monitoring Equipment to be installed. 11. The Blast Monitoring Equipment was installed and confirmed as operational by Barrick's third-party blast monitoring advisors on 7 August 2014.
DATE OF RESPONSE	5 August 2014

DETAILS	Resident of Lake Cowal, (Complainant J)
COMPLAINT / CONCERN	Local Landholder – called the CGM Community Relations Manager directly regarding blasting activities
DATE and TIME	**14 August 2014 – 12:50pm**
OUTCOME	1. The Complainant called Barrick Cowal's dedicated Complaint's Hotline at 12:50pm on Thursday, 14 August 2014 and advised that they were calling about the effects of blasting on that day. 2. Barrick Cowal's Community Relations Manager returned the Complainant's call at 12:52pm on the same day. During the discussion, the Complainant advised that they had felt the blast from the mine which had caused an initial rumble followed by an extended shaking of the house. 3. The Community Relations Manager responded by saying that a Blast Monitor had recently been installed at the Complainant's property so, the Community Relations Manager would be able to retrieve the blast monitoring data from the equipment and provide it to the Complainant within 24 hours via email. 4. The Community Relations Manager contacted the third-party blast monitoring advisors at 1:27pm on Thursday, 14 August 2014 to request blast monitoring data for the relevant blast which had triggered this complaint. The blast monitoring data was received at 8:11am on Friday, 15 August 2014 5. The Community Relations Manager emailed the Complainant at 9:29am on Friday, 15 August 2014 and provided the blast monitoring data for the blast which took place on Thursday, 14 August 2014. The Blast Monitoring Data indicated that the blast had complied with the Blast Impact Assessment Criteria described in the Development Consent Conditions for the Cowal Gold Mine (Peak Ground Vibration: 0.24mm/s and Peak Air Overpressure 94.0dB(L)). 6. The Community Relations Manager also advised the Complainant via email that if they remained concerned about the impact of blasting (or any other impact) on their property then they may elect to seek independent mediation of their complaint via the CEMCC. Alternatively, the Complainant was also advised that they may prefer to seek independent assessment of the Cowal Gold Mine's impact on their property via the NSW Government's Department of Planning and Environment. Contact details for the NSW Government's Department of Planning and Environment were provided.
DATE OF RESPONSE	14 August 2014

DETAILS	Resident of Lake Cowal, (Complainant K)
COMPLAINT / CONCERN	Local Landholder – called the CGM Community Relations manager directly regarding employee driving behaviour
DATE and TIME	**01/10/2014 – 6:05pm**
OUTCOME	1. Barrick Cowal's Community Relations Manager received a call from the Complainant at 6:05pm on Wednesday, 1 October 2014. 2. The Complainant advised that they had called to complain about Barrick Cowal Gold Mine employees and/or contractors who were forgetting to switch off their flashing lights on their vehicles when driving on public roads. 3. The Cowal Gold Mine apologised to the Complainant for the inconvenience and undertook to remind all mine personnel of the requirement to switch off flashing lights prior to departing the mine site. 4. The Complainant indicated their satisfaction with this response.
DATE OF RESPONSE	01/10/2014

DETAILS	Resident of Lake Cowal, (Complainant L)
COMPLAINT / CONCERN	Local Landholder – called the CGM Complaints Hotline regarding the impacts of blasting
DATE and TIME	**21/10/2014 – 12:43pm**
OUTCOME	1. Barrick Cowal's Community Relations Manager received a call from the Complainant at 12:43pm on Tuesday, 21 October 2014. 2. The Cowal Gold Mine Community Relations Manager returned the Complainant's call at 2:04pm on the same day. 3. The Complainant advised they they had heard a loud bang at or around 12:40pm that day. 4. The Cowal Gold Mine Community Relations Manager acknowledged the report and advised that they would review available blast monitoring data to determine whether the measured effects of the blast had exceeded the Statutory Development Consent Conditions which restrict the impacts of blasting. 5. The Cowal Gold Mine's Community Relations Manager faxed a letter to the Complainant at 3:25pm on Wednesday, 22 October 2014. The letter advised that the blast monitoring data for the previous day's blasting activities had indicated that the blast had complied with the development consent conditions. 6. The letter advised that the blast had resulted in peak overpressure of 104.2dB(L) and peak ground vibrations of 0.32mm/s 7. The letter also advised that if the Complainant wished to seek independent mediation of their concerns via the CEMCC, that remained an option for them. 8. Furthermore, the letter advised that the Complainant may wish to seek independent assessment of the CGM's impact on their property via the NSW Government's Department of Planning and Environment. Contact details for the NSW Government's Department of Planning and Environment were provided.
DATE OF RESPONSE	21/10/2014

DETAILS	Resident of Lake Cowal, (Complainant M)
COMPLAINT / CONCERN	Local Landholder – called the CGM Community Relations Manager directly regarding employee behaviour
DATE and TIME	**04/12/2014 – 10:53am**
OUTCOME	1. The Complainant attempted to call the Cowal Gold Mine's Community Relations Manager directly at 10:53am and left a message on the automated answering service. 2. The Community Relations Manager returned the Complainant's call at 11:46am on the same day. 3. The Complainant advised that they were dissatisfied with the outcome of an engagement between the Complainant and a representative of the Cowal Gold Mine. 4. The Complainant advised that the Mine's representative had contacted the Complainant to request that the Complainant remove their stock (cattle) from Cowal Gold Mine Mining owned land. 5. The Complainant went on to state that the Cowal Gold Mine's representative had said they would remove the stock themselves to the nearby travelling stock route unless the complainant promptly removed the stock. 6. The Complainant expressed their dissatisfaction with the nature of the conversation. 7. The Community Relations Manager apologised to the Complainant and advised the Cowal Gold Mine personnel would not take action to have the stock moved to the travelling stock route. The Cowal Gold Mine would simply rely on the Complainant to remove their own stock from the mine-owned land when safe to do so.

	8. The Complainant and The Community Relations Manager discussed what other actions could be taken to prevent stock from moving onto Cowal Gold Mine owned land as Lake Cowal was receding and fencing was inadequate to prevent unwanted stock movement. 9. Fencing was planned to be undertaken by the end of the year (2014) with costs shared between the Cowal Gold Mine and the Complainant. 10. The call ended with the Community Relations Manager reiterating the earlier apology and reassuring the Complainant that the stock would not be moved by Cowal Gold Mine personnel. 11. The cattle were removed by the Complainant and boundary fencing completed in 2014.
DATE OF RESPONSE	04/12/2014

4.2 COMMUNITY LIAISON

Community Environmental Monitoring and Consultative Committee

The CEMCC was established prior to commencement of construction works, in accordance with the Development Consent requirements. The CEMCC monitors compliance with conditions of the Development Consent and other matters relevant to the operation of the mine.

During the reporting period, quarterly meetings of the CEMCC were conducted.

The CEMCC quarterly meetings during the reporting period occurred on 5 March, 4 June, 3 September, and 3 December 2014. The CEMCC meets on-site or in local communities, undertakes regular inspections, reviews environmental and audit reports and discusses any incidents or complaints that may have been registered. The CEMCC members are an active conduit between local communities and the CGM. Minutes are taken from each meeting and published in the local library and also on the BSC website (see Appendix E). Since July 2014, the Minutes have also been published on the CGM's website: (http://www.barrick.com/operations/australia/cowal/default.aspx).

It should be noted that as of 24 July 2015, the CEMCC meeting minutes will be available on Evolution Mining's website (http://www.evolutionmining.com.au).

Community Information Newsletters

The "Cowal Update" is the CGM community newsletter that was released regularly during the construction and start-up phase of the project (2003 to August 2006). New editions of the Cowal Update were released in March and July 2014. Copies of the Cowal Update community newsletter are distributed to all households in West Wyalong, Condobolin, and Forbes, and via insert within the four local newspapers covering the Bland, Lachlan and Forbes Shires. It is scheduled that the Cowal Update will be published every six months with the next edition due in July 2015.

Other Community Involvement

Barrick extended invitations to numerous community groups to visit the CGM for presentations and site visits. Site visits were undertaken by a number of groups during the reporting period including:

- Bland, Forbes and Lachlan Shire Councils;
- Wiradjuri Condobolin Corporation;
- local farmers;
- various community and charity groups from neighbouring towns and villages;
- various primary and secondary schools;
- employee family visits: and
- community visit day for community members of Bland, Forbes & Lachlan Shires

Community and Family visit days are conducted annually with up to 600 people in attendance over the two days. In addition, the CGM regularly hosts school and community group visits. Stakeholder meetings are carried out on-site or in the local community depending upon the group and topic. These meetings can consist of 3 to 20 people, for example:

- CEMCC meetings (which are held quarterly);
- Local landholders and local community and charitable groups; and
- Local Government and State agency meetings.

Barrick also attended several off-site presentations involving the community including:

- local community and charitable groups;
- Wiradjuri Condobolin Corporation
- Lachlan, Bland and Forbes Shire Councils; and
- Local secondary schools.

Wiradjuri Condobolin Community Liaison

Barrick works with the Wiradjuri Condobolin Community through the Wiradjuri Condobolin Corporation (WCC) and a number of formal committees:

- the Cowal Project Coordinating Committee (**CPCC**); and
- the Employment, Training and Business Committee (**ETBC**), which meets with the WCC on a regular basis.

Barrick has committed to provide employment opportunities for Wiradjuri people on-site and has developed an Indigenous Peoples Plan to improve engagement opportunities for Indigenous People in the Barrick Cowal workforce. The Wiradjuri Traineeship Program was implemented in early 2010 with the introduction of a Business Administration Traineeship and a Store Warehousing Traineeship, both traineeships were successfully filled.

WCC was awarded the offices and facilities cleaning contract in February 2007, which is a further 12 employees. WCC were also successful in tendering for the CGM's freight and logistics contract in 2009.

During the reporting period the WCCHC has provided archaeological monitoring services on-site. Monitoring has been carried out on an as needs basis.

Barrick employees and contractors continued to attend Cultural Heritage Inductions presented by the WCCHC during the reporting period.

Through the ETBC, Barrick and the WCC have continued to award Scholarships to Wiradjuri students moving into University studies. During the reporting period 6 Wiradjuri scholarships were awarded.

In addition to Wiradjuri support, Barrick continues to support students in the Bland, Lachlan and Forbes Shires and offers the "Endeavour" Scholarship program. In collaboration with local senior schools, Barrick has reviewed the structure of the Endeavour Scholarship program, ensuring it meets the needs and aspirations of Barrick and local students. This review led to local schools distributing over $37,500 worth of scholarships and bursaries from Barrick in 2014.

Barrick Donations

Barrick has continued to support numerous donation, sponsorships and partnerships to a variety of local schools, annual events, charity and not for profit groups, community infrastructure and town advancement groups. Barrick again made substantial contributions to the community during this reporting period.

Barrick operates two schemes to facilitate financial contributions to the community. The Cowal Partnering Program (**CPP**) and the Barrick Buddies (**BB**) Program, both programs were established in 2006 and both programs will continue to operate during the next reporting period.

The BB Program offers $250 to successful employee volunteers, completing 25 or more hours of service to a charity, sporting or community group per annum. The employee presents the funds to their nominated group. The BB Program promotes community involvement amongst the work force.

Barrick allocated more than $165,000 of funds to via the CPP and BB Programs during 2014.

Legacy Fund

In 2013, a Memorandum of Understanding (MOU) was signed between the Barrick Cowal Pty Ltd and the three surrounding local government areas. The MOU established a Legacy Fund to benefit the residents of the Bland, Forbes and Lachlan Shires following the eventual closure of the CGM. Each year, the CGM will contribute a proportion of any unspent but budgeted funds for community initiatives to the Legacy Fund which is held in trust and to be transferred to the three Councils after the eventual closure of the mine.

During the reporting period, Barrick contributed $30,000 to the Legacy Fund, making the current balance of the fund approximately $195,000.00

The Lake Cowal Foundation Limited (LCF)

The LCF continues to grow into an important local independent “Environmental Trust”. The Foundation is actively supported financially and in-kind by CGM. The LCF Board meet as required, some meetings are held via teleconference.

In addition to housing the LCCC on Barrick-owned property ‘Hillgrove’, Barrick has also provided the LCF with considerable freehold property to undertake conservation and research projects. Barrick also provides secretariat services to the LCF.

The LCF has now been involved in approximately 32 conservation projects in the Lake Cowal region and has developed a relationship with 34 project partners, including:

- numerous local land owners and managers;
- Riverina and Central West Local Lands Services;
- EPA, National Landcare Program, Natural Heritage Trust, Environmental Trust, Greening Australia and DPI (Fisheries);
- Forbes, Lachlan, Weddin, Temora and Bland Shire Councils, and Condobolin, Forbes and Young Pastures Protection Boards;
- Charles Sturt University, CSIRO, Western Research Institute, Western Institute of TAFE and West Wyalong High School; and
- numerous local bodies such as the West Wyalong Anglers and Gardening Clubs.

Some of the projects that the LCF have completed or are involved in include:

- the restocking of Bland and Sandy Creeks with native fingerlings;
- Lake Cowal and Bland Creek revegetation projects;
- Bland Creek Catchment Incentives Grants Project that has combined contributions of approximately $5 million;
- a Natural Sequence Farming project which aims to reconnect the hydrologic function of the ten kilometre Spring Creek with its floodplain;
- collaborative research with CSIRO Plant Industry into native grassland population dynamics;
- Pasture Re-establishment Trials and Pasture Cropping Trials;
- the LCCC; and
- seed collection, assessment of remnant vegetation and establishment of a herbarium.

The LCF continues to be an important organisation with conservation, pastoral, community, government, educational and mining groups working collaboratively together to achieve considerable outcomes for the Lake Cowal region.

5 REHABILITATION REPORT

5.1 BUILDINGS

No buildings were renovated or removed from ML 1535 during the reporting period.

5.2 REHABILITATION OF DISTURBED LAND

A summary of rehabilitation undertaken at the CGM during the reporting period (Plate 5) are as follows:

- PWE – applied rock, topsoil and gypsum to the 2nd and 3rd lifts of the outside southern and eastern sections;
- PWE – reshaped and applied rock, topsoil and gypsum and a rock lined drain to the south western end;
- PWE – reshaped and applied rock, topsoil and gypsum to sections of the inner batters, also applied stripped rehabilitation material from the NTSF (removed to commence buttressing of 2nd lift) to sections of the inner batters;
- NWE – North Wall (Pond D1 rehabilitation trial area, on north-eastern side) – planting of tubestock;
- NWE – North Wall – applied rock, topsoil and gypsum to parts of the 1st, 2nd, 3rd and 4th lifts immediately to the west of the Pond D1 trial area;
- NWE – North Wall – applied rock, topsoil and gypsum to the lower seven lifts of the western end;
- SWE – South Wall (rock – topsoil trial plots) ongoing monitoring of the direct seeding of November 2011;
- SWE – South Wall – applied rock, topsoil and gypsum to the lower three lifts;
- SWE – South Wall – reshaped the upper five lifts from the south-west corner to above the SWE trial area;
- SWE – East Wall - applied rock, topsoil and gypsum to the 1st and 2nd lifts adjacent to Pond D4;
- Temporary Isolation Bund and Lake Protection Bund - road and weed maintenance; and
- NTSF – Rehabilitation material on the 2nd lift was stripped to allow buttressing works to proceed (this stripped material was relocated and used directly on the inner batters of the PWE as described above).

Plate 5: Conceptual view of areas rehabilitated during the reporting period

Topsoil was stripped from a 6.5ha area to the west of the NWE to enable construction of a rock stockpile (Tails 08) for use during future NTSF lift works. Approximately 34,000m^3 of topsoil was stripped from this area and is stockpiled near this location for future use during rehabilitation works (Topsoil Stockpiles 24 and 25) (Figure 17).

All disturbed areas/structures had temporary erosion and sediment control measures implemented during construction in accordance with the ESCMP. Control measures included temporary sediment traps, sediment filters, diversion banks and silt fences. Further detail of erosion and sediment control measures for these areas/structures is described in Paragraph 3.2.2 and presented in the ESCMP.

Plate 6: Rehabilitation works continuing on Southern Waste Rock Emplacement (March 2015).

Table **50** provides details of the nature of disturbance, area and rehabilitation status for areas that have been disturbed up to and including the reporting period.

Table 50: Nature of Disturbance and Rehabilitation Status of Disturbed Land

Disturbed Area	Nature of Disturbance				Area (ha) (approximate)	Rehabilitation Status
	Vegetation Cleared	Topsoil and Subsoil Stripped	Earthworks	Construction Works Status*		
NTSF						
• Floor	✓	✓	✓	Complete	168	Not yet rehabilitated
• Starter embankment	✓	✓	✓	Complete	15	Shaped and covered
• Upstream lifts (2nd & 4th)	N/A	N/A	✓	Commenced	18	Not yet rehabilitated
• Upstream lift (3rd)	N/A	N/A	✓	Complete	8	Rock-topsoil cover
STSF						
• Floor	✓	✓	✓	Complete	156	Not yet rehabilitated
• Starter embankment	✓	✓	✓	Complete	15	Shaped and covered
• Downstream lift	✓	✓	✓	Complete	24	Shaped and covered
• Upstream lift	✓	✓	✓	Commenced	18	Rock-topsoil cover
Open Pit	✓	✓	✓	Commenced	107	Not yet rehabilitated
PWE	✓	✓	✓	Commenced	60	All sections shaped and covered (except northern most area)
NWE (excluding outer batters)	✓	✓	✓	Commenced	230	Not yet rehabilitated
SWE (excluding outer batters)	✓	✓	✓	Commenced	140	Southern section shaped
NWE outer batters	✓	✓	✓	Commenced	23	Some sections shaped and covered
SWE outer batters	✓	✓	✓	Commenced	25	Some sections shaped and covered
Ore Stockpiles	✓	✓	✓	Commenced	58	Not yet rehabilitated
Tailings service corridor	✓	✓	✓	Complete	5	Not yet rehabilitated
Soil stockpiles	✓	✓	✓	Commenced	125	Not yet rehabilitated
Processing plant (including contained water storages D5 and D6)	✓	✓	✓	Complete	20	Not yet rehabilitated
Mining Hardstand (including workshop and fuel farm)	✓	✓	✓	Complete	8	Not yet rehabilitated
Internal mine access road	✓	✓	✓	Complete	8	Not yet rehabilitated

* Construction works status refers to earthworks, excavations and/or emplacement of material.

Table 48 (Continued): Nature of Disturbance and Rehabilitation Status of Disturbed Land at the end of the Reporting Period

Disturbed Area	Nature of Disturbance				Area (ha) (approximately)	Rehabilitation Status
	Vegetation Cleared	Topsoil and Subsoil Stripped	Earthworks	Construction Works Status*		
Contained water storages D1 and D4	✓	✓	✓	Complete	5	Not yet rehabilitated
Contained water storages D2, D3 & D8B	✓	✓	✓	Complete	11	Not yet rehabilitated
Contained Water Storage D9	✓	✓	✓	Complete	13	Not yet rehabilitated
Stilling basin and outfall	✓	✓	✓	Complete	1	Not yet rehabilitated
Temporary tank and holding pond for bore field water	✓	✓	✓	Complete	<1	Not yet rehabilitated
Mine dewatering bores	✓	N/A	✓	Complete	<1	Not yet rehabilitated
Minor internal roads and haul roads	✓	✓	✓	Commenced	40	Not yet rehabilitated
Temporary laydown areas	✓	✓	✓	Complete	1	Not yet rehabilitated
Exploration Geology office	✓	✓	✓	Complete	1	Not yet rehabilitated
Administration office	✓	✓	✓	Complete	1	Not yet rehabilitated
Temporary administration office	✓	✓	✓	Complete	1	Not yet rehabilitated
ML 1535 perimeter fence	✓	N/A	✓	Complete	<1	Not yet rehabilitated
Magazine compound	✓	✓	✓	Complete	2	Not yet rehabilitated
Temporary isolation bund	✓	✓	✓	Complete	10	Shaped and covered
Lake protection bund	✓	✓	✓	Complete	10	Shaped and covered
Up-catchment diversion system	✓	✓	✓	Complete	2	Rehabilitated and under maintenance
Internal catchment drainage system (permanent catchment divide)	✓	✓	✓	Complete	2	Rehabilitated and under maintenance
BCPC water supply pipeline	✓	✓	✓	Complete	2	Not yet rehabilitated
Saline groundwater supply borefield and associated pipeline	N/A	✓	✓	Commenced	10	Not yet rehabilitated
Boart Longyear office	✓	✓	✓	Complete	1	Not yet rehabilitated
Bioremediation area	✓	✓	✓	Complete	1	Not yet rehabilitated
Waste management yard	✓	✓	✓	Complete	1	Not yet rehabilitated
TSF construction compound	✓	✓	✓	Complete	2	Not yet rehabilitated

N/A: Not applicable

* Construction works status refers to earthworks, excavations and/or emplacement of material.

The following provides detail of the construction and rehabilitation of each key final landform at the CGM (including the rehabilitation of Pond D9 embankments and ML 1535 amenity landscaping).

Perimeter Waste Emplacement

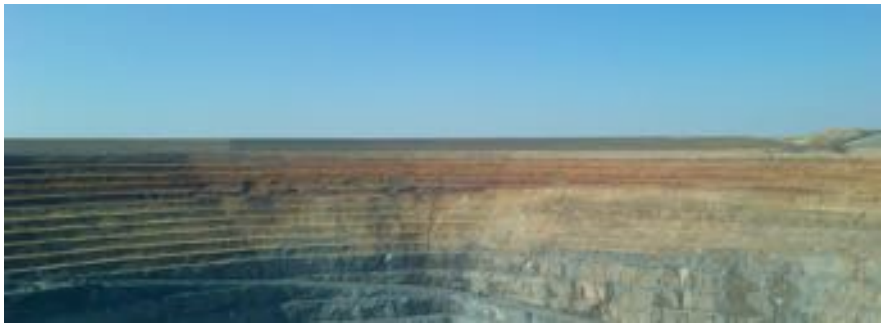
The PWE has been constructed to approximately RL 223 m and surrounds the pit to the north, east and south (Figure 3). The emplacement occupies an area of approximately 60ha and forms part of the series of embankments (i.e. Temporary Isolation Bund and Lake Protection Bund) between the open pit and Lake Cowal. The emplacement elevation has been designed to reduce potential noise and light impacts of mining and processing on the surrounding environment and sensitive receptors.

As per the January 2009 s96(1A) Modification, the PWE bund wall to the north-east of the open pit was reduced in height to maintain geotechnical performance during vertical advancement of the pit floor. This cut reshaped the inside eastern pit wall from June 2009 and removed the northern half of the earlier rehabilitation trial plots in March 2010.

Beginning in November 2011, the 1st eastern lift of the PWE was repaired using the rock-topsoil method with gypsum application at 10t/ha along the full length along with rock armouring of the outer face of the LPB.

During 2013, the 2nd and 3rd lifts of the eastern side of the PWE was reshaped due to large erosion gullies affecting rehabilitation stability. These lifts were subsequently rehabilitated in early 2014 using the rock-topsoil method along with application of 10t/ha gypsum. The four lifts of the inner batters of the PWE were also reshaped to repair large erosion gullies in 2014, with stripped rehabilitation material from the NTSF 2nd lift applied to the southern half of the PWE (Plate 6). The remainder of the inner batters had the rock-topsoil method applied. The entire inner batter will have gypsum applied at the standard rate of 10t/ha in early 2015.

Plate 7: Inside east face of the re-worked Perimeter Waste Rock Emplacement (March 2015).



A small number of tubestock (approx. 30 left over from planting in the D1 trial area) were planted on the south western corner of the PWE in early September 2014. Further tubestock will be planted in this area in 2015.

Physical and Chemical Characteristics of Emplaced Material Relevant to Rehabilitation

Material within the PWE consists primarily of oxide waste rock. Oxide waste rock is typically saline and non-acid forming silty clayey rock fill. This material breaks down following track rolling/compaction and most likely forms a material of medium to low permeability.

Method of Land Shaping

The PWE has been constructed in approximately 5m to 10m lifts with land shaping and rehabilitation works undertaken progressively during run-of-mine operations.

Characteristics of Cover Material

As described above, based on rehabilitation trial results to date, the cover material of the waste emplacement batters most likely to provide stable landforms and successful revegetation performance includes a rock mulch topsoil cover treatment. As a result, most areas of the PWE have now been reshaped and covered using this cover system.

Thicknesses of Cover Layers and Methods of Laying and Compaction

The cover system concept includes approximately 0.25 m deep layer of rock mulch, a layer of 0.25m topsoil cross-ripped with 10t/ha gypsum. Topsoil has been transferred from soil stockpiles or directly from stripped rehabilitation areas of the TSF and spread using dozers.

Drainage and Erosion Control

Batter drainage is effected by the use of wide reverse-graded berms every 5m vertical height. The berms diffusely grade inwards and the surfaces are kept as rough as possible to maximise absorption. This has the effect of absorbing and storing rainfall in all but extreme events (in which case, runoff will longitudinally fall along the berms to be held for absorption by a series of depressions constructed every 50m – 100m in the reverse-grading berms). This minimises the use of artificial drainage structures on the batters. The reverse-graded berms have been progressively installed as the lifts were constructed and were regraded during the reporting period as a result of the PWE rehabilitation earthworks. Drainage on the top surfaces of the emplacement will be similarly managed via a series of small shallow basins (depressions) and deep cover of high absorption capacity. The use of depressions is aimed at maximising internal drainage without creating permanent ponding during normal and heavy rainfall events. A rock lined drain from the top southern end of the PWE was installed during the reporting period to drain water from the top surface during extreme rainfall events.

Final Landform Profile and Slopes

A typical section through the perimeter waste rock emplacement and lake isolation system is shown in Figure 20. Typical slopes of the perimeter waste rock emplacement are 1(V):5(H) (Figure 20).

Soil Treatment

Soils to be used in rehabilitation are treated with gypsum where necessary. Gypsum is spread over oxide waste rock by tractor spreader before the addition of primary waste rock and topsoil. A further application of gypsum is placed on the topsoil and cross ripped. A rate of 10t/ha gypsum was used during the reporting period.

Gypsum application rates for the topsoil and subsoil stockpiles have been prepared by McKenzie Soil Management and are detailed in their (2013) *Cowal Gold Mine Soil Stockpile Characterisation Report*.

Revegetation Species and Methods for Establishment

The top surfaces and inner and outer batters of the PWE are to be revegetated following placement of topsoil with native and introduced grasses and native trees and shrubs (woodland community species). A small number of tubestock were planted on the southern most outer batter during the reporting period. Further tubestock are planned to be planted in this area in 2015.

Long-term rehabilitation of the waste rock emplacement will be informed by the results of the rehabilitation trials carried out over the mine life and will include the progressive re-establishment of woodland community species with the planting/seeding of local native grasses, shrubs and trees.

Extent to which Agreed Rehabilitation Outcomes and Landuse Have Been Met

The proposed progressive rehabilitation of the PWE is in accordance with rehabilitation concepts presented in the CGM Extension Modification Environmental Assessment (Barrick, 2013) and ROMP. Further rehabilitation of the emplacement will be undertaken to achieve final rehabilitation outcomes and other subsequent environmental approvals in accordance with the *Cowal Gold Mine Extension Modification Environmental Assessment* (Barrick, 2013).

Maintenance Activities/Requirements

Annual rehabilitation (and visual) monitoring of revegetated landforms including the PWE is conducted to ensure vegetation is establishing and to determine the need for any maintenance and/or contingency measures (such as the requirement for supplementary plantings, erosion control and weed control). The 2014 rehabilitation works are subject to ongoing independent consultant review of effectiveness.

Northern and Southern Waste Rock Emplacements – Outer Batters

The NWE is approved to be constructed to approximately 308 m AHD and will occupy an area of approximately 269 ha northwest of the pit. The SWE is approved to be constructed to approximately 283 m AHD and will occupy an area of approximately 140 ha southwest of the pit.

Physical and Chemical Characteristics of Emplaced Material Relevant to Rehabilitation

Material within the NWE predominantly consists of primary waste rock and a minor proportion of oxide waste rock. Material within the SWE consists of a large proportion of oxide waste rock with some primary rock.

Method of Land Shaping

The waste rock emplacements are constructed in 10m lifts with land shaping and rehabilitation works generally undertaken progressively during run-of-mine operations. Land shaping is carried out by dozers and involves the construction of drainage and erosion and sediment control features.

During 2008, a portion of the lower three lifts of the southern SWE was shaped for use in a rehabilitation trial area. The trial plots were established in 2009 to assess the erosion potential of various cover treatments.

In total, 25ha of the SWE was re-shaped during the reporting period (Plate 8). 10ha of this had rock, topsoil and gypsum applied whilst the remainder had a rock cover applied. Completion of rehabilitation on this remaining area will take place during the next reporting period.

Plate 8: Southern Waste Rock Emplacement South Side (March 2015)

Plate 9 : North side of Northern Waste Rock Emplacement (March 2015)

Characteristics of Cover Material

The waste emplacement outer batter cover material will be of low salinity to avoid the potential for saline runoff and enable satisfactory vegetation growth. The cover system concept for the NWE and SWE batters will be the same as applied to PWE described earlier in this section (i.e. the rock mulch-topsoil method).

Thicknesses of Cover Layers and Methods of Laying and Compaction

The cover system concept for the NWE and SWE batters will be the same as applied to PWE described earlier in this section.

Drainage and Erosion Control

Batter drainage will be the same as applied to PWE described earlier in this section.

Final Landform Profile and Slopes

A typical section through the northern waste rock emplacement is shown in Figure 21. Typical slopes of the waste rock emplacements will be 1(V):5(H).

Soil Treatment

Soils to be used will be the same as applied to PWE described earlier in this section.

Revegetation Species and Methods for Establishment

Outer batters of the emplacements will be the same as applied to PWE described earlier in this section.

In November 2011 a direct seeding application of local provenance stock was applied to the topsoil plots of the SWE south trial area.

DnA Environmental conducted surveys of nutrient in soil profile and tree root penetration tracking through the SWE south trial plots (as per Independent Monitoring Panel recommendation (2011 report)). The results of DnA Environmental's survey is provided in Paragraph 5.4.

Extent to which Agreed Rehabilitation Outcomes and Landuse Have Been Met

The proposed progressive rehabilitation of the waste rock emplacements is in accordance with rehabilitation concepts presented in the currently approved *Cowal Gold Mine Extension Modification Environmental Assessment* (Barrick, 2013). Further rehabilitation of the emplacements will be undertaken to achieve final rehabilitation outcomes and land use in accordance with the *Cowal Gold Mine Extension Modification Environmental Assessment* (Barrick, 2013).

Maintenance Activities/Requirements

Annual rehabilitation (and visual) monitoring of revegetated landforms including the northern and southern waste rock emplacements is conducted to ensure vegetation is establishing and to determine the need for any maintenance and/or contingency measures (such as the requirement for supplementary plantings, erosion control and weed control).

Temporary Isolation Bund (TIB) and Lake Protection Bund (LPB)

The TIB was designed to control water inflow to the open pit development area from the lake during construction of the LPB (Figure 20). This structure was designed with a short-term function, however, the bund will remain until stability of the PWE is assured. Vegetation along the TIB has grown significantly since this area was inundated by flood waters in early 2012 due to the continued availability of water. Vegetation consists of River Red Gum and River Cooba that have established well along the entire length of the bund. The permanent LPB is a low permeability embankment to prevent water inflow from the lake into the open pit development area over the life of the mine and post-mining.

Physical and Chemical Characteristics of Emplaced Material Relevant to Rehabilitation

The Australian National University (ANU) Honours project (Paragraph 5.4) undertaken during 2006 indicated that the soil to be used for the LPB cover system was potentially dispersive. Amelioration with gypsum was undertaken in August 2006 at a rate of 5 t/ha tractor spread over the surface area of the LPB.

In early 2012, before the Lake Cowal flood event, the first lift above the LPB access road and the lower face in the TIB-LPB (wave break), was reshaped and treated with the waste rock-topsoil and gypsum methodology.

Method of Land Shaping

The TIB was constructed to RL 206.5m, has a crest length of 3,170m and reaches a height of 2m in the centre of the arc. Approximately 180,000m^3 of fill was required for construction. Settlement analysis undertaken by SNC Lavalin (SNC Lavalin, 2004) indicated the subsurface formation is typically well consolidated and any settlement is likely to cease soon after completion of the construction period. Prior to commencement of construction and, in accordance with the original EIS, a silt fence was erected to provide the lake protection from any sediment laden runoff. Prior to the placement of fill, the upper approximate 300mm of topsoil was stripped from the footprint area of the bund and stored for later rehabilitation of the bund. The bund was constructed in short sections with placement and compaction of the fill section in 0.3m lifts. Following construction of the bund to its final height the structure was shaped and the side slopes were flattened to slopes of 4(H):1(V) on the mine side and 5(H):1(V) on the lake side (Barrick, 2007). Further details on rehabilitation of the TIB are provided in the ROMP (and will be included in the RMP).

The LPB has been constructed to its final height of RL 208.35m. The structure was built as a two-zone earthfill embankment and meets specific engineering criteria for compaction to ensure that required compaction densities are achieved. The bund has a crest length of 4,200m and approximately 500,000m^3 of fill was used for construction. Prior to construction, the upper 300mm of topsoil and loose clay sediment material were stripped and stored for future rehabilitation of the bund. A cut-off section a further 1.7m deep was constructed as a means of further reducing the expected minimal seepage under the bund system. Placement and compaction of the fill section was conducted in 0.3m lifts. Following construction of the bund to its final height, the structure was shaped and the lake side slope flattened to 5(H):1(V) (Barrick, 2010). Further details on rehabilitation of the LPB are provided in the the ROMP (and will be included in the RMP.).

Short-term heavy rain during the 2011 reporting period lead to degradation and temporary closure of the lake protection bund access road. The first lift of the LPB outer slope was repaired using the rock-topsoil method and gypsum at 10t/ha from November 2011. The top of the LPB was covered in a 0.5 m layer of course crushed waste rock with a fines finish in March 2012 and the road is now an all weather access.

Characteristics of Cover Material

The cover material will be of low salinity to avoid the potential for saline runoff and enable satisfactory vegetation growth.

Thicknesses of Cover Layers and Methods of Laying and Compaction

Prior to the placement of fill, the upper approximate 300mm of topsoil was stripped from the footprint area of the bund and stored for later rehabilitation of the bund.

Drainage and Erosion Control

Incidental rainfall runoff from the LPB outer face is held by the TIB.

Final Landform Profile and Slopes

A typical section through the perimeter waste rock emplacement and lake isolation system is shown on Figure 20. Typical slopes of the perimeter waste rock emplacement and lake protection bund will be 1(V):5(H) (Figure 20).

Soil Treatment

Soils used in rehabilitation have been treated with gypsum. Gypsum had previously been tractor spread over the topsoiled surface of the LPB a rate of 5 t/ha. A follow up application of gypsum was applied in 2012 to the LPB at a rate of 10 t/ha.

Revegetation Species and Methods for Establishment

The New Lake Foreshore will continue to be opportunistically revegetated (subject to seasonal conditions) using native seedlings (propagated by a nursery using locally collected seed) and direct seeding. Following the 2012 flood event, significant native vegetation has grown along the outer eastern batter of the TIB.

Extent to which Agreed Rehabilitation Outcomes and Landuse Have Been Met

Since 2012, there has been no additional revegetation work undertaken on the LPB or TIB. The cessation of traffic along the top of the TIB by placement of log stocks was the main contributor to plant growth (G Pearson 2011, *pers. comm.*) prior to the 2012 flood event. Water retreated from the TIB during the reporting year, with the Lake fully dry in December 2014.

Maintenance Activities/Requirements

Barrick have proposed to raise the height of the TIB by 0.5m once Lake Cowal receded to a suitably safe distance from the toe of the TIB. These works would be undertaken in consultation with DTIRIS-DRE when necessary. Given the significant growth of native trees along the TIB, further consideration will be given to the advantages/disadvantages of raising the TIB and disturbing this vegetation.

Annual rehabilitation (and visual) monitoring of revegetated landforms including the bunds will continue to be conducted to ensure vegetation is establishing and to determine the need for any maintenance and/or contingency measures (such as the requirement for supplementary plantings, erosion control and weed control). Vegetation monitoring of the new lake foreshore was undertaken during the reporting period.

There were no variations in activities undertaken from those proposed in the currently approved MOP.

Northern and Southern Tailings Storage Facility – Starter Embankments and Lifts

The tailings storage facilities are located 3.4km west of the Lake shoreline. Starter embankments have been progressively raised throughout the mine life with tailings disposal alternating between each facility.

The 4th lift of the NTSF commenced construction in December 2013 with completion achieved in August 2014. The 5th lift of the STSF began in December 2014 and is expected to reach completion in September 2015.

The 4th lift of the NTSF was not rehabilitated due to the requirement to buttress that lift in a future year. Likewise, once the 5th lift of the STSF is complete, this lift will also not be immediately rehabilitated. The outer face of the lift will be constructed with primary waste rock and therefore will be protected from erosion.

Rehabilitation material was stripped off the 2nd lift of the NTSF in October-November 2014 and utilised on the PWE inner batters. Buttressing of the 2nd lift was carried out in November-December 2014.

Physical and Chemical Characteristics of Emplaced Material Relevant to Rehabilitation

Material used in the construction of the tailings storage facilities starter embankments includes soft oxide waste rock and clays. Results of recent and past geochemical testing indicate that oxide waste rock will be typically saline and non-acid forming silty clayey rock fill. Clays excavated from within the tailings storage footprints are expected to be stable with low permeability and high strength when compacted (North Limited, 1998).

Commencing from the 4th lift of the NTSF, material used in the construction of the TSF lifts will be a 3m clay core supported by a primary waste rock shell. Both lifts commenced/completed during the reporting year have utilised this new design.

Buttress works on the 2nd lift of the NTSF were completed during the reporting year. This involved stripping the rehabilitation materials off the lift wall and placing run of mine primary waste rock over that batter to strengthen the wall.

Method of Land Shaping

The cover system concept for the tailings storage facility batters has been updated to include rock mulch and topsoil and is consistent with the updated concept for the waste emplacement batter cover system. Buttressing activity proposed for each lift of the NTSF and STSF will delay the construction of cover systems on the TSF walls. Rehabilitation of these walls will be described in future ARs as it is completed.

Characteristics of Cover Material

The characteristics of the cover materials are the same as applied to the WREs. Where buttressing has been constructed, these areas have currently been left at angle of repose for rehabilitation in a future reporting period.

Thicknesses of Cover Layers and Methods of Laying and Compaction

Similar to the waste rock emplacement cover system, the thickness of the rock mulch layer is 0.25m followed by a 0.25m thick layer of topsoil.

The cover system for the top surfaces of TSFs will be conducted according to a mine closure plan and would include capping and shallow-medium root depth vegetation species.

Final Landform Profile and Slopes

A conceptual profile of the northern tailings facility is shown in Figure 22. The overall slope of the rehabilitated embankments will be 1(V):5(H). The top surfaces of the TSFs will be shallow, draining towards the centre.

Soil Treatment

Soils to be used in rehabilitation will be treated with gypsum where necessary.

Revegetation Species and Methods for Establishment

The downstream rehabilitation zone will be ripped and seeded (if required). Revegetation species will include native and introduced grasses. As a result of the hay mulching on the northern wall of the NTSF in previous years, germination of annual grass species and groundcover was generally quite good compared to the untreated eastern wall. No additional seeding took place on the NTSF or STSF embankments during the reporting period.

As discussed in Paragraph 5.4, observations of the surface treatments (e.g. rock mulch) trials on the outer batters of the TSFs are positive (i.e. landforms are stable and vegetation is establishing within the rock mulch) and indicate that this cover treatment is likely to provide for successful rehabilitation of mine landforms at the CGM (Barrick, 2011).

Extent to which Agreed Rehabilitation Outcomes and Landuse Have Been Met

Construction and rehabilitation works for embankments of the NTSF and STSF during the reporting period have been undertaken in accordance with the currently approved MOP. Further rehabilitation of the embankments will be undertaken during subsequent reporting periods to progress rehabilitation of the tailings storage facilities towards the final landform concept described in the *Cowal Gold Mine Extension Modification Environmental Assessment* (Barrick, 2013). The short-term rehabilitation objectives for the tailings storage facilities include establishing good groundcover using native and exotic pasture species (to provide minimal habitat value for bird life). The long-term rehabilitation objectives for the tailings storage facilities include the re-establishment of woodland communities and will commence following the cessation of tailings deposition.

Maintenance Activities/Requirements

Annual rehabilitation (and visual) monitoring of revegetated landforms including the NTSF and STSF embankments is conducted to ensure vegetation is establishing and to determine the need for any maintenance and/or contingency measures (such as the requirement for supplementary plantings, erosion control and weed control).

Any emergent deeper rooted species that germinate in the walls of the TSF structures continued to be poisoned by stump paste with glyphosate. As per ongoing Cowal Mine TSF fauna protection practices, no trees shall be encouraged to grow until after the final capping is completed on the TSFs.

Contained Water Storage D9

The D9 water storage facility occupies an area of approximately 13 hectares and has an operational maximum volume of 690 ML.

Physical and Chemical Characteristics of Emplaced Material Relevant to Rehabilitation

The characteristic of the cover material used for rehabilitation of the water storage embankments is described below.

Method of Land Shaping

The water storage was constructed as a "turkey's nest" type dam with no direct catchment external to its perimeter embankment. The dam has a nominal fill height of 8 Metres (**m**) and a nominal cut depth of approximately 2 m. Freeboard for a 1 in 100 year Annual Recurrence Interval (**ARI**) 48 hour rainfall event will be maintained in the storage.

Characteristics of Cover Material

The embankment cover material is of low salinity to avoid the potential for saline runoff and enable satisfactory vegetation growth. At final rehabilitation (if the structure is not retained), the storage would be drained and the area reshaped, topsoiled and rehabilitated with endemic Eucalypt woodland species and native pasture species .

Thicknesses of Cover Layers and Methods of Laying and Compaction

Topsoil that had been stripped from the footprint of the dam was used to cover the outer batters of the facility with a depth of 0.25m using an excavator.
Drainage and Erosion Control

The outer walls drain to the adjacent stormwater Pond D8B.

Final Landform Profile and Slopes

The outer slopes of Pond D9 were topsoiled and are sloping at approximately 1 (V): 4 (H).

Soil Treatment

Soils to be used in rehabilitation will be treated with gypsum where necessary.

Revegetation Species and Methods for Establishment

The outer batters of the storage were revegetated, following placement of topsoil, with native and introduced grasses.

Extent to which Agreed Rehabilitation Outcomes and Landuse Have Been Met

At the cessation of mining operations, rehabilitation of the storage will be undertaken to achieve final rehabilitation outcomes and post-mining land use objectives described in the the *Cowal Gold Mine Extension Modification Environmental Assessment* (Barrick, 2013).

Maintenance Activities/Requirements

Annual rehabilitation (and visual) monitoring of revegetated landforms including Pond D9 continued be conducted during the reporting period to ensure vegetation is establishing and to determine the need for any maintenance and/or contingency measures (such as the requirement for supplementary plantings, erosion control and weed control).

Boundary Amenity Plantings

Inspections of the vegetation screening surrounding the CGM identified that no additional tubestock was required to be planted during the reporting period.

5.3 OTHER INFRASTRUCTURE

No other rehabilitation activities were conducted during the reporting period further to those described above.

5.4 REHABILITATION TRIALS AND MONITORING RESULTS

Since 2008, Barrick has commissioned numerous specialists/expert personnel to work with mine and University personnel on the following issues relevant to the rehabilitation/stabilisation of landforms at the CGM:

- Geo-Environmental Management Pty Ltd – review of erosion control and restoration strategies for the Lake Protection Bund, Waste Rock Emplacement and Tailings Storage Facilities. Specifically, the investigation of the geochemical suitability of rock armouring on the outer batters of the mine landforms.
- Landloch – completion of a surface materials assessment and review of rehabilitation strategies and landform design. Specifically, investigation and recommendations regarding erosion control, landform design and the suitability of different treatment materials (e.g. rock mulching).
- Gilbert and Associates – assessment and revision of the rehabilitation and water management concepts, particularly in regard to erosion control and water management on the top surfaces of the mine landforms.
- Australian National University – ongoing trials and research relevant to revegetation and alternative surface treatment measures (e.g. mulch) that will assist in the refinement of revegetation objectives. Additional research into topsoil resources and investigation into optimal topsoil amendment rates (i.e. gypsum treatment) and fertiliser treatments.
- DnA Environmental - design of rehabilitation monitoring methodology and trial design and to determine a set of completion criteria that complies with and is consistent with conditions specified with Management Plans and approval documents and relevant NSW legislation, policies and best practice guidelines.
- McKenzie Soil Management – sampling and characterisation of the CGM's stockpiled soil resources to inform the most appropriate soil treatment measures to improve the soil stocks for rehabilitation use.
- Carnegie Natives - design of rehabilitation monitoring methodology and revegetation tube trial design to assist in informing CGM's rehabilitation programme.

The results of the abovementioned investigations will be used to inform the progressive rehabilitation/stabilisation of mine landforms at the CGM. Other specialists/expert personnel experienced in dealing with the rehabilitation issues relevant to the CGM (e.g. AECOM formerly URS Corporation, Principal GSS Environmental and the LCF) will continue to be engaged where necessary as rehabilitation progresses.

A detailed description of the results of DnA Environmental's (2015a) *'2014 Rehabilitation Monitoring Report'* is provided in Paragraph 5.4.1, including monitoring results of the new lake foreshore revegetation trials, tailings storage facility and waste rock emplacement revegetation trials, and northern and southern offset area monitoring results. A summary of DnA Environmental's rehabilitation monitoring methodology is provided below.

Rehabilitation Monitoring Methodology and Determination of Completion Criteria: Ecosystem Sustainability

DnA Environmental was engaged by Barrick in 2011 to design a monitoring methodology and determine a set of rehabilitation completion criteria for the CGM. The primary objective of the monitoring of rehabilitation areas and trials was to establish an annual rehabilitation monitoring program and develop a set of completion criteria that complies with and is consistent with conditions of the CGM's approval documents and management plans and aligns with the then applicable DTIRIS-DRE (2011) *Rehabilitation and Environmental Management Plan Guidelines Consultation Draft V2.0 June 2010*. DnA Environmental (2011a) subsequently prepared the 2011 report *Rehabilitation monitoring methodology & determination of completion criteria: Ecosystem sustainability*. A description of the monitoring programme and methodology is provided below.

The CGM's monitoring programme aims to establish clearly defined, repeatable and consistent methodologies for monitoring changes in various aspects of ecosystem stability, recovery and long-term sustainability. The process included:

- Establishing a range of relevant reference sites to compare and track the progress of rehabilitation areas and inherent ecosystem function;
- Selecting a range of suitable reference sites that reflect the desired final land use, biodiversity targets, historical disturbances and local community expectations; and
- Undertaking a monitoring program that provides simple and reliable information that indicates positive recovery trends or rapid detection of rehabilitation failure.

The objective behind the use of reference sites is to set the benchmark for rehabilitation success or at least provide a target to achieve. To account for variations in ecosystems across the landscape, each vegetation community is best represented in triplicate. In 2010, there was difficulty in selecting three reference sites for each of the four broad vegetation community types. This was largely due to the lack of suitable area of remnant vegetation in the near vicinity of the mine and due to flooding of some the Lake Cowal Environment.

The broad rehabilitation vegetation communities used within part of this program include those associated with:

- Lake: Woodlands occurring within the lake and lake foreshores (RL 205 – 220m) = 2 sites (one 2010 site inaccessible; one new site established);
- Slopes: Woodland occurring on flat to gently undulating slopes (RL 210 – 225m) = 2 sites:
- Hills: Woodlands occurring on low ridges, hills and elevated land (RL 220 – 245m) = 3 sites; and
- Grass: Cleared native grasslands, predominantly occurring on flat to gently undulating slopes (RL 210 – 225m) = 2 sites.

The resultant number of revegetation monitoring sites established during 2011 was nine. Monitoring during spring aims to capture a more accurate representation of species present in the area. Numerous areas have already undergone some rehabilitation, which will be progressive over the life of the mine.

A new approach to rehabilitation and environmental management accountability, including rehabilitation monitoring and completion criteria was drafted and released for consultation by the DITRIS (DnA Environmental, 2011a). The DTIRIS-DRE draft guidelines indicate that in order to receive closure sign-off of rehabilitation, it will be necessary to demonstrate that selected performance indicators (or criteria) have reached their established completion criteria or that a satisfactory successional trajectory has been established that will result in a self-sustainable ecosystem. The draft approach includes five major stages of ecosystem development as demonstrated below, by which a set of performance indicators or criteria will need to be monitored and either be equivalent to or exceed those assessed for the reference sites (DnA Environmental, 2011a):

- Landform establishment;
- Growth medium development;
- Ecosystem establishment;
- Ecosystem development; and
- Ecosystem sustainability.

The CGM monitoring methodology was developed in accordance with the DTIRIS-DRE draft guidelines and adopts a standard and simple procedure that can be easily replicated over any vegetation community or revegetation area and importantly results in a system that essentially compares like with like (DnA Environmental, 2011a). The methodology used includes a combination of LFA, accredited soil analyses and various measurements of ecosystem diversity and habitat values (DnA Environmental, 2011a). For a full description of rehabilitation methodology, refer to the DnA Environmental report titled '*Rehabilitation monitoring methodology & determination of completion criteria: Ecosystem sustainability'.*

The DTIRIS-DRE new MOP Guidelines supersedes the draft 2011 guidelines. Therefore, Barrick will continue to work with DnA Environmental to revise the CGM's monitoring methodology in accordance with the DTIRIS-DRE's new guidelines.

5.4.1 Rehabilitation Trial Results

New Lake Foreshore Revegetation Trials

There have been significant changes occurring on the new lake foreshore area since 2005. The sites have been progressing and are beginning to stabilise despite dynamic climatic conditions. The ponded water between the temporary isolation bund and lake protection bund has created additional aquatic habitat. There continued to be active erosion derived from sections of the PWE that remain unvegetated above the permanent lake protection bund. A significant area of the outer batters of the PWE was repaired/reshaped in 2014, which appears to have addressed much of the gully erosion issues.

In 2013 and 2014, the two rehabilitated lake foreshore sites were ecologically functional to their comparative reference sites but they continued to have low infiltration capacity due to the hard setting sodic soils.

Active wave erosion along the temporary bund wall which had resulted in the physical loss of almost half of site CWT6 in 2011 has continued and last year there was further bank erosion. Despite the increasing cover of vegetation along the foreshore areas, the sodic soils are particularly susceptible to wave action along the waterline. Active intervention including rock lining is being planned to halt the further deterioration of the lake foreshore area after the lake has sufficiently dried to allow the works to be undertaken.

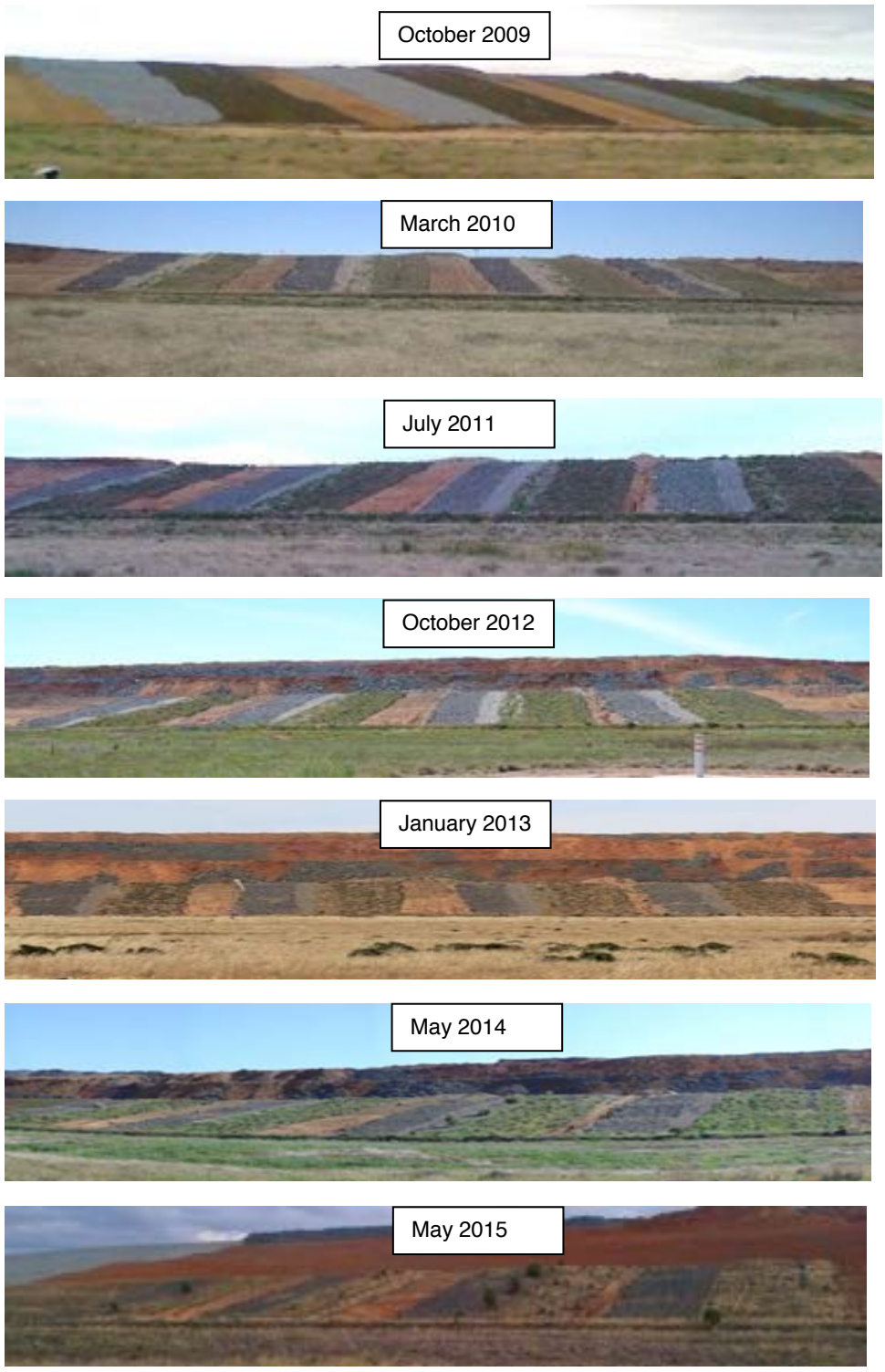
Southern Waste Emplacement rehabilitation trials

These trials were established on the south side of the Southern Waste Emplacement (**SWE**) in late 2009 to examine the benefits of rehabilitating slopes with long continuous slopes compared to a three tiered battered slope, with and without different mulching treatments (Plate 10). A variety of treatments were setup with a full description provided in the DnA Environmental (2011b) report titled *2010 Cowal Rehabilitation Monitoring Report*.

The layout of the trial is shown below. The growth rate on the southern aspect has been observed to be higher than the sunny northern aspect (hotter and drier). The trials were as follows using an 8m wide D9 dozer blade as a spacing guide:

- Subsoil (with and without);
- Slope (3 tiered 1:3 battered, single continuous slope);
- Rock mulch (R);
- Rock mulch + woodchips (R+Wc);
- Rock + topsoil + woodchips (R+T+Wc);
- Rock + topsoil (R+T);
- Topsoil (T); and
- Control or No treatment (C).

Plate 10: SWE - Southern Slope Trial Plots



No Subsoil												Subsoil											
3 tiered Batter (1:3)						Single continuous slope (1:5)						Single continuous slope (1:5)						3 tiered Batter (1:3)					
R	R+Wc	R,T+Wc	R+T	T	C	R	R+Wc	R,T+Wc	R+T	T	C	R	R+Wc	R,T+Wc	R+T	T	C	R	R+Wc	R,T+Wc	R+T	T	C

Over all treatments it appears that T4 (Rock + Topsoil) and T5 (Topsoil only) achieved more numerous ecological performance targets compared to the other trial treatments. The success of these two topsoil treatments has largely been derived by the voluntary establishment of the grassland vegetation from the soil seed bank which has resulted in a comparably good cover of native and exotic plants. The long-term success and the ability to meet completion targets will largely depend on the capacity of the native perennial plants to drive the ecological function and integrity of the site. While the sites contained some weedy species, these species are part of the successional process and have made a positive contribution in providing protective ground cover and assisting with the development of the microbial and nutrient recycling process. Since 2010, there has been a marked reduction in the weeds but this is likely to be implicated with the dry seasonal conditions. Both sites have previously contained a good representation of native perennial plant species which are expected to set seed and become more abundant over time.

Under the conditions of this trial, T4 and T5 treatments were very similar in the ecological parameters that were measured but there may be additional benefits in using the underlying rock mulch, to provide additional stability in the case of extreme climatic events (high rainfall and drought), especially before the vegetation had become established. Both sites had suffered from previous extensive rilling but due to the underlying rock and/or established vegetation, the sites now appeared to be stable.

This trial has also confirmed that it is imperative that a protective soil cover treatment be applied, regardless of its type or combination. Better longer term ecological outcomes and achieving completion goals may be obtained when there is good plant establishment, especially that of the native perennial vegetation. The treatments compared in these trials have shown that this can be achieved using topsoil, with or without a rock mulch underlay, but initial erosion control measures such as the light-medium application of native pasture hay or other mulch treatments in rows along the contour and/or shallow ripping along the contour may be required to provide immediate soil protective cover and additional erosion control features.

Ecological targets that have not been met in these trials were largely related to the development of the tree and shrub populations. DnA Environmental will be consulted for a progress review on the performance of these trials in 2015.

Northern Waste Emplacement Rehabilitation Trial

The NWRE rehabilitation trial aim to further assess the effectiveness of a variety of rehabilitation treatments or combination of treatments known to improve rehabilitation objectives in a replicated experimental design. The design has incorporated “standard” rehabilitation procedures such as a rock mulch underlay, topsoil and gypsum application which have proven to be essential components in the rehabilitation of saline, sodic and dispersive top soils and the extreme climatic condition of the semi-arid Lake Cowal environment. These rehabilitation trials aim to determine if adequate rehabilitation outcomes can be obtained by reducing the depth of topsoil from the recommended 300mm application whilst achieving a selection of primary ecological completion targets.

The trials also aim to assess the effectiveness of applying different mulch types such as wheaten straw and seed-bearing native pasture hay as an erosion control treatment / seed application method. The trials also incorporate the planting of native tubestock to observe the growth, establishment and survival of trees and shrubs on the constructed landform. These tubestock were planted in late August 2014 (Plate **11** and Plate **12**.

Plate 11: NWE – Pond D1 North Trial Planting (29 August 2014)

Plate 12: NWE – Pond D1 North Trial Plantings (23 January 2015

Monitoring of these trials is consistent with that used for the annual ecological programs being implemented at the CGM. A range of ecological performance targets from the trial treatments are compared to those measured within reference sites of woodlands occurring on ridges and hills and lower foot slopes. A selection of critical performance indicators provide the benchmark for rehabilitation success and therefore comprise the completion criteria required for mine closure and are consistent with the new ESG3 MOP guidelines (DRE, 2013).

Due to the various issues associated with the implementation of the rehabilitation trial, there ended up being two main experiments. The first was undertaken during 2012/2013 with the second implemented late in 2014. There have also been numerous variations to the original experimental design with difficulties in the timing and applying uniformity (eg. soil, pasture hay, plot size, tubestock species, mortality, density) thus there was high variability within the experimental treatments. Further variability associated with the hand watering of the tubestock is also expected, therefore the results should be treated with some consideration.

The results indicate that improved ecological function can be obtained by the application of straw and native pasture hay mulches, regardless of topsoil depth, during the early establishment phase. The application of the straw and native pasture hay mulches has helped accelerate the development processes by providing immediate protective cover and organic materials. These are vital in the nutrient decomposition and recycling processes, with slight states of decomposition already being recorded in some of these treatments. Due to the high levels of ground cover there was little evidence of erosion and deposition. While soil crusts have developed in most sites, there continued to be some slaking of the subsoils. Presently there was little to no perennial vegetation due to the short establishment time combined with the hot, dry seasonal conditions (Plate **12**).

Within the no mulch (Nil) treatments, in the older 2012/2013 rehabilitation trial area, there has been extensive voluntary establishment of *Lolium rigidum* (Wimmera Ryegrass) from the soil seed bank and this has significantly improved the functional patch area, litter cover and decomposition rates as well as reducing erosion. This year there was no significant differences in the overall ecological function between the topsoil or mulch treatments, except the 200mm topsoil Nil treatment was much lower. In the newly established 2014 rehabilitation areas, the straw and native pasture hay treatments provided additional functional capacity compared to the Nil treatment and presently there was little difference between the types of mulch used.

The number of tubestock planted as part of the experimental design varied between 27 – 31 per 20 x 20m plot (except in 200Nil plots which had 42 - 45 due to the larger size of the plots). In total there were 948 tubestock counted however 232 (24%) of these had died. The highest mortality was recorded in individuals planted straight onto the slopes or banks (69.7%), while survival was increased when they were planted into a trough or depression (87.2%). Overall there was 75.5% survival. Average live stem densities ranged from 16 (200Nil) – 27 (150NPH and 300Straw) translating into a density of 400 – 675 per hectare with all treatments meeting the shrub and juvenile tree target range. In most treatments there were 2 – 9 dead individuals except in 200Nil which had the highest mortality of 27 individuals. There was no apparent difference in survival between the individual treatments however survival appeared to be slightly better in the 2014 trial area. Presently all individuals were less than 0.5m in height.

In the 2012/2013 NWRE trial areas, all treatments except 200Nil had 96 – 98% total ground cover, which was almost entirely comprised of dead leaf litter. Differences however lie within the derivation of the litter, with the extensive voluntary establishment of *Lolium* providing the litter cover within the Nil treatments, while Wheaten Straw had obviously been applied as part of the rehabilitation trials. In the 2014 trial areas the lowest ground covers were recorded in the Nil treatments, while both the NPH and Straw applications provided total covers ranging between 88 – 97%. In several of the Nil treatment sites, there were occasional native perennial plants. There may have been some scattered rocks and some persisting annual weeds in the bare moist depressions across the other sites but typically the straw and NPH was too thick and suppressed plant establishment.

While the diversity of native species was particularly low in all monitoring sites this year due to the prolonged dry conditions, the highest diversity was recorded in the younger rehabilitation areas that did not have a protective mulch application, as well as in the older 200Nil treatment. In the new 2014 trial area, more exotic species were recorded in areas treated with the NPH. Presently there was no clear indication that the depth of topsoil affected the diversity of species but the heavy application of straw and NPH mulches is likely to reduce floristic diversity as it was applied too thick.

In 2014 three species of acacia, *Acacia deanei* (Green Wattle), *A. decora* (Western Golden Wattle) and *A. hakeoides* (Hakea Wattle), two species of eucalypts, *Eucalyptus microcarpa* (Grey Box) and *E. dwyeri* (Dwyer's Red Gum) and *Dodonaea viscosa subsp. cuneata* (Wedge-leaf Hopbush) were planted within each of the rehabilitation sub-plots and were therefore common to all treatments. One site (150Nil01) however did not have *Eucalyptus dwyeri*.

The prolonged dry conditions has significantly reduced floristic diversity around Lake Cowal this year, but the occasional exotic species *Sonchus asper* (Prickly Sowthistle)*, L. rigidum* (Wimmera Ryegrass)*, Avena fatua* (Wild Oats) and *Polygonum aviculare* (Wireweed), plants persisted in the moist depressions in some of the sites. The hardy native perennials *Convolvulus erubescens* (Australian Bindweed) and *Eriochloa crebra* (Cup Grass) were also recorded in five of the 31 sites. The prolonged dry conditions did not allow a true representation of floristic diversity which would be different under more favourable seasonal conditions.

The soils in the 2014 rehabilitation areas were moderately alkaline, extremely saline and were highly sodic. They had a high Cation Exchange Capacity (CEC) but were deficient in Organic Matter (OM), phosphorus (P) and nitrate (N) with 300Straw also having these soil characteristics. In the 2012/2013 rehabilitation trials the soils had slightly better characteristics and were typically neutral, slightly saline and sodic, had high CEC, P and N but were also low in OM. The results of the soil tests have also indicated excessively high levels of sulfur in the NWRE, especially in the 2014 trial area with concentrations of 2335 mg/kg compared to the recommended levels of 10 mg/kg which may have some implications for the development of these rehabilitation areas.

The extensive establishment of the *Lolium* has been favourable to the ecological function of the rehabilitation area which received no mulching treatments, with the older 2012/2013 areas having little apparent differences after 12-18 months development compared to those which were mulched. While there were anomalies in soil characteristics even within replicated treatments it appears too early to tell which depth of topsoil and mulch application is more conducive to a produce a functional and diverse woodland community which is representative of the hills and ridges of the Lake Cowal area. This is likely to become more apparent with the growth and development of the planted trees and shrubs which will have a significant influence on the composition of the sites.

5.4.2 Offset Area and Reference Site Monitoring Results

Southern Offset Area

Two rehabilitation reference sites were established in the southern offset area resembling woodlands occurring on low ridges, hills and elevated land (RL 220 – 245). These communities are dominated by *Eucalyptus dwyeri, Acacia doratoxylon, Callitris endlicheri and E. sideroxylon* on the rockier ridge tops and intergraded with *E. populnea*, *E. microcarpa* and *Callitris glaucophylla* woodlands on the lower parts of the slope. The reference sites that form the revegetation benchmarks and completion targets are named “RHill01” and “RHill02”.

The Southern Offset areas were ecologically very stable due to the relatively high levels of litter which were largely derived from dead annual plants. Cryptogams remained common and the soils were very hard and crusted and there was little evidence of erosion and deposition. However low levels of perennial vegetation combined with very hard crusted soils resulted in sites with currently low infiltration and nutrient recycling capacity.

The soil properties remained within the local or desirable levels but were low in organic matter and sodic. In terms of meeting completion targets there was an obvious lack of tree and shrub species and associated structure and habitat requirements. The proposed revegetation activities of these sites should show an improvement in these KPIs providing appropriate species and densities are implemented. As the completion criteria have been derived from the adjacent ridge and hill communities, revegetation activities should aim to replicate these communities (DnA Environmental, 2015a).

Northern Offset Area

Two rehabilitation reference monitoring sites (Offset03 and Offset04) were established in the northern offset area prior to rehabilitation. The established sites were chosen to resemble *Acacia pendula – Casuarina cristata* woodlands occurring on flat to gently undulating slopes. These sites were compared to reference sites RSlope01 and RSlope02.

The Northern Offset area demonstrated a decline in ecological function this year, however this reduction was evident within the natural slope and floodplain communities as a result of the prolonged dry conditions with both Offset sites more functional than their comparative reference sites. All sites have demonstrated a decline in floristic diversity but Offset03 continued to be weedier than desired.

In 2010 the water filled gilgais were a particularly important feature in these sites and while they have been dry at the time of monitoring since then, they continued to provide topographic relief and additional habitat features. The Offset sites were similar in composition to the reference sites however they had particularly low perennial plant covers this year and lacked the vertical structure which would be provided by population of trees, shrubs and sub-shrubs.

The soil chemistry was highly variable within and between sites however this year the data show they were typically deficient in organic matter, P and N and were saline and sodic but these were typical of these lowland woodlands. In Offset03 the soils were also alkaline. The results indicate that there were unusually high levels of calcium, magnesium and potassium in the Offset sites, however these elements were also recorded in elevated levels within the reference sites suggesting that these elements can occur at naturally higher levels within the lake and floodplain environments around Lake Cowal.

DnA Environmental recommended that as part of the rehabilitation process that deep ripping is not undertaken in the northern offset area due to the occurrence of potentially highly sodic soils, gilgais, and the high species richness. Deep ripping may compromise the ecological function and high conservation significance of the site. Any revegetation that is to occur should aim to replicate the associated reference sites, taking care to replicate the structure and future habitat requirements of these communities (DnA Environmental, 2015a).

5.4.3 Soil Stockpile Characterisation Results

A comprehensive sampling programme of the CGM's stockpiled topsoil and subsoil resources commenced in 2012 to characterise the available soil resources, assess their suitability for rehabilitation use and to determine the most effective amelioration or treatment measures required to improve the soil for rehabilitation use.

Barrick engaged Dr David McKenzie (a leading certified professional soil scientist in NSW) of McKenzie Soil Management Pty Ltd to interpret the results from the sampling programme, assess the suitability of the soils for rehabilitation use and provide recommendations for amelioration of the soil.

McKenzie Soil Management's (2013) report *Cowal Gold Mine Soil Stockpile Characterisation Assessment* presents the findings of the sampling programme and summarises the results from the soil characterisation assessment.

Following is a summary of the characteristics of the stockpiled soil resources at the CGM.

Topsoil

The majority of stockpiled topsoil resources at the CGM reflect the hard pedal red duplex soils associated with the majority of the ML area. The soils have a fine sandy clay loam to medium heavy clay loam texture and are hard setting (McKenzie Soil Management, 2013). These soils are dispersive (where non-saline), have variable pH, are partially Phosphorus deficient, range from non-saline to strongly saline and are sodic (McKenzie Soil Management, 2013).

Some small patches of topsoil stocks (within Topsoil Stockpiles 02 and 06), however, are strongly saline in the upper profile and are therefore recommended to be discarded. In addition, some topsoil stocks show physical and chemical characteristics typical of subsoil and have been recommended for inclusion with subsoil stocks to be treated with gypsum (i.e. Topsoil Stockpile 19 and Topsoil Stockpile 10) (McKenzie Soil Management, 2013).

To enhance the suitability of topsoil stocks for plant growth, gypsum application rates ranging between 0 and approximately 35 tonnes per hectare per metre (t/ha/m) have been recommended by McKenzie Soil Management (2013), except for Topsoil Stockpile 19 and Topsoil Stockpile 10 which have been recommended for inclusion with subsoil stocks. These stocks have been assessed by McKenzie Soil Management (2013) as requiring approximately 74 and 73 t/ha/m gypsum respectively.

Subsoil

The majority of stockpiled subsoil resources also reflect the hard pedal red duplex soils associated with the majority of the ML area. The soils have a light medium clay texture and are extremely hard when dry (McKenzie Soil Management, 2013). The subsoil stocks are dispersive, strongly saline, strongly sodic, Phosphorus deficient and have variable pH ranging from neutral to alkaline (McKenzie Soil Management, 2013).

To enhance the suitability of subsoil stocks for plant growth, gypsum application rates ranging between approximately 91 and 153 t/ha/m have been recommended by McKenzie Soil Management (2013).

Details of the gypsum (and other relevant treatment) application rate requirements estimated by McKenzie Soil Management for each soil stockpile are provided in McKenzie Soil Management's report (2013).

Soil Amelioration and Management

Various soil amelioration methods have been recommended by McKenzie Soil Management (2013). These methods may include (McKenzie Soil Management, 2013):

- deep-ripping and applying gypsum (or other relevant treatment) to existing and proposed soil stockpiles;
- applying gypsum to soil during re-application on rehabilitation areas;
- spreading gypsum on the surface of original soil profiles prior to soil stripping; and
- placing and treating strongly sodic and dispersive soil stocks with gypsum in a dedicated soil amelioration farm.

A summary of the proposed soil amelioration methods is provided below.

Treatment of Soil Stockpiles

Based on McKenzie Soil Management's recommendations, soil stockpiles would be deep ripped with gypsum (or lime, or a gypsum-lime blend) and applied at the approximate rates relevant to each soil stockpile (McKenzie Soil Management, 2013).

Based on the results of soil testing, the surface layer of the soil stockpile (up to approximately 1 m deep) would be stripped for rehabilitation use. The new surface of the stockpile would then be deep ripped with gypsum (or other relevant treatment) (at a rate determined from soil testing results). This process would be repeated until all soil within the stockpile has been treated.

Treatment of Soil on Rehabilitation Areas

Consistent with current rehabilitation procedures at the CGM, gypsum would continue to be applied to soil used on rehabilitation areas. The rate of gypsum application would be based on soil testing results and would consider the prior treatment of the soil (i.e. while stockpiled or within the soil amelioration farm).

Based on McKenzie Soil Management's recommendations, soil re-application activities would include:

- deep-ripping the soil surface to minimise compaction;
- applying coarse grade gypsum at approximately 10 t/ha to rehabilitation areas to provide a prolonged source of electrolyte to minimise dispersion of surface soils for as long as possible and to assist with the revegetation establishment; and
- applying native pasture hay where possible to protect the surface soil and provide slow-release nutrients to encourage native plant growth.

Treatment of Original Soil Profile

McKenzie Soil Management has indicated that the most effective way of ameliorating soil is by spreading gypsum on the surface of original soil profiles prior to soil stripping (McKenzie Soil Management, 2013). Accordingly, gypsum is proposed to be applied to the surface of proposed disturbance areas prior to soil stripping (where practicable). Soil sampling and testing would be undertaken prior to stripping to characterise the soil and determine appropriate gypsum application rates.

Soil Amelioration Farm

McKenzie Soil Management (2013) has identified that a soil amelioration farm could be used to treat/ameliorate strongly sodic and dispersive soils over a period of time to reduce the sodicity and dispersiveness of the soil (and to improve other chemical characteristics). A summary of McKenzie Soil Management's (2013) preliminary design of the soil farm is provided below.

The soil farm would be approximately 0.5 m deep. The surface would be deep-ripped with gypsum to a depth of approximately 450 mm to incorporate as much gypsum through the soil profile to optimise the calcium/sodium exchange process. A soluble fine-grade gypsum would be used to provide a consistent cover of gypsum across the soil surface.

A drainage collection system (including a toe drain around the perimeter of the farm, a seepage collection dam and a pump system) would be installed to collect and transfer sodium rich drainage water to an appropriate contained water storage within ML 1535. Prior to the placement of soil on the ground surface, topsoil would be stripped and stockpiled separately.

Some vegetation would be established on the soil surface to assist in increasing infiltration of water into the soil profile (via formation of shrinkage cracks) to encourage drainage of sodium salts and facilitate the calcium/sodium exchange process. However, dense vegetation cover is considered undesirable as the vegetation would likely consume considerable amounts of water that otherwise would be flushing salts from the root zone. A thick application of hay mulch with limited vegetation cover would likely be the most desirable soil surface cover. Hay mulch and vegetation establishment would also improve other soil characteristics such as organic carbon content, structural stability, biological activity and promote development of the soil seed bank. Weed control would also be undertaken as required to minimise the potential for weed incursion and suppression of native pasture seed.

The term of treatment would vary depending on approximate gypsum requirement, the amount of rainfall (or irrigation water [if required]) and on-going soil testing results. If the farm is irrigated, the soil would require a drying period prior to re-handling the material.

The design concepts of the soil farm described above are provisional, with detailed design concepts to be confirmed as a result of research including simulation modelling of quantitative predictions of water and gypsum requirements.

An annual soil sampling programme would be implemented to assess the performance of the farm and to inform the requirements for additional treatment measures. Soil samples would be taken at consistent locations across the soil farm area to the depth of the soil profile. Analysis of the soil samples would focus on exchangeable cations, electrical conductivity, pH and dispersibility of the soil.

In accordance with recommendations made by McKenzie Soil Management, soil stocks requiring the highest gypsum application would be ameliorated first as these soils would likely involve the longest treatment period.

Once soil test results indicate the soils are likely suitable for rehabilitation use, the soil would be removed from the farm and placed directly on rehabilitation areas or stockpiled separately. The soil farm establishment process would then be repeated using the next volume of soil stocks requiring amelioration.

Soils ameliorated within the farm are anticipated to improve revegetation outcomes for the CGM final landforms (due to improved soil properties for plant growth) and may increase the number and diversity of revegetation species able to be used in the CGM rehabilitation programme (i.e. additional species could be used that are typically less tolerant to deficient soils).

Detail regarding the design, implementation and management of the soil amelioration farm would be included in the MOP and developed in consultation with the DRE and other relevant regulatory authorities.

5.5 DEVELOPMENT OF THE FINAL REHABILITATION PLAN

Proposed rehabilitation outcomes have been continuously developed throughout the CGM approval process. The currently approved Cowal Gold Mine Extension Modification Environmental Assessment (Barrick, 2013) (and once approved, the CGM's RMP) details the final rehabilitation philosophy and objectives for the approved CGM as well as the proposed rehabilitation programme and final landform and revegetation concepts.

Rehabilitation will continue to be iterative and based on results of rehabilitation trials and formulated in consultation with DTIRIS-DRE and other relevant stakeholders. A Final Rehabilitation Plan will be included in the CGM Mine Closure Plan.

Table **51** provides a summary of rehabilitation activities at the CGM during the reporting period. The table includes details of rehabilitation at the start of the reporting period and estimated for the next report.

Table 51: Rehabilitation Summary

		Area Affected/Rehabilitated (hectares)		
		Previous Report	**Current Report**	**Next Report (estimated)**
A	**MINE LEASE AREA**			
A1	Mine Lease(s) Area	2,650	2,650	2,650
B	**DISTURBED AREAS**			
B1	Infrastructure Area[1]	355	355	355
B2	Active Mining Area[2]	107	107	107
B3	Waste Emplacements[3]	342	342	342
B4	Tailings Emplacements	369	369	369
B5	Shaped Waste Emplacement[4]	96	127	127
ALL DISTURBED AREAS[5]		1,269	1,300	1,295
C	**REHABILITATION PROGRESS**			
C1	Total Rehabilitated Area[6]	118	110	153
D	**REHABILITATION ON SLOPES**			
D1	10 – 18 Degrees	118	110	153
D2	Greater than 18 Degrees	0	0	0
E	**SURFACE OF REHABILITATED LAND**			
E1	Pasture and Grasses	151	151	151
E2	Native Forest/Ecosystems	46	67	67
E3	Plantations and Crops	0	0	0
E4	Other	0	0	0

1 Includes areas such as ore and soil stockpiles, contained water storages, processing plant and roads.
2 Open pit area.
3 Areas of waste emplacements yet to be shaped and rehabilitated.
4 Areas of waste emplacements that have been shaped and rehabilitated.
5 Includes any area that has been disturbed by mining activities. This value includes the Total Rehabilitation Area presented in C1.
6 Any areas that have been rehabilitated including areas of waste emplacements and tailings storage facilities progressively shaped and rehabilitated.

Table **52** gives a summary of the maintenance works carried out on rehabilitated land over the reporting period. Also summarised are planned works to be undertaken during the next reporting period.

Table 52: Maintenance Activities on Rehabilitated Land

Nature of Treatment	Area Treated (ha)		Comments/Control Strategies/Treatment Detail
	Report Period	Next Period	
Additional erosion control works	15	4	The inner and upper outer lifts of the PWE were repaired during the reporting period and reverse graded berms reinstated where required. A small rock drain was also installed on the southern flank of the PWE to allow water to drain off the top in extreme rainfall events.
Re-covering	15	5	The inner and upper outer batters of the PWE were covered with primary waste rock and topsoil to repair earlier rehabilitation efforts that had failed.
Soil treatment	0	0	Despite field sampling testwork indicating a need for higher gypsum dose (above 10t/ha), and extended treatment times, no areas have yet been prepared for the treatment of the relevant site subsoil and topsoil stocks (Modification allowing this to occur was approved on 22 July 2014).
Treatment/Management	20	20	Slashing and grading of firebreaks was undertaken during the reporting period. It is expected that the same activities will be undertaken in the next reporting period. Lake fire trails were graded during the reporting period.
Re-seeding/Replanting	4	4	Tubestock were planted within the D1 trial area and a small area on the southern batter of the PWE. A further 2000 tubestock have been ordered for delivery during July 2015.
Adversely affected by weeds	300	300	*Xanthium spinosum* (Bathurst Burr), *Sclerolaena birchii* (Galvanised Burr) *Ibicella* lutea (Devil's Claw) and *L ferrocissimum* (African Boxthorn) were treated by spot spraying with chemical or by manual removal. Infestations were mainly in isolated low lying areas that held enough moisture long enough for germination.
Feral animal control	2,650	2,650	Feral animal control activities were undertaken during the reporting period. Activities included fox and rabbit baiting on ML 1535 and parts of Barrick-owned land. Feral cat trapping also took place during 2014.

6 IMPLEMENTATION OF IMP RECOMMENDATIONS

In accordance with correspondence provided by the DP&E (dated 1 December 2014), this section provides a summary of the recommendations (and other key issues) from the *Tenth Annual Report of the Independent Monitoring Panel for the Cowal Gold Project – October 2014* and a description of the implementation of the IMP's recommendations.

2014 IMP Report Recommendation 1

CGM should continue to monitor all existing rehabilitation trials and those to be established in 2014/2015 (direct-seeded native species areas) with a view to continually refine its approach to achieving large-scale sustainable rehabilitation. Particular attention should be paid to the landform design, rehabilitation materials, rehabilitation cover system and revegetation concepts defined in the 2014 CGM Rehabilitation Risk Assessment (draft of May 2014).

Barrick will continue to engage independent specialists, DnA Environmental, to monitor all existing rehabilitation trial areas, in particular the NWE rehabilitation trial area, to determine the most effective applications of the rock mulch, topsoil and hay cover system, and to assess the performance of the selected Eucalypt and Acacia revegetation species.

2014 Rehabilitation Risk Assessment

Barrick's *2014 Rehabilitation Risk Assessment* (RRA) describes the approved rehabilitation strategy for the CGM, including the landform design, rehabilitation materials, rehabilitation cover system concepts and revegetation concepts, as described in the *Cowal Gold Mine Extension Modification Environmental Assessment Rehabilitation Proposal* (Barrick 2013). The RRA involved a qualitative assessment and evaluation of potential risks associated with the successful rehabilitation of the approved CGM rehabilitation strategy. Risk treatment measures were proposed, where required, to reduce the level of risk. The key risk treatment measures identified in the RRA include:

- Armouring batter slopes and berms with benign primary waste rock, cross-ripping with approximately 10t/ha gypsum-treated topsoil along the contour to minimise erosion potential and spreading native pasture hay (approximately 5 centimetres deep) to improve slope stability and establish initial cover crop.
- Applying approximately 10 tonnes per hectare (t/ha) gypsum to oxide waste rock surfaces (on berms and batter slopes) prior to application of rock mulch and gypsum-treated topsoil to reduce dispersive nature of oxide waste material and minimise erosion potential.
- Deep-ripping and applying gypsum (or other relevant treatment) to soil stockpiles in accordance with relevant application rate outlined in McKenzie Soil Management's (2013) *Cowal Gold Mine Soil Stockpile Characterisation Report*. Once soil testing indicates it is suitable for rehabilitation use, strip the top layer and repeat process.
- Constructing the TSF rock buttressing in accordance with approved design concepts for TSFs (i.e. overall slope angle of 1 vertical:5 horizontal) and avoiding use of angle of repose.
- Rock armouring the outer batter slope of the Temporary Isolation Bund to stabilise and maintain integrity of bund in the long-term.

During the 2014 RRA workshop, the success and suitability of a number of the risk treatment measures were determined to be uncertain due the further requirement for trial results and/or further research. Recommendations to address these uncertainties are as follows:

1. Undertake erosion modelling to assist with determining optimal depth of primary rock mulch which would minimise erosion potential on final landform slopes.
2. Conduct Northern Waste Rock Emplacement (D1) rehabilitation trial to inform:
    - effectiveness of 300 millimetres (mm) deep layer of primary rock in stabilising and minimising erosion potential on final landform slopes;
    - effectiveness of 150 mm, 200 mm and 300 mm deep layer of topsoil as a suitable growth medium which can support long-term vegetation growth;

- effectiveness of a 5 centimetres layer of seed-bearing native pasture hay versus clean wheaten straw hay in protecting the soil resource, minimising erosion potential and increasing the potential for germination of native grass and ground cover species; and
- performance of select Eucalyptus and Acacia plant species grown in the various rehabilitation material combinations.

3. Conduct vegetation growth trial to evaluate performance of select tree and shrub species grown in various combinations of rehabilitation materials which reflect the cover system for the top surfaces of the waste rock emplacements and TSFs. Trial to also evaluate the effectiveness of a 200 mm deep capillary break layer of primary rock versus a 450 mm deep capillary break layer in minimising salt rise.
4. Develop a revised soil stockpile management strategy including a soil requirement schedule to determine when (and how much) soil is required for proposed short-term and long-term rehabilitation activities. Conduct a cost benefit analysis of options including treating soil at a higher rate on rehabilitation areas, stripping soil to a depth to achieve a soil surplus, treating soil stockpiles in-situ and implementation of small scale soil amelioration farm (on the top surface of the southern waste rock emplacement) to determine preferred approach for minimising the potential of a soil deficit occurring or a delay to availability of suitable soil stocks.
5. Prepare a materials balance to determine availability and likely volumes of benign (i.e. non-acid forming, non-saline and non-dispersive) primary waste rock for rock buttressing the TSF embankments, for armouring waste rock emplacement, TSF, Temporary Isolation Bund and Lake Protection Bund batter slopes and for use as a capillary break on the surface of the TSFs. .
6. Evaluate soil analysis results for existing and new rehabilitation areas, the Northern Waste Rock Emplacement trial and proposed vegetation growth trial to investigate the natural soil leaching process where Electrical Conductivity levels in soil decline over time. Investigation to also assess vegetation performance and inform suitability of revegetation species to highly saline soils.
7. Prior to mine closure, develop detailed design for rehabilitation of the top surfaces of the TSFs. Design to consider results of water balance modelling which has assessed likely quantity, quality and expected duration of surface water ponding.
8. Re-assess relevant rehabilitation reference sites for waste rock emplacement, TSF and Lake Protection Bund and Temporary Isolation Bund batter slopes to confirm they are appropriate benchmarks for the relevant CGM final landform due to the introduction of rock mulch/rock armour into the substrate profile for these landforms.
9. Develop a whole of rehabilitation programme seed supply strategy. Strategy to involve collecting local endemic species likely suitable for revegetation of CGM final landforms (including the New Lake Foreshore, low slopes, ridges and hills, and grassland areas). Strategy to identify estimated seed and tubestock quantities anticipated to achieve rehabilitation completion criteria.
10. Monitor performance (germination rate) of first waste rock emplacement direct seeding campaign to confirm effectiveness of direct seeding method.

Barrick will continue to annually track the progress of implementation of the RRA recommendations, and assess the performance of the CGM's approved rehabilitation strategy based on review of the CGM's rehabilitation monitoring programme results.

2014 IMP Report Recommendation 2

That watering continue over summer until seedlings have established their roots, and that plant available water in the soil be monitored to guide watering if above average dry conditions continue.

Barrick watered the tubestock planted on the NWE rehabilitation trial area in August 2014 for a eight month period (over summer) through to April 2015.

Barrick will engage DnA Environmental to incorporate the assessment of plant available water in the soil into the rehabilitation monitoring programme for the NWE trial to guide the future requirement for watering.

2014 IMP Report Recommendation 3

That raising of the TIB is conducted in a manner that ensures protection of the naturally recruited river red gum saplings and swale habitats.

Barrick, with input from DnA Environmental, will review the approach for works to raise the height of the TIB by 0.5 m to protect the naturally recruited vegetation and swale habitats as far as practicable.

2014 IMP Report Recommendation 4

That the requirement to deconstruct or breach the TIB be reconsidered based on an assessment of the naturally developing habitat and biodiversity values of the structure.

As a part of the next rehabilitation risk assessment undertaken for the CGM and any future mine closure planning activities, Barrick will review the currently approved rehabilitation strategy for the Temporary Isolation Bund in consideration of the naturally developing habitat and biodiversity value that has developed surrounding the bund.

Additional Issue Raised by 2014 IMP Report

The IMP also notes that care must be taken when planting tubestock to ensure that the root mass is planted into substrate. We observed instances where the root mass was suspended in the hay mulch, possibly due to the speed of planting; these seedlings will die. More care is required in the balance between speed of planting and effectiveness of planting.

Barrick will develop a revegetation planting procedure for any future revegetation campaigns at the CGM. The procedure will include directions such as planting tubestock within 'trough' areas and planting tubestock at a sufficient depth within the substrate. All relevant CGM staff and contractors will be trained in the procedure prior to implementation of the planting campaign. The procedure will involve a follow-up inspection of planted tubestock by the CGM Environmental Department to confirm all tubestock have been planted appropriately.

7 ACTIVITIES PROPOSED FOR THE NEXT AR PERIOD

Mining and landform rehabilitation activities will continue to be undertaken in the next AR period in accordance with the Development Consent, the MOP, RMP and other relevant EMPs and approvals.

Operational activities will include the continuation of mining and mineral processing during the next reporting period.

7.1 ENVIRONMENTAL MANAGEMENT TARGETS AND STRATEGIES

The management strategies set out in the CGM EMPs prepared to date would continue to be implemented during the next reporting period in order to meet the objectives and targets described in the EMPs. A summary of the management targets and objectives, as set out in the EMPs for the next reporting year is provided in Table 53.

In accordance with Development Consent Condition 9.1(c) (i) through (vi), periodic review and update (if necessary) of CGM EMPs will be undertaken and the outcomes documented in the relevant AR.

Table 53: Summary of Environmental Targets and Management Strategies for the Next Reporting Year

Environmental Management Plan	Objectives/Targets (for next reporting period)	General Management Strategies
Environmental Management Strategy (EMS) (October 2014)	• Implement DP&E approved EMS.	• Maintain EMS governance.
Blast Management Plan (BLMP) (February 2015)	• Implement DP&E approved BLMP. • Optimisation of blasts by Geotechnical personnel. • Maintain network during dried Lake phase. • Continue to work with near neighbours and CGM Community Relations and adjust programme resources as required.	• Blasting in accordance with the Development Consent impact assessment criteria. • Maintain monitoring network and Cowal Saros Blast Hub external services. • Remedial measures in events which exceed blast criteria or disturb birdlife. • Install new meteorological sensors equipment on the new generation blast loggers of 2012. • Maintain relocated BM08.1 at 'Cowal North' (old temporary BM08). • Ongoing consultation with affected landholders as required.
Bushfire Management Plan (BMP) (internal plan only)	• Implement internal BMP. • Conduct staff training and drills. • Maintain the available fire trails across seasons from / to ML1535 Gates and Barrick farmland during dried Lake phase.	• Maintenance of Emergency Response Procedures. • Reduction of bushfire threat and protection of assets at risk after fuel growth period.
Compensatory Wetland Management Plan (CWMP)	• Continue weed and pest control.	• Prevention of grazing stock entry. • Natural regeneration of native plants. • Limitation of vehicular access. • Improvement of habitats for wildlife. • 2016 Lake Cowal fish survey (receding) – if the lake is full.

Table 51 (Continued): Summary of Environmental Targets and Management Strategies for the Next Reporting Year

Environmental Management Plan	Objectives/Targets (for next reporting period)	General Management Strategies
Air Quality Management Plan (AQMP)	• Continued use of Petro Tac on light roads. • Continue NMI and ALS analysis of CGM bulk dust standard samples. • Maintain network during dried Lake phase. • Observe trends DG14 in lake floor (moved DG8 'Hillgrove' to ML location n-e of E42 Pit between Site 52 and DG 5 (as per Cattle, 2012)). Became in-Lake ML location DG14.	• Reduction/control of dust emissions. • The University of Sydney will continue to advise Barrick personnel on the dust sampling methodology, to reduce the likelihood of sample contamination via the incorrect implementation of sampling techniques. • Evaluate use of original and 2012 taller tripod gauges in Lake Cowal for duplicates with gauge campaigns of up to quarterly duration to further investigate high Cu and Zn assays.
Heritage Management Plan (HMP)	• Advise the relevant stakeholders that Cowal Mine has no remaining HMP items of interest. Request removal of HMP. • Assist LCF launch of "***About Lake Cowal***" booklet (17 April 2015).	• Maintenance of stored items. • Weed and pest control around items. • Fire control around stored items Shed. • Surface water control, basal layer. • Relocation to LCCC museum area. • Maintenance of 'Cowal West' Shearing Shed at LCCC (opened on 19 April 2013) .
Erosion and Sediment Control Management Plan (ESCMP) (Addendum February 2015)	• Implement DP&E approved ESCMP. • Continue event based structure inspections. • Enhance the southern portion of the UCDS through repair and strengthening of erosion control structures. Clear sediment from UCDS south front basin. • Conduct annual peer risk review. • Reclamation Standard compliance.	• Effective control of sediment and salinity migration. • Maintain lake floor/ edge access fire trail and planned general inspections of assets after lake Fill event. • Maintenance of downstream (Lake) water quality. • Ongoing approval use for the rock-topsoil method using independent review and amended MOP, EMPs, DC modification, etc.
Cyanide Management Plan (CMP)	• Continued cyanide management. • Continue use of SMBS system and maintain Caro's Acid preparedness. • Maintain TSF auto-sampler in the concrete bunded tailings slurry pumping hopper area. • Independent audit ICMI Code - fourth triennial re-certification was posted at start 2014.	• Maintain strategy of excellence in environmental management of installed facilities, process water streams, on-site reagent storage, use and emergency preparedness. • Implement engineering design solution for repeat, aggressive corrosion at sulphuric acid sump and continue maintenance program for the SMBS area. • Maintain full compliance status with the ICMI Code.
Flora and Fauna Management Plan (FFMP)	• Submit revised FFMP by end-May 2015. • Continue NSW WIRES training for employees. • Relocate wildlife as required. • Continue maintenance of TSF and Pond D6 bird deterrent system and fences. • Continue control of vermin and noxious weeds.	• Remnant vegetation enhancement programme. • Vegetation clearance protocol. • Weed management and pest control. • Protection of flora and fauna threatened species located within the CGM. • Maintain bird and bat nesting boxes and hollows at 'Hillgrove' and 'Lakeside' trees.
Hazardous Waste and Chemical Management Plan (HWCMP)	• Continue appropriate transport, handling, disposal, and recycling of wastes. • Ongoing ICMI Cyanide Code full compliance – operational phase. • Appropriate responses to spillages. • Ongoing use and management of bioremediation area. • Audit and maintain emergency preparedness oil & chemical spill kits.	• Substances Inventory Register (IR). • Distribution of revised employee environmental awareness handbook and spill training. • Emergency preparedness contingency. • Root cause analysis of spill incidents with action programs to eliminate. • Enhanced employee use of upgraded Chemalert III system software features.

Table 51 (Continued): Summary of Environmental Targets and Management Strategies for the Next Reporting Year

Environmental Management Plan	Objectives/Targets (for next reporting period)	General Management Strategies
Indigenous Archaeology and Cultural Heritage Management Plan (IACHMP)	• Continued use of approved IACHMP. • Continued assessment of areas as per IACHMP prior to soil stripping.	• Protection/Management (GDP) of sites within the CGM area. • Dissemination of cultural heritage information and offsets.
Land Management Plan (LMP) Addendum (April 2015)	• Submit Addended LMP by end-May 2015. • Continue control of vermin and noxious weeds. • Approval and implementation of the RMP. • Approval and implementation of the BOMP.	• Pasture and remnant vegetation management. • Weed management and pest control. • Farm Planning.
Monitoring Programme for Detection of any Movement of Lake Protection Bund, Water Storage and Tailings Structures and Pit/Void Wall (LPBMP) (April 2015)	• Submit Addended LPBMP by end-May 2015. • Maintain monuments inspection frequency of TSF walls. • Maintain Pond structure inspections.	• Raise height of TIB by 0.5 m given Lake Cowal remains at a safe distance from the TIB. • Detection of any movement of the Lake Protection Bund, water storage and tailings structures, and pit/void walls. • Effective responses to any detected movement.
Soil Stripping Management Plan (SSMP) (February 2015)	• Implement DP&E approved SSMP. • Continue soil stockpile management. • Update database as required.	• Continue McKenzie survey of site rehabilitation stockpiles qualities. • Conduct a LiDAR aerial 3-D ± 0.1survey of site stockpiles in early 2016. • Continued use of ArcGIS as a management tool. • Effective scheduling and management of soil stripping operations.
Water Management Plan (WMP)	• Submit revised WMP by end-May 2015. • Maintain monitoring and reporting of open pit dewatering system. • Continue process water management. • Water Conservation Standard compliance.	• Prevent the quality of any surface water (including waters within Lake Cowal) and groundwater being degraded. • Effective management of the quantity of surface water and groundwater generated within the CGM area. • Effective amelioration of potential impacts to surface water and groundwater.
Surface Water, Groundwater, Meteorological and Biological Monitoring Programme (SWGMBMP)	• Submit revised SWGMBMP – operational & post-operational phases by end-May 2015. • Ongoing use of DP&E approved revised SWGMBMP.	• Detection of any adverse affects to surface water, groundwater, and/or biology. • Effective responses to any detected adverse affects. • Re-stocking Lake with native fish should Lake levels rise enough in future years. • 2016 Lake Cowal fish survey - receding.
Noise Management Plan (NMP)	• Continue employee awareness. • Continued monitoring in accordance with NMP – quarterly ambient noise monitoring.	• Prevention of adverse mine operational noise. • Ongoing development of bund walls and waste rock emplacements. • Prevention of adverse mine traffic noise. • Ongoing consultation with affected landholders as required. • Complaint response and dispute resolution procedures.
Threatened Species Management Protocol (TSMP)	• Develop species-specific plans as required. • Conduct surveys for threatened species as required • Biodiversity Conservation Standard compliance.	• Ensure the viability of a local population of a threatened species is not put at risk by the CGM. • Species-specific management plans.

Table 51 (Continued): Summary of Environmental Targets and Management Strategies for the Next Reporting Year

Environmental Management Plan	Objectives/Targets (for next reporting period)	General Management Strategies
Implementation Plan to Protect Fauna from Interactions with the Tailings Storage Facilities	• Continue monthly bat monitoring • Conduct daily routine inspection and monitoring of fauna, process, tailings discharge, surface water and groundwater. • Maintain controls for unwanted tree and shrubs growth on walls.	• Prevent fauna and avifauna use of operational tailings storage facilities. • Maintain TSF perimeter fencing and avifauna deterrents. • TSF Operations and Maintenance Plan.
MOP (August 2014 – August 2016) and MOD11 approvals process)	• Schedule Mine development. • Continue progressive landscape and rehabilitation management.	• Soil stripping scheduling. • Soil stockpile management – amelioration options. Continue to prevent the contamination of surrounding land whilst working towards setting phased completion criteria. • Mine waste rock emplacements. • Closure and decommissioning plan. • Life of Mine Plan. • TSF Operations and Maintenance Plan. • Next draft MOP ready (June 2016).
THMS	• Maintain arrangements for THMS. • Continue emergency preparedness contingency with external services. • Use of inland road and/or other emergency routing as required (e.g. 2011-12 Flooding).	• Employee awareness training. • On-site facilities inspection and maintenance. • Contract management. • Emergency preparedness.
RMP	• Approval and implementation of the RMP.	• Mine site rehabilitation management.
BOMP	• Approval and implementation of the BOMP.	• Offset areas management. • Establish mechanism for long-term security of the offset areas (i.e. draft VPA) by the end of July 2015, or otherwise agreed with the Secretary of the DP&E).

Environmental Management System

Barrick will continue development of the CGM EMS in accordance with corporate standards during the next reporting period. Risk-based management of significant environmental aspects by ongoing management review and employee involvement in site wide planned general inspections will continue during the next reporting period.

Barrick has five (5) environmental standards and the core EMS standard:

- Closure;
- Water Conservation;
- Tailings Facility Design;
- Climate Change; and
- Incident Reporting and Investigation.

Internal and external review of compliance to these standards is ongoing across Barrick operations.

The CGM underwent both Preliminary and Stage 1 EMS audits during the 2012 reporting year. The CGM passed a Stage 2 ISO 14001 external audit by ERM-CVS on 28 February 2013 and was recommended for certification which occurred 12 June 2013 (UKAS Certificate 495; *Mining and Ore Processing Operations and Support Services for Gold and Silver production*). Cowal Mine's second six-monthly surveillance audit as an ISO 14001 certified site will occur 27-30 October 2014.

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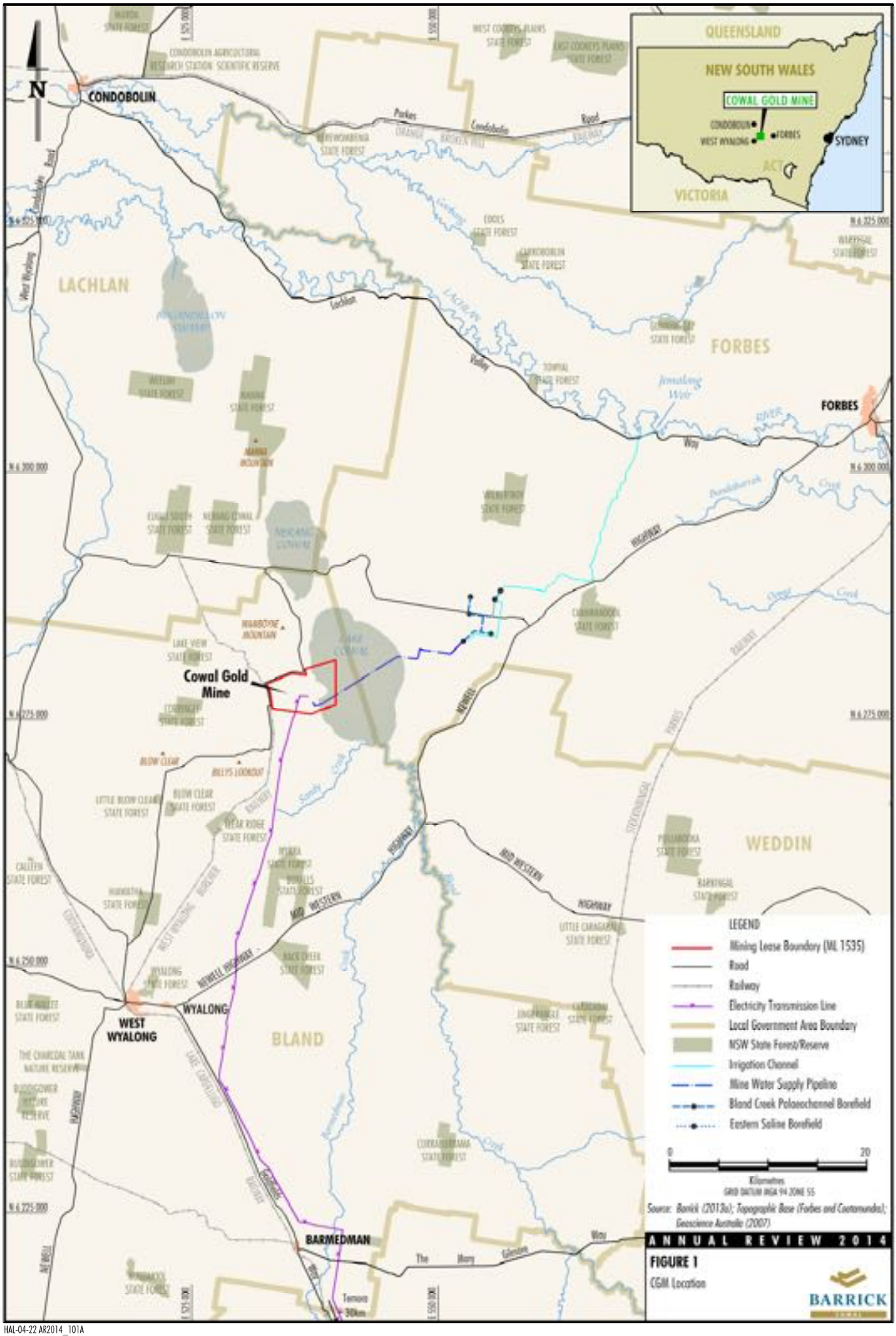
9 GLOSSARY OF TERMS

AR	Annual Review
ANZECC	Australian and New Zealand Environmental Conservation Council
ARD	Acid Rock Drainage
ARMCANZ	Agriculture and Resource Management Council of Australia and New Zealand
ARI	Annual Recurrence Interval
AWS	Automatic Weather Station
BB	Barrick Buddies
BCPC	Bland Creek Paleochannel
BDHS	Bland District Historical Society
BLMP	Blast Management Plan
BMP	Bushfire Management Plan
BSC	Bland Shire Council
CEMCC	Community Environmental Monitoring & Consultative Committee
CGM	Cowal Gold Mine
CIL	Carbon in Leach
CMP	Cyanide Management Plan
CMS	Chemical Management Strategy
CPCC	Cowal Project Coordinating Committee (WCC - Barrick)
CPP	Cowal Partnering Program
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CW	Compensatory Wetland
CWHC	Cowal West Homestead Complex
CWMP	Compensatory Wetland Management Plan
DMP	Dust Management Plan
DP&I	Department of Planning and Infrastructure
DPI	Department of Primary Industries
DTIRIS-DRE	Department of Trade and Investment, Regional Infrastructure and Services – Division of Resources and Energy
DSC	Dams Safety Committee
EA	Environmental Assessment
EC	Electrical Conductivity
EEC	Endangered Ecological Community
EFA	Ecosystem Function Analysis
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
EMS	Environmental Management System
EPA	Environment Protection Authority
EPL	Environment Protection License
ERO	Emergency Response Officer
ERP	Emergency Response Plan (see PIRMP)
ERT	Emergency Response Team
ESCP	Erosion and Sediment Control Program
ESB	Eastern Saline Borefield
ESCMP	Erosion and Sediment Control Management Plan
ETBC	Employment, Training and Business Committee
FFMP	Flora and Fauna Management Plan
FOR	Fuel and Oils Register
GEM	Geo-Environmental Management
GFZ	Gilmore Fault Zone
HMP	Heritage Management Plan
HWCMP	Hazardous Waste and Chemical Management Plan
HSDG	Hazardous Substances and Dangerous Goods
HSDGR	Hazardous Substances and Dangerous Goods Register
IACHMP	Indigenous Archaeology and Cultural Heritage Management Plan
ICMC	International Cyanide Management Institute Code for Cyanide Management
IEA	Independent Environmental Audit
IMP	Independent Monitoring Panel

INP	Industrial Noise Policy
ISO 14001	International Standards Organisation – Best Practice Environmental Management Standard
LCCC	Lake Cowal Conservation Centre
LCF	Lake Cowal Foundation
LEP	Local Environment Plan
LHPA	Livestock Health and Pest Authority – now LLS (formerly RLPB).
LiDAR	Light detection and ranging. High-speed aerial laser pulses to generate 3-D shot (3-D ± 0.1 m).
LOR	Limit of Reporting
LPB	Lake Protection Bund
LPMBP	Monitoring Programme for Lake Protection Bund, Water Storage and Tailings Structures and Pit-Void Walls
LFA	Landscape Function Analysis
LLS	Local Land Service. Late 2013 replacement of LHPA, LCMA and DPI-Agriculture entities. Lake Cowal sits across the LLS Riverina & LLS Central-west zones (roughly on a north-south line).
LMP	Land Management Plan
MIC	Maximum Instantaneous Charge
ML	Mega Litres = 1 Million Litres
m	metres
ML	Mining Lease
MOP	Mining Operations Plan
NMP	Noise Management Plan
NoW	New South Wales Office of Water (formerly DWE within OEH - EPA).
NPI	National Pollutant Inventory
NTSF	Northern Tailings Storage Facility
NWRE	Northern Waste (rock) Emplacement
OEH	Office of Environment and Heritage
PIRMP	Pollution Incident Response Management Plan (see ERP)
PPE	Personal Protective Equipment
PWE	Perimeter Waste (rock) Emplacement
RFS	NSW Rural Fire Service
RIMS	Barrick Responsibility Information Management System
RL	Relative Level metres
ROMP	Rehabilitation and Offset Management Plan
RVEP	Revegetation Enhancement Project
SDS	Manufacturer's Safety Data Sheet
SMBS	Sodium metabisulphite (cyanide destruct reagent replacing Caro's Acid)
SOI	Southern Oscillation Index
SSMP	Soil Stripping Management Plan
STSF	Southern Tailings Storage Facility
SWE	Southern Waste (rock) Emplacement
SWGMBMP	Surface Water, Groundwater, Meteorological and Biological Monitoring Programme
SWMP	Site Water Management Plan
THMS	Transport of Hazardous Materials Study
TIB	Temporary Isolation Bund
TSF	Tailings Storage Facility
TSMP	Threatened Species Management Protocol
TSMS	Threatened Species Management Strategy
TSP	Total Suspended Particulates
TSR	Travelling Stock Route
UCDS	Up Catchment Diversion System
WAD	Weak Acid Dissociated
WCC	Wiradjuri Condobolin Corporation
WCCHC	Wiradjuri Condobolin Cultural Heritage Company
WIRES	Wildlife Information Rescue and Education Service

FIGURES



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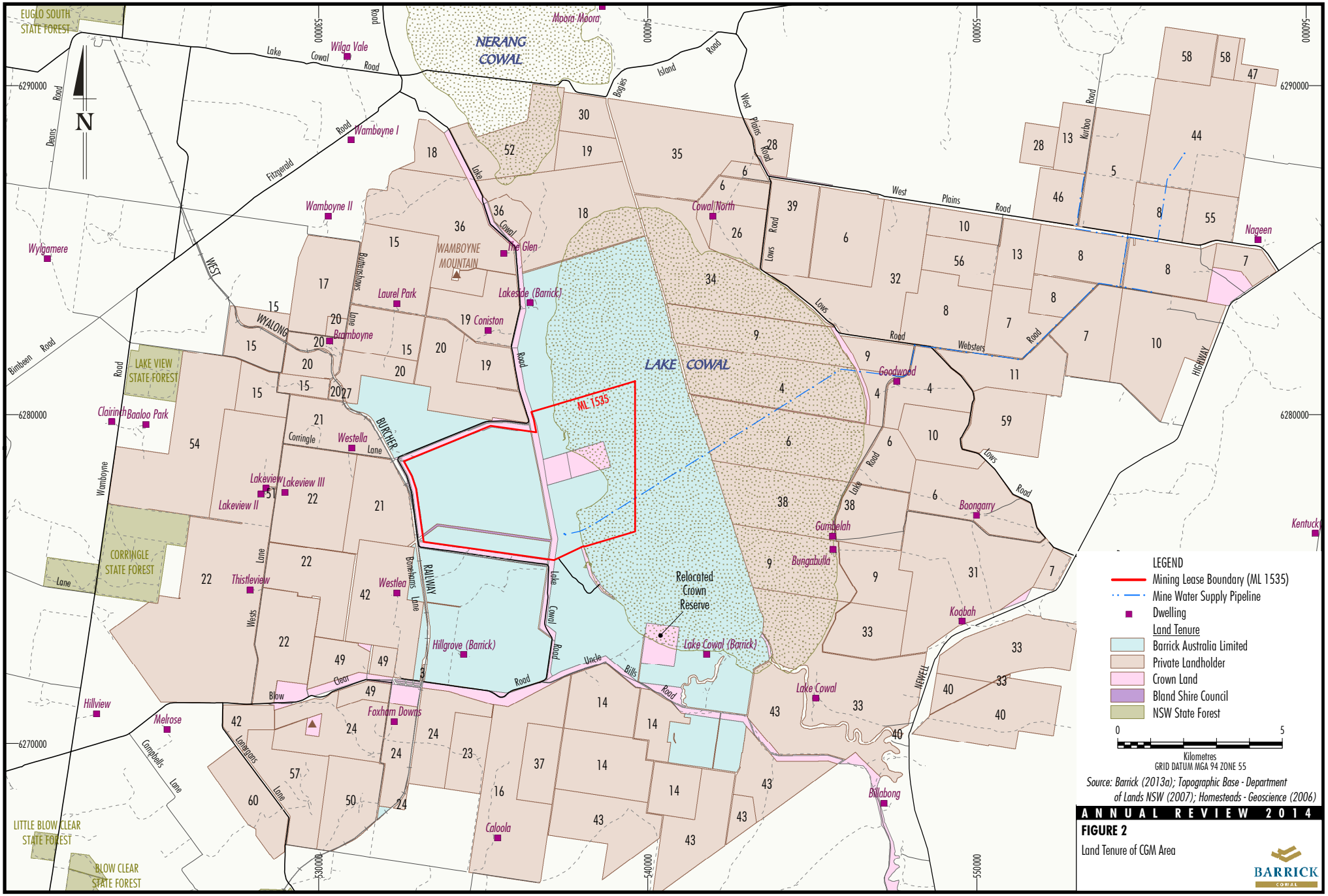

Source: Barrick (2013a); Topographic Base - Department of Lands NSW (2007); Homesteads - Geoscience (2006)

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FIGURE 2

Land Tenure of CGM Area

BARRICK COWAL

HAL-04-22 AR2014_201A

0 1000
Metres
GRID DATUM MGA 94 ZONE 55
Source: Barrick (2013a); Date of Orthophoto: Feb 2014

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FIGURE 3
Cowal Gold Mine
General Arrangement

BARRICK

NAL-04-22 AR2014_103A

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FIGURE 4
Land Preparation and Areas Under Rehabilitation as at December 2014

BARRICK

MAL-04-22 AR2014_100C

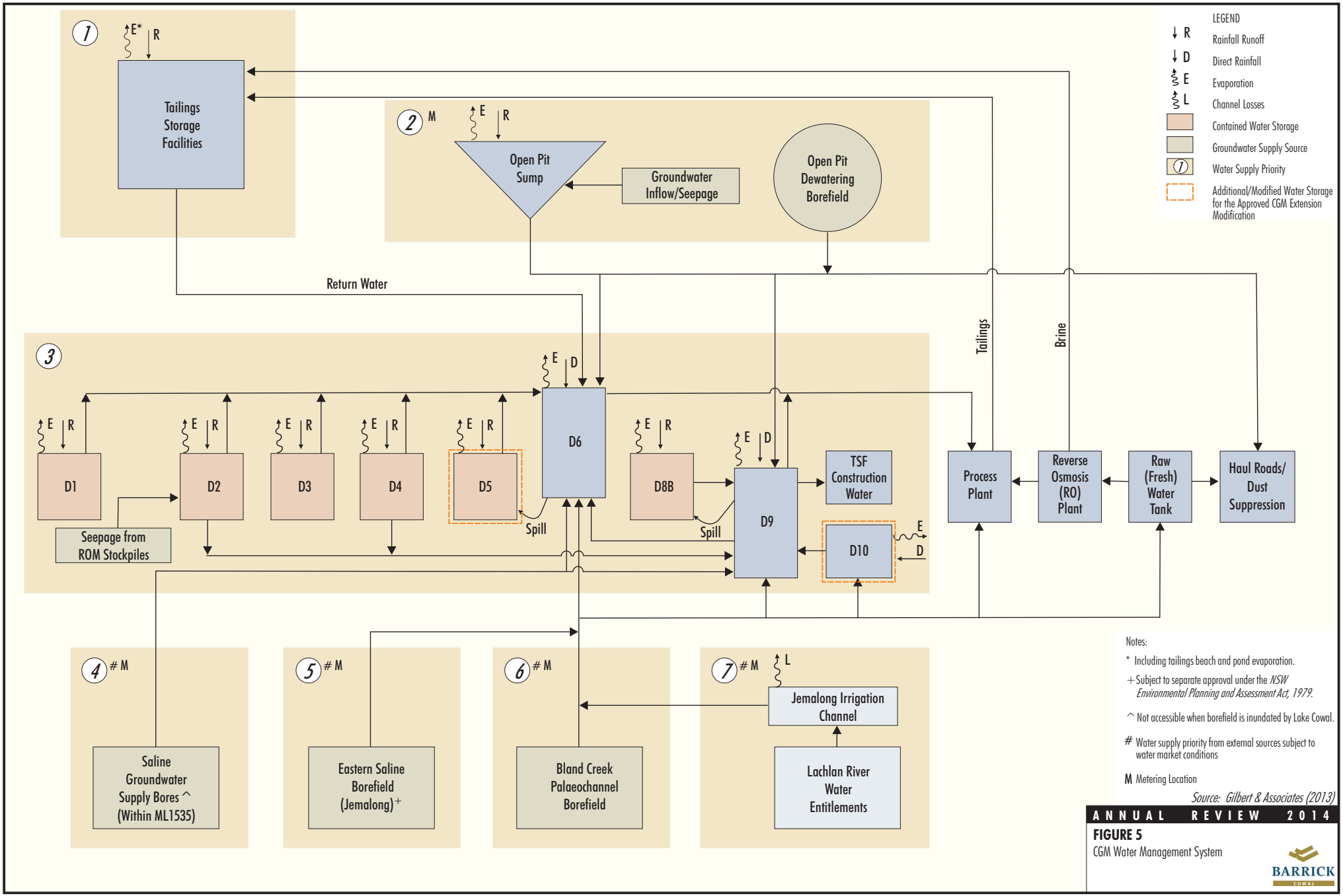

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FIGURE 5

CGM Water Management System

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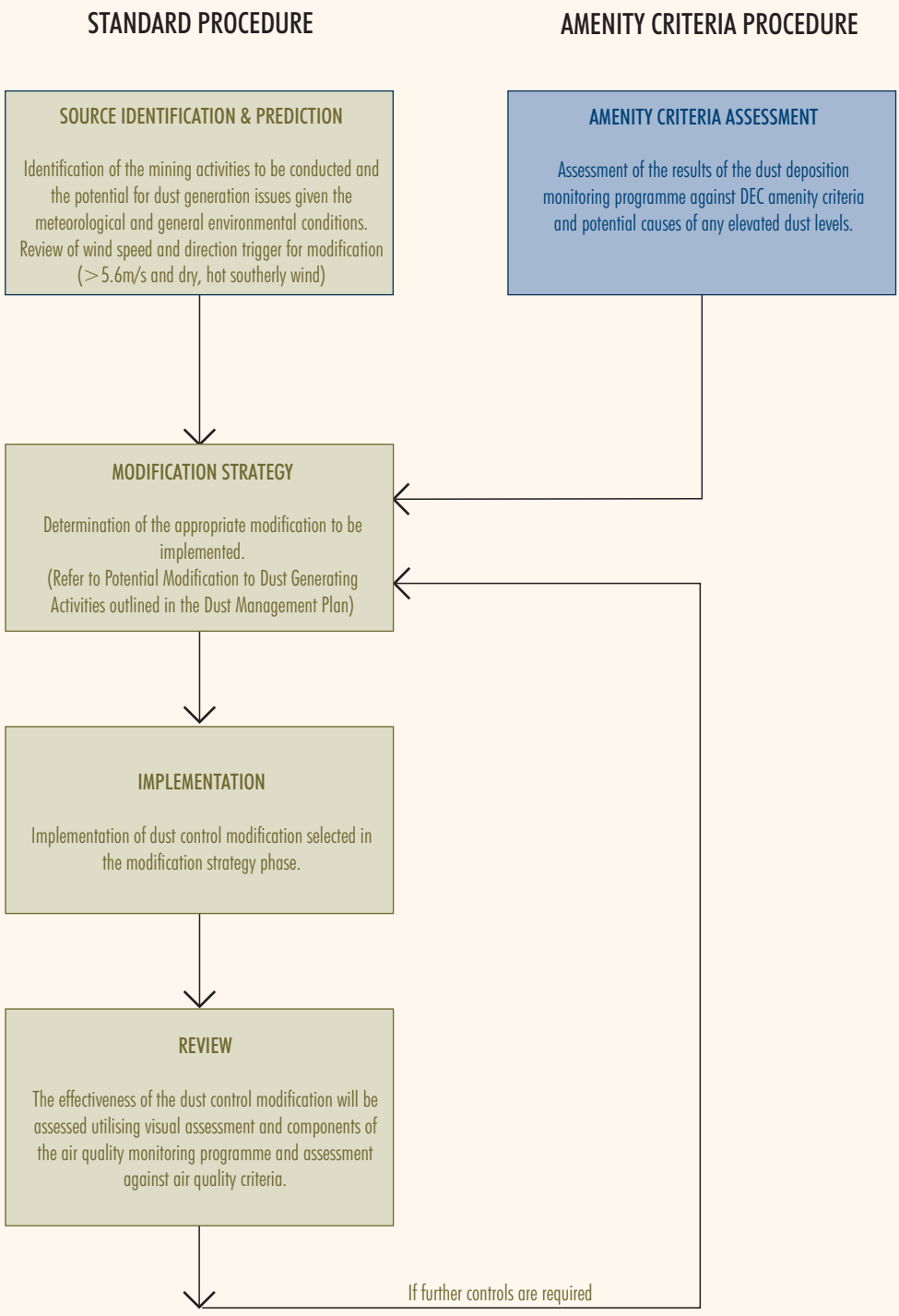
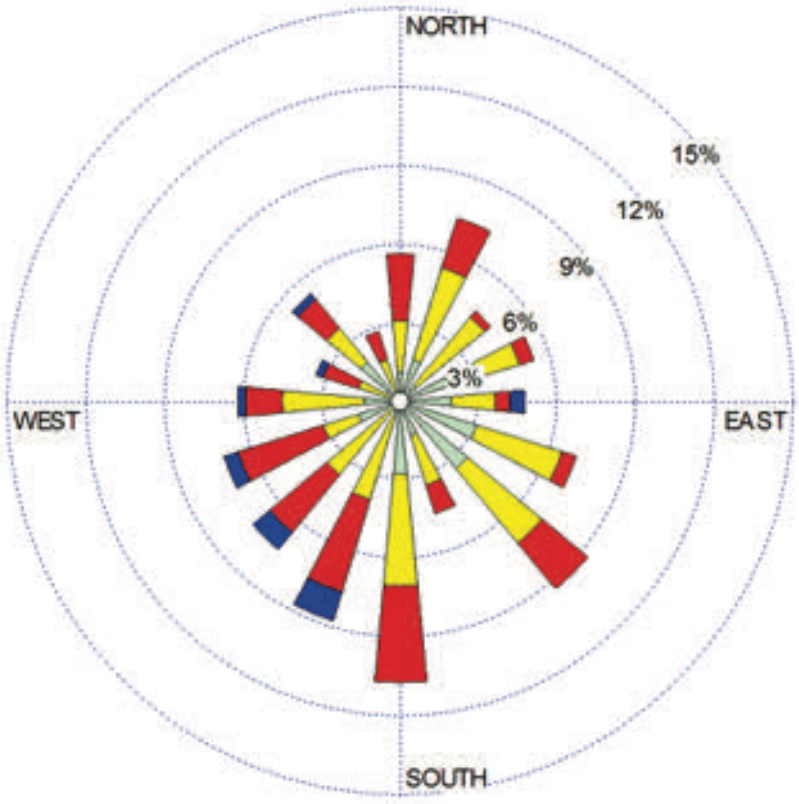


FIGURE 6

Dust Management Procedures

BARRICK COWAL



Wind speed (km/hr)

2–8	21–32
8–13	32–40
13–21	>40

Source: University of Sydney (2015)

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FIGURE 7a

Annual Wind Rose for 2014

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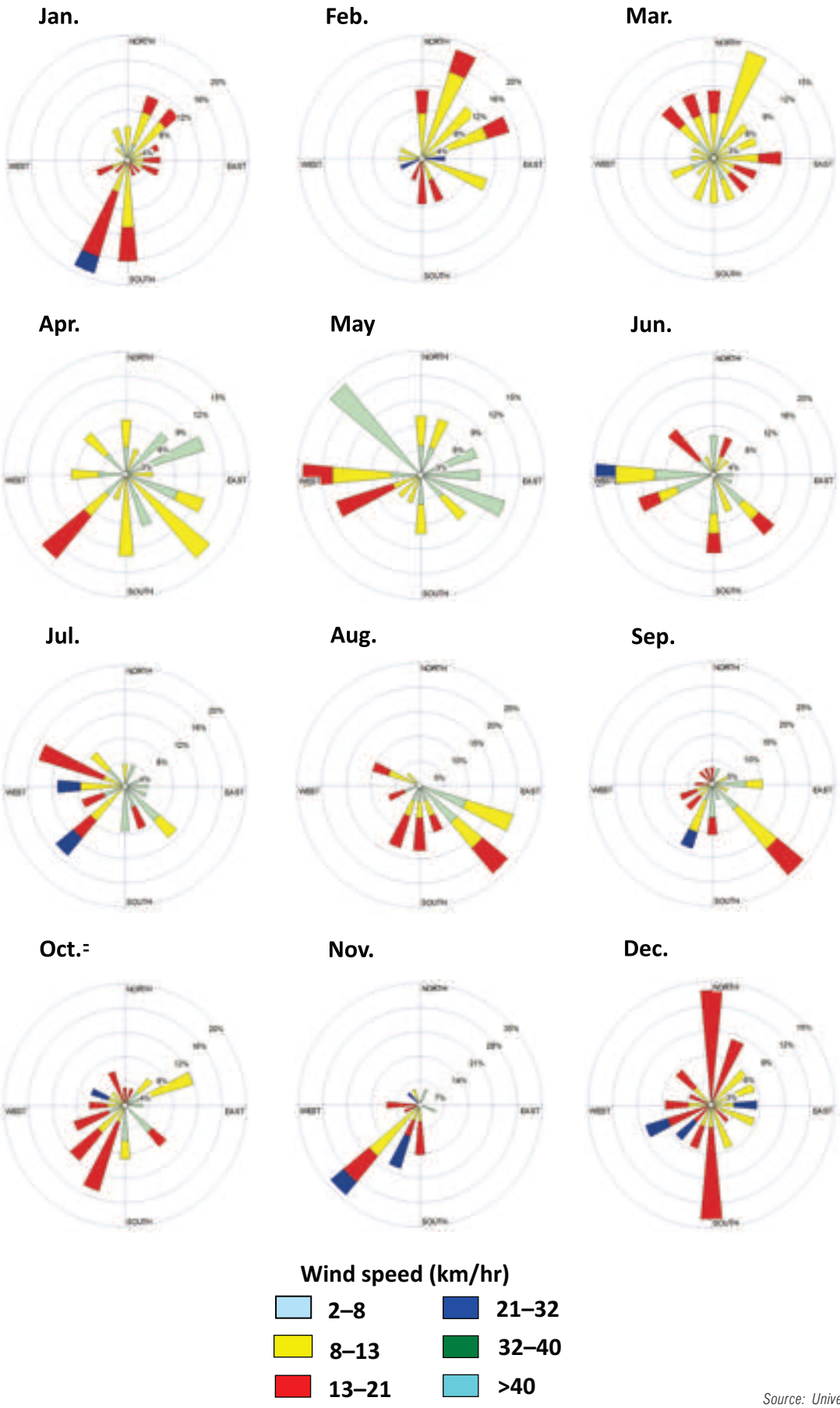

Source: University of Sydney (2015)

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FIGURE 7b

Monthly Wind Roses for January - December 2014

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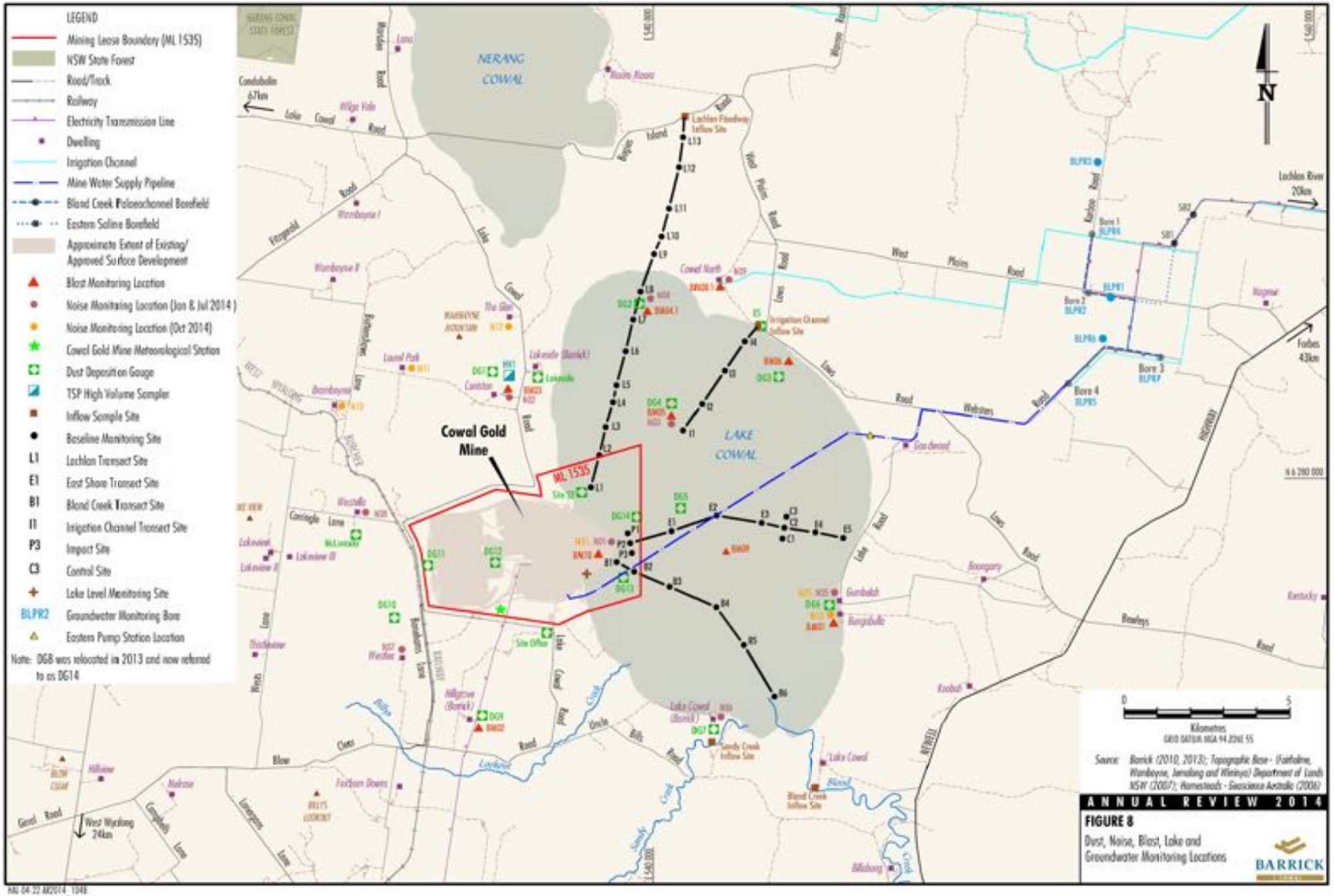
LEGEND
Mining Lease Boundary (ML 1535)
NSW State Forest
Road/Track
Railway
Electricity Transmission Line
Dwelling
Irrigation Channel
Mine Water Supply Pipeline
Bland Creek Paleochannel Borefield
Eastern Saline Borefield
Approximate Extent of Existing/ Approved Surface Development
Blast Monitoring Location
Noise Monitoring Location (Jan & Jul 2014)
Noise Monitoring Location (Oct 2014)
Cowal Gold Mine Meteorological Station
Dust Deposition Gauge
TSP High Volume Sampler
Inflow Sample Site
Baseline Monitoring Site
L1 Lachlan Transect Site
E1 East Shore Transect Site
B1 Bland Creek Transect Site
I1 Irrigation Channel Transect Site
P3 Impact Site
C3 Control Site
Lake Level Monitoring Site
BLPR2 Groundwater Monitoring Bore
Eastern Pump Station Location
Note: DG8 was relocated in 2013 and now referred to as DG14
Cowal Gold Mine
ML 1535
NERANG COWAL
LAKE COWAL
Condobolin 67km
Lachlan River 20km
Forbes 43km
West Wyalong 24km
N
0
5
Kilometres
GRID DATUM: MGA 94 ZONE 55
Source: Barrick (2010, 2013); Topographic Base - (Fairholme, Wambeyne, Jemalong and Wiminya) Department of Lands NSW (2007); Homesteads - Geoscience Australia (2006)
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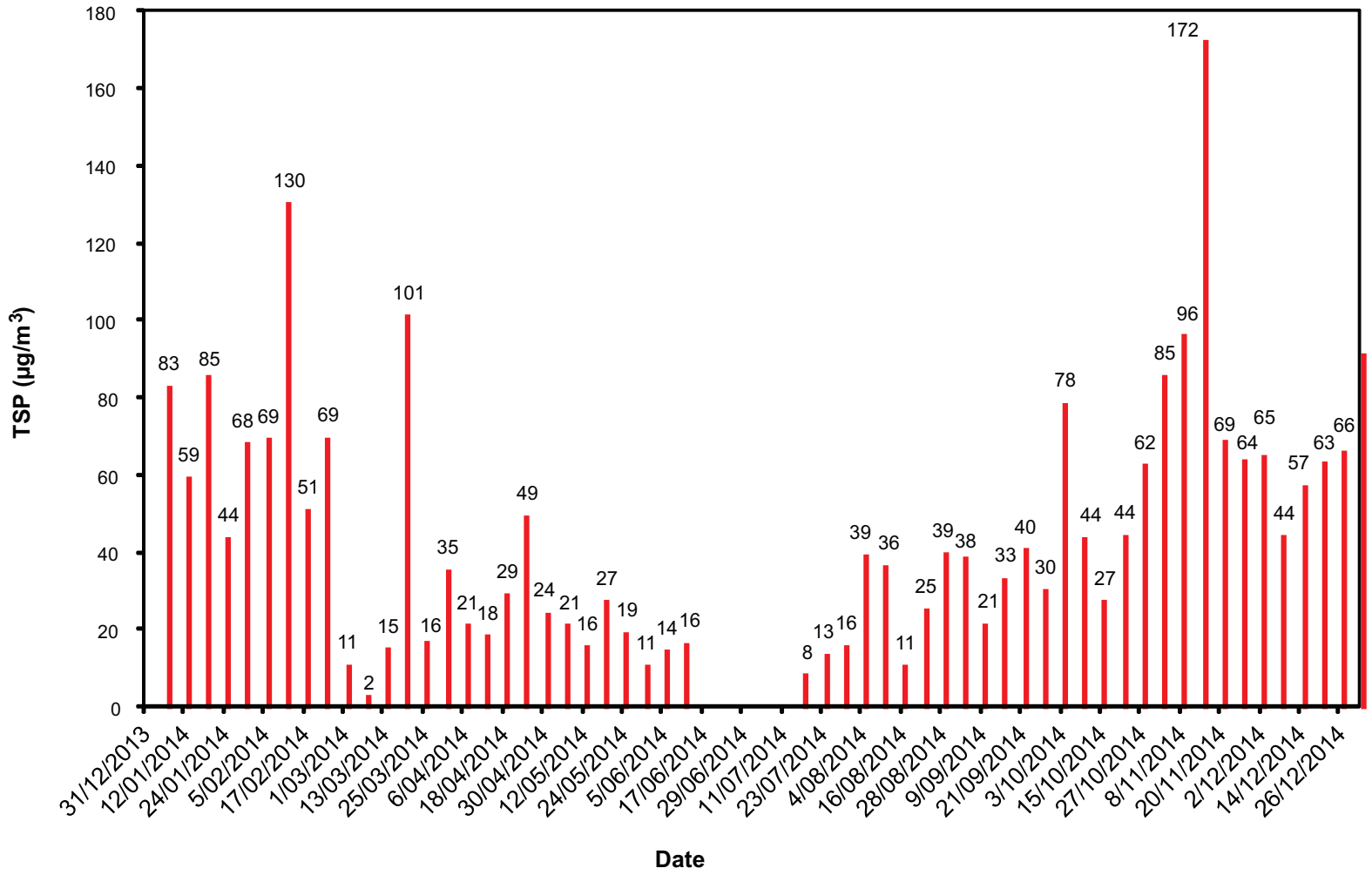
FIGURE 8
Dust, Noise, Blast, Lake and Groundwater Monitoring Locations
BARRICK



Source: University of Sydney (20154)

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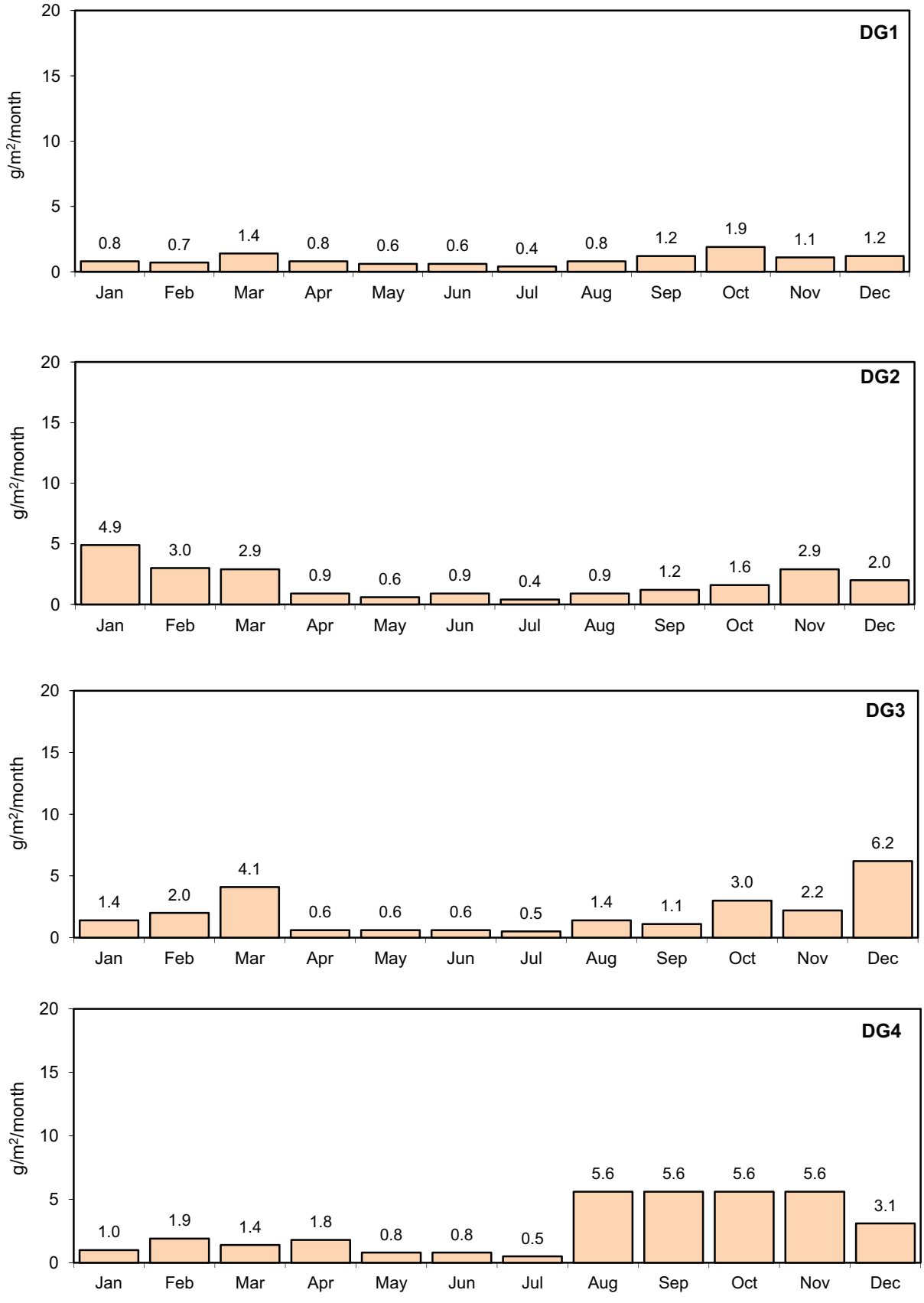
FIGURE 9
High-Volume TSP Dust Results
(31 December 2013 to
26 December 2014)

BARRICK COWAL

HAL-04-22_AR2014_005A



Source: University of Sydney (2015)

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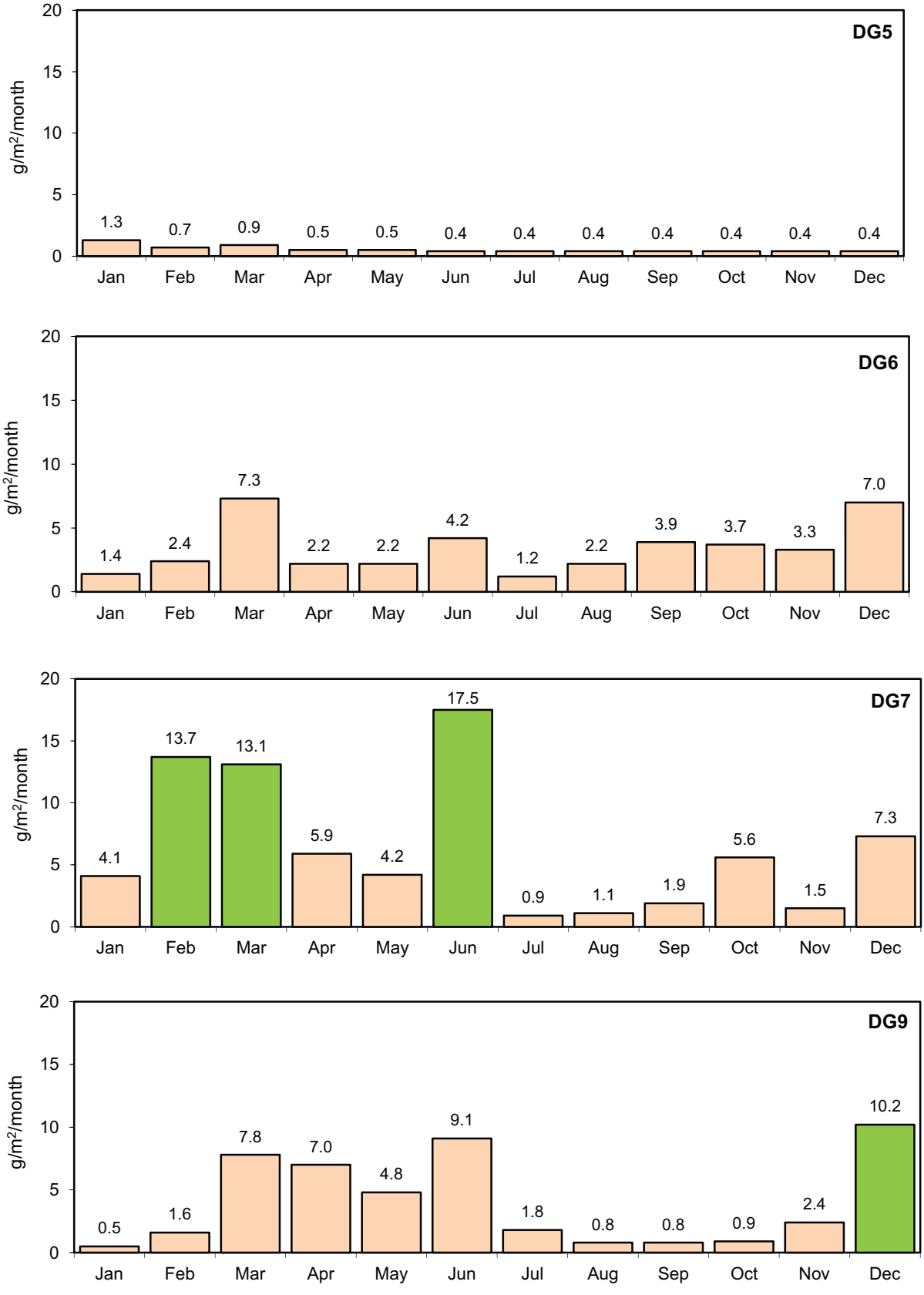
FIGURE 10a

Insoluble Solids in Dust (g/m²/month), January - December 2014 for Dust Gauges DG1 to DG4

BARRICK COWAL



Source: University of Sydney (2015)

Note: The green column indicates that >50% of the collected large mass was combustible (i.e. organics, including insects and plant matter) and not mineral dust.

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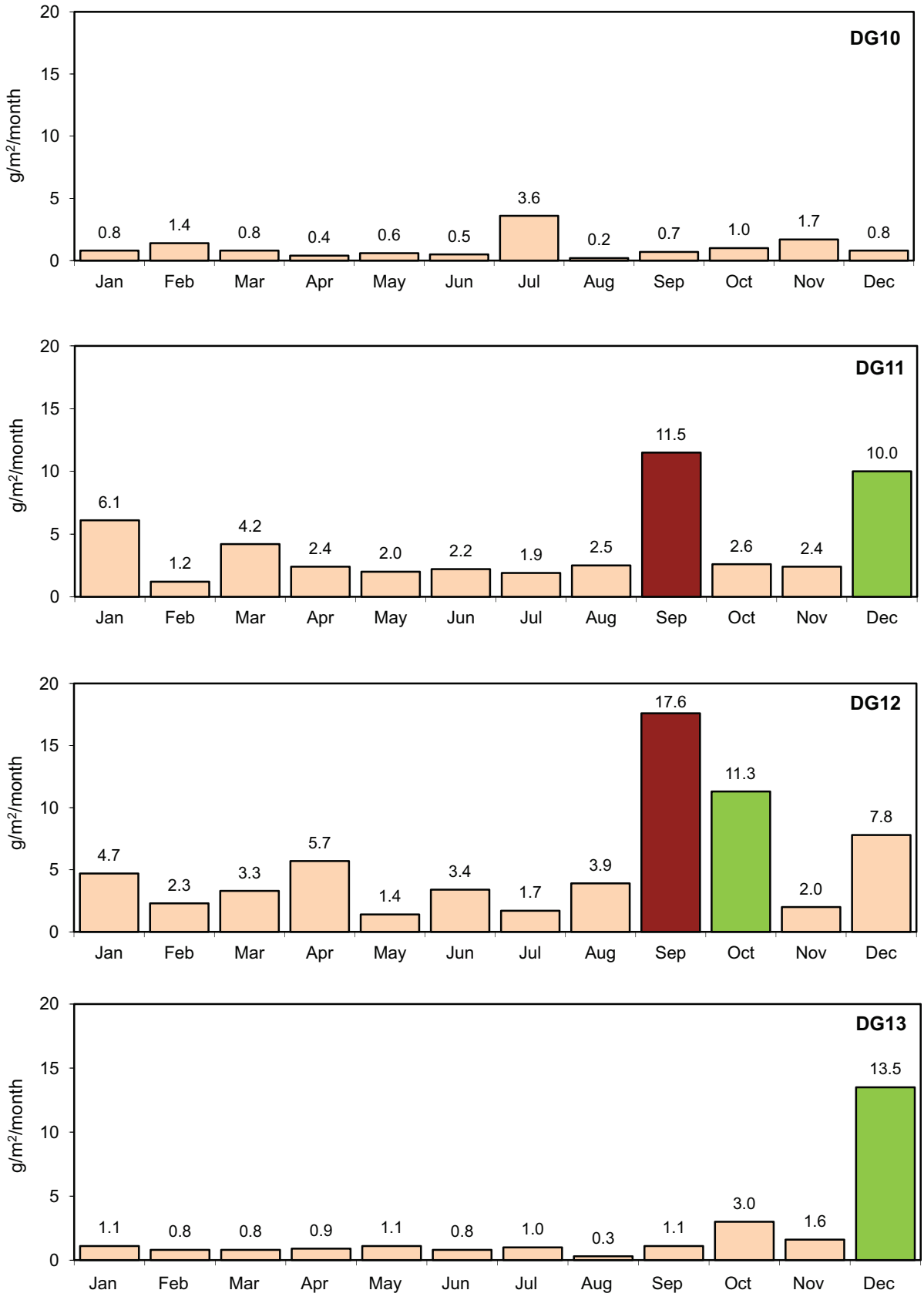
FIGURE 10b

Insoluble Solids in Dust (g/m²/month), January - December 2014 for Dust Gauges DG5 to DG9

BARRICK COWAL

HAL-04-22_AR2014_006A



Note: The red column indicates that a large proportion of the collected large mass was mineral material, suggesting either vandalism of the gauge (addition of soil) or contributions by muddy bird claws.

The green column indicates that >50% of the collected large mass was combustible (i.e. organics, including insects and plant matter) and not mineral dust.

Source: University of Sydney (2015)

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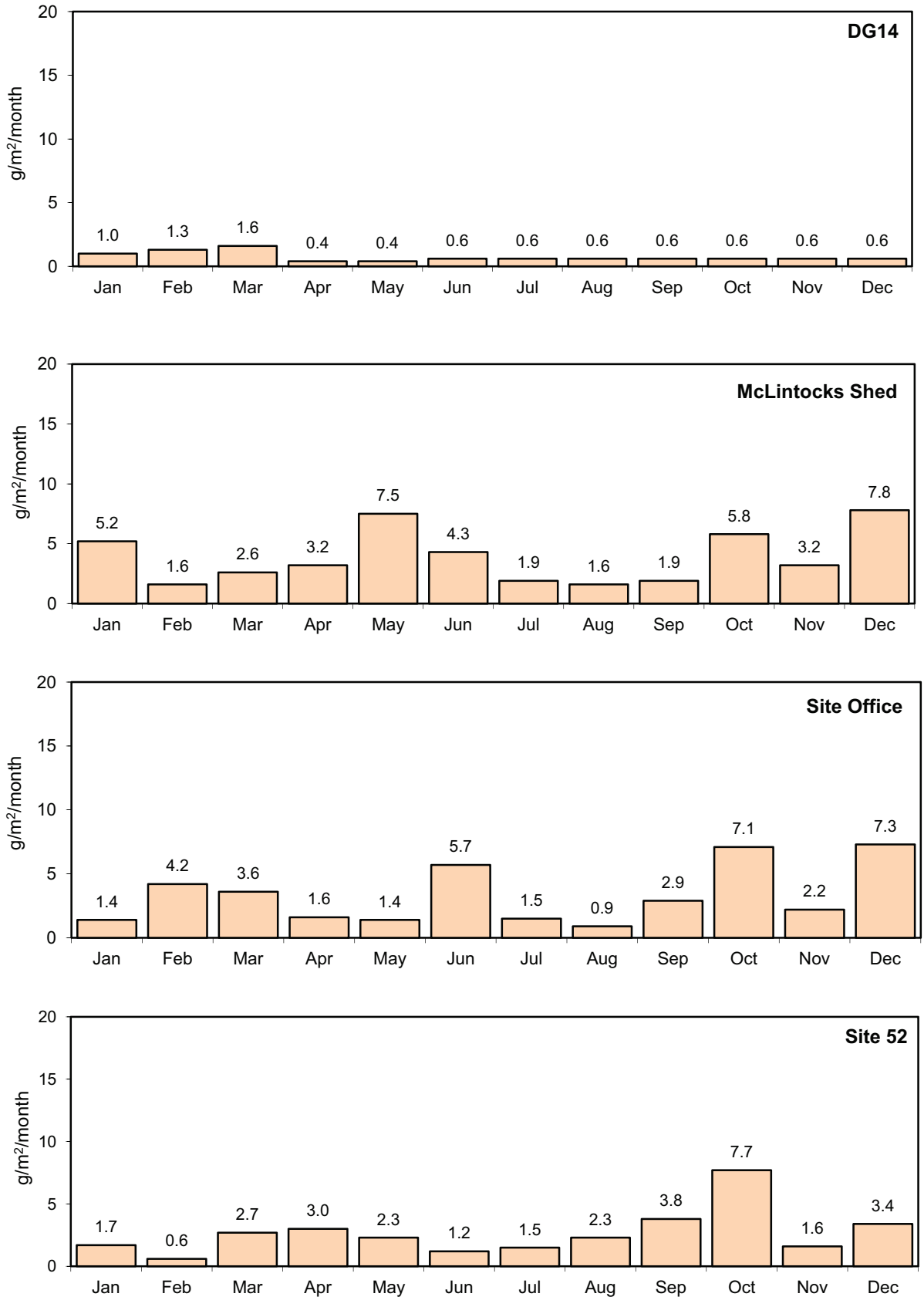
FIGURE 10c

Insoluble Solids in Dust (g/m²/month), January - December 2014 for Dust Gauges DG10 to DG13

BARRICK COWAL



Source: University of Sydney (2015)

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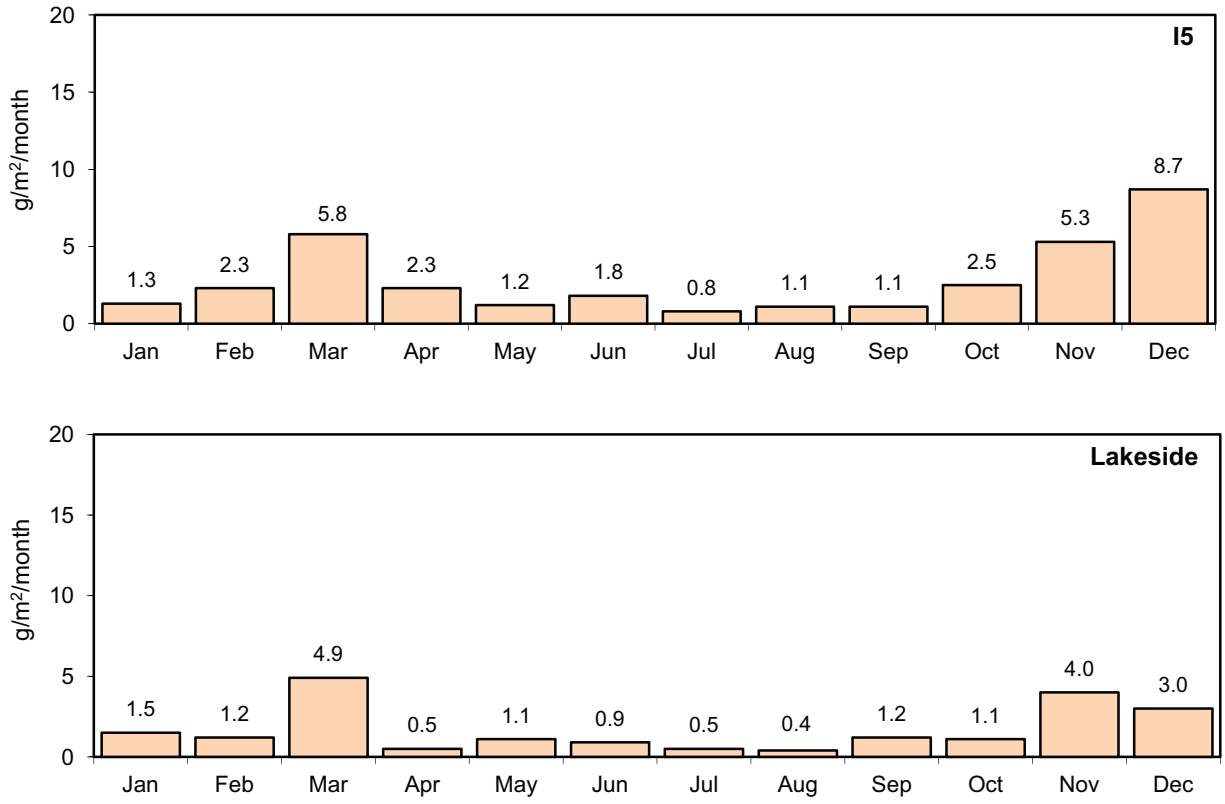
FIGURE 10d

Insoluble Solids in Dust (g/m²/month), January - December 2014
Dust Gauges DG14 ,McLintocks Shed, Site Office and Site 52

BARRICK COWAL



Source: University of Sydney (2015)

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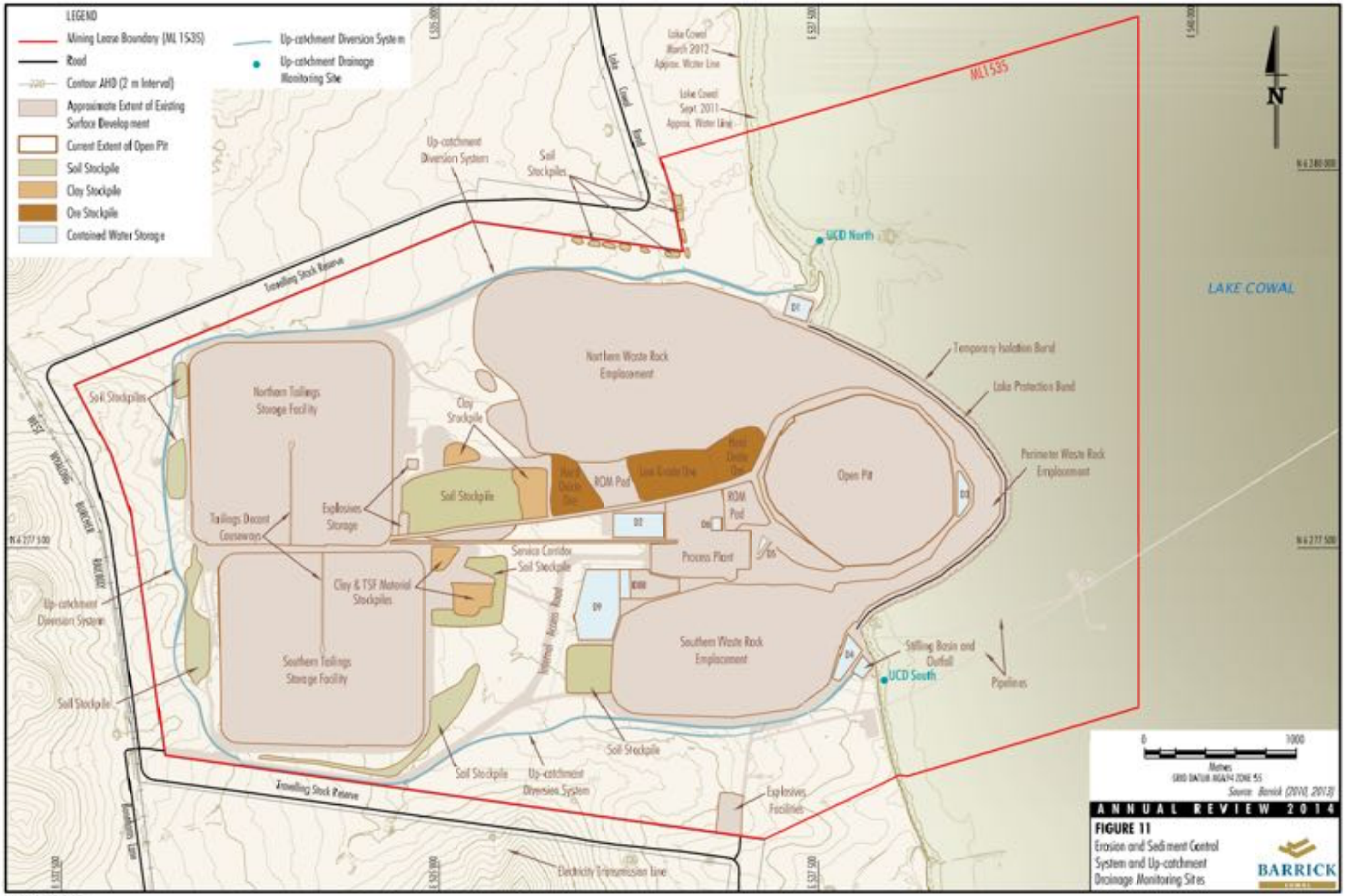
FIGURE 10e

Insoluble Solids in Dust (g/m²/month), January - December 2014 for Dust Gauges I5 and Lakeside

BARRICK COWAL



ML 04-22 AR2014_105A

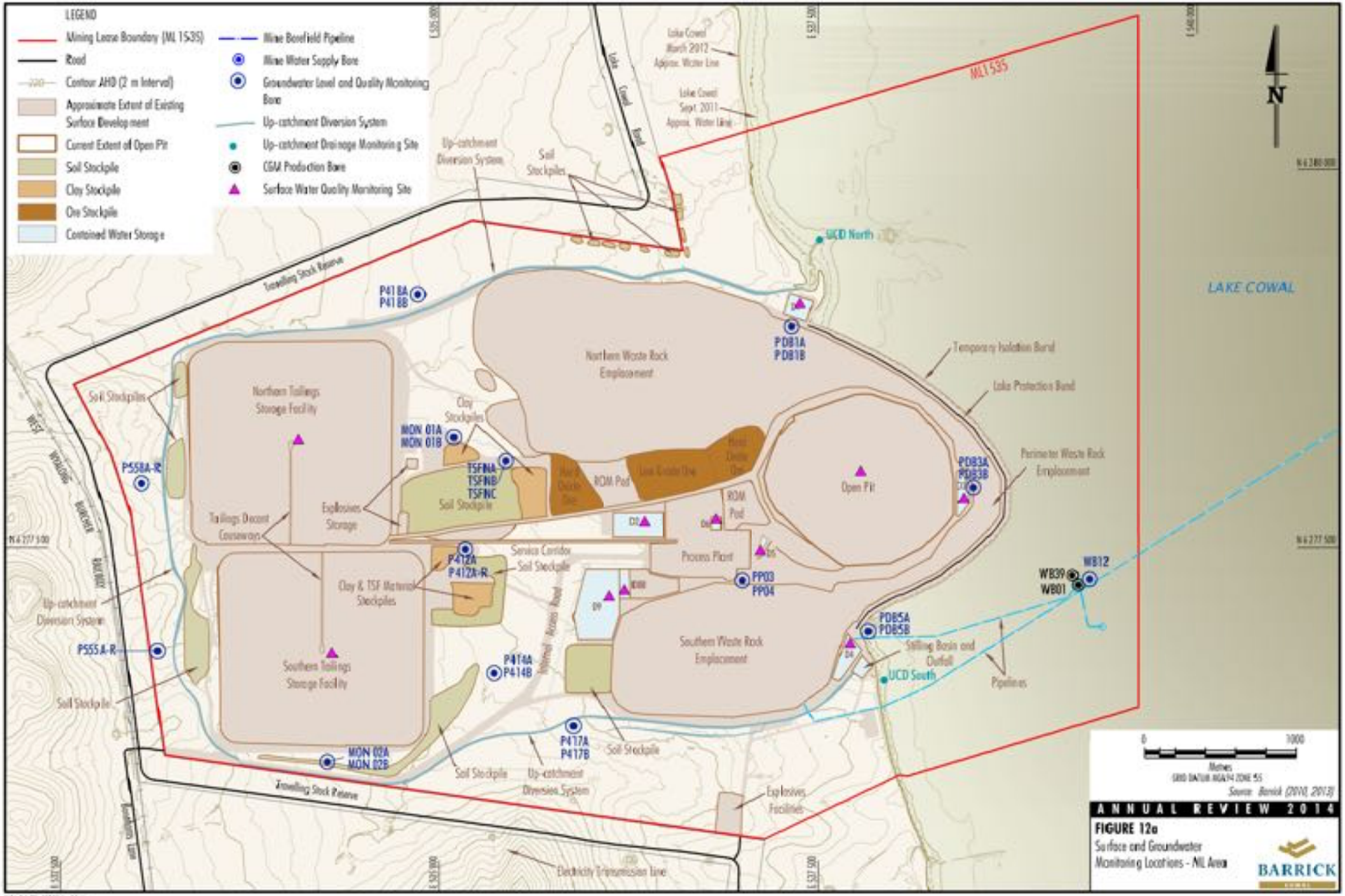

LEGEND
Mining Lease Boundary (ML 1535)
Road
Contour AHD (2 m Interval)
Approximate Extent of Existing Surface Development
Current Extent of Open Pit
Soil Stockpile
Clay Stockpile
Ore Stockpile
Contained Water Storage
Mine Borefield Pipeline
Mine Water Supply Bore
Groundwater Level and Quality Monitoring Bore
Up-catchment Diversion System
Up-catchment Drainage Monitoring Site
CGM Production Bore
Surface Water Quality Monitoring Site
LAKE COWAL
ML1535
Northern Waste Rock Emplacement
Northern Tailings Storage Facility
Southern Tailings Storage Facility
Southern Waste Rock Emplacement
Open Pit
Process Plant
ROM Pad
Perimeter Waste Rock Emplacement
Temporary Isolation Bund
Lake Protection Bund
UCD North
UCD South
Stilling Basin and Outfall
Pipelines
Soil Stockpiles
Clay Stockpiles
Explosives Storage
Tailings Decant Causeways
Clay & TSF Material Stockpiles
Service Corridor Soil Stockpile
Soil Stockpile
Up-catchment Diversion System
Travelling Stock Reserve
Explosives Facilities
Electricity Transmission Line
P418A
P418B
PDB1A
PDB1B
MON 01A
MON 01B
TSF1NA
TSF1NB
TSF1NC
P558A-R
P412A
P412A-R
PP03
PP04
WB39
WB01
WB12
PDB3A
PDB3B
PDB5A
PDB5B
P555A-R
P414A
P414B
P417A
P417B
MON 02A
MON 02B
0
1000
Metres
Source: Barrick (2010, 2013)
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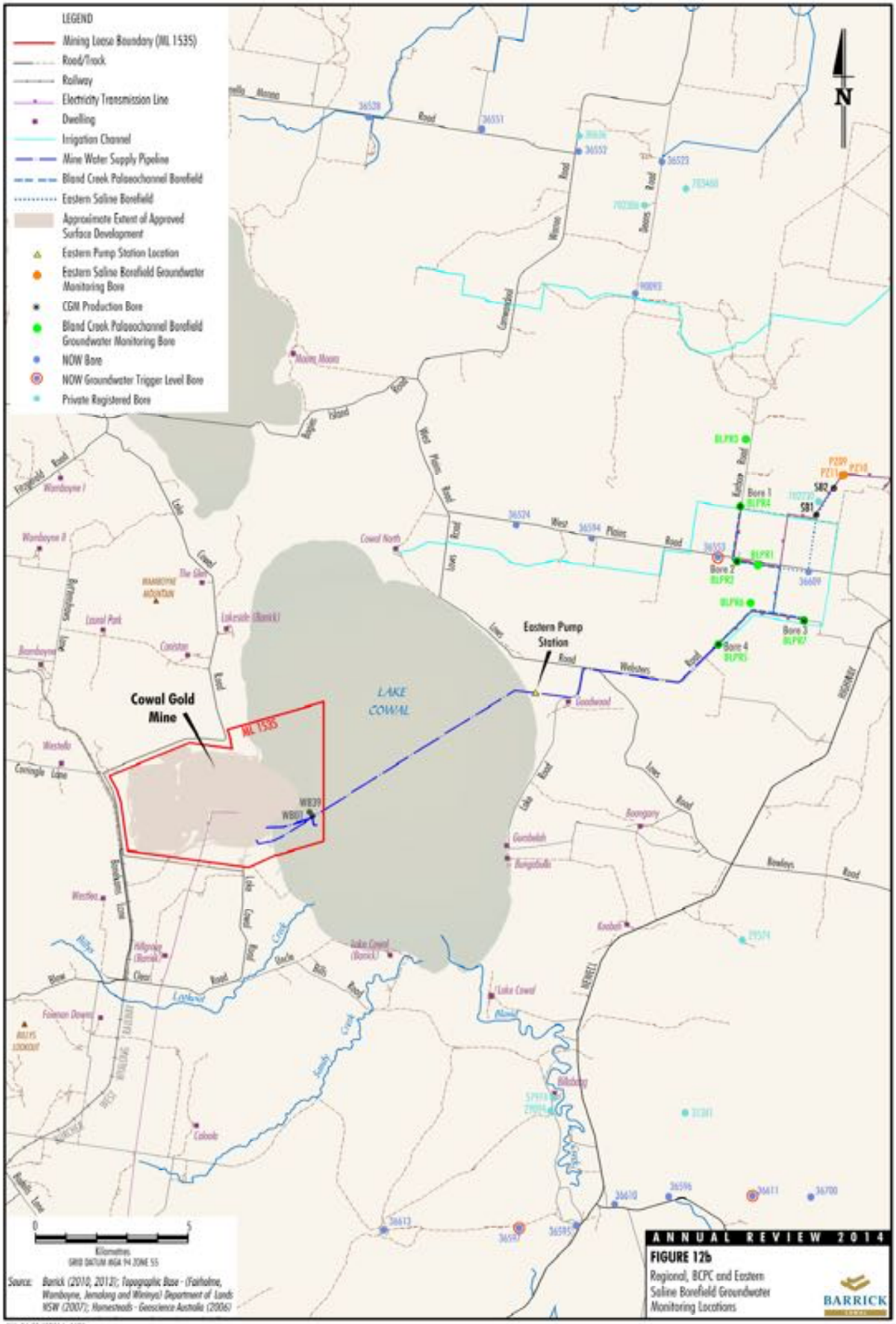
FIGURE 12a
Surface and Groundwater Monitoring Locations - NIL Area
BARRICK



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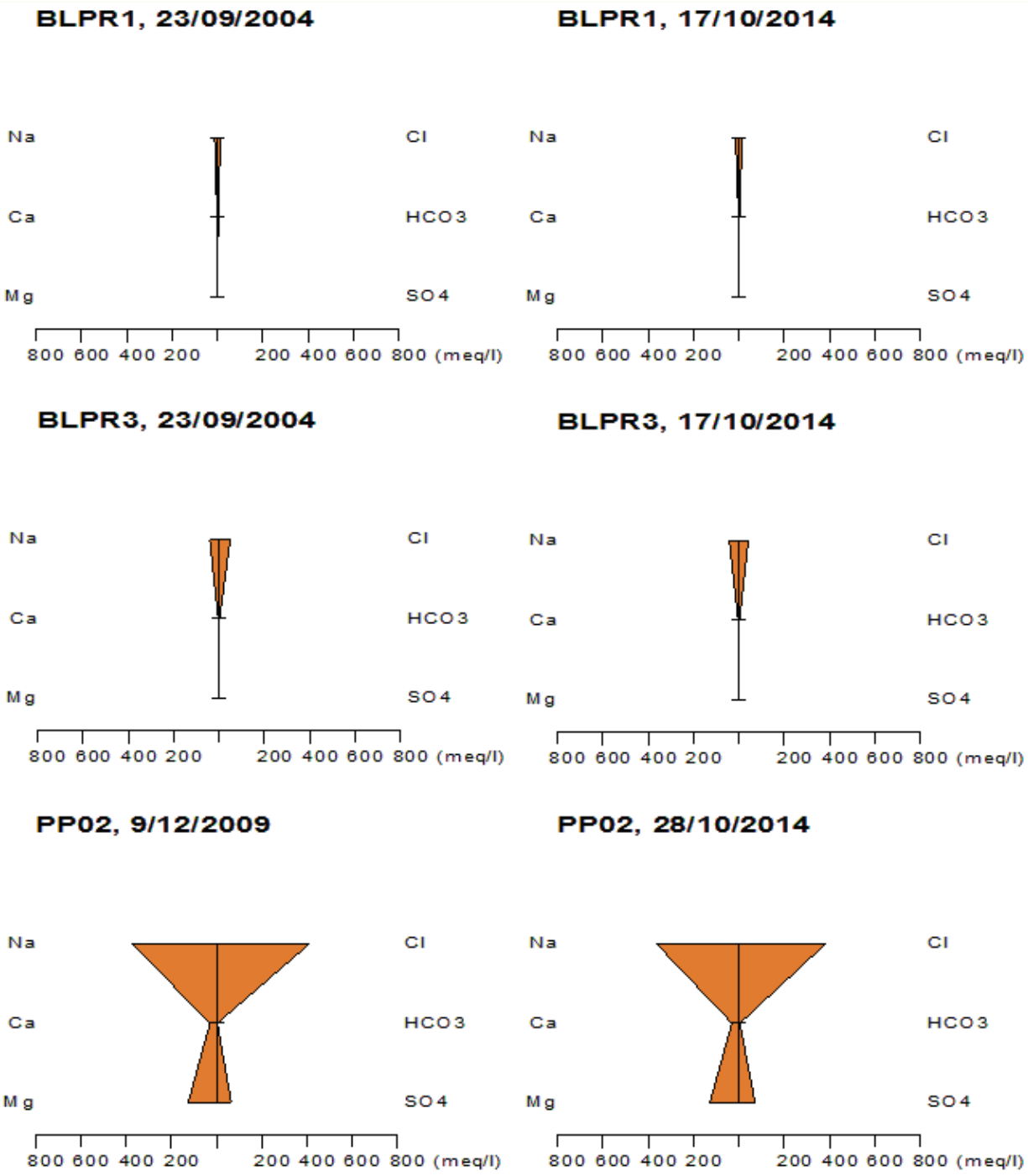
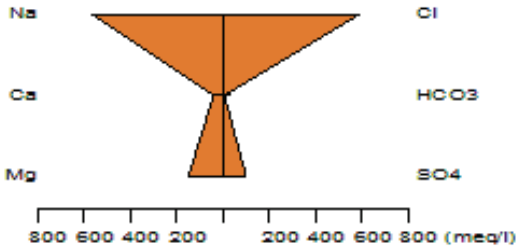


Source: Coffey Geotechnics Pty Ltd (2015)

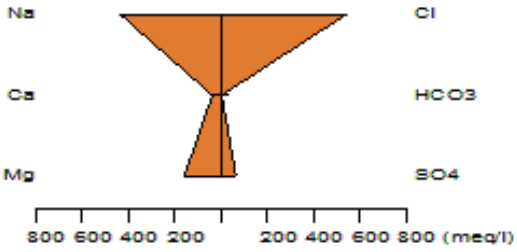
FIGURE 13a

Stiff Plots of Groundwater Chemistry (Bland Creek Palaeochannel Borefield and Processing Plant Area)

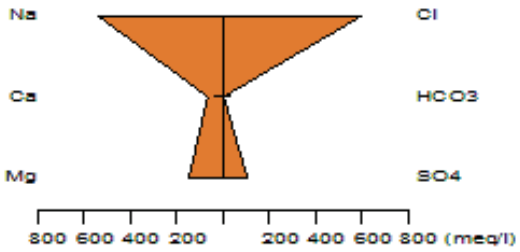
PDB5A, 10/11/2004



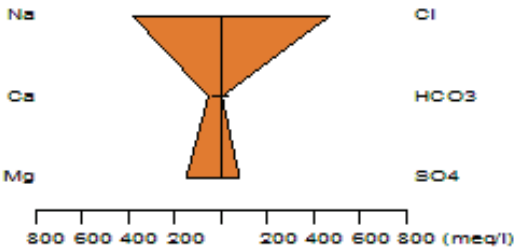
PDB5A, 21/10/2014



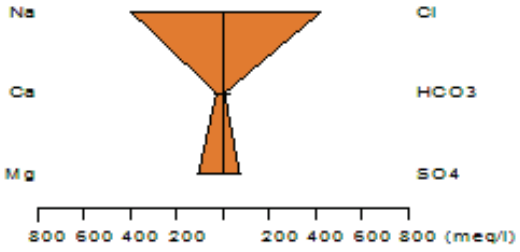
PDB3A, 10/11/2004



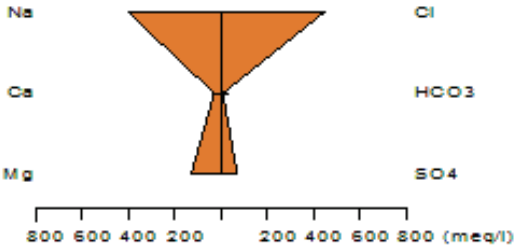
PDB3A, 9/10/2014



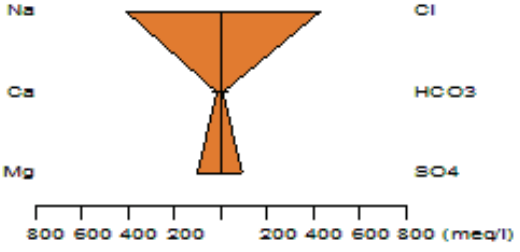
P417A, 17/05/2005



P417A, 7/10/2014



P418B, 9/11/2004



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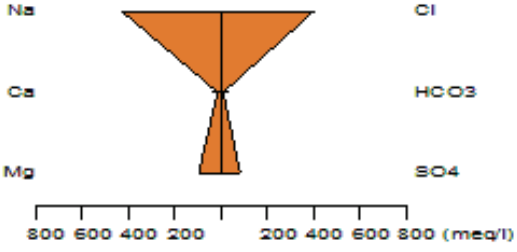

Source: Coffey Geotechnics Pty Ltd (2015)

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FIGURE 13b

Stiff Plots of Groundwater Chemistry (Pit Area and Tailings Storage Area)

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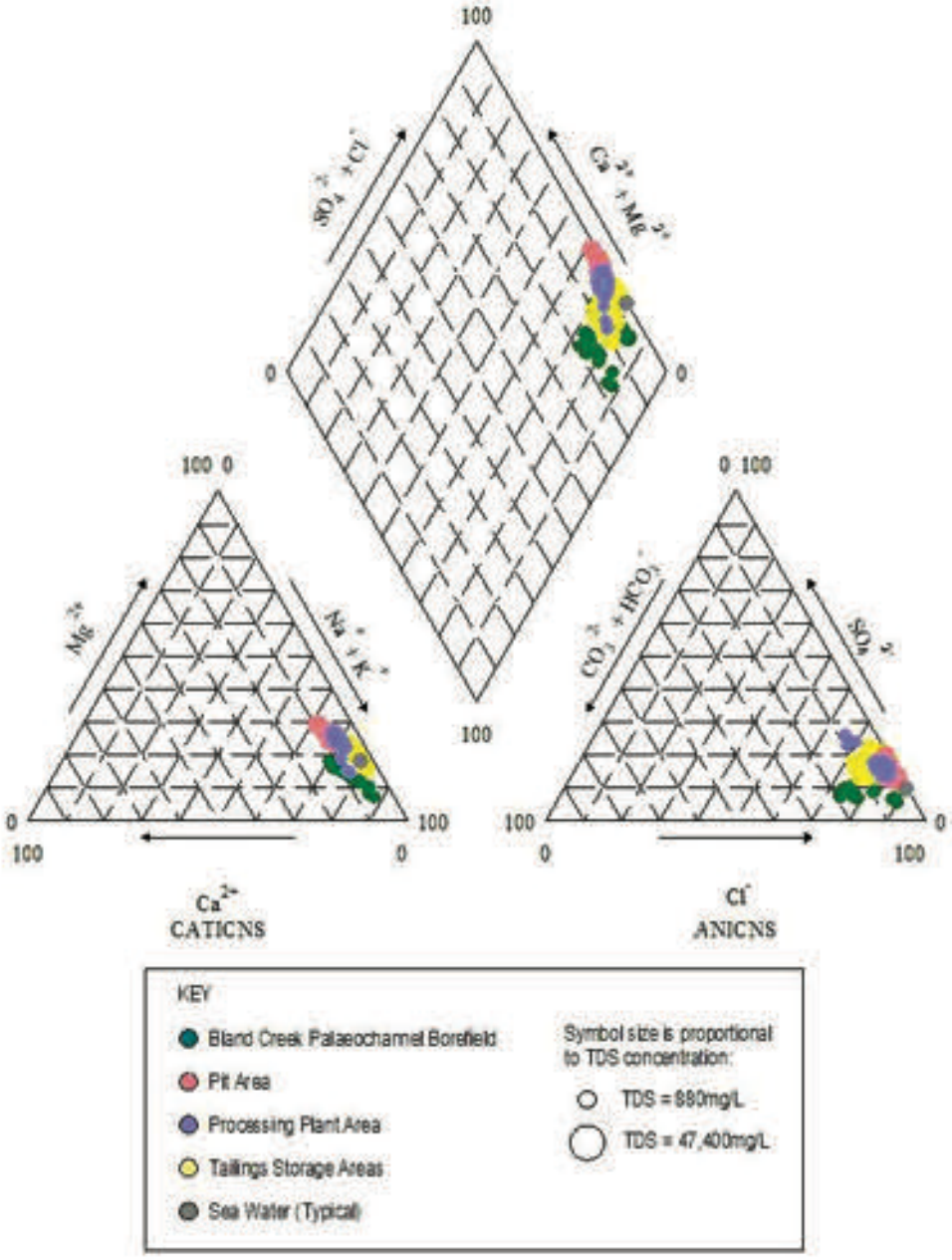

Source: Coffey Geotechnics Pty Ltd (2015)

FIGURE 14
Piper Plot of Groundwater Chemistry

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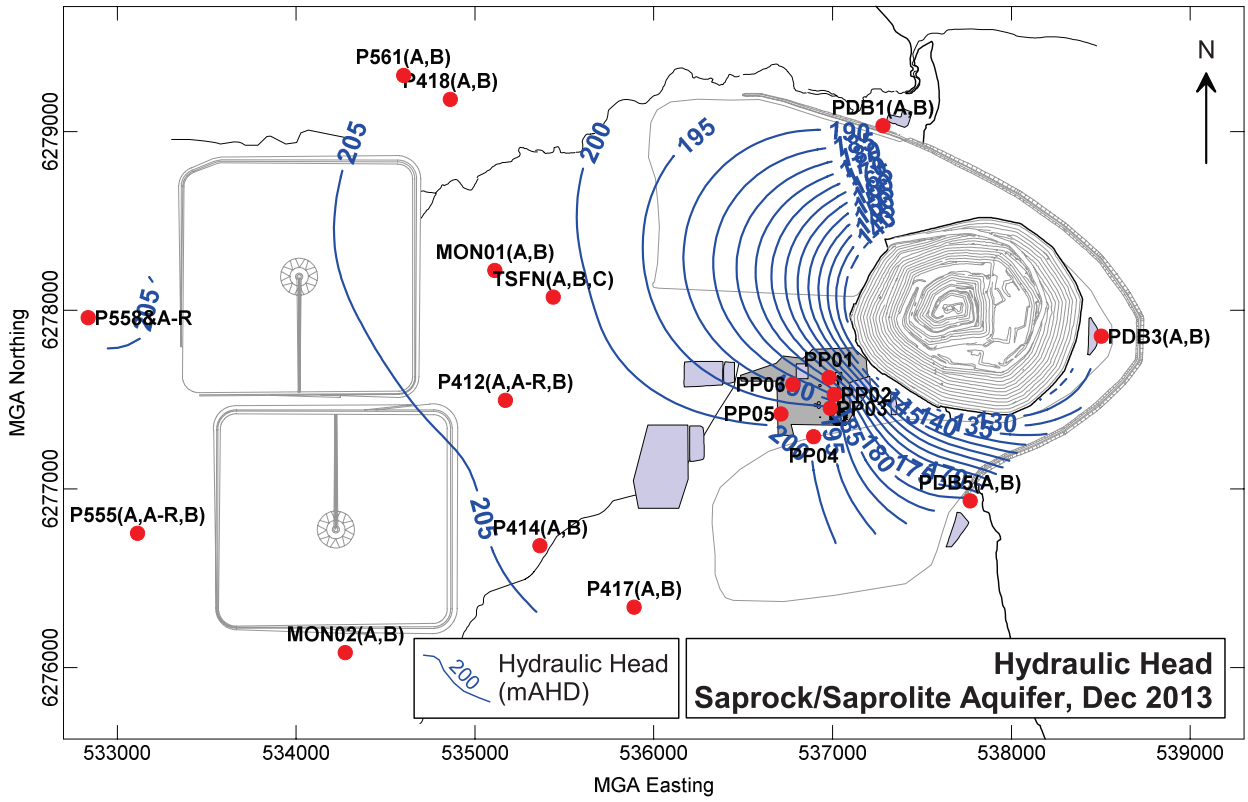

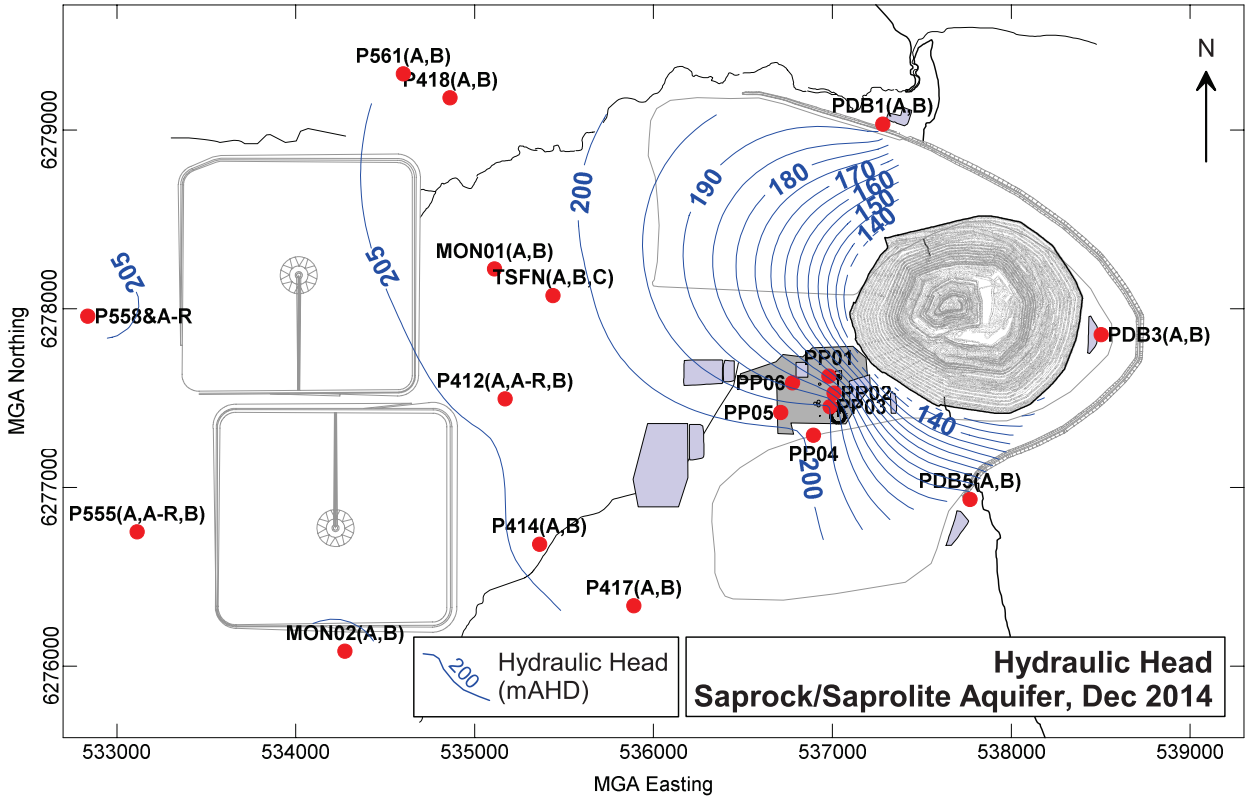

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FIGURE 15a

Deep Groundwater Contours

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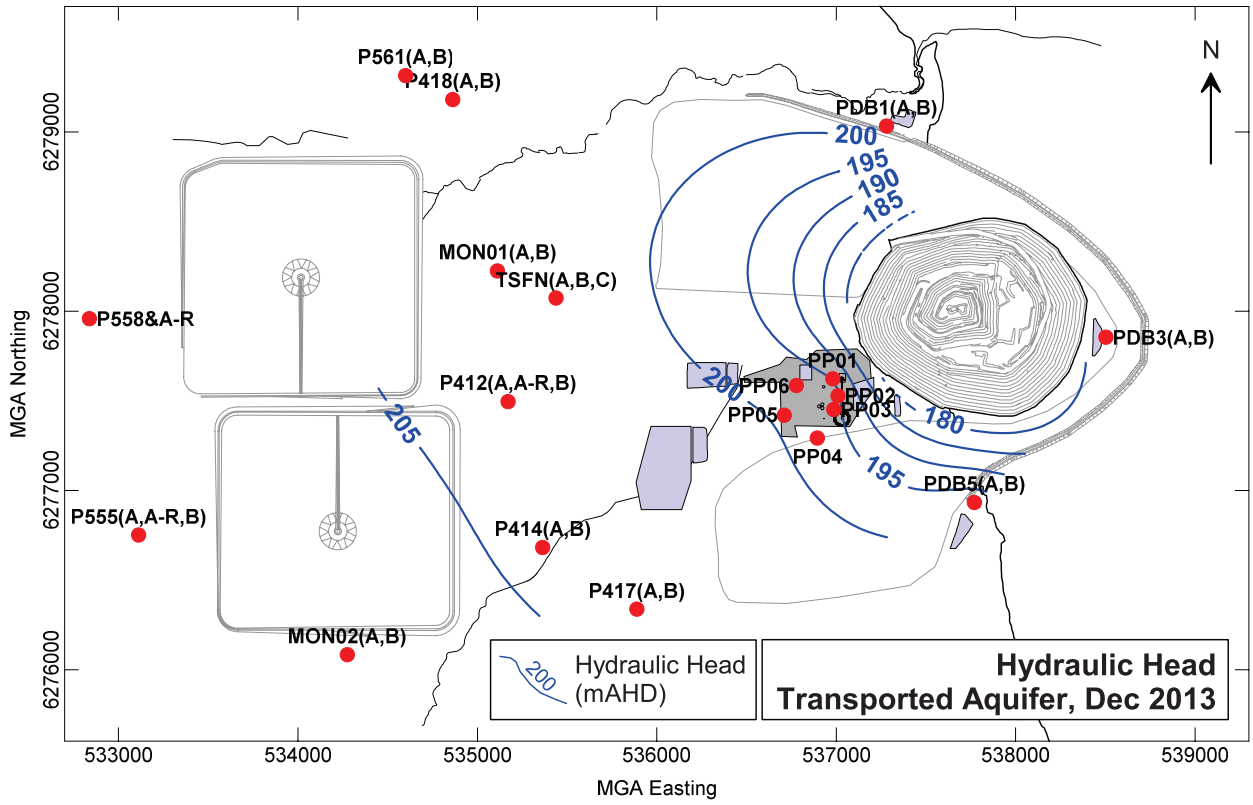

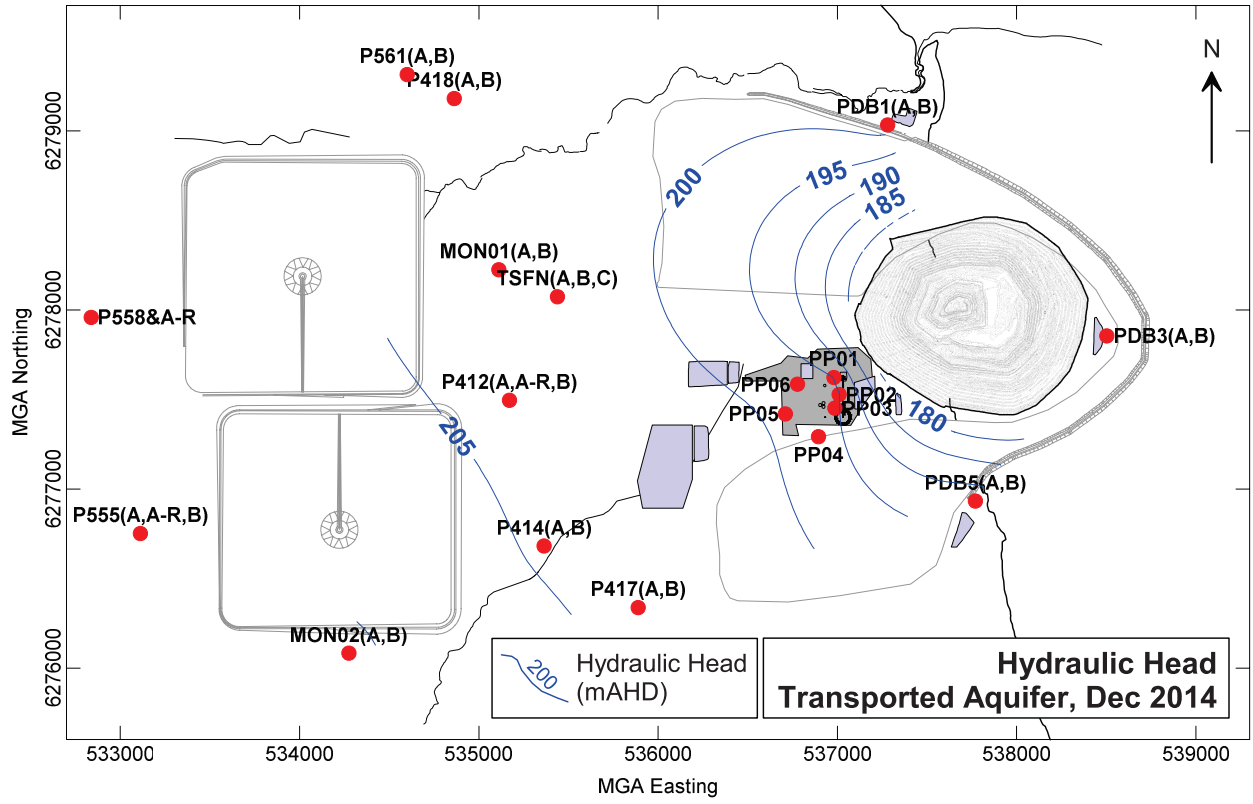

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FIGURE 15b

Shallow Groundwater Contours

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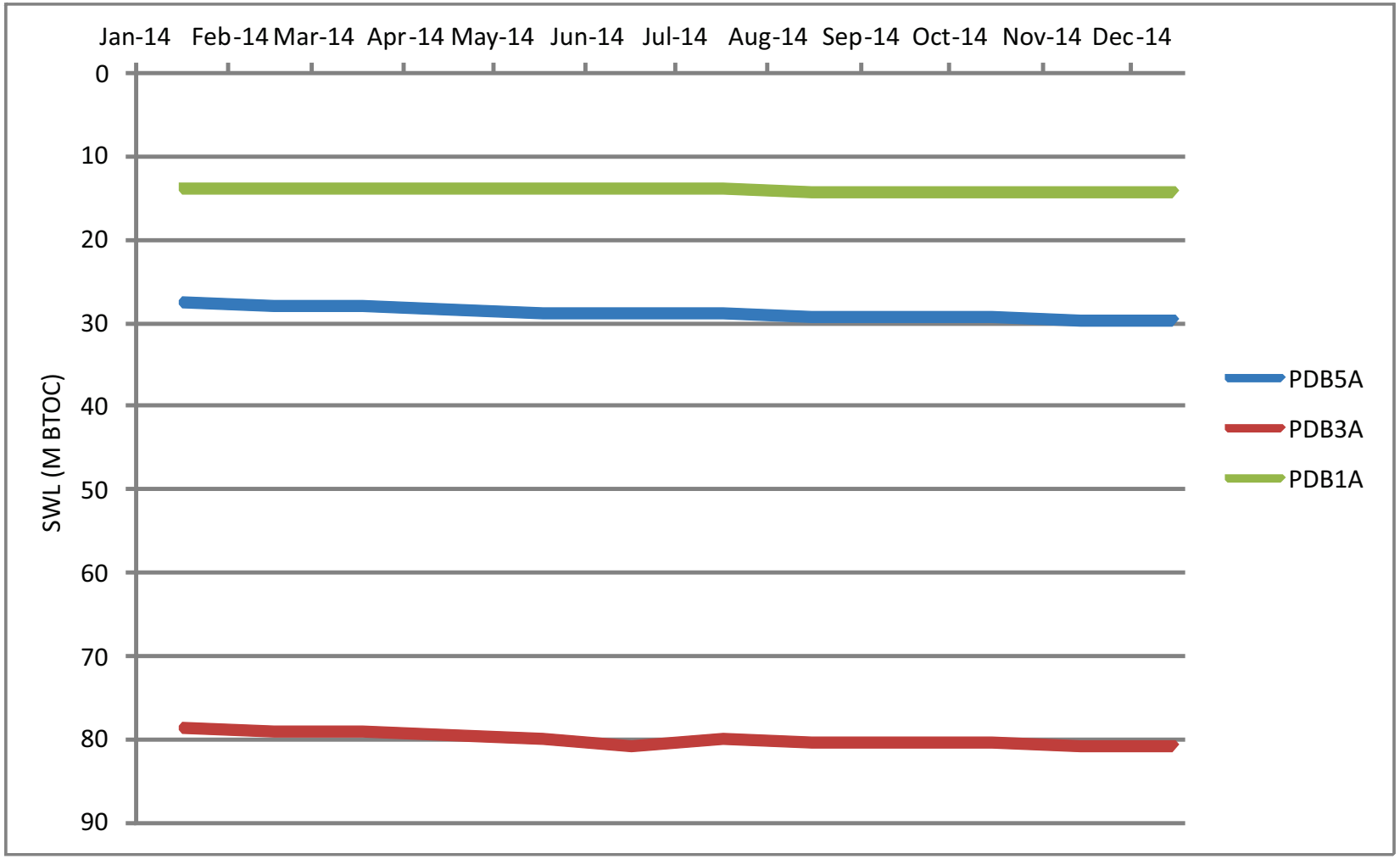

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FIGURE 16
Bores PDB 1A, 3A and 5A Standing Water Levels Measured During the Reporting Period

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HAL-04-22_AR2014_012B

WAL 04-22 AR2014_107A

VEGETATION CLEARANCE PROTOCOL

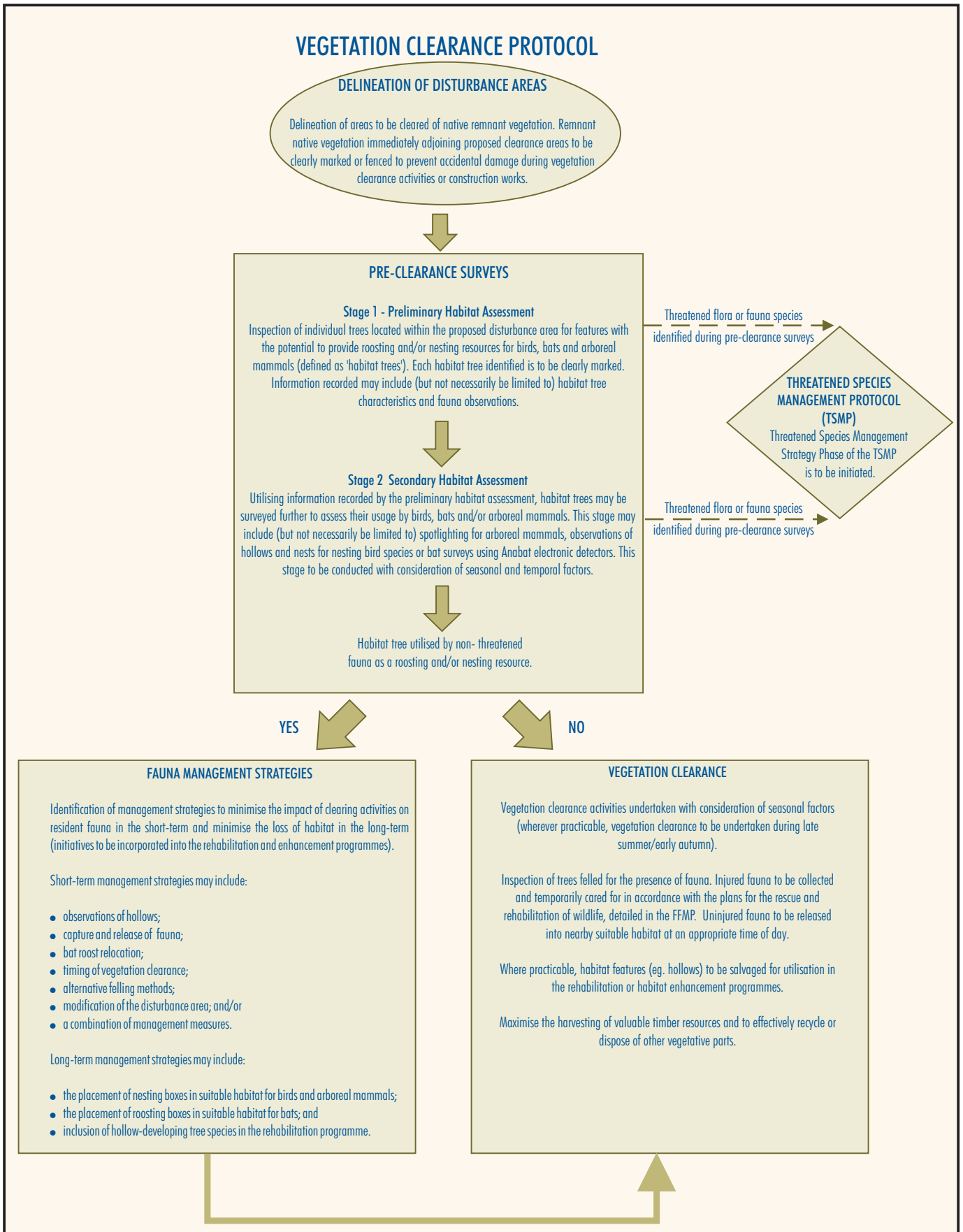

FIGURE 18
Vegetation Clearance Protocol

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FIGURE 19

Location of Offset Areas, Remnant Vegetation Enhancement Areas and Compensatory Wetland

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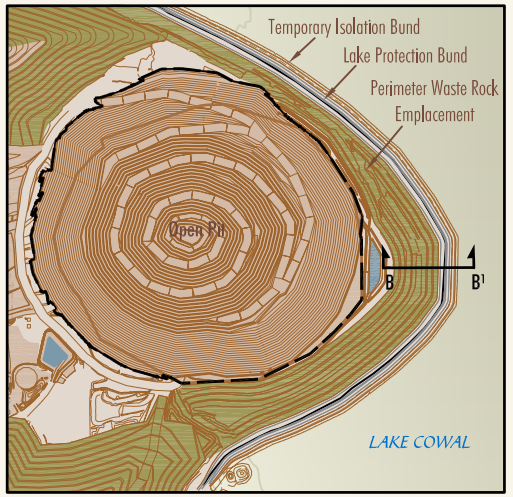
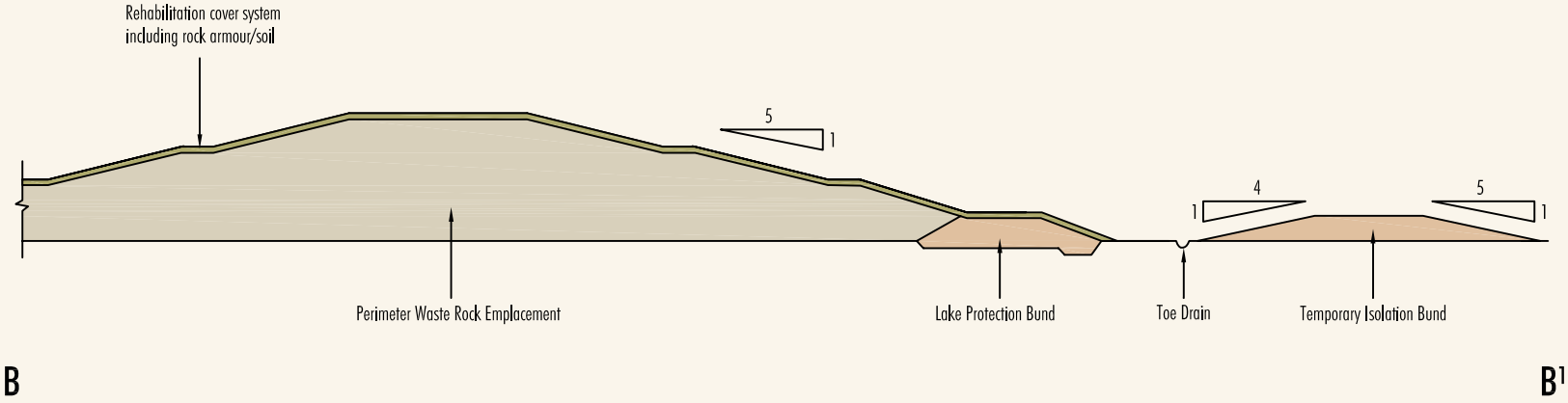


INSET



Not to Scale

Source: Barrick (2013)

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FIGURE 20

Typical Section Through Perimeter Waste Emplacement and Lake Isolation System

BARRICK

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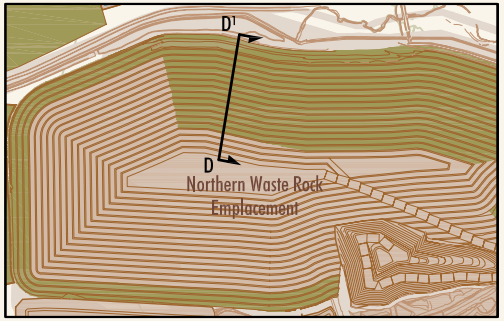
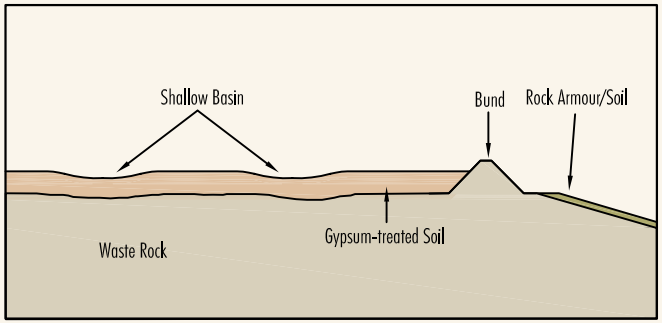
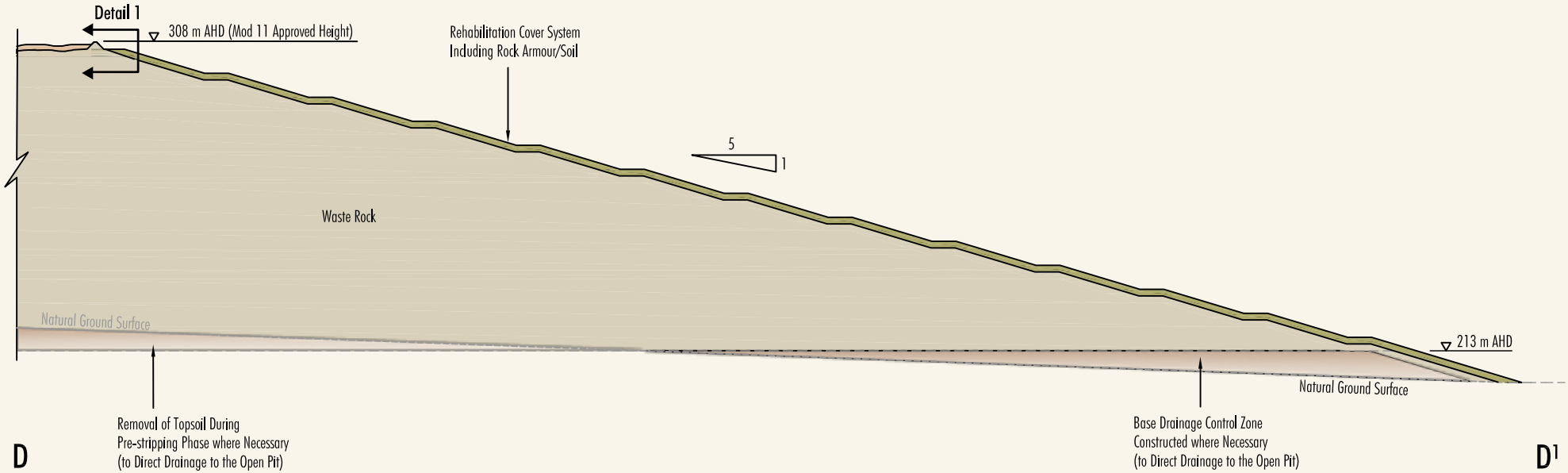


INSET
Refer to Figure 3-3 of CGM Extension
Modification Environmental Assessment



DETAIL 1



Not to Scale

Source: Barrick (2014)

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FIGURE 21
Conceptual Embankment Section of
Northern Waste Rock Emplacement

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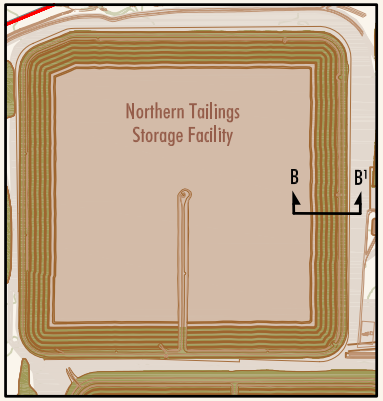
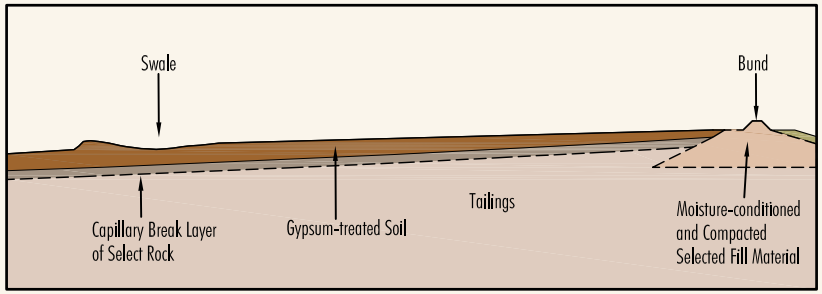
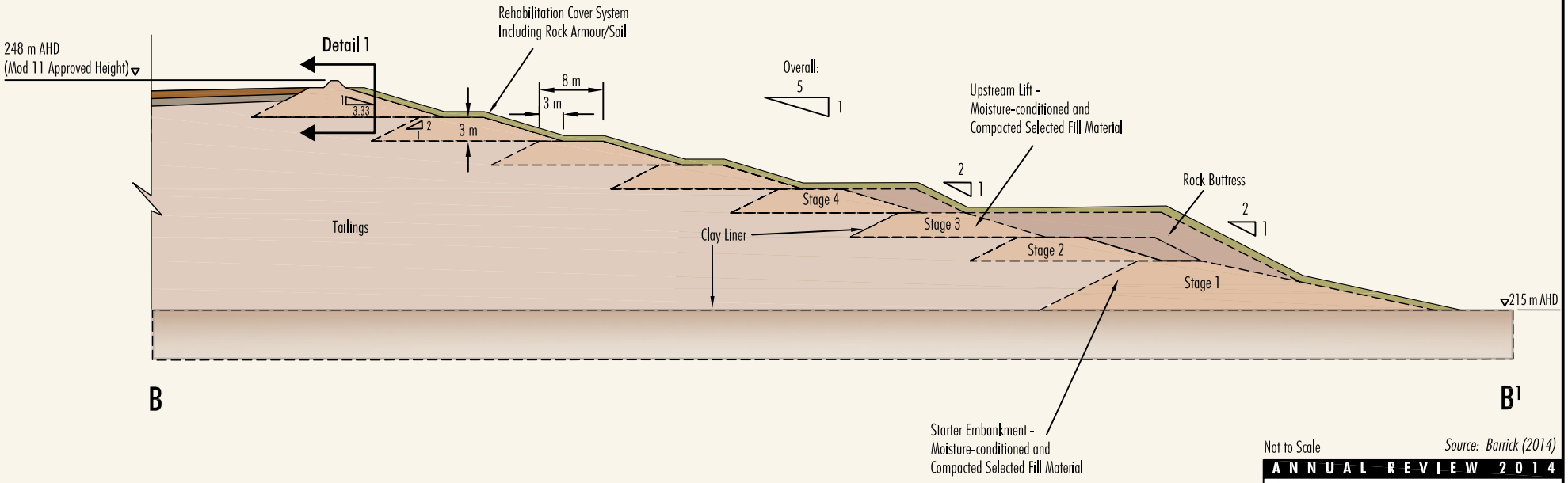


INSET
Refer to Figure 3-3 of CGM Extension
Modification Environmental Assessment



DETAIL 1



Not to Scale
Source: Barrick (2014)

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FIGURE 22
Conceptual Embankment Section of
Northern Tailings Storage Facility

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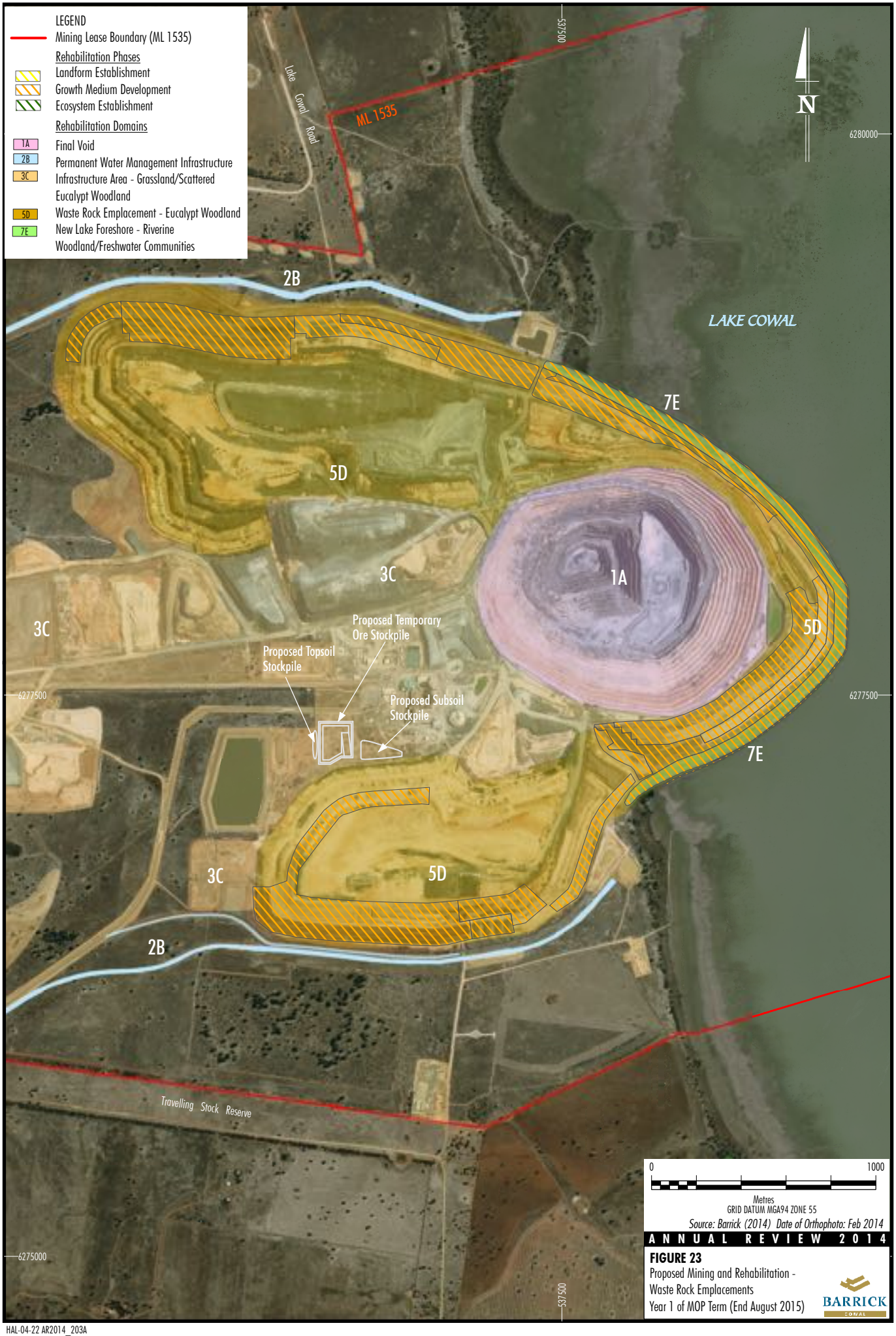

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FIGURE 23
Proposed Mining and Rehabilitation - Waste Rock Emplacements
Year 1 of MOP Term (End August 2015)

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HAL-04-22 AR2014_204A

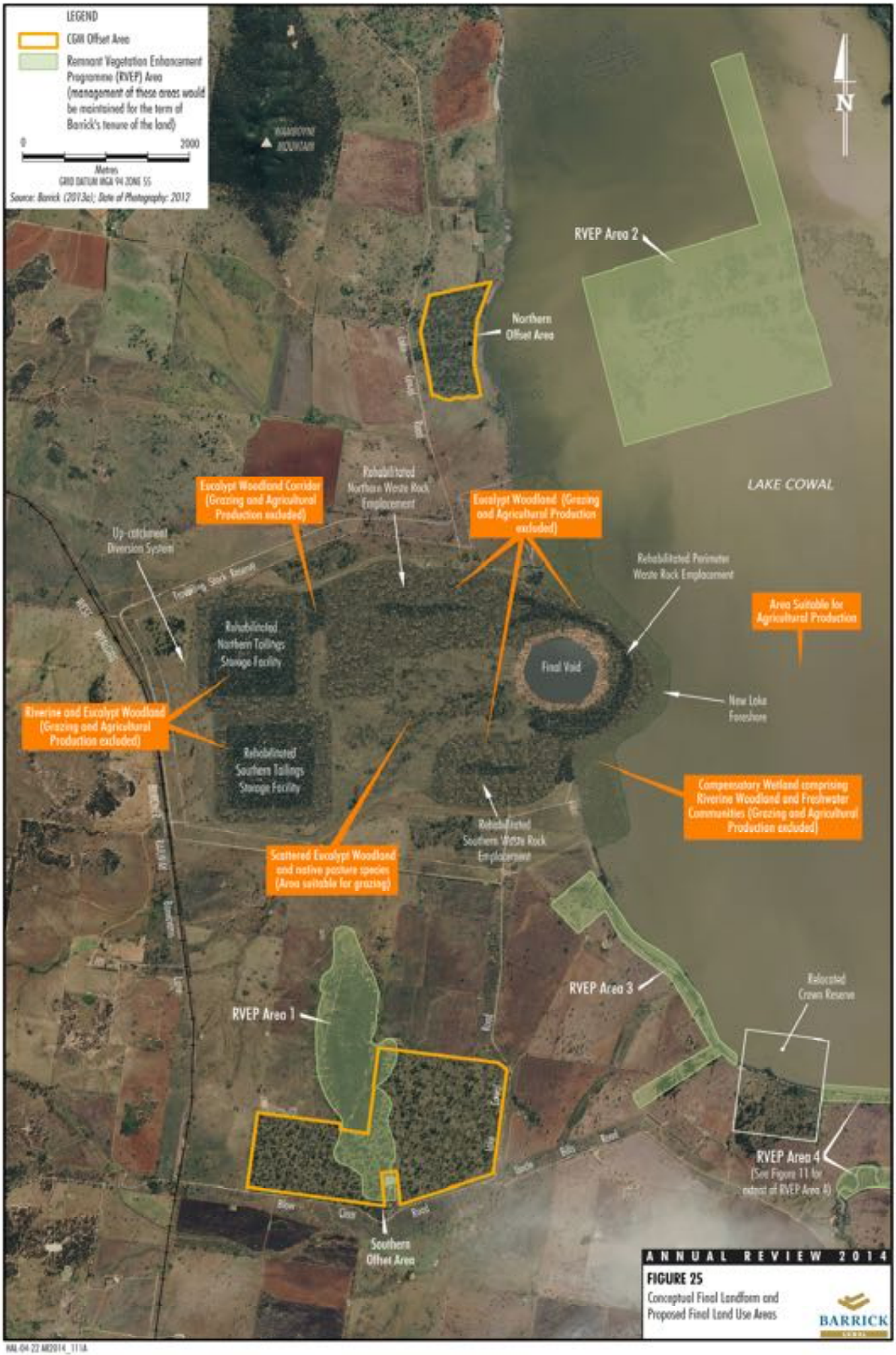

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FIGURE 25

Conceptual Final Landform and Proposed Final Land Use Areas

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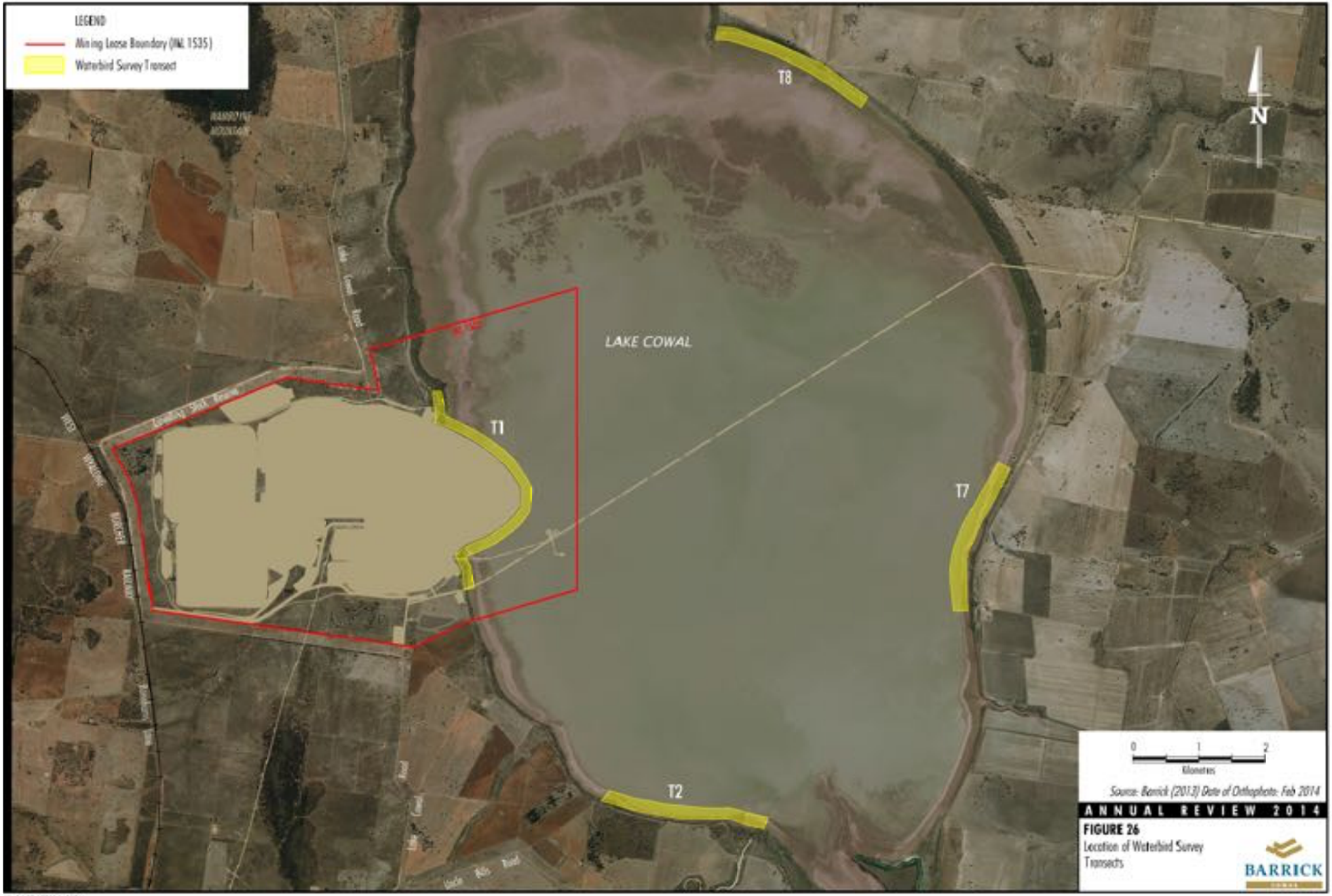

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FIGURE 26
Location of Waterbird Survey Transects

BARRICK

ML 04-22 AR2014_113A

APPENDIX A

COWAL GOLD MINE INDEPENDENT ENVIRONMENTAL AUDIT 2014

Photograph courtesy of Bronwyn Flynn

INDEPENDENT ENVIRONMENTAL AUDIT COWAL GOLD MINE

May 2014

This Independent Environmental Audit was conducted to satisfy the requirement of condition 8.8 in the Project Approval granted for the Cowal Gold Project by the Minister for Planning on 26 February 1998.

Cowal Gold Mine

Independent Environmental Audit
28 April to 31 May 2014

Prepared for:
Barrick (Cowal) Limited
Cowal Gold Mine
Clear Ridge Road
West Wyalong NSW 2671 Australia

Report prepared by:
trevor brown & associates
applied environmental management consultants

ABN: 65 850 181 279

aemc Ref: BAR14/05

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tebrown@bigpond.com

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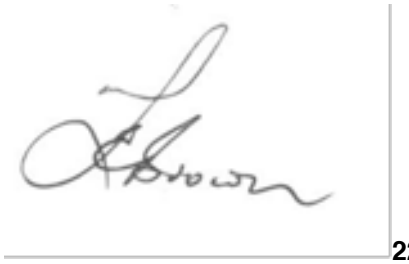
12	Barrick (Cowal) Limited		

This document was prepared for the sole use of Barrick Australia Pty Limited and the regulatory agencies that are directly involved with this project, are the only intended beneficiaries of our work. No other party should rely on the information contained herein without the prior written consent of Trevor Brown & Associates.

by

Trevor Brown & Associates
ABN: 65 850 181 279

42 Skiff Street Vincentia NSW Australia 2540



22 June 2014

Trevor Brown
Principal Environmental Consultant

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EXECUTIVE SUMMARY

An independent environmental audit of the Cowal Gold Mine (CGM) was conducted between the 28 April and 2 May 2014 by Trevor Brown Principal Environmental Management Auditor of Trevor Brown & Associates,, to assess the status of the CGM operations in accordance with the Minister's Conditions of Approval (MCoA) 8.8(a). The audit reviewed the status of compliance of the CGM operations from 1 May 2013 to 1 May 2014.

The audit was conducted generally in accordance with the Australian/New Zealand Standards AS/NZS ISO 19011:2002 - Guidelines for Quality and/or Environmental Management System Auditing.

The documentation and files held at the CGM site and interview/discussion with relevant site personnel provided the auditors with the required information and documentation for the verification of compliance of the CGM operations with the MCoA and other statutory environmental approvals.

Environmental Management Plans
All EMP's were reviewed in 2008-2009 and revised as necessary (in accordance with MCoA 3.2(a)). Revisions of the Management Plans were submitted to DoP/DP&I. Some of the revised management plans were still awaiting approval by DP&I at the date of this audit (i.e. 28 April 2013 to 31 May 2014).

The latest revision of the EMP's that address the requirements of the latest modifications to the Development Consent (i.e.MOD 10), are being implemented by Barrick for the management of the CGM operations although they had not been officially approved by DP&I at the date of this audit.

Heritage
The Non-Indigenous Heritage Management Plan prepared for the CGM site provided for management of the 'Cowal West Homestead Complex' components (including the Shearing Shed). Demolition of the Homestead complex was approved via Development Consent MOD 9 March 2010. Demolition of the homestead occurred during 2011-2012. Relocation of the re-construction of the Shearing Shed and reconstruction at the Lake Cowal Foundation Information Centre was completed in April 2013, with an official opening ceremony held on 19 April 2013.

The Indigenous Archaeology and Cultural Heritage Management Plan developed and implemented for the CGM provides adequate management and controls for the protection of Aboriginal interests in the MLA. Archaeological investigations and collection of artefacts from any areas prior to disturbance of the CGM site have been conducted by Dr Colin Pardoe Consultant Archaeologist and Cultural Heritage Officers provided by Wiradjuri Condobolin Corporation. The surveys are conducted under Section 87 Permits and Section 90 Consents issued under the *National Parks and Wildlife Act*.

Flora and Fauna
The Flora and Fauna Management Plan, provides an adequate basis for the management of flora and fauna on the CGM project MLA and surrounding Barrick owned land. The implementation of the commitments in the Flora and Fauna Management Plan are supplemented by the commitments in the Compensatory Wetland Management Plan, Land Management Plan, Rehabilitation and Offset Management Plan, and Surface Water, Groundwater, Meteorological and Biological Monitoring Program.

The monitoring program reports prepared under the Flora and Fauna Management Plan provide a comprehensive ongoing assessment of the status of flora, fauna, avifauna, fish and habitats of the CGM project development and demonstrate that the project has not had a measurable negative impact on the surrounding environment or its flora and fauna.

Erosion and Sediment Control
The erosion and sediment control strategies implemented for the CGM project site in accordance with the Erosion and Sediment Control Plan are considered to be effective in meeting the objectives of the Plan, as demonstrated by the environmental performance indicators. The Erosion and Sediment Control Plan is generally consistent with requirements in *Managing Urban Stormwater: Soils and Construction (Volume 2E – Mines and Quarries) Manual* (EPA 2008) Appendix C.

Soil Stripping

The Soil Stripping Management Plan has been implemented and the separation of the topsoil and subsoil horizons stockpiles has occurred. Reuse of the topsoil and subsoil has occurred for rehabilitation trials and final constructed surfaces on the tailings storage facilities and waste rock emplacement areas. The Soil Stripping Management Plan and implementation are considered adequate and representative of mining best practice

Rehabilitation
The Rehabilitation and Offset Management Plan (in conjunction with the requirements of the Land Management Plan and Mining Operations Plan) provide a basis for the rehabilitation of the CGM site.

Rehabilitation trials on the CGM site have also continued to determine suitable substrates and procedures for the stabilisation and revegetation. The rehabilitation trials have exhibited variability of results of vegetative establishment on the blends of rock, subsoil, gypsum and mulches, and the results of the trails have also been affected by the weather conditions experienced during the 2010 to May 2014 period. The rehabilitation targets outlined in the MOP and reported in the AEMR's have generally not been met due to the influence of the extreme weather conditions on the establishment and succession of growth, however improvement was noted during this audit with the activities undertaken between May 2013 and May 2014 increasing the area of reshaped land where disturbance has been completed and the revegetation of these areas commenced to address the rehabilitation targets in the MOP.

Land Management
The Land Management Plan prepared to satisfy MCoA 3.10(A)(i) provides the basis for the long term management of the disturbed areas of ML 1535 and collates many of the commitments in other plans that also have associated long term management and rehabilitation strategies / processes for the ML are (e.g. Flora and Fauna Management Plan, Remnant Vegetation Enhancement Program, Rehabilitation and Offset Management Plan, Compensatory Wetland Management Plan etc).

Compensatory Wetland
The Compensatory Wetland Management Plan provides a comprehensive management and monitoring regime that is providing detailed reports on the status of the accessible compensatory wetland areas. The surveys and reports on the flora and fauna in the declared areas are indicating that the removal of livestock from grazing in the compensatory wetland areas and the climatic influences (particularly the heavy rainfall years and flooding of the Lake Cowal area), have had a significant positive influence on the structure and composition of the lake foreshore communities.

Bushfire
The Bushfire Management Plan provides a sound basis for the management of CGM MLA and Barrick owned land in relation to control of vegetation fuel sources and firefighting ability by the CGM staff. CGM has dedicated fire and hazard response equipment housed in the Emergency Response / Rescue Station located near the administration block, process plant and maintenance facilities on the site.

Water Management
The Site Water Management Plan provides an adequate program for the management of water use by the CGM project and is controlling the surface water runoff from the disturbed areas of the CGM site that protecting the water quality in Lake Cowal. A revised Site Water Management Plan was lodged with DP&I on 17 February 2012 and August 2013. Barrick was still awaiting approval of the revised Site Water Management Plan from DP&I at the date of this audit.

Water monitoring has been conducted in accordance with the Site Water Management Plan and Surface Water, Groundwater, Meteorological and Biological Monitoring Program. The monitoring data did not exhibit results that indicate a connection between the closed catchment of the CGM operations and the waters of Lake Cowal. Extraction of water from the Bland Creek Paleochannel bore-field and water obtained from the Lachlan Regulated River Water Source did not exceed the allowable extraction rates or volumes during the May 2013 and May 2014 period.

Cyanide Management

The Cyanide Management Plan required under MCoA 5.3(b) and subsequent addenda have been approved by DP&I. The management of cyanide at the CGM site and process plant is representative of best practice. CGM is a signatory to the *"International Cyanide Management Code for the Manufacture, Transport, and Use of Cyanide in the Production of Gold"* and regular third party audits of the site practices and record keeping have confirmed compliance with the requirements of the International Cyanide Management Code.

Between May 2013 and May 2014 no cyanide results exceeded the 20mg CN_{WAD}/L or the maximum 30mg CNWAD/L level. Donato Environmental Services reported on wildlife visitation to the tailings storage facilities and noted that the monitored cyanide concentrations were all below the level that would be expected to cause mortality.

Hazardous Waste and Chemical Management

The Hazardous Waste and Chemical Management Plan provides the processes and procedures implemented on site for the management of all hazardous chemicals transported to, stored on, used in the process plant, and hazardous wastes generated on site. The handling of fuels, oils, and chemicals on site is managed in accordance with the plans, audits and reporting required under MCoA 5.4, the CGM Emergency Response Management Plan and CGM Safety Management System. The Hazardous Waste and Chemical Management Plan has been revised regularly to address the changes in CGM operations under the various Modifications to the Development Approval. The management procedures and protocols have resulted in best practice for any chemicals transported to, stored and/or used on the CGM site.

Dust

The Dust Management Plan prepared to satisfy MCoA has been implemented for the CGM operations and the dust data collected is reviewed annually by Dr Stephen Cattle of University of Sydney. Management of dust generation occurs in accordance with the Dust Management Plan and compliance was achieved at all residences and bird-breeding and native fauna areas. No complaints in relation to dust were received by CGM between May 2013 and May 2014.

Blast Management

The Blast Management Plan was prepared to satisfy MCoA 6.3 and the management of blasting has been undertaken in accordance with the Blast Management Plan. The Blast Management Plan required under MCoA 6.3 was revised in May 2010 and submitted to DP&I. Barrick was awaiting written approval from the DP&I of the May 2010 revision at the time of this audit (i.e. May 2014).
The Blast Management Plan provides a sound basis for the control of noise and vibration impacts from the CGM activities. Blast overpressure and vibration monitoring has demonstrated compliance of all blasts conducted during weekdays and Saturdays with the criteria specified in the MCoA/EPL/ML conditions. Exceedence of the 95dB(L) Sundays and Public Holidays criteria (MCoA 6.3(a)) occurred from five (5) blasts on between January 2013 and March 2014.

Noise

The Noise Management Plan prepared to satisfy the requirements of MCoA 6.4(b) has been implemented for the CGM operations. The revised Noise Management Plan was approved by DoP in April 2010. The implementation of the control strategies outlined in the Noise Management Plan have minimised noise emissions from the CGM and are considered to be best practice and effective as demonstrated by the noise monitoring data and environmental performance indicators.

Operational noise surveys conducted by SLR in January / February and July each year during 2013 and 2014 have demonstrated that CGM is operating in compliance with the noise assessment criteria imposed in the Development Consent and EPL conditions, and commitments made in the Environmental Assessment. No operator attended noise monitoring results exhibited operational noise criteria exceedences during the May 2013 to May 2014 period

Traffic Noise

Traffic noise monitoring is included in the revised Noise Management Plan. SLR conduct a traffic survey and attended traffic noise monitoring annually at 130 Ungarie Road (TN1), “Clearview” residence Wamboyne Road (TN2) and Windstone” residence on Wamboyne Road (TN3).

Noise results for the 2013 and 2014 traffic surveys indicate no traffic noise exceedence was at TN1, TN2 or TN3 between May 2013 and May 2014. Barrick entered into Agreements with residents who may potentially be affected traffic noise attributable to the mine traffic, in September 2012.

No complaints from residents regarding traffic noise were received during the period May 2013 to May 2014.

Community Complaints

The complaints handling process and procedure for reporting of complaints and action taken by CGM / Barrick, comply with the requirements of MCoA 10.1 and EPL condition M4. The RIMS database includes all the information required by the approval conditions and details of each complaint and action taken by CGM in response to the complainant. A significant reduction in blasting and noise complaints occurred in late 2013 after CGM finalised agreements with three complainants. All other complaint numbers dropped between May 2013 and May 2014.

Independent Monitoring Panel

The Independent Monitoring Panel (IMP) Reports prepared annually have provided a useful third party review of the status of the CGM activities in relation to environment and rehabilitation issues. Barrick provides responses to the IMP recommendations and address the IMP requirements within the 12 month IMP review period.

Where the intent of the recommendations have not been met by Barrick within the 12 months between the IMP Annual Reports, the IMP have provided comment on the status of action taken by Barrick and provided ongoing or modified recommendations to address the particular issue where required.

Conclusion

The independent environmental audit findings confirm the Cowal Gold Mine has been developed generally in accordance with the project description outlined in the Environmental Assessment documents submitted for Development Approval by the NSW Minister for Planning. The operation of the CGM development is generally in accordance with the predictions in the Environmental Assessments and demonstrates a high degree of compliance with the Minister's Conditions of Approval, Environment Protection Licence conditions and requirements of the conditions attached to the Mining Lease.

1.0 INTRODUCTION

1.1 Background

The Development Consent granted for the Cowal Gold Mine (CGM) requires an Independent Third Party Audit of compliance in accordance with the Minister's Condition of Approval (MCoA) 8.8(a) - Third Party Monitoring/Auditing:

> *(a) An Independent Environmental Audit shall be completed:*
> - *six monthly during construction;*
> - *12 months after commencement of ore processing;*
> - *then every three years thereafter until decommissioning of the mine and ore processing operations respectively, or as otherwise directed by the Director-General.*
>
> *The Applicant shall conduct an environmental audit of the mining and infrastructure areas of the development in accordance with ISO 14010 - Guidelines and General Principles for Environmental Auditing, and ISO 14011 - Procedures for Environmental Auditing (or the current versions), and in accordance with any specifications required by the Director-General. Copies of the report shall be submitted by the Applicant to the Director-General, BSC, DECCW, OoW (NoW), DII (Minerals) and CEMCC within two weeks of the report's completion for comment.*
> *(i) The audit shall:*
> *a. assess compliance with the requirements of this consent, licences and approvals;*
> *b. in the event of any non-compliance, report on the effectiveness of the environmental management of the mine as it may relate to the area of non-compliance;*
> *c. be carried out at the Applicant's expense; and*
> *d. be conducted by a duly qualified independent person or team approved by the Director-General in consultation with BSC and CEMCC.*

This Independent Environmental Audit was commissioned by Barrick (Cowal) Ltd (Barrick) and conducted by Trevor Brown & Associates between 28 April and 31 May 2014.

1.2 Scope of Work

The audit was conducted generally in accordance with the Australian/New Zealand Standards AS/NZS ISO 19011:2002 - *Guidelines for Quality and/or Environmental Management System Auditing.*

The scope of work for the audit of the CGM included the following components:

- review of the implementation of the requirements of the development consent conditions, and other environmental licences and approvals with environmental conditions for the operation of the mine and process plant;
- conduct site inspections and review of on-site documentation and monitoring data relevant to the independent audit;
- hold discussions with project staff in relation to the development consent conditions;
- assess compliance of the project with the development consent conditions and other environmental conditions; and
- prepare an Independent Environmental Audit Report providing assessment of compliance against each consent condition.

1.3 Structure of the Audit Report

The report has been prepared to provide comment on each condition of approval in a tabulated form, with additional discussion where required on specific matters. The tabulated comments are attached for the MCoA, Environmental Protection Licence (EPL) conditions and Mining Lease (ML) environmental conditions, with discussion of the status of compliance provided where relevant:

1.4 Compliance Tables

The following terminology is used to express the status of compliance of the CGM with the Minister's Conditions of Approval, Environment Protection Licence and Mining Lease conditions expressed in Attachments A – C:

Compliant	C	Implies compliance with the intent and/or requirement of the approval condition.
Non-Compliant	NC	The specific requirement of the consent condition was not met.
Not Activated	N/A	The condition had not been activated because the activity had not yet commenced.
Not Applicable	NA	The requirement of the condition had not been triggered (e.g. complaint driven monitoring, land acquisition, etc) by the current activities
Noted		No specific auditable requirement for the condition.

2. PROJECT STATUS

Following receipt of the Minister's Conditions of Approval (MCoA) for the CGM on 26 February 1999 and preparation and approval of the required environmental management plans in accordance with the MCoA conditions, construction activities commenced in January 2004. Commissioning of the process plant began in March 2006 and an Independent Environmental Audit was conducted in April 2007, 12 months after commencement of the ore processing operations, in accordance with MCoA 8.8(a). Operation of the mine and process plant has continued generally in accordance with the development described in the documents listed in MCoA 1.1, viz:

"(a) The Development is to be carried out generally in accordance with the:

(i) EIS dated 13 March 1998, including the Statement of Intent by North Gold (WA) Ltd, and prepared by Resource Strategies, as amended by the plans in Appendix 2 of this consent;

(ii) other relevant documentation, including the Applicant's primary submission, and submission in reply to the Commission of Inquiry;

(iii) modification application submitted by Barrick Australia Limited, dated 20 June 2003;

(iv) modification application and supporting information submitted by Barrick Australia Limited, dated 13 November 2003;

(v) modification application and supporting information submitted by Barrick Australia Limited, dated 22 June 2004;

(vi) modification application and supporting documentation submitted by Barrick Australia Limited, dated 15 August 2006;

(vii) modification application and supporting documentation submitted by Barrick Australia Limited, dated 24 December 2007;

(viii) modification application and supporting documentation submitted by Barrick Australia Limited, dated 30 January 2009;

(ix) modification application and supporting documentation submitted by Barrick (Cowal) Limited, dated 23 June 2009;

(x) modification application dated 25 March 2008 and supporting EA submitted by Barrick Australia Limited;

(xi) modification application dated 22 November 2010 and supporting letter submitted by Barrick Cowal Limited; and

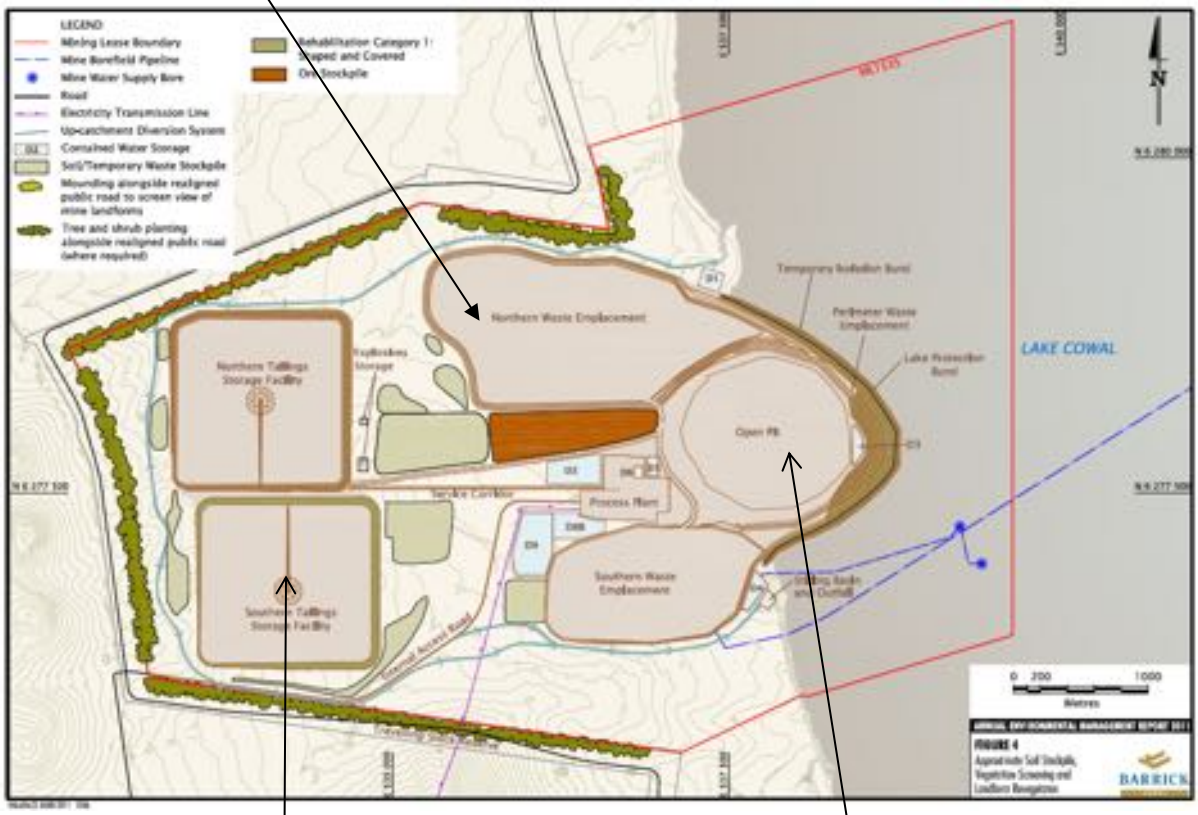
(xii) modification application dated 16 December 2010 (Mod 10) and supporting Environmental Assessment titled Cowal Gold Mine Water Supply Modification (Section 75W Modification) and dated December 2010, submitted by Barrick (Cowal) Limited; and

(xiii) conditions of this consent."

Cowal Gold Mine pit - February 2014

Figure 1: Cowal Gold Mine Project - May 2014

Northern Waste Emplacement Area



CGM Tailings Storage Emplacements

CGM Pit (viewed from the east)

2.1 Mine Development May 2013 to May 2014

Mine development components constructed and operated between May 2013 and May 2014 are summarised in Table 1.

Table 1: CGM Construction during 2010 and April 2013

Infrastructure Component	Construction Status
Northern Waste Rock Emplacement (NWRE)	No areal expansion of the NWRE occurred during 2013-2014. The NWE emplacement continued to receive waste from the Pit stages D, E, F and G. Some reclamation shaping of the outer northern batter occurred during 2013 with rehabilitation trials established on the Lake Cowal batters of the NWRE.
 **The Northern Waste Rock Emplacement (NWRE) continued to receive waste rock - May 2013 and May 2014**.	
Southern Waste Rock Emplacement (SWE)	The SWRE has continued to receive waste rock from Pit with the north-west corner of the SWRE expanded into the area of basal layer where the 'Cowal West' homestead stood until May 2012. The rehabilitation trials on the south side of the SWRE have continued. Pre-treated seed was spread across the trial plots with topsoil treatment in late 2011. The establishment of vegetative growth on the trial plots reduced erosion on the trial plot areas during significant rainfall in 2011 to 2013.
 **SWRE establishment of vegetative growth on the trial plots May 2014 (trials commenced in October 2009).**	
Perimeter Waste Emplacement (PWE)	No expansions occurred on the Perimeter Waste Emplacement during the 2013 to 2014 period. Some rehabilitation of the outside lifts above the Lake Protection Bund roadway has occurred and contouring and rock and topsoil placement was progressing at the time of this audit (May 2014.
 **Perimeter Waste Emplacement rehabilitation trials of the outside lifts (above the Lake Protection Bund)**	
Tailings Storage Facility (TSF) Sub-soil Stockpile	Waste rock mined from the open pit has been stockpiled for the tailings storage facility wall lift works and outer batter slope rehabilitation. Clay obtained from mine pit excavation works is stockpiled near the TSF Depot and used for future works. The STSF was being used for tailings placement in May 2014 and the fourth lift on the NSTF was being constructed in May 2014. This process of TSF lifts continues on an annual basis.
Southern Tailings Storage Facility (STSF)	The fourth lift of the STSF became operational from April 2013. Tailings deposition was still occurring to the STSF in May 2014.

STSF in use May 2014 with recovery of tailings water for use in the process plant.

Northern Tailings Storage Facility (NTSF)	Construction of the next lift of the NTSF was occurring in May 2014.

NTSF construction of the new lift (May 2014)

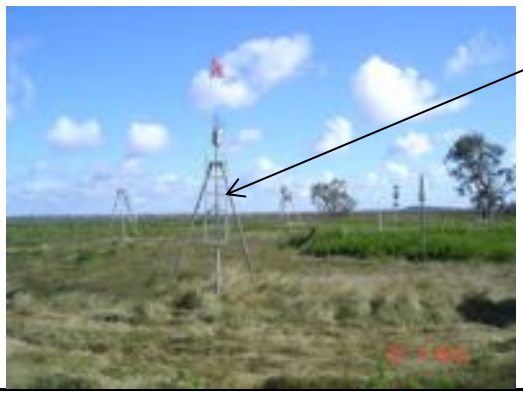
Temporary Isolation Bund and Lake Protection Bund	Lake Cowal waters reached the Temporary Isolation Bund in August 2010. The Temporary Isolation Bund was overtopped by the waters of Lake Cowal in mid-February 2012. The outer faces on either side of the Lake Protection Bund road were stabilised using the rock-topsoil method from late-2011 to the start of the heavy rains of early 2012. The establishment of natural vegetation on the Temporary Isolation Bund batters provided protection of the outer bund wall from wind / wave erosion resulting from the waters of Lake Cowal.

Temporary Isolation Bund establishment of natural vegetation providing protection of the outer bund wall from wind / wave erosion resulting from the waters of Lake Cowal.

Rehabilitation works adjacent to Pond D1	The south wall of Pond D1 was raised 0.50m in mid-February 2012 as a precaution against any further heavy rainfall events. Replicate rehabilitation trials adjacent to Pond D1 on the northern face of NWRE were constructed using the rock-topsoil method as a basis. The rehabilitation of this area was being progressed in May 2014 with re-contouring and placement of rock / topsoil surfacing prior to seeding.

Rehabilitation works adjacent to Pond D1 using the rock-topsoil method for revegetation of the lower batters.

Lake Cowal monitoring equipment	Modification to the monitoring locations and equipment occurred to enable ongoing monitoring in areas of Lake Cowal where water levels have interfered with existing equipment and access to the sites. Blast monitoring stations on Lake Cowal bed were inundated by 0.10 to 0.50m of water during 2010-2011. New blast logging stations were installed in land-based cabinets in March 2012.



New tripod stations manufactured in early 2012 were installed to duplicate, taller dust gauges alongside the existing 2m tall monitors. Deployment of the raised dust tripods and ambient noise monitoring logger stands in the 3 to 4m deep parts of Lake Cowal occurred in mid-2012.

3.0 PROJECT ENVIRONMENTAL APPROVALS

3.1 Development Consent 14/98

Development Consent (DA14/98) was granted on 26 February 1999 under the *Environmental Planning and Assessment Act* 1979 (EP&A Act) with the Minister's Conditions of Approval (MCoA) for the CGM. Modifications to the Consent were granted in August 2003, December 2003, August 2004, August 2006, February 2008, February 2009, August 2009, March 2010 and January 2011 for the development of the CGM. Notice of Modification (MOD10, April 2011) allows for the operation of Stage 1 of the eastern saline bore-field.

Table 1: Modifications to Development Consent DA14/98

Date of Modification	Modification Summary
Modification 10 - December 2010 (Part3A Mod)	The proposal involves using an increased proportion of saline water at the mine. Notice of Modification (MOD10, April 2011) allows for the operation of Stage 1 of the eastern saline bore-field.
Modification 9 - November 2010 (Part3A Mod)	The proposal involves an amendment to the development consent to reflect the 15 year mine operation life described in the modified E42 Modification (Modification 6)
Modification 8 - June 2009 (Part4Mod)	Expanding waste rock emplacements, introducing an alternative cyanide destruction method and developing a saline groundwater bore-field.
Modification 7 - January 2009 (Part4 Mod)	Expanding the surface dimensions of the open pit at the Cowal Gold Mine, with disposal of the spoil and waste rock on the existing emplacements.
Modification 6 - E42 Modification (Part3A Mod)	The E42 Modification included: - Expanding an open cut gold mine to extract an additional 23 Mt of ore for processing and supply to market; - increasing the mines maximum production rate from 6.9 to 7.5 million tonnes of ore a year; - expanding a range of associated infrastructure at the mine, such as the tailings dams, waste rock emplacement dumps, and stockpiles; and - extending the life of the mining operation by 2 years.
Modification 5 – Biological Monitoring and Fauna Reporting	The Applicant proposes to remove the requirement for baseline biological monitoring and change the reporting Commitments for fauna deaths contained in the existing development consent.

In addition to the Minister's Conditions of Approval on Development Consent 14/98, MCoA 12 requires:

> *"The Applicant shall ensure that all statutory requirements including but not restricted to those set down by the Local Government Act 1993, Pollution Control Act 1970, Clean Air Act 1961, Clean Water Act 1970, Noise Control Act 1975, Protection of the Environment Administration Act 1991, Protection of the Environment Operations Act 1997, 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 BSC, DECC, DPI(Minerals), DSC, DWE, RTA, DPI (Agriculture), DPI(Fisheries), and RAC, are fully met.."*

The licences, permits and approvals in Table 4 are held by Barrick for the CGM.

Table 2: Licences, Approvals and Permits for CGM

Instrument	Relevant Authority	Date Granted	Duration of Approval
Mining Lease (ML 1535)	DII-Minerals	13 Jun 2003	21 years.
Mining Operations Plan	DII Minerals	30 March 2011	January 2011 to September 2012
Environment Protection Licence (No. 11912)	DECCW	23 Dec 2003	The licence is subject to review with the next review due 23 Dec 2016
Permit #1361 under section 87(1) of *the National Parks and Wildlife Act 1974*	DECCW (NPWS)	23 May 2002	Valid for period of exploration drilling on the lots covered by the permit.
Consent #1467 under section 90 of the NPW Act	DECCW (NPWS)	27 Nov 2002	These approvals lapse when the Minister acknowledges that satisfactory rehabilitation work has been completed under ML1535 or 18 years after completion of construction works, whichever occurs first.
Permit #1468 under section 87(1) of the NPW Act	DECCW (NPWS)	27 Oct 2003	
Consent #1680 under section 90 of the NPW Act	DECCW (NPWS)	28 Jul 2003	
Permit #1681 under section 87(1) of the NPW Act	DECCW (NPWS)	28 Jul 2003	
Production bore licence #70BL229248	NoW & EPA	14 Sep 2012	WAL31864 14 Sep 2015
Production Bore Licenses #70BL229249, #70BL229250, #70BL229251	NoW & EPA	14 Sep 2012	WAL31864 14 Sep 2015
Production bore licence #70BL232691 and #70BL232692	NoW & EPA	21 Mar 2014	WAL36615 14 Sep 2015. Upper 10% (366 units. Upper Lachlan Alluvial Zone 7). Valid for the operation of three lake floor saline production bores when not inundated by Lake Cowal
DA No. 2011/0064 #70BL233321 & 70BL233323	NoW & FSC	20 Dec 2010	9 Jun 2016. Valid for the operation of the eastern saline bore-field.
Pit dewatering bore licences #70BL230205 – #70BL230234 and newer.	NoW & EPA	6/1/2010	WAL36615 14 Sep 2015. Upper 10% (366 units. Upper Lachlan Alluvial Zone 7). Replacement de-watering bore licenses as exchanged for decommissioned bores.
High Security Title WAL13749 DNR Reference 70AL603333	DoL	21 Dec 2006	Title for allocation from Regulated River Source.
General Security WAL13748 DNR Reference 70AL603332	DoL	21 Dec 2006	Title for allocation from Regulated River Source.

3.2 Environment Protection Licence No. 11912

Barrick received an Environment Protection Licence (EPL) 11912 under section 55 of the *Protection of the Environment Operations Act 1997* for the CGM, on 23 December 2003.
Notices of Variation of the Licence between 2009 and 2013 dated 6 April 2009, 17 July 2009 and 24 June 2011 have been advised.

Table 3: Notices of Variation to Environment Protection Licence 11912

Date	EPL Notices of Variation
6 April 2009 1097712	Revision of Scheduled Activity - Mineral Processing; and Fee Based Activity - Mineral Processing >2000,000T processed **c.P1.2 - Groundwater monitoring locations revised**

	c.L5.2(e) inserted: Waste generated at the premises as described in Attachment A of the licence variation application supporting documentation for Proposed On-Site Waste Tyre Management' was received by the DECC on the 4 February 2009. Waste tyres were classified as special waste in accordance with the Waste Classification Guidelines (DECC 2008) is permitted by this licence to be disposed at the premises. **c.M7.1(a) revised:** Airblast overpressure and ground vibration levels must be measured at blast monitoring locations labelled as "BM01", "BM02", "BM03", "BM04" and "BM05" in Figure 2 'Blast Monitoring Sites' Locations' of the proposed addendum to the "Cowal Gold Project Blast Management Plan" dated August 2003received 12/2/2009 and on DECC file FIL07/2610-05 - for all blasts carried out in or on the premises; and
17 July 2009 1103991	**c.A4.2(5) insert** - Modifications to the Cowal Gold Project approved by the Department of Planning. **c.M2.1 revised:** Monitoring Points 39 and 48 deleted
24 June 2011 1126045	Licensee amended: Barrick (Cowal) Limited **c.L3.3 delete Monitoring Points 46 and 47 and reinstate and revise Monitoring Point 48** **c.L6 Noise Limits conditions L6.1 L6.3 revised** **c.L7 Blasting – conditions L7.1 to L7.4 revised** **c.M7.1(a) Blast monitoring locations revised**
2 May 2013 1513100	The computer system used by the EPA to store and process licences has been upgraded. Some changes to the format of the licence may have occurred as a result of the upgrade. Conditions that were previously recorded as "not applicable" have been removed from the licence. These upgrades are not intended to change the substance of the licence. By this notice the EPA varies licence No. 11912. The attached licence document contains all variations that are made to the licence by this notice.
21 May 2014 1522063	c.M2.4 – Update to state that the monitoring at points 14, 15, 16, 17 and 18 is not required when the water level in Lake Cowal is at or below 204.5mAHD.

Review of compliance with the EPL conditions is summarised in Attachment B.

3.3 Mining Lease ML1535

Mining Lease (No.1535) area of 2,650 hectares was granted to Barrick under the *Mining Act 1992* on 13 June 2003. .

The October 2012 to January 2014 MOP was approved by the DTIRIS (Minerals) on 19 December 2012. On 4 October 2013, the Director-General of the DTIRIS-DRE granted Barrick an extension to the term of the previous *Cowal Gold Mine Mining Operations Plan (ML 1535) October 2012 – January 2014*) to 31 January 2015

A draft Mining Operations Plan (MOP) has been prepared by Barrick in accordance with the requirements of the Mining Lease 1535 condition 25, MCoA 2.1 and the latest NSW Department of Trade and Investment, Regional Infrastructure and Services – Division of Resources and Energy (DTIRIS-DRE) guideline - *ESG3: Mining Operations Plan (MOP) Guidelines, September 2013* (the MOP Guidelines). This MOP (when approved) will replace the previous MOP and describes the proposed operational mining activities for the currently approved CGM for the period 30 April 2014 to 30 April 2016.

Compliance with the Mining Lease environmental conditions is summarised in Attachment C, Mining Lease Environmental Conditions Table.

3.4 Environmental Management System

Barrick (Cowal) Limited gained Certificate of Registration under ISO14001-2004 on 12 June 2013. Certificate of Registration No. 495 was issued by ERM Certification and Verification Services (ERMC√S) for Mineral and Ore Processing Operations and Support Services for Gold and Silver production.

4. MINISTER'S CONDITIONS OF APPROVAL

Development Consent (DA14/98) was granted on 26 February 1999 under the *Environmental Planning and Assessment Act 1979* (EP&A Act) with the Minister's Conditions of Approval (MCoA) for the CGM. Modifications to the Consent were granted in August 2003, December 2003, August 2004, August 2006, February 2008, February 2009, August 2009, March 2010 and January 2011 for the development of the CGM.

This Independent Environmental Audit reviewed the available documentation for the CGM operations between 1 May 2013 and 1 May 2014, in relation to the Consolidated Minister's Conditions of Approval (MCoA) dated January 2011 and other environmental approval conditions granted for the mining activities and process plant.

Where an authority other than DP&I has administrative responsibility for the requirements of a condition or other approvals, compliance status has been determined by reviewing correspondence from the relevant agencies in relation to the conditions of approval.

Review of compliance and comments on the MCoA for the CGM are summarised in Attachment A. Additional specific comments on the implementation of the Environmental Management Plans are presented below.

4.1 Environmental Management Plans

The majority of the Environmental Management Plans for the CGM were initially approved by the Director-General in 2003. MCoA 3.2 requires the review and revision/update of the Environmental Management Plans (as necessary to address the current operations of the mine and process plant) to be undertaken at least every five years. Reviews have been conducted and revision of the management plans has occurred as necessary.

All EMP's were reviewed in 2008-2009 and revised as necessary in accordance with MCoA 3.2(a). Revisions of the Management Plans were submitted to the relevant authorities where consultation was required and then submitted to DoP/DP&I. Some of the revised management plans were still awaiting approval by DP&I at the date of this audit (i.e. 28 April 2013 to 31 May 2014):

- Revised Rehabilitation and Offset Management Plan (lodged 21 August 2013)
- Flora and Fauna Management Plan - Threatened Species Management Strategy (lodged 13 November 2012)
- Revised Noise Management Plan (lodged 24 December 2012)
- Revised Site Water Management Plan (lodged 8 August 2013)
- Addendum Surface Water, Groundwater, Meteorological and Biological Management Programme (Mine Operations) (lodged 13 August 2013)
- Post Mine Operations SGWMBMP (lodged 10 October 2013)
- Revised Blast Management Plan (lodged 11 December 2012)
- Addendum to Flora Fauna Management Plan response sent 13 November 2012.

Management plans revisions during 2012 to 2014 have included:

- Cyanide Management Plan was amended and approved by the DoP on 20 October 2010.
- Rehabilitation and Offset Management Plan submitted to the DoP on 30 July 2010 following consultation with DECCW, OoW and BSC. An addendum to the Rehabilitation and Offset Management Plan was submitted to DoP in December 2010. Comments were received by Barrick from DP&I on 14 August 2012.
- Threatened Species Management Strategy was prepared in consultation with DECCW (for the Inland Forest Bat, Sloanes Froglet and Woodland birds) and was accepted by DECCW without objections on 23 February 2011. The Threatened Species Management Strategy was submitted to DoP on 28 February 2011 and comments to this addendum to the Flora and Fauna Management Plan were received from DP&I on 14 August 2012. A revised Flora and Fauna Management Plan addressing the DP&I comments was prepared by Barrick and

submitted to the DP&I on 13 November 2012. No response had been received by Barrick from DP&I at the date of this audit.

- Noise Management Plan was lodged with DoP on 30 July 2010 and comments received from DP&I on 14 August 2012. A revised Noise Management Plan addressing the DP&I comments was submitted to DP&I on 24 December 2012. No response had been received by Barrick from DP&I at the date of this audit.
- Blast Management Plan was revised and the revision accepted by DECCW and DI&I. The Blast Management Plan was submitted to DoP in May 2012 and comments were received by Barrick from DP&I on 14 August 2012. A revised Blast Management Plan addressing the DP&I comments was submitted to DP&I on 11 December 2012. No response had been received by Barrick from DP&I at the date of this audit.
- Site Water Management Plan revised and submitted to DP&I in February 2012 and comments were received by Barrick from DP&I on 14 August 2012. Barrick responded to the comments from DP&I but no response had been received by Barrick from DP&I at the date of this audit. A further revision of the Site Water Management Plan was prepared and su mitted to DP&I in August 2013, and no response had been received by Barrick from DP&I at the date of this audit.
- Surface Water, Groundwater, Meteorological and Biological Management Program was revised and approved by DP&I in July 2011. An addendum to the Protocol was submitted to DoP in November 2011and approved by DP&I on14 August 2012. A further revision of the Site Water Management Plan was prepared and su mitted to DP&I in August 2013, and no response had been received by Barrick from DP&I at the date of this audit.
- Hazardous Waste and Chemical Management Plan was revised and approved by DP&I on 13May 2011.

The latest revision of the EMP's that address the requirements of the latest modifications to the Development Consent (i.e. MOD 10), are being implemented for the management of the CGM operations although they had not been officially approved by DP&I at the date of this audit.

Specific comments on the commitments made in each of the management plans and the implementation of the management plans for the CGM are presented under specific conditions below.

Compliance status of each specific management plan is addressed in the table in Attachment A - MCoA conditions.

Recommendation 1

The management plans required under the MCoA are due for review each 5 years in accordance with MCoA 3.2. As a response has not been received from DP&I on a number of the revised management plans submitted during the 2012-2014 period, it is recommended that the review of each of the management plans occur when the decision by DP&I on MOD11 for the CGM Project and approval conditions are finalised.

4.2 Heritage Management

[Minister's Condition of Approval 3.3]

4.2.1 Heritage Management Plan

[Minister's Condition of Approval 3.3(a)(i)]

The Heritage Management Plan for non-indigenous heritage was prepared to satisfy MCoA 3.3(a)(i) and approved by DIPNR in 2003. The Heritage Management Plan was reviewed in 2008 and no revision of the document was required.

Commitments in the non-indigenous Heritage Management Plan are listed in Table 4.

Table 4: Heritage Management Plan Commitments

Section/ Page No.	Heritage Management Plan Commitments	Comment
s.6.1.3/p16	Monitor dust within quarters and shed as excessive amounts of dust can adversely affect the heritage value of the shed.	This commitment is now not relevant as the quarters and shearing shed have been dismantled and the shearing shed reconstructed at the LCF site.
s.7/p16	Monitor the effectiveness of the management measures outlined in the HMP (*MCoA 8.6).*	The management of the heritage structures was undertaken in accordance with the HMP prior to demolition.
s.7/p16	Dust and blast monitoring programs will be conducted in accordance with AS: Use of explosives (1993). If blast monitoring exceeds standards, a structural assessment of the quarters and shed will be undertaken.	Dust and blast monitoring occurs as part of the CGM monitoring programs and the results assessed in relation to the prescribed levels.
s.7/p18	The non-indigenous heritage program will be revised / updated annually, unless otherwise stated by the D-G, to reflect changing environmental requirements, significant changes in technology / operational practices and results from monitoring conducted (MCoA 8).	The non-indigenous heritage program has been reviewed annually. Demolition of the 'Cowal West Homestead Complex' (CWHC) was approved via MOD 9 March 2010. Demolition of the homestead occurred during 2011-2012. Relocation of the Shearing Shed and reconstruction of that building at the Lake Cowal Foundation Information Centre was completed in April 2013. An opening ceremony was held on 19 April 2013.
 **Plate 1: Shearers Shed (rear) reconstruction completed April 2013, at LCF Information Centre**		 **Plate 2: Shearers Shed (front) reconstruction completed April 2013, at LCF Information Centre**.
 **Plate 3: Reconstrtced shearing shed – internal structure with original components recovered from CGM site.**		
s.9/p20	An AEMR will be prepared in accordance with the requirements of the DMR (Condition of Authority - 26 Section 1) and Project Consent Condition 9.2 and submitted to the Director-General.(*MCoA 9.2)*	Annual Environmental Management Reports (AEMR) have been prepared by CGM in accordance with MCoA 9.2 and the heritage components are reported in section 3.14.

4.2.2 Indigenous Archaeology and Cultural Heritage Management Plan

[Minister's Condition of Approval 3.3(a)(ii)]

The Indigenous Archaeology and Cultural Heritage Management Plan was prepared to satisfy MCoA 3.3(ii) and approved by the Wiradjuri Condobolin Corporation (WCC) in writing on 11 November 2003. Approval was given under the auspices of the Wiradjuri Condobolin Culture and Heritage Company (WCC&HC), that was set up to manage the cultural and heritage component of the agreement between Barrick and the Wiradjuri Condobolin People.

The Indigenous Archaeology and Cultural Heritage Management Plan will be reviewed and revised as necessary to reflect the *Due Diligence Code of Practice for Protection of Aboriginal Objects in NSW*, latest revision (dated 24 February 2010) during the triennial WCCC-Barrick (Cowal) Deed Review.

The implementation of the management program for indigenous archaeology and cultural heritage has occurred in accordance with the Indigenous Archaeology and Cultural Heritage Management Plan:

- No new areas of disturbance occurred during May 2013 to May 2014.
- Meetings of the Cowal Project Co-ordinating Committee (CPCC) and the Employment Training and Business Committee (ETBC) were held between May 2013 and May 2014.

Commitments in the Indigenous Archaeology and Cultural Heritage Management Plan are listed in Table 5.

Table 5: Indigenous Archaeology and Cultural Heritage Management Plan Commitments

Section/ Page No.	Indigenous Archaeology and Cultural Heritage Management Plan Commitments	Comments
s.5.4/p20	In all areas within the ML, water pipeline and bore-field area where soil stripping occurs, the areas will be inspected after topsoil removal to identify "datable materials". Samples will be obtained and submitted for chronological analysis. ***(Permit 1682 Special Condition 11)***	All areas within the ML Area, water pipeline area and bore-field area where soil stripping occurred have been resurveyed in accordance with this Special Condition.
s.5.4/p20	A cultural heritage officer approved by the West Wyalong Aboriginal Land Council will be available on site to monitor construction earthworks. An archaeologist will also be on site to monitor the works to a depth at which Aboriginal objects are likely to exist.	Cultural Heritage Officers provided by Wiradjuri Condobolin Corporation, work under the Principal Consulting Archaeologist Dr Colin Pardoe and undertake surface archaeological surveys prior to any land disturbance or earthworks at the CGM mine lease site.
s.5.4/p21	If an Aboriginal object (other than human skeletal remains) of a type that has not been previously identified during the archaeological works is identified during construction earthworks, the Aboriginal object will be collected (Special Condition 1 in each of Permit 1468, Consent 1467, Permit 1681 and Consent 1681).	No Aboriginal objects that had not been previously identified during the archaeological surveys have been identified during CGM construction works during May 2013 to May 2014.
s.5.4/p21	Construction works shall stop if human skeletal remains are identified and the DECC (OEH) will be immediately notified (Special Condition 1 of Permit 1468 and Special Condition 11 of Permit 1681).	No skeletal remains have been identified during the CGM development.
s.5.5/p21	With respect to all collected Aboriginal objects: • Sufficient data must be recorded to enable technological analysis to be undertaken for report purposes; • This information must form the basis of a master inventory; • Each object must be bagged and labelled detailing the specific area of collection. (Special Condition 12 of Permit 1468 and Special Condition 4 of Permit 1681).	Archaeological investigations and collection of artefacts from any areas proposed to be disturbed on the CGM site have been conducted under Section 87 and 90 Consents issued for the project by NPWS.
S5.6/p21	All collected Aboriginal objects must be kept in a temporary Keeping Place on the project site until a	All collected Aboriginal objects are currently kept in a temporary Keeping Place on the CGM project

Section/ Page No.	Indigenous Archaeology and Cultural Heritage Management Plan Commitments	Comments
	permanent Keeping Place is available.	site. A permanent Keeping Place has been constructed at the Condobolin Community Centre but the objects have not yet been transferred to the permanent site.
s.5.6/p21	Barrick must fund the design and construction of a Keeping Place for Aboriginal objects collected pursuant to Permit 1468, at a location to be agreed with the registered native title claimants for the ML Area and the West Wyalong Local Aboriginal Land Council. Barrick must reach an agreement with the registered native title claimants for the ML Area and the West Wyalong Local Aboriginal Land Council about the details and scope of the keeping place, but if no agreement is reached before the commencement of construction, the details and scope will be determined by DEC.(***Special (Consent 1467 condition 9***)	Barrick arranged for the design of a permanent Keeping Place for collected Aboriginal objects at the Condobolin Aboriginal Community Centre. Construction of the building is completed but the objects have not yet been transferred to the permanent site.
P23/s.5.7	The Project Consultant Archaeologist has the responsibility to conduct archaeological works authorised by Permit 1468 and Permit 1681 and monitor construction earthworks to a depth where Aboriginal objects are likely to exist; supervise the Barrick field coordinator, cultural heritage officers and Wiradjuri field assistants and provide technical supervision of the Keeping Place and advise Barrick with respect to all cultural heritage matters arising in relation to the Project (Project Consultant Archaeologist is the holder of Permit 1468 and Permit 1681).	Principal Consulting Archaeologist Dr Colin Pardoe manages and supervises archaeological investigations prior to any land disturbance or earthworks at the CGM mine lease site.
P26/s.6.3.1	Barrick agrees to brief the Wiradjuri Condobolin people (within 30 days of Board Approval for the project), on matters including cultural heritage issues; annually, on matters including cultural heritage issues; and on any cultural heritage issues that Barrick reasonably believes they should or might wish to be informed of as soon as possible after they arise, and on any material changes in the circumstances which were the subject of a briefing.	Barrick arranges and holds regular meeting with the Wiradjuri Condobolin people in relation to cultural heritage issues and project status. . Quarterly meetings between Barrick and the Cowal Project Co-ordinating Committee (CPCC) and the Employment Training and Business Committee (ETBC) are held each year, or as required.
P26/s.6.3.2	Barrick will produce a Mining Operations Plan to give a detailed account of the proposed mine site activities for a nominated term. It will include all mining and rehabilitation operations and relevant environmental controls and procedures necessary for compliance with lease conditions. It will include the relevant Aboriginal heritage management measures to be included during works for the nominated MOP term.	Barrick has prepared the following Mining Operations Plans for the CGM development: • MOP June 2007 to June 2009 was approved by DPI in June 2007. • MOP April 2009 to December 2010. An Addendum to the April 2009 to December 2010 MOP was submitted on 18 March 2010 • An extension of the 2009-2010 MOP until 31 March 2011 was granted by DI&I on 23 November 2010. • MOP January 2011 to September 2012 • A Variation to the January 2011 to September 2012 MOP was requested 5 April 2012. • MOP October 2012 to January 2014. • MOP extension to January 2015. • Draft MOP for April 2014 to April 2016 has been prepared
P23/s.6.3.2	The AEMR, issued by Barrick, will annually report relevant cultural heritage management measures conducted for the previous year. Proposed management measures for the next year will also be reported.	Annual Environmental Management Reports (AEMR) have been prepared by CGM in accordance with MCoA 9.2 and Aboriginal Heritage matters are reported in section 3.13, and European Heritage matters are reported in section 3.14.

4.2.3 Conclusion

The Non-Indigenous Heritage Management Plan prepared for the CGM site provided for management of the 'Cowal West Homestead Complex' components (including the Shearing Shed). Demolition of the Homestead complex was approved via Development Consent MOD 9 March 2010. Demolition of the homestead occurred during 2011-2012. Relocation of the re-construction of the Shearing Shed and reconstruction at the Lake Cowal Foundation Information Centre was completed in April 2013, with an official opening ceremony held on 19 April 2013.

The Indigenous Archaeology and Cultural Heritage Management Plan developed and implemented for the CGM provides adequate management and controls for the protection of Aboriginal interests in the MLA. Archaeological investigations and collection of artefacts from any areas prior to disturbance of the CGM site have been conducted by Dr Colin Pardoe Consultant Archaeologist and Cultural Heritage Officers provided by Wiradjuri Condobolin Corporation. The surveys are conducted under Section 87 Permits and Section 90 Consents issued under the *National Parks and Wildlife Act*.

4.3 Flora and Fauna Management

[Minister's Condition of Approval 3.4]

4.3.1 Flora and Fauna Management Plan

The Flora and Fauna Management Plan prepared to satisfy MCoA 3.4 was approved by DIPNR on 30 October 2003. The Flora and Fauna Management Plan was updated/amended and approved by DoP in October 2008. An addendum to the Flora and Fauna Management Plan to reflect the revised monitoring programme for fish and aquatic invertebrates, to maintain consistency with the approved Surface Water, Groundwater, Meteorological and Biological Monitoring Program, was prepared in May 2010 and submitted to DoP. No response or approval had been received from DP&I at the date of this audit.

The Flora and Fauna Management Plan, provides general management strategies for the conservation of wildlife values within ML1535 and around Lake Cowal. The Threatened Species Management Protocol and Vegetation Clearance Protocol developed as part of the Flora and Fauna Management Plan have been implemented and the requirements of each Protocol completed prior to the disturbance of areas of the CGM.

Commitments included in the Flora and Fauna Management Plan are summarised in Table 6.

Table 6: Flora and Fauna Management Plan Commitments

Section/ Page No.	Flora and Fauna Management Plan Obligations	Comments
s.3 /p.13	In accordance with Consent Condition 3.4(a)(v) effective mechanisms shall be developed to keep fauna and avifauna away from the tailings storages.	The tailings storage facilities have been: • designed to minimise the area of open water in the tailings dams; • fenced to prevent terrestrial fauna from entering the areas; • designed to maintain the area non-conducive to the establishment of wildlife habitats; and • designed using of current best practice methods to deter avifauna.
s.3.1/p.14	The area of open water in the tailings dams will be minimised by maximising the dry density of tailings and the re-use of water from the tailings dams (North Limited, 1998a).	Deposition of tailings to the storage facilities is controlled to ensure minimal supernatant water collects around the decant towers near the centre of the storage facility. The supernatant water is returned to the process plant for reuse.
s.3.1.1/p.13	Tailings will be deposited peripherally via a spigotted ring main, allowing for the controlled development or "build-up" at any point around the surface of the tailings dams….. As a result,	A spigotted ring main is used to deposit tailings peripherally providing for the controlled development or "build-up" of tailings ensuring water contained within the tailings drains towards the decant towers located in the centre of the storage facility.

Section/ Page No.	Flora and Fauna Management Plan Obligations	Comments
	water contained within the tailings will drain towards a pond area and decant towers located in the centre of the storage, thus maximising the exposure of the tailings surface to air-drying and increasing in-storage tailings dry densities (North Limited, 1998a).	
 **Plate 4: Spigotted ring main deposits tailings around the periphery of the tailings storage facilities to minimise the area of open water to keep fauna and avifauna away from the tailings storages**.		
s.3.1.2/p14	Water re-use will be maximised using an under-drainage pipe network, decant towers, reclaim water dam and water return pipeline to the process water storage pond. The tailings ponds will be maintained as small as possible through continual recycling of water through the processing plant (North Limited, 1998a).	Recovery of supernatant water from the tailings storage facilities for reuse in the process plant is maximised to reduce the area of surface water and deter fauna and avifauna from using the tailings storages. Reuse of this supernatant water reduces the requirement for water to be extracted from the Paleochannel bore-field and/or the Lachlan River Regulated Water Source.
s.3.2/p.14	The tailings storages will be fenced to prevent medium to large terrestrial fauna (such as Echidnas and Kangaroos), as well as amphibians from entering the area. The fence will be positioned around the surface perimeter of the tailings storage area. Gates (of similar design) will be constructed within the fence to provide mine personnel access to the tailings storage area.	The tailings storage facilities have been suitably fenced. Access to the tailings storage facilities by CGM personnel is only gained through locked gates. Gates are closed immediately after entry or exit of vehicles.  **Plate 5: Fencing around the Tailings Storage Facilities to prevent terrestrial fauna entering the TSF.**
s.3.3/p.14	Rehabilitation of the tailings storage area during operations will be such that minimal habitat opportunities will be created for terrestrial fauna. Rehabilitation of the tailings storage batters will achieve soil stabilisation yet will not create desirable habitat.	The batters of the tailings storage facilities are being rehabilitated with native or introduced grass. The batters are maintained so that other vegetation (such as trees and shrubs) do not establish.
 **Plate 6: Rehabilitation of tailings storage facility batters with grass cover to stabilise the walls.**		
s.3.5/p.16	"Bird-Friten" ammunition (or similar) may be fired at the tailings storage facilities during	Use of cannons at the tailings storage facilities has been implemented, plus radar

<table>
<tr><th>Section/
Page No.</th><th>Flora and Fauna Management Plan Obligations</th><th>Comments</th></tr>
<tr><td></td><td>high risk periods to scare birds away from the tailings storages. The "Bird-Friten" ammunition (or similar) may be fired at irregular intervals to reduce the chance of habituation (ie. fauna becoming accustomed to the noise, thereby reducing its effectiveness).</td><td>activated acoustic deterrents to scare birds off the tailings storage facilities.</td></tr>
<tr><td>s.4/p.16</td><td>In accordance with Consent Condition 3.4(a)(i), the tailings dams (also referred to in this Plan as tailings storages) will be monitored for daily and seasonal fauna usage, and to determine whether deaths or other effects or incidents are occurring.</td><td>Daily observational monitoring of the tailings storage facilities occurs for fauna and avifauna to identify any incidents or deaths within the tailings storage areas. Any impacts are recorded and recovery of any affected fauna occurs.</td></tr>
<tr><td>s.4.1/p.17</td><td>In the event that native fauna incidents or deaths are recorded, the Protocol for reporting any deaths or other incidents within ML 1535 will be initiated.</td><td>The protocol has been implemented. Recording of any fauna incidents on the tailings storage areas are reported to the Environment Manager and actions initiated in accordance with the Protocol.</td></tr>
<tr><td>s.4.1/p.17</td><td>Usage of the tailings dams by bat fauna will also be monitored using an Anabat CF Zcaim echolocation call detector system, controlled by a call-activated switching device. The detector will be operated for two consecutive nights every month from dusk to dawn, with calls being recorded onto compact flash cards for later analysis from computer displays. Bat fauna monitoring data will be analysed monthly by a suitably qualified person(s) to determine bat fauna usage of the tailings dams</td><td>The Anabat system is operational and bat monitoring occurs twice a month with the results provided to Donato Environmental Services for review and interpretation reported in their six monthly reports on Seasonal wildlife use patterns of the Cowal Gold Mine tailings storage facility.</td></tr>
<tr><td>s.4.2/p.18</td><td>Usage of the tailings dams by fauna will be reported to the EPA and NPWS on a six monthly basis, unless otherwise directed by the Director-General. The monitoring results will also be reported in the AEMR in accordance with the requirements of Consent Condition 9.2.</td><td>Reports are provided to the OEH (EPA and NPWS) on a six monthly basis and a summary of all records are presented in the AEMR section 3.8.</td></tr>
<tr><td>s.5/p.18</td><td>In accordance with Consent Condition 3.4(a)(vi), Sections 5.1 and 5.2 include plans for the rescue and rehabilitation of wildlife that may become bogged/sick/trapped in the tailings dams or elsewhere within ML 1535.</td><td>Wildlife rescue and rehabilitation plans have been prepared in consultation with the Wildlife Information and Rescue Service (WIRES). The plans are provided in the Flora and Fauna Management Plan sections 5.1 and 5.2.</td></tr>
<tr><td>s.6.1/p.20</td><td>In the event that fauna incidents are observed, the following details and observations will be recorded:
• observer details (ie. name and position);
• date and time of inspection;
• type of species;
• number of individuals of each species;
• location; and
• any other details of the fauna incident.
(Flora and Fauna Management Plan addendum June 2008)</td><td rowspan="2">Example of fauna incident report:<table><tr><th>Date/Time of Incident</th><th>14 February 2011</th></tr><tr><td>Location</td><td>TSF gravel access track.</td></tr><tr><td>Species and number of individuals</td><td>Dwyer’s Black-headed Snake (1)</td></tr><tr><td>Description of Incident</td><td>Deceased snake noted on the gravel track.</td></tr><tr><td>Outcome</td><td>Injuries consistent with vehicular impact.</td></tr></table>Records of all fauna deaths are prepared by CGM and reported in the AEMR section 3.8. Any fauna deaths attributable to cyanide are reported within 24 hours to the OEH, DTIRIS (DRE) and CEMCC and in the case of fish, DPI (Fisheries).</td></tr>
<tr><td>s.6.2/p.20</td><td>In accordance with MCoA 3.4(a)(ii), any fauna deaths (except those attributable to physical trauma such as vehicle strike) will be reported to the DECC, DPI (Minerals) and CEMCC (refer to condition 8.7) and, in the case of fish, DPI (Fisheries) within 24 hours (or the next working day).
A record will be maintained of any wildlife deaths or other incidents and this record will be provided in the AEMR in accordance with</td></tr>
</table>

Section/ Page No.	Flora and Fauna Management Plan Obligations	Comments
	MCoA 3.4(a)(ii). (Flora and Fauna Management Plan addendum June 2008)	
s.6.3/p.20	In accordance with Consent Condition 3.4(a)(iii) fauna autopsy facilities will be provided to enable the cause of any fauna death(s) to be quickly determined. Flora and Fauna Management Plan sections 6.3.1 to 6.3.2 provide an overview of the procedures and laboratory tests to be conducted on dead fauna recorded on the ML to be autopsied. (Flora and Fauna Management Plan addendum June 2008)	Fauna autopsies are undertaken by the West Wyalong Veterinary Clinic as required. The dead fauna requiring autopsy are delivered to the West Wyalong Veterinary Clinic by CGM and a report is provided by the veterinarian on the cause of death. The fauna autopsy results are provided to the DTIRIS (DRE), OEH and NPWS, when they are made available by the West Wyalong Veterinary Clinic.
s.8/p.22	Contingency measures for reducing cyanide levels in the tailings dams in the event it is established that fauna deaths are occurring from cyanide in tailings dam water as required in MCoA 3.4(a)(iv).	Contingency measures for reducing cyanide levels in the tailings dams (as outlined in the Flora and Fauna Management Plan section 8.2) would be Implemented if required.
s.9.1/p.24	In accordance with MCoA 3.4(a)(vii) a number of methods will be utilised to protect, conserve and enhance wildlife values within ML 1535 and around Lake Cowal.	The Flora and Fauna Management Plan includes outlines of mitigation measures: • Compensatory Wetland Management Plan Initiatives (Section 9.2). • Remnant Vegetation Enhancement Programme (Section 9.3). • Rehabilitation of ML 1535 Disturbance Areas (Section 9.4). • Project Design (Section 9.5). • Threatened Species Management Protocol (Section 9.6). • Vegetation Clearance Protocol (Section 9.7). • Weed Management (Section 9.8). • Pest Control (Section 9.9).
s.9.3.1/p.26	In order to encourage the natural regeneration of native plant species, livestock will be controlled in the enhancement areas through fencing control and management, as outlined in the LMP.	Remnant vegetation and regeneration areas within ML 1535, on Barrick owned land and around Lake Cowal have been fenced to exclude livestock, as outlined in Land Management Plan section 4.3.

Plate 7: Northern Offset area fenced around Barrick owned land to exclude livestock (May 2014).

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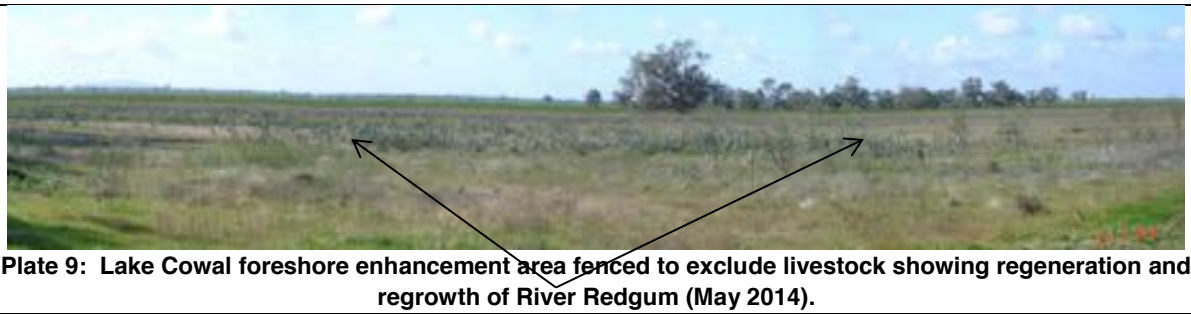
 **Plate 8: Land adjacent to Northern Offset area (not Barrick owned land) where grazing is not excluded (May 2014) and regeneration of native species is reduces by livestock grazing.**		
 **Plate 9: Lake Cowal foreshore enhancement area fenced to exclude livestock showing regeneration and regrowth of River Redgum (May 2014).**		
s.9.3.2/p. 27	Remnant vegetation monitoring will be conducted within the enhancement areas…. A number of survey plots (50 x 20 m) will be established within each enhancement area to obtain quantitative data on species diversity and abundance…. The survey plots will be monitored annually (when not inundated) after Year 2 of mine operations. Control plots may also be established at sites outside of the enhancement areas to provide a reference point against which the management measures can be assessed.	Remnant vegetation monitoring has been conducted annually by DnA Environmental. Reports are prepared describing the status of the vegetation in each survey plot, with photo points established for each quadrat to record annual appearance.
s.9.4/p.29	Mine rehabilitation works will be undertaken progressively as construction activities and mining proceed, in accordance with a progressive rehabilitation program described in the MOP in accordance with requirements of the DMR (DMR, 2002).	Mine rehabilitation is being undertaken generally in accordance with the approved MOP. The targets for rehabilitation in the MOP have not generally been met due mainly to weather conditions. The rehabilitation activities during 2013 and May 2014 have improved Rehabilitation status is reported in the AEMR section 4.6.
s.9.5.1/p.35	In accordance with Consent Condition 3.10(C), topsoil stockpiles within ML 1535 will not be located within any area of remnant Wilga woodland.	No soil stockpiles have been located in any area of Wilga Woodland.
s.9.5.2/p.35	Fences will be constructed within ML 1535 and around the ML boundary in accordance with MCoA 2.3 which requires the mine site to be secured…….	The CGM site has a security fence around the boundary of ML 1535, with internal fencing around the tailings storage facility areas.
s.9.6/p.36	The CGM Threatened Species Management Protocol was developed to minimise potential impacts of the Project on threatened flora and fauna species known and/or considered possible occurrences in the Project disturbance areas and/or	Flora and Fauna Management Plan Appendix A - Threatened Species Management Protocol has been implemented as required for the protection of threatened species when they were encountered on the CGM site. The Threatened Species Management

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	immediate surrounds. The Threatened Species Management Protocol will be implemented in accordance with MCoA 3.4(b).	Protocol was not triggered between May 2013 and May 2014.
s.9.7/p.38	In accordance with MCoA 3.4(a)(vii) which requires the protection of retained habitats within the ML area and 3.10(B) which requires the minimisation of the removal of trees and other vegetation from the mine site, a Vegetation Clearance Protocol (VCP) has been developed for the Project (Figure 8). All vegetation clearance activities required by the Project will be conducted in accordance with the VCP. The VCP will be implemented by suitably qualified person(s) and coordinated by the Environmental Manager.	In accordance with MCoA 3.10(B) and the Flora and Fauna Management Plan, the Vegetation Clearance Protocol is implemented where any vegetation clearance activities have been required within ML 1535. Vegetation clearance has been restricted to areas required for mine activities, buildings and paved surfaces, and areas necessary for fire control. The Vegetation Clearance Protocol is consistent with the JLWMP and LWMPLC to minimise vegetation clearance in the region.
s.9.8/p.42	Barrick will implement a weed monitoring program at the commencement of construction. Barrick owned land will be surveyed annually and follow up inspections will also be made of specific areas following the implementation of weed control measures. General weed management activities will be reported in the AEMR.	Annual weed surveys have been conducted by Carnegie Natives and involve recording the extent of weed occurrences, details of weed distribution and any new weed species infestation. Photographs, general descriptions and GPS coordinates have been taken of each of the surveyed areas of ML 1535 and Barrick-owned land . Weeds of concern, those that are declared noxious in the BSC Local Government Area, and environmental weeds are targeted with on-going weed control measures undertaken on a weekly basis or as required. The weed management program is reported in the AEMR section 3.9.
s.9.9/p.43	Pest control on ML 1535 will be conducted in accordance with the general procedures detailed in the LMP and in conjunction with adjacent landholders for more effective pest control in accordance with CRLPB and NSW Agriculture recommendations.	Use of the NSW Agriculture Vertebrate Pest Control Manual for pest control activities occurs as necessary. A regular control program for foxes has been conducted. During a mouse plague in 2011-2012, rodent control was implemented with 440 large rodent bait stations established on the ML 1535 area and Barrick owned land. Control of spiders and black crickets has also occurred at 3 to 6 monthly intervals.
s.10/p.45	In the event that a threatened species is identified within a Project disturbance area, the Threatened Species Management Strategy phase of the Threatened Species Management Protocol that involves the identification of mitigation measures to ameliorate any potentially significant impacts on the threatened species will be initiated.	No new threatened species were identified during the May 20143 to May -2014 period.
s.11/p.46	In accordance with MCoA 3.4(a)(viii), fauna, flora, fish and aquatic invertebrates will be monitored as documented in the Project EIS and SIS.	The fauna, flora, fish and aquatic invertebrates monitoring has been conducted in accordance with the Surface Water, Groundwater, Meteorology and Biological Monitoring Plan (prepared to address the components of the Project EIS and SIS) and in accordance with MCoA 3.4(a)(viii).
s.11.1.5/p.49	The Blast Management Plan outlines a blast monitoring program that includes a network of six blast monitoring sites, two of which (sites BM04 and BM06) are located proximal to bird breeding areas…….. Barrick is required to undertake remedial measures if blasting overpressure	Bird breeding activity has been variable since the filling of Lake Cowal and it was reported that blasting had not had any effect on bird breeding activity.

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	demonstrably disturbs bird breeding.	
s.11.1.6/p.50	Waterbird surveys of the New Lake Foreshore will be conducted annually after the completion of its construction. The monitoring programme will utilise the existing waterbird survey transect within ML 1535.	The New Lake Foreshore had not been established at the time of the audit (May 2014), as the mine construction works are not completed. Refer to DnA Environmental, January 2014, *Compensatory Wetland Monitoring Results and* DnA Environmental, February 2014 A simple and rapid procedure for monitoring was developed by CSIRO (Gibbons 2002), for assessing habitat quality across a range of vegetation types resulting in the Biometric Model used in the Property Vegetation Planning Process (Gibbons *et al* 2008). Some adaptations have been made to incorporate aspects of newly formed revegetation sites (at Cowal) in the early stages of recovery. *In conclusion it appears grazing pressure and climatic influences have had a dramatic influence on the wetland communities with the early results indicating that improved management in the grazed wetland areas was required, particularly during the very dry years. The lake foreshores have provided a dynamic environment as a result of flood waters and active wave action and these have had a significant influence on the structure and composition of the two lake foreshore communities as quantified by the annual monitoring program."*
s.11.2.1/p.51	As described in the Compensatory Wetland Management Plan, monitoring will be conducted to determine whether vegetation planted within the New Lake Foreshore is establishing and to determine the need for any maintenance and/or contingency measures (such as the requirement for supplementary plantings, erosion control or weed and pest control). Visual observations will be made on a regular basis to assess whether plants are growing and to assess the health of planted vegetation. In addition, a number of survey plots (50 x 20 m) will be monitored annually following the commencement of revegetation activities (when the area is not inundated) to obtain quantitative data on species diversity and abundance.	
s.11.2.1/p.51	The quality of rehabilitation will be monitored using Ecosystem Function Analysis (EFA) or a similar systems-based approach.	
s.11.3.1/p.53	Biological monitoring, including fish and aquatic invertebrates, will be undertaken in accordance with Consent Condition 3.4(a)(viii). In accordance with Consent Condition 8.2(a)(iii), a biological monitoring program has been developed that will be implemented during the operations phase of the mine. (Flora and Fauna Management Plan addendum, May 2010).	The biological monitoring program was developed in consultation with and to the satisfaction of the DI&I (Fisheries). In addition, the CGM Independent Monitoring Panel were consulted during preparation of this program. Details of this program are provided in the Surface Water, Groundwater, Meteorological and Biological Monitoring Program (SWGMBMP).
s.11.3.2/p.54	As outlined in the Compensatory Wetland Management Plan, fish fauna surveys will be conducted within the New Lake Foreshore, Compensatory Wetland and remaining wetland areas within ML 1535, no more than annually, when the lake is full (ie. at full storage level).	A fish and aquatic invertebrate survey was conducted during July 2012, February 2013 and February 2014 in accordance with the SWGMBMP. . The primary findings of the survey conducted during February 2014 were that "*The community composition of fish in the surveys was similar to the community composition of fish recorded elsewhere in areas of the Murray-Darling Basin that experience adverse environmental conditions (i.e. ephemeral water-bodies, high water temperatures, low percent saturation of dissolved oxygen). The fish communities of the study area are species-poor and were dominated by exotic species (i.e. Eastern Gambusia) that accounted for 98% of the catch; goldfish and the common carp".* .
s.12.2.1/p.55	Water quality of Lake Cowal will be monitored for a number of parameters along the Lake Cowal transect and lake inflow sites.	Flora and Fauna Management Plan Table 6 outlines the monitoring locations, frequency of monitoring and surface water parameters that are monitored, in accordance with the SGWMBMP.

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s.12.2.1.2/p.56	The Dust Management Plan outlines an air quality monitoring program that includes a network of 18 dust gauges to monitor dust deposition in the vicinity of the Project. Three of these dust gauges (ie. DG2, DG3 and DG4) are located proximal to bird breeding areas and will be analysed monthly. (Flora and Fauna Management Plan addendum, May 2010)	Dust deposition monitoring has occurred in accordance with the Dust Management Plan where possible. During the March, April, May and June 2012, the high water level of Lake Cowal resulted in the loss of some dust gauges located at sites within the lake. (Ref: Cattle, S. *Interpretation and Discussion of 2012 Air Quality Monitoring Results, Cowal Gold Mine*, University of Sydney). Modified dust gauge stands were installed enable data collection from the submerged sites.
s.12.2.1.3/p.56	The Noise Management Plan outlines a noise monitoring programme that includes a network of six noise monitoring sites, two of which (sites NO3 and NO4) are located proximal to bird breeding areas. The noise monitoring sites will be monitored at six monthly intervals in accordance with MCoA 6.4(b) and 8.4(a)(i).	Noise monitoring has been conducted six monthly by SLR in accordance with the Noise Management Plan during the 2010-2013 period.
s.12.2.1.4/p.56	The Blast Management Plan outlines a blast monitoring programme that includes a network of six blast monitoring sites, two of which (sites BM04 and BM06) are located proximal to bird breeding areas. In accordance with MCoA 6.3(i), Barrick will undertake remedial measures if blasting overpressure demonstrably disturbs bird breeding.	All blasts at CGM have been monitored in accordance with the Blast Management Plan. Blasting has not been reported to have had any effect on bird breeding activity (refer to Lake Cowal Water Bird Monitoring Survey Progress Reports 2012 to 2014).
s.12.2.3.8/p.59	A monitoring program will be developed to monitor fauna usage (including threatened fauna) of the final void. ……for the long-term management and monitoring of the area. The strategy will be submitted five years before mine closure.	Not yet activated. The strategy will be submitted five years before mine closure.
s.12.2.4.1/p.60	Water quality of Lake Cowal will be monitored for a number of parameters along the Lake Cowal transect and lake inflow sites. Table 6 outlines the monitoring locations, frequency of monitoring and surface water parameters that will be monitored in accordance with the SWGMBMP. The default high conservation/ecological value protection level triggers (including the 99% protection level for toxicants) provided in ANZECC and ARMCANZ (2000) will be used to trigger surface water investigations, as described in Section 8 of the SWGMBMP. (Flora and Fauna Management Plan addendum, May 2010).	Water quality monitoring of Lake Cowal has occurred along the Lake Cowal transects and lake inflow sites identified in the Site Water Management Plan and Surface Water, Groundwater, Meteorological and Biological Monitoring Program. See Surface Water and Sediment Sampling and Analysis, Lake Cowal, NSW 2012 (McMahon Pty Ltd) report summary re trigger levels.
s.12.2.4.2/p.60	The location of the Cowal ore body is such that mining the deposit requires part of the open pit to extend beyond the full storage level of Lake Cowal and as a result will remove/modify potential habitat for fish fauna. The impact of removal/ modification of habitat on fish fauna will be monitored in accordance with the SGWMBP and CWMP.	A fish and aquatic invertebrate survey was conducted during July 2012, February 2013 and February 2014 in accordance with the SWGMBMP. The primary findings of the survey conducted during February 2014 were that "*The community composition of fish in the surveys was similar to the community composition of fish recorded elsewhere in areas of the Murray-Darling Basin that experience adverse environmental conditions (i.e. ephemeral water-bodies, high water temperatures, low percent saturation of dissolved oxygen). T*he fish communities of the study area are species-poor and were
s.12.2.4.2/p.60	The impact of removal/modification of habitat on fish fauna will be monitored in accordance with the surface water monitoring programme (as outlined in Table 6 and described in Section 4.3 of the SWGMBMP) and CWMP. (Flora and Fauna Management Plan	

Section/ Page No.	Flora and Fauna Management Plan Obligations	Comments
	addendum, May 2010). A monitoring program will be implemented to assess the success of the wetland rehabilitation on the New Lake Foreshore and enhancement measures in the Compensatory Wetland areas (and remaining areas of wetland in ML 1535) in improving wetland habitats for fish fauna.	dominated by exotic species (i.e. Eastern Gambusia) that accounted for 98% of the catch; goldfish and the common carp. Monitoring to assess the success of the wetland rehabilitation on the New Lake Foreshore and enhancement measures in the Compensatory Wetland areas (and remaining areas of wetland in ML 1535) will be part of the program outlined in the SWGMBMP.
s.12.2.4.4/p.60	The SWGMBMP outlines a sediment monitoring program that will be undertaken at lake transect sites, when water levels within Lake Cowal permit (dependent on sampling location). The sampling locations, frequency and parameters that will be monitored in accordance with the SWGMBMP.	Sediment monitoring has been conducted by DM McMahon and reported in the Surface Water and Sediment Sampling and Analysis Reports. The Lake Cowal sediment results assessed against the ANZECC and ARMCANZ (2000) recommended trigger values, indicated that the 2014 extractable results were below the recommended trigger values and were similar to the 2010 and 2013 monitoring results.
s.12.4/p.66	In the event that assessment of the monitoring results (Section 12.3) indicates that impacts are occurring on birdlife in bird breeding areas, threatened flora, threatened fauna, fish or aquatic invertebrates, contingency measures will be implemented.	No impact on birdlife in bird breeding areas, threatened flora, threatened fauna, fish or aquatic invertebrates that required contingency measures to be implemented, have been identified in the annual surveys conducted between 2010 and April 2014.
s.13/p.74	Upon the cessation of mining operations, tenure of ML 1535 will be maintained by Barrick until such time as lease relinquishment criteria are satisfied.	Not activated until the cessation of mining operations.
s.16/p.78	An AEMR will be prepared in accordance with the requirements of Consent Condition 9.2	Annual Environmental Management Reports (AEMR) prepared by CGM in accordance with MCoA 9.2 reported flora and fauna management in sections 3.7 and 3.8.

4.3.2 Flora and Fauna Monitoring

The following comments are provided on the implementation and monitoring associated with the Flora and Fauna Management Plan:

- No replanting or additional tree and shrub planting occurred in the four monitoring quadrants set up on Fellmans Hill Revegetation Enhancement Project (RVEP) between May 2013 and May 2014. Monitoring at Fellmans Hill RVEP was conducted by DnA Environmental in November 2013.

- The Revegetation Enhancement Project reports prepared by DnA Environmental concluded that "*Macropods continue to graze the vegetation on Fellman's Hill. The fenced enclosures have demonstrated that heavy macropod preferentially take refuge within the dense woodland vegetation on the hills and ridges and their grazing can have significant effects of the recovery and health of the woodland vegetation. In the more open grassland areas the impacts appear to be relatively minor and macropod grazing in these grassland areas is likely to be desirable to encourage new plant growth and maintain species diversity".*

- Recent Vegetation Clearance Protocol Reports were completed for:
  - an area at the Southern Tailing Storage Facility Depot where twelve (12) trees were removed (12 September 2011);
  - the east wall of the NTSF where 4 trees were removed (23 September 2011);
  - thirty-three (33) trees on the north-west corner of the Southern Waste Emplacement during demolition of the old 'Cowal West' homestead and relocation of the Shearing Shed (March 2011 - May 2012); and

- seven (7) trees cleared adjacent Pond D9 to allow for the January 2013 relocation movement of the Millers Crusher topsoil stocks into this area.
- multiple trees in the area north of the Southern Waste Rock Emplacement and east of the water storage ponds D8B and D9

- Bird surveys conducted in August and October 2013 and January 2014 on Lake Cowal by the Centre for Environmental Management, University of Ballarat. The summary of findings of the bird surveys indicated:

  "Dry climatic conditions have resulted in the level of Lake Cowal falling between August 2013 and January 2014 survey. The reduced depth increased the extent of shallows around the margins of the lake reducing further habitat for birds typical of deeper waters (e.g. Eurasian Coot and diving birds such as grebes).

  The shallow waters continued to provide habitat for wading birds. This represents the terminal phase of community change over a filling and drying cycle with wading species making use of the extensive shallows after an extended phase of fish-eating species dominating when lake levels are higher.

  The highest species count continued to be recorded on the mine site transect (T1) that may arise as the bund wall extends out into the lake, while the northern and southern ends of the transect represent typical littoral habitat.
  .

  Colonial breeding typically commences by October each year and often extends into January. There was no apparent breeding in October, and with further lowering of water levels, this continued into January 2014."

- An annual survey of amphibian species carried out by Cenwest Environmental Services identified eight (8) frog species previously not recorded on the mine site. No threatened species were reported.

- The summary in the Surface Water and Sediment Sampling and Analysis Report on Lake Cowal, 2013 (D M McMahon Pty Ltd), in relation to water quality for Lake Cowal stated:

  - The results of the surface water monitoring reported for 2013 did not exhibit any trend that indicated a connection between the closed catchment of the CGM operations and Lake Cowal waters. The comparison of the 2013 Lake Cowal surface water quality results against the baseline water quality results from 1991 – 1992 and 2010-2012 indicates that the 2013 monitoring results are generally similar.

  - A comparison of the 2013 Lake Cowal surface water quality results against the ANZECC and ARMCANZ (2000) default trigger values for surface water (lakes) indicates that the 2013 monitoring results (totals and dissolved) were below or marginally above the default trigger values. Nickel, Lead and Zinc levels all increased slightly from previous readings but this is a trend seen in both the lake and inflow results. Overall, the Turbidity and Suspended Solids are higher than previously recorded which is a trend seen across both the lake and inflow sites.

- The summary in the *Cowal Gold Mine, Compensatory Wetland Habitat and Fish Investigation* February 2014 (frc environmental) stated:

  "The diversity of fish species in Lake Cowal in the 2011 to 2014 surveys has been low.

  Overall, only six species have been caught in the recent surveys, with three being native species (common carp gudgeons, Australian smelt and bony bream), and three being introduced species (mosquito fish, goldfish and carp). Only two native species, the common carp gudgeon and bony bream, were caught in February 2014, with the two other fish species caught being introduced.

The community composition of fish in the surveys was similar to the community composition of fish recorded elsewhere in areas of the Murray-Darling Basin that experience adverse environmental conditions (i.e. ephemeral water-bodies, high water temperatures, low percent saturation of dissolved oxygen).

Based on the assessments of aquatic habitat and fish communities, the Compensatory Wetland, Enhancement Wetland and the New Lake Foreshore areas within ML 1535 have similar habitat compared to adjacent comparative sites, and provide structure that supports feeding, shelter and reproduction for a variety of fish species. The current surveys clearly show the dominance of species that are resilient to harsh environmental conditions and that can rapidly colonise newly available habitat, especially introduced species recorded during the surveys, and only one native species (i.e. common carp gudgeons)."

4.3.3 Conclusion

The Flora and Fauna Management Plan, provides an adequate basis for the management of flora and fauna on the CGM project MLA and surrounding Barrick owned land. The implementation of the commitments in the Flora and Fauna Management Plan are supplemented by the commitments in the Compensatory Wetland Management Plan, Land Management Plan, Rehabilitation and Offset Management Plan, and Surface Water, Groundwater, Meteorological and Biological Monitoring Program.

The monitoring program reports prepared under the Flora and Fauna Management Plan provide a comprehensive ongoing assessment of the status of flora, fauna, avifauna, fish and habitats of the CGM project development and demonstrate that the project has not had a measurable negative impact on the surrounding environment or its flora and fauna.

4.4 Erosion and Sediment Control Management

[Minister's Condition of Approval Condition 3.5(a)]

4.4.1 Erosion and Sediment Control Management Plan

The Erosion and Sediment Control Management Plan required by MCoA 3.5(a) was approved by DIPNR in 2004. Review of the Erosion and Sediment Control Plan was conducted during 2009 and the applicability of the plan to the operational management of the site assessed during the review process. The Plan presents general measures to be implemented to control erosion and sediment loss to the environment from the disturbed areas of the project site. The Plan was amended and submitted for approval in March 2009.

The commitments outlined in the Erosion and Sediment Control Management Plan are summarised in Table 7.

Table 7: Erosion and Sediment Control Management Plan Commitments

Page No./section	Erosion and Sediment Control Management Plan Commitments	Comments
s.4.2.2/p62	As the pipeline will be buried, no permanent erosion and sediment controls are necessary. The buried pipeline corridor will be progressively rehabilitated.	The pipeline construction across Lake Cowal and along the alignment to the east of the lake towards the production bores occurred in 2004 involved the burial of the pipe 1.5 metres below the surface and refilling of the trench with the original excavated material compacted to the original ground level.
s.4.2.3/p63	Weekly inspections will be undertaken during the operational phase of the Project to ensure revegetation and planting areas along the buried pipeline corridor have properly established. Inspections will record condition of the erosion and sediment control structures;	Inspection of the pipeline alignment occurred following completion of construction in 2004 until Lake Cowal filled with water in 2010-11. No erosion along the corridor was

Page No./section	Erosion and Sediment Control Management Plan Commitments	Comments
	maintenance requirements (if necessary) including instructive actions; volume of sediment removed (eg. from sediment basins to retain capacity requirements); and sediment disposal locations	recorded during the period the lake bed was dry. The monitoring of the pipeline route, rehabilitation has not occurred during the period of inundation of Lake Cowal between 2010 and May 2014.
s.4.2.3/p63	Maintenance activities, including; cleaning out of containment structures, diversion drains etc where sediment/sand/soil/ vegetation builds up; repairing of areas of erosion (eg. Lining with a suitable material which may include use of grasses, plastic, geotextile, rock, concrete); further application of seed/fertiliser in areas of minor soil erosion and/or inadequate vegetative establishment; and installation of additional erosion and sediment control structures.	Maintenance activities have occurred as required to ensure the erosion and sediment control structures retain their operational performance around containment structures, diversion drains with additional erosion and sediment control structures installed as required.
s.5.2.3/p66	Regular inspections will be undertaken during the operational phase of the project to ensure revegetation and planting areas along the relocated Travelling Stock Route have properly established. Inspections will record condition of the erosion and sediment control structures; maintenance requirements (if necessary) including instructive actions; volume of sediment removed (eg. from sediment basins to retain capacity requirements); and sediment disposal locations	The new road and Travelling Stock Route (TSR) works were completed in Q1 2004. Barrick transferred Lot 100 DP 1059150 as the land for the new TSR to the Crown as. The TSR is regularly inspected and maintenance or repairs conducted to maintain the route and manage erosion.
s.6.1/p68	Salinity - Limit clearing of areas; clearly delineated, where appropriate, with barrier mesh and sediment fencing in accordance with 4.2.1 of Managing Urban Stormwater - soils and construction. Unrestricted vehicular plant access to undisturbed areas will not be permitted. Vegetation in close proximity to works areas will be demarcated with flagging tape so as to prevent disturbance. All employees will undertake an induction/training programme.	Areas of surface disturbance where salinity may be a potential problem have been defined prior to commencement of any land disturbance works and access limitations are imposed. All CGP employees and contractors undertake induction training that includes restriction of access to demarcated areas.
s.6.1/p68	Identification of saline soils (infill testing) and selective soil resource management.	Infill testing of soil profiles is undertaken when new areas of works are commenced.
s.6.1/p68	Identification of low salinity construction material (construction fill testing) and selective resource management	Testing of soil profiles is undertaken when new areas of works are commenced.
s.6.1/p68	Fencing ML 1535 to restrict stock and prevent overgrazing and erosion.	ML 1535 has been fenced to restrict stock entry and the fence is inspected monthly and maintenance works conducted if necessary.
s.6.1/p68	Implementation of appropriate erosion and sediment control systems and ongoing monitoring and maintenance including water monitoring (suspended solids, EC and pH).	Monitoring and maintenance of erosion and sediment control structures occurs after rainfall events and water quality is tested.
s.6.2/p69	Containment and management of saline surface water runoff. The surface water management strategy is contained in the SWMP.	Surface water management within ML 1535 occurs in accordance with the SWMP.
s.6.2/p70	During project operations, water will accumulate within open pit/final void due to surface water runoff. The final void will intercept a large proportion of runoff, preventing sediment from entering the Lake. As a result, salt loads entering the lake from the Project site are expected to marginally decrease post mining as salt will also be trapped by the void.	A strategy for the long term management of the final void will be developed in consultation with relevant agencies and stakeholders in accordance with Consent Condition 4.1/4.2(b).
s.7/p71	Soil Management – the general strategy of soil resource management will be to strip soil resources from all proposed mine disturbance areas within ML 1535 and store these in dedicated stockpile areas for reuse during progressive rehabilitation works.	All topsoil resource is stripped from proposed mine disturbance areas within ML 1535 and placed in dedicated stockpile areas for reuse during rehabilitation works.
s.7.2/p72	Vegetation Clearance Protocol and Threatened Species	The Vegetation Clearance Protocol

Page No./section	Erosion and Sediment Control Management Plan Commitments	Comments
	Management Protocol will be implemented consisting of Pre-clearance survey for flora, including a targeted survey for any threatened species recorded in the mine site area; and preliminary and secondary fauna habitat assessments.	and Threatened Species Management Protocol are implemented and completed prior to any clearing of previously undisturbed areas of ML 1535.
s.8/p74	Effective rehabilitation will be implemented by undertaking the rehabilitation programme in accordance with the general principles outlined in the EIS. These include: the rehabilitation of project landforms is to be progressive and conducted in accordance with approved, verified plans which are to be updated manually (MCoA 3.6 and 6.2(ii)).	Rehabilitation of disturbed areas is undertaken in accordance with the Rehabilitation Management Plan and the current Mining Operations Plan for ML 1535.
s.8/p74	The stability of newly prepared landforms prior to the establishment of long term vegetation is to be protected via the construction of moisture-retaining graded drains, water-holding structures (e.g. surface depressions) and, where appropriate, the use of authorised hybrid cover crops to provide initial erosion protection	Stability of newly prepared landforms is undertaken in accordance with the Rehabilitation Management Plan and the current Mining Operations Plan for ML 1535.
s.8/p74	Rehabilitation of the outer embankments of the tailings storages to be grassed during processing operational years, reducing habitat opportunities for avifauna	The outer embankments of the tailings storage facilities are progressively grassed for stability and to reduce potential habitat for avifauna. The tailings storage facility batters are inspected regularly.
s.8/p74	Endemic groundcover, understorey and tree seed and seedlings will be cultivated and utilised	Endemic groundcover, understorey and tree seed and seedlings are utilised where practicable.
s.8/p74	The annual rehabilitation program and budget is to be prepared by a site team incorporating the Project's senior management.	The annual rehabilitation program and budget is prepared by a site Environmental Section team including CGM Project senior management.
s.11/p78	Report on the effectiveness and performance of the sediment and erosion control systems against the objectives contained in the ESCMP to: control the movement of sediment and salinity migration from areas disturbed by mining and construction activities; and maintain downstream (Lake) water quality.	Effectiveness and performance of the sediment and erosion control systems against the objectives contained in the ESCMP are reported annually in the AEMR section 3.2.
s.12/p79	Annual Environmental Management Report	Annual Environmental Management Reports (AEMR) prepared by CGM in accordance with MCoA 9.2, addressed erosion and sediment control aspects in section 3.2.

4.4.2 *Erosion and Sediment Control Performance*

Erosion and sediment control management has involved maintenance and inspection of erosion and sediment control structures after trigger rainfall events.

The CGM geotechnical department conducts monthly monitoring and assessment of all water holding ponds on site, waste rock emplacements and the lake protection bund for sediment movement and effectiveness of erosion control. Investigation of the lake protection bund indicated that the increased rainfall experienced during 2010 and 2012 had not significantly impacted on the stability of the lake protection bund structure. Some surface erosion and sediment movement was evident. The ongoing management of erosion and sediment control on the batters of the temporary lake protection bund has included rock armouring to ensure that the rehabilitation of the constructed surfaces is maintained for long term stability.

Lake Cowal has not been impacted by sediment inflow from the CGM disturbed areas, due to the presence and effectiveness of the temporary isolation bund (TIB) and initial vegetation cover on the adjacent lifts of the emplacement areas trapping sediment movement.

The Lake Cowal water and sediment quality report prepared by D M McMahon Pty Ltd, (Surface Water and Sediment Sampling and Analysis, Lake Cowal, NSW 2014) stated:

> *"The comparison of the 2013 Lake Cowal surface water quality results against the baseline water quality results from 1991 – 1992 and 2010-2012 indicates that the 2013 monitoring results are generally similar."*

Lake Cowal water quality results have not indicated any impact on Lake Cowal from the disturbed areas of the CGM project site during the 2010-2014 the period of inundation of the Lake Cowal bed. The erosion and sediment control structures appear to have intercepted sediment laden runoff from the site and retained the sediment in the ponds (D4 and stilling basin) prior to any discharge on water from the site to the Lake.

Stabilisation works conducted on the batter slopes of the Southern Tailings Storage Facility and Northern Tailings Storage Facility, using rock ribbons along the batters has retained topsoil/sediment and reduced erosion during the 2013 to 2014 period. The outer slopes of the 4th Lift of the Southern Tailings Storage Facility and 3rd Lift of the Northern Tailings Storage Facility were completed using the new rock-topsoil method during 2011-2013 and was observed during this audit to be successfully stabilising the batters reducing overall erosion and providing for establishment of vegetative cover.

4.4.3 Conclusion

The erosion and sediment control strategies implemented for the CGM project site in accordance with the Erosion and Sediment Control Plan are considered to be effective in meeting the objectives of the Plan, as demonstrated by the environmental performance indicators. The Erosion and Sediment Control Plan is generally consistent with requirements in *Managing Urban Stormwater: Soils and Construction (Volume 2E – Mines and Quarries) Manual* (EPA 2008) Appendix C.

4.5 Soil Stripping Management

[Minister's Condition of Approval 3.5(b)]

4.5.1 Soil Stripping Management Plan

The Soil Stripping Management Plan required under MCoA 3.5(b) was approved by DIPNR in 2003. The Plan was reviewed in 2009 and the current details of soil stockpile location, stripping volumes and soil management measures are provided in the current *"Cowal Gold Project Mining Operations Plan."* The Soil Stripping Management Plan presents the processes and scheduling for the soil stripping activities in the Mining Operations Plan(s) (prepared in accordance with the Mining Lease requirements).

The Soil Stripping Management Plan includes the Commitments summarised in Table 8.

Table 8: Soil Stripping Management Plan Commitments

Section /Page No.	Soil Stripping Management Plan Commitments	Comments
s.4/p9	Characterisation of the suitability of material for rehabilitation works is to be conducted prior to stripping (including both the EIS assessment and further infill testing - Section 4.1)	Infill testing of soil profiles is undertaken for each new area of works commenced.
s.4/p9	Strip and store soil resources on areas proposed for mine development. Store in a way that long term viability is ensured and maintained	Soil resources are stripped and placed on specific stockpile emplacements for reuse in rehabilitation. The stockpiles are limited in height and time of storage is kept to a minimum to ensure viability of the soil characteristics.
s.4/p9	Progressively rehabilitate final landforms as soon as soon as practical after completion of landforms or when areas are no longer required.	Final landforms are being progressively rehabilitated when areas are no longer required for mining activities, in accordance with the Rehabilitation Management Plan

Section /Page No.	Soil Stripping Management Plan Commitments	Comments
		and MOP.
s.4.1.1/p10	Ensure that soil moisture conditions are suitable for stripping by examining meteorological data. If conditions are unsuitable, stripping will be postponed until conditions are suitable.	Weather conditions and soil moisture are assessed prior to soil stripping to confirm suitable conditions for removal of the soil profile components for stockpiling.
s.4.2/p11	Topsoil and subsoil will be stripped and stored in separate stockpiles comprising topsoil; low salinity subsoil; gypsum treated subsoil and native seeded subsoil.	Soil horizons are stripped and placed on separate stockpiles for storage to provide suitable topsoil and subsoil classes for rehabilitation.
s.4.2/p12	Hard pedal red duplex upper sub soil material will be stripped as a priority and stored as the primary topsoil resource.	Red duplex upper subsoil material is stripped and stored as the primary topsoil resource.
s.4.3/p12	Soil stripping activities (including infill soil testing) will comply with the requirements of the NPWS Section 87 permit and Section 90 consent granted under the *National Parks and Wildlife Act, 1974.* These allow collection of visible artefacts prior to soil stripping and also the collection of unknown artefacts that may be contained within the soil profile. In accordance with Condition 11 of the Section 87 permit, "*all areas where soil stripping occurs shall be inspected following this operation in the event that datable materials might be revealed"* (MCoA 3.3(b)).	Aboriginal artefact surveys are conducted by the Archaeological Consultant and local Aboriginal Land Council representatives on any new area prior to disturbance to enable the collection of visible artefacts prior to soil stripping, in accordance with the conditions of the Section 87 permit and Section 90 consent, granted under the *National Parks and Wildlife Act, 1974.*
s.4.3/p12	Vegetation Clearance Protocol and Threatened Species Management Protocol will be implemented when stripping soil, including: • pre-clearance survey for flora; • targeted survey for any threatened species recorded in the mine site area; and • preliminary and secondary fauna habitat assessments (MCoA 3.4(a) and (b)).	The Vegetation Clearance Protocol and Threatened Species Management Protocol are completed prior to any vegetation clearing or soil stripping of previously undisturbed areas of ML 1535
s.4.3/p13	Barrick to minimise the removal of trees and other vegetation to approved areas (MCoA 3.10(B)).	Development of the CGM on ML 1535 has occurred with removal of trees and other vegetation kept to the minimum required for the development.
s.4.3.1/p13	No disturbance of Belah Woodland (as identified on Figure 3-13 of the EIS) is permitted and no soil stripping will be undertaken within these areas (MCoA 3.10(D)).	No disturbance of Belah Woodland has occurred during the development of the CGM.
s.4.3.1/p13	Through all stages of soil stripping earthworks, soil stockpiling and re-application for rehabilitation, operations will be closely supervised to maintain correct recovery depths of suitable soils.	All stages of soil stripping earthworks, soil stockpiling and re-use of soils for rehabilitation, are supervised by CGM personnel to maintain correct recovery depths of suitable soils.
s.4.3.2/p13	Prior to initiation of soil stripping activities, site supervisor will ensure that the appropriate protocols (e.g. aboriginal heritage and land clearance requirements in accordance with Consent Condition 3.3 and 3.4(b)) have been followed and the recommended stripping depths are confirmed ahead of stripping (section 4.1)	The relevant Vegetation Clearance, Threatened Species Management, Aboriginal Heritage, and Land Clearance protocols are completed prior to any soil stripping activities occurring on undisturbed land within ML 1535.
s.4.3.2/p14	The control of soil erosion and dust along the pipeline and bore-field areas will be in accordance with the DMP and ESCMP and will include the adoption of measures such as: • watering of works areas when necessary; • installation of soil/sediment control measures where necessary (e.g. the installation of silt fencing); • regular inspection of works and stockpile areas and enactment of any remedial or response measures with respect to dust and soil/sediment control.	The installation of the pipeline along the alignment from the Paleochannel bore-field was undertaken when the Lake bed was dry in 2004. The required mitigation measures in relation to dust generation and erosion and sediment control were implemented.
s.4.3.2/p14	Works associated with the burial of the water pipeline will be in accordance with the general requirements of the DIPNR and in consultation with NSW Fisheries.	The installation of the pipeline along the alignment from the Paleochannel bore-field to the CGM site was undertaken in 2004

Section /Page No.	Soil Stripping Management Plan Commitments	Comments
	Soil stockpiles will be short term features during pipeline burial and soils will be promptly replaced during the progressive rehabilitation of the pipeline burial route (MCoA 4.4(b)).	when the Lake bed was dry a in accordance with the regulatory requirements of DIPNR and NSW Fisheries.
s.4.3.3/p14	A section of the existing TSR is to be relocated around the MLA area. Where soils are disturbed by public road construction works, soil stripping will comply with the general stripping procedures outlined in section 4.3 (MCoA 3.9(b)).	The section of the Travelling Stock Route (TSR) was relocated around the MLA area and the works completed in Q1 2004 in accordance with the general procedures outlined in the Soil Stripping Management Plan.
s.4.4/p14	Soil stockpiles will be located outside the Lake Cowal flood plain and will avoid the areas of Wilga Woodland (MCoA 3.1(C)).	All soil stockpiles have been located outside the Lake Cowal flood plain and have not imposed on areas of Wilga Woodland.
s.4.4/p14	The surface of the completed soil stockpiles will be left in a 'rough' condition to help promote water infiltration and minimise erosion, prior to vegetation establishment.	Soil stockpiles surfaces are left in a rough condition to allow rainfall infiltration and reduce erosion from surface runoff.
s.4.4/p14	Soil stockpiles will be fertilised and seeded to maintain soil organic matter levels, soil structure and microbial activity.	Long term soil stockpiles are managed to maintain soil structure and microbial activity.
s.4.4/p15	Subsoil stockpiles may also be treated with gypsum to reduce dispersiveness during stockpiling.	Subsoil stockpiles are treated with gypsum if required to reduce dispersive soil reactions.
s.4.4/p15	All soil stockpiles are to be signposted with the date of placement and type of soil/overburden for identification on drawings in the MOP and AEMR	Soil stockpiles are signposted and locations, soil type and date of placement recorded on drawings in accordance with the MOP.
s.4.4/p15	All soil stockpiles will be recorded on a site database maintained by Barrick that will detail the location and volume of each stockpile and the stockpile maintenance records in accordance with the requirements of the DIPNR and EIS.	All soil stockpiles are recorded on a site database that details the location and volume of each stockpile and the stockpile maintenance records.
s.4.4/p15	Where practicable, soil will be stripped from one area and immediately transferred to an active rehabilitation area for direct placement. This will reduce the size of soil stockpiles and optimise soil fertility for rehabilitation.	Stripped soil is placed on active rehabilitation areas as soon as practicable after stripping.
s.4.4/p15	Long term topsoil stockpiles will be constructed up to a maximum of 3 m in height with slopes at a maximum acceptable angle to resist erosion. The native seed topsoil stockpile will not exceed 2 m in height.	Long term topsoil stockpiles are constructed to a maximum of 3 m in height with slopes at an angle to resist erosion.
s.4.4.1/p16	Soil conservation water management features will be implemented where practical and include the use of silt fences and sediment traps to minimise soil movement; use of diversion banks, channels and rip-rap structures to divert surface water around disturbed areas and control runoff velocity; constructing roads at appropriate slope along the contour.	Silt fences / sediment traps to minimise soil movement, use of diversion banks, channels and rip-rap structures to divert surface water around disturbed areas and control runoff velocity; and construction of roads at appropriate slope along the contour has occurred to manage water runoff.
s.4.4.2/p17	Where required to improve structural and fertility characteristics prior to application, soil stockpiles will be deep-ripped to establish aerobic conditions. Soil stockpiles will have sediment control measures installed in accordance with the requirements of the ESCMP. The control measures used will depend on the size and location of each stockpile.	Management of the soil stockpiles to maintain soil structural characteristics occurs in accordance with the ESCMP, dependent on the size and location of each stockpile.
s.5/p18	The rehabilitation of Project landforms is to be progressive and conducted in accordance with approved, verified plans which are to be updated annually.	The rehabilitation of the CGM project area is assessed annually and the rehabilitation works are progressed when conditions are suitable, in accordance with plans and predictions provided annually in the AEMR and MOP and reporting required under the approved MOP.

Section /Page No.	Soil Stripping Management Plan Commitments	Comments
s.5/p18	The stability of newly prepared and topsoiled landforms is to occur via the construction of moisture-retaining graded drains, water-holding structures and, where appropriate, the use of authorised hybrid cover crops to provide initial erosion protection.	Stability of newly prepared landforms is undertaken in accordance with the Rehabilitation and Offset Management Plan and the MOP for ML 1535.
s.5/p18	Rehabilitation of the outer embankments of the tailings storages to be grassed during processing operational years, reducing habitat opportunities for avifauna.	The outer embankments of the tailings storage facilities are progressively grassed for stability and to reduce habitat potential for avifauna. The tailings storage facility batters are inspected regularly for erosion and stability of the slopes.
s.5/p18	Rehabilitation works will be described in the MOP in accordance with the requirements of the DMR.	Rehabilitation works as described in the MOP follow the requirements of the DMR guidelines.
s.5/p19	Effective rehabilitation will be ensured by: • the implementation of the rehabilitation programme in accordance with the above general principles; • rehabilitation maintenance work; • rehabilitation monitoring activities and compliance with the DMR's Mining Rehabilitation and Environmental Management Process.	Rehabilitation of disturbed areas is undertaken in accordance with the Rehabilitation and Offset Management Plan, the approved MOP for ML 1535, and in accordance with the DMR *Mining Rehabilitation and Environmental Management Process*.
s.8.1/p22	Soil stripping will be reported in accordance with the MOP. In accordance with MCoA 9.1 the predicted annual soil stripping volumes and detailed soil stockpile locations and soil management measures will be provided in the Cowal Gold Project MOP.	Soil stripping and rehabilitation are reported annually in accordance with the MOP and in the AEMR section 5.
s.8.2.1/p23	Effectiveness of soil stripping methods will be recorded in a site soil database that will include soil stockpile locations, soil volumes, amelioration treatment, weed control, fertiliser application and date(s) of soil stripping (MCoA 3.5(b)).	Soil stripping is recorded in the site soil database, includes soil stockpile locations, soil volumes, amelioration treatment, weed control, fertiliser application and date(s) of soil stripping. This database is revised annually.
s.8.2.1/p24	Soil stripping activities against the objectives of this SSMP and the soil management objectives/strategies of the EIS are reported in the AEMR.	Annual Environmental Management Reports (AEMR) have been prepared by CGM in accordance with MCoA 9.2 and the erosion and sediment control status is reported in AEMR section 5, and Table 38.

4.5.2 Soil Stripping Activity

Soil stripping on the CGM site where required for the development on the mine, has occurred in accordance with the Soil Stripping Management Plan. In total more than 1.7 million m^3 of topsoil and 2.0 million m^3 of subsoil are stored on site.

The topsoil stockpile database is updated as new mining stockpile information is obtained from estimates determined from the site activities. Aerial photography and surveying of the soil stockpiles is conducted to accurately record soil stockpile locations and volumes.

4.5.3 Conclusion

The Soil Stripping Management Plan has been implemented and the separation of the topsoil and subsoil horizons stockpiles has occurred. Reuse of the topsoil and subsoil has occurred for rehabilitation trials and final constructed surfaces on the tailings storage facilities and waste rock emplacement areas. The Soil Stripping Management Plan and implementation are considered adequate and representative of mining best practice.

The topsoil stockpile database is updated as new mining stockpile information is obtained from estimates determined from the site activities. Aerial photography and surveying of the soil stockpiles is conducted to accurately record soil stockpile locations and volumes.

4.6 Rehabilitation and Offset Areas

[Minister's Condition of Approval 3.6]

4.6.1 Rehabilitation and Offset Management Plan

The Rehabilitation and Offset Management Plan was prepared to satisfy MCoA 3.6(b) and submitted to the DoP on 30 July 2010 following consultation with DECCW, OoW and BSC. An addendum to the Rehabilitation and Offset Management Plan was submitted to DoP in December 2010 and comments were received by Barrick from DP&I on 14 August 2012. A further revision of the Rehabilitation and Offset Management Plan was prepared in August 2013 for submission to DP&I.

The Rehabilitation and Offset Management Plan addresses each of the requirements of MCoA 3.6(b) for the progressive rehabilitation of the mine site in accordance with the MOP and the requirements of *Guidelines to the Mining, Rehabilitation and Environmental Management Process* (MREMP Guidelines) (NSW Department of Primary Industries – Mineral Resources 2006), and conditions of ML 1535.

The Rehabilitation and Offset Management Plan also references/includes requirements in the Land Management Plan, Erosion and Sediment Control Plan, Flora and Fauna Management Plan, Compensatory Wetland Management Plan, Remnant Vegetation Enhancement Program, Soil Stripping Management Plan, Bushfire Management Plan, where relevant.

Commitments in the Rehabilitation and Offset Management Plan are listed in Table 9.

Table 9: Rehabilitation and Offset Management Plan Commitments

Section /Page No.	Rehabilitation and Offset Management Plan Commitments	Comments
s.3.2.3 / p17	Access tracks outside disturbance areas will be kept to a minimum and be positioned so that they do not cause any unnecessary damage to the land. Temporary access tracks will be ripped, topsoiled and revegetated as soon as possible after they are no longer required for mining operations.	No new access tracks were constructed outside the MLA disturbance area during 2013-2014.
s.3.2.4 / p17	Riparian vegetation will be used to stabilise the permanent drainage lines.	Management of drainage lines and establishment of riparian vegetation has been carried out on southern and northern low flow drainage structures within the MLA and on an ephemeral drainage line on Barrick owned land. The success of the riparian vegetation establishment was affected by the dry weather experienced up to 2011. Vegetation establishment has occurred since 2011 on the treated areas following the increased regular rainfall during 2011 and 2013.
s.3.2.6 / p18	Management of soil stockpiles has been established in the Soil Stripping Management Plan (SSMP) (Barrick, 2003c) and includes soil handling measures that optimise the retention of soil characteristics (in terms of nutrients and micro-organisms) favourable to plant growth.	Management of topsoil stockpiles is conducted in accordance with the Soil Stripping Management Plan.
s.3.2.7 / p19	A Vegetation Clearance Protocol (VCP) developed in the FFMP includes pre-clearance surveys. The Pre-clearance surveys include a preliminary habitat assessment the results of which will be utilised to determine appropriate secondary habitat assessment activities.	The Vegetation Clearance Protocol developed under the approved Flora and Fauna Management Plan is activated for any undisturbed area, prior to any vegetation clearance occurring. The pre-clearance surveys are conducted by suitably qualified consultants.
s.3.2.9 / p20	Progressive rehabilitation of waste emplacements and the tailings storage	Rehabilitation trials have occurred on the batters of the tailings storage facilities and

Section /Page No.	Rehabilitation and Offset Management Plan Commitments	Comments
	facilities will be undertaken to reduce the contrast between the CGM landforms and the surrounding landscape.	waste emplacements to determine suitable rehabilitation methodology and to reduce contrast with the surrounding landscape.
s.3.2.9 /p20	Earth mounds will be constructed on sections of the western and northern boundaries of ML 1535 to break up continuous views from Lake Cowal Road. These earth mounds and vegetation screen areas surrounding ML 1535 (including along Lake Cowal Road) are to be planted with endemic plants compatible with the existing surrounding vegetation.	Earth mounds constructed on the western and northern boundaries of ML 1535 to break up continuous views from Lake Cowal Road were planted with endemic species in 2005. The vegetative cover on the mounds was not successful because of the dry conditions. Plantings around the mounds have been established and provide some screening of the mine areas from Lake Cowal Road.
 **Plate 9: View of the CGM from Lake Cowal Road with vegetative establishment around the mounds.**		
s.3.2.12 / p21	Weeds will be managed at the CGM in accordance with measures described in the Land Management Plan (LMP).	Weeds management within the ML 1535 and other Barrick owned lands is undertaken in accordance with measures described in the Land Management Plan (LMP).
s.3.2.12 / p22	Barrick will undertake pest control activities at the CGM in accordance with the procedures detailed in the FFMP and LMP.	Pest control activities described in the LMP are implemented across the Barrick owned properties.
s.3.2.13 / p23	Grazing and cropping activities will be excluded within ML 1535 during operation and rehabilitation of the CGM.	No grazing and cropping activities have occurred within ML 1535.
s.3.2.15 / p23	Bushfire management …… strategies and procedures will be implemented during the life of the mine.	Bushfire preventative measure programs outlined in the Bushfire Management Plan (BMP) are implemented by the CGM Emergency Response Officers to manage fire hazard risk.
s.3.3 / 24	Performance criteria for mine site rehabilitation have been developed to reflect the measures for mine site rehabilitation.	Rehabilitation and Offset Management Plan Table 2 provides the performance criteria for mine site rehabilitation.
s.3.4 / p25	A rehabilitation monitoring program has been developed to monitor the effectiveness of the short, medium and long-term measures and progress against the performance and completion criteria (MCoA 3.6(d)(v)).	DnA Environmental conduct an annual rehabilitation monitoring program and have developed a set of completion criteria that complies and is consistent with conditions of approval and management plans, and aligns with the DTIRIS-MR (2011) *Rehabilitation and Environmental Management Plan (REMP) Guidelines Consultation Draft V2.0 June 2010*. Monitoring occurs during spring to capture an accurate representation of species present in the area. A summary of the results of this monitoring, and a description of any additional measures required, are provided in the AEMR.
s.3.4.2 / p27	Monitoring will be conducted to determine whether vegetation planted within the New Lake Foreshore is establishing and to determine the need for any maintenance and/or contingency measures (such as the requirement for supplementary plantings,	Annual monitoring of the Lake Foreshore areas is conducted by DnA Environmental to assess establishment of the vegetation. Results of the surveys are reported in the AEMR section 3. 7.3.2.

<table>
<tr><th>Section /Page No.</th><th>Rehabilitation and Offset Management Plan Commitments</th><th>Comments</th></tr>
<tr><td></td><td>erosion control or weed and pest control).</td><td></td></tr>
<tr><td>s.3.4.2 / p27</td><td>Visual monitoring of revegetated landforms will be conducted to confirm that vegetation is establishing and to determine the need for any maintenance and/or contingency measures (such as the requirement for supplementary plantings, erosion control and weed control).</td><td>Visual monitoring of revegetated landforms is conducted by DnA Environmental to assess establishment of the vegetation planted. Results of the surveys are reported in the AEMR section 3. 7.3.2.</td></tr>
<tr><td>s.3.4.2 / 27</td><td>The effectiveness of the erosion and sediment control systems and the performance of those systems will be reported against the objectives contained in the ESCMP.</td><td>Performance of erosion and sediment control against the requirements in the Erosion and Sediment Control Management Plan is undertaken following significant, high intensity rainfall events, and reported in the AEMR section 3.2.</td></tr>
<tr><td>s.3.4.2 /p28</td><td>Monitoring of fauna usage of the New Lake Foreshore, waste emplacements, Tailings Storage Facilities and the Compensatory Wetland will be conducted in accordance with the FFMP and CWMP.</td><td>Twice daily monitoring of fauna usage of the tailings facilities has been undertaken since the commissioning of the facilities in April 2006. Six-monthly reporting on fauna usage of the TSFs by Donato Environmental Services and the reports are is included in the AEMR.</td></tr>
<tr><td></td><td>Offset Areas</td><td></td></tr>
<tr><td>S4.1.1/p29</td><td>Locations of the northern and the southern offset areas are within the following properties owned by Barrick:

Northern Offset Area
• 8/753097; and
• 1/530299.
Southern Offset Area
• 19/753083; and
• 18/753083.</td><td>Proposed Offset Areas

<table><tr><th>Offset Management Area</th><th>Description</th><th>Minimum Size [ha]</th></tr><tr><td>Enhancement Area (Southern Offset Area)
18/753083 and 19/753083</td><td>Enhancement through natural regeneration and management for conservation.</td><td>110</td></tr><tr><td>Revegetation Area (Northern Offset Area)
1/530299 and 8/753097</td><td>Re-establishment of woodland in cleared agricultural land by revegetation.</td><td>100</td></tr><tr><td colspan="2">Total Area Conserved (ha)</td><td>210</td></tr></table></td></tr>
<tr><td>s.4.3.1/p34</td><td>Within Offset Enhancement Areas the following revegetation activities will occur:
• revegetation of unnecessary access tracks;
• selective planting in other cleared areas where natural regeneration is not occurring.
Annual inspections will identify areas within the Offset Enhancement Areas which will benefit from selective plantings.</td><td>Existing fences around the offset areas are being maintained or improved by Barrick.
No access tracks within the offset areas have required revegetation.
Any other work commitments related to the offset areas are on hold, awaiting approval of DP&I of the Voluntary Planning Agreement for the proposed offset areas submitted to DP&I on 28 April 2014.</td></tr>
<tr><td>s.4.3.1/p35</td><td>Measures and procedures will be implemented to facilitate the natural regeneration of Myall Woodland remnant vegetation within the northern offset area of the Offset Enhancement Areas.</td><td rowspan="2">Measures and work commitments are on hold, awaiting approval of the Voluntary Planning Agreement (VPA) by DP&I .
Pest control activities within the offset areas have been conducted in accordance with the Land Management Plan.
Fox baiting was undertaken in May 2012 to November 2012.</td></tr>
<tr><td>s.4.3.4/p40</td><td>Barrick will undertake pest control operations within the offset areas in accordance with the Land Management Plan and Flora and Fauna Management Plan.</td></tr>
<tr><td>s.4.3.5/p41</td><td>Grazing and cropping activities will be excluded within the offset areas.</td><td>Grazing has been excluded from the proposed offset areas. Measures and work commitments are delayed, awaiting approval of the VPA by DP&I .</td></tr>
<tr><td>s.4.4/p42</td><td>From Spring 2012, the performance of the</td><td>Performance measure monitoring has been</td></tr>
</table>

Section /Page No.	Rehabilitation and Offset Management Plan Commitments	Comments
(Table 8)	offset areas will be measured against the following performance criteria: • Selective revegetation undertaken within Offset Revegetation Area and Offset Enhancement Areas. • Weed control and feral pest measures are effective. • Grazing and cropping activities excluded within the offset areas and perimeter fencing maintained. • Access to the offset areas restricted to authorised personnel and perimeter fencing maintained. • Bushfire management undertaken in accordance with the BMP.	delayed, awaiting approval of the VPA by DP&I for the proposed offset areas. Existing fences have been maintained. Weed control and feral pest monitoring has been conducted.
s.4.5.2/p44	Visual monitoring will be conducted regularly to evaluate the effectiveness of the implemented measures and determine the need for additional measures.	Visual monitoring by DnA Environmental of the proposed offset areas has occurred and existing fences are maintained. Other work is awaiting approval of the VPA by DP&I for the proposed offset areas.
s.4.5.3/p44	Permanent photo-points will be established within the offset areas to monitor the change in the offset areas over time. The method for photographic monitoring described below reflects the NPWS (2003) *Conservation Management Note 9 – Photographic Monitoring.*	Permanent photo points have been established by DnA Environmental and are reported on in the biological monitoring reports.
s.4.5.4/p45	A number of permanent flora survey quadrats (20 x 20 m) will be established in the offset areas and at control sites to obtain quantitative data on plant species diversity and abundance. The control sites will serve as a reference point against which the performance of the offset areas can be assessed.	Permanent flora quadrats have been established by DnA Environmental and are reported on in the biological monitoring reports.
s.4.7/p46	In accordance with Consent Condition 3.6(b), by the end of December 2011, Barrick will make suitable arrangements to provide appropriate long-term security for the offset areas to the satisfaction of the Director-General of the DoP. Options proposed to provide appropriate long-term security for the offset areas include: • a Voluntary Conservation Agreement; or • a Property Vegetation Plan; or • rezoning and/or re-conditioning of relevant landholdings to reflect conservation purposes in consultation with the BSC.	Barrick proposed a Voluntary Conservation Agreement (VCA) and consulted with the OEH in relation to the development of a VCA. The VCA was not agreed to by OEH. DP&I suggested a Voluntary Planning Agreement (VPA) could be used for the Offset areas. The Voluntary Planning Agreement for the proposed offset areas was submitted to DP&I on 28 April 2014.
s.9/p51	An AEMR will be prepared in accordance with the requirements of Consent Condition 9.2 and I&I NSW (Minerals and Petroleum) requirements (Condition of Authority 26) (Section 2.1) and submitted to the Director-General.	Annual Environmental Management Reports (AEMR) have been prepared by CGM in accordance with MCoA 9.2 and rehabilitation aspects are reported in section 5.

4.6.2 Rehabilitation

Following discussions with DI&I (Minerals) on 2 July 2010 and the comments of the Independent Monitoring Panel, Barrick established replicate trials to determine the most suitable rehabilitation procedure(s) for the waste rock emplacements, tailing storage facility bunds and other disturbed areas. Decisions on the optimal blend of rock, subsoil, gypsum and mulches have occurred in consultation with the relevant authorities to determine the long term rehabilitation procedures for the CGM. .

Rehabilitation of completed areas on the northern or southern waste rock emplacement areas was commenced in the 2013 to May 2014 period, with reshaping and placement topsoil and rock in readiness for gypsum application and mulch prior to seeding.

Plate 10: Rehabilitation trial on lake side overburden emplacement with contouring and using straw bale substrate to control erosion and retain soil for vegetation establishment

DnA Environmental conducts an annual assessment of rehabilitation trials located on the Lake Cowal Foreshore, Southern Waste Rock Emplacement, Northern Tailings Storage Facility and Southern Tailings Storage Facility batters.

Rehabilitation status for the latest AEMR reporting period, undertaken in accordance with the Mining Operations Plan is shown in Table 10.

Table 10: Summary of Mine Lease Areas Disturbed/Rehabilitated

	Area Disturbed / Rehabilitated (hectares)		
	2011	2012	**2013**
A MINE LEASE AREA			
A1 Mine Lease(s) Area	2,650	2,650	2650
B DISTURBED AREAS			?
B1 Infrastructure Area[1]	350	350	355
B2 Active Mining Area[2]	107	107	107
B3 Waste Emplacements[3]	335	342	342
B4 Tailings Emplacements	369	369	369
B5 Shaped Waste Emplacement[4]	62	87	96
ALL DISTURBED AREAS[5]	1,223	1,255	1269
C REHABILITATION PROGRESS			
C1 Total Rehabilitated Area[6]	110	110	118
D REHABILITATION ON SLOPES			
D1 10 – 18 Degrees	110	110	118
D2 Greater than 18 Degrees	0	0	0
E SURFACE OF REHABILITATED LAND			
E1 Pasture and Grasses	151	151	151
E2 Native Forest/Ecosystems	38	38	46
E3 Plantations and Crops	0	0	0
E4 Other	0	0	0

1 Includes areas such as ore and soil stockpiles, contained water storages, processing plant and roads.
2 Open pit area.
3 Areas of waste emplacements yet to be shaped and rehabilitated.
4 Areas of waste emplacements that have been shaped and rehabilitated.
5 Includes any area disturbed by mining activities including the Total Rehabilitation Area presented in C1.
6 Any areas that have been rehabilitated including areas of waste emplacements and tailings storage facilities progressively shaped and rehabilitated.

Plate 11: Rehabilitation trials along the southern wall of the Southern Waste Emplacement Area

4.6.4 Rehabilitation Monitoring

The vegetation assemblages reported by DnA Environmental in the Annual Rehabilitation Monitoring Reports, are considered to be representative of and consistent with the final land use and approved rehabilitation objectives for CGM and these were:

- **Lake:** Woodlands occurring within the lake and lake foreshores (RL 205 – 220m);
- **Slopes**: Woodland occurring on flat to gently undulating slopes (RL 210 – 225);
- **Hills:** Woodlands occurring on low ridges, hills and elevated land (RL220 – 245m); and
- **Grass:** Cleared native grasslands, predominantly occurring on flat to gently undulating slopes (RL 210 – 225m).

Major rehabilitation areas assessed as part of the 2013 monitoring program included rehabilitation trials undertaken on the Northern and Southern Tailings Storage Facilities (TSF) and the Lake Protection Bund.

The monitoring methodologies used included a combination of Landscape Function Analyses (LFA), soil analyses and an assessment of ecosystem characteristics using an adaptation of the Biometric Model used in the Property Vegetation Planning Process.

The DnA Environmental Report on Rehabilitation Monitoring, conducted in November 2013, presented the following conclusions:

Lake Foreshore trials

Since 2005 there has been an increasing trend in ecological function in the lake foreshore rehabilitation sites largely due to the increase in ground cover from plants that established as a result of natural regeneration from the topsoil stored seed bank and seed applied by hand broadcasting. The inundation of Lake Cowal in 2010 resulted in a significant increase in floristic diversity.

The ecological data obtained from the lake foreshore rehabilitation area indicated improved plant cover and increasing diversity and abundance of native species being recorded. In 2012 and 2013 the dry conditions had a negative impact of the perennial plant cover and in February 2014 most cover was provided by dead leaf litter.

Overall there have been significant changes occurring on the new lake foreshore area since 2005. The sites have been progressing and are beginning to stabilise despite the extreme climatic conditions.

Tailings Storage Facility trials

Rehabilitation trials on the Northern Tailings Storage Facility (NTSF) and Southern Tailings Storage Facility (STSF) walls were implemented during 2009. An assessment of these areas undertaken during March 2010 recorded each treatment to determine which treatments were more effective and those that had failed. The treatments selected were:

1. NTSF01: Rock mulch and topsoil on the northern TSF; and
2. NTSF02: Topsoil (2009) + Wheaten Hay (2010) on the northern TSF; and
3. STSF01: Rock Ribbon and wheaten hay on the southern TSF.

Both NTSF trial sites were ecologically functional grasslands and in 2013 fell within stability, infiltration and nutrient recycling targets provided by the local native grassland communities. The site on the STSF continued to improve.

All rehabilitation sites had moderate to strongly alkaline soils and a high Cation Exchange Capacity (CEC), were sodic and low in organic matter and phosphorous.

In conclusion, sites situated on both the NTSF and STSF have performed relatively well and despite not meeting all completion targets, the sites are immature and have much ecological development to undertake and have demonstrated significant increases in many ecological attributes over the 2012 to 2014 period.

Southern Offset Area

The two Southern Offset monitoring sites were ecologically very stable due to the relatively high levels of litter largely derived from dead annual plants. The soil properties remained within the local or desirable levels but were both low in organic matter, and in the Offset02 quadrant, the soils continued to be sodic.

Northern Offset Area

The two Northern Offset monitoring sites demonstrated a decline in ecological function in 2013, however this reduction was also evident within the natural slope and floodplain communities as a result of the dry conditions. Both Offset sites fell within the stability, infiltration and nutrient recycling completion targets. The sites also demonstrated a decline in floristic diversity however site Offset03 continued to have a high diversity of native species.

Northern Waste Rock Emplacement Trials

A separate Northern Waste Rock Emplacement (NWRE) Rehabilitation Monitoring Report was prepared by DnA in February 2014.

The NWRE was dominated by a heavy cover of dead leaf litter derived largely from an abundance of exotic annual plants such as *Lolium rigidum* that had established from the soil seed bank, however the early results indicate that better ecological stability, infiltration and nutrient recycling can be obtained by the application of a straw mulch, regardless of topsoil depth. The prolonged dry conditions did not allow a true representation of floristic diversity which would be different under more favourable seasonal conditions.

While there were anomalies in soil characteristics even within replicated treatments, it appeared too early to tell which depth of topsoil and mulch application was more conducive to the establishment of a functional and diverse woodland community on NWRE that would be representative of the hills and ridges of the Lake Cowal area.

Southern Waste Emplacement Rehabilitation Trials

The overall better performing sites on the SWRE in terms of ecological sustainability and similarity to the hill reference sites, were those with a topsoil application (i.e. rock mulch + topsoil or topsoil only treatments).

Under the conditions of this trial these two treatments were very similar in the parameters that were measured but there may be additional benefits in using the underlying rock mulch which provides additional stability in the case of high rainfall or drought. especially if applied before the vegetation had become established.

The treatments compared in these trials have shown that initial erosion control measures such as the light-medium application of native pasture hay or other mulch treatments in rows along the contour and/or shallow ripping along the contour may be required to provide immediate soil protective cover and additional erosion control features.

Conclusion from the Rehabilitation Monitoring Report (DnA 2013) was "*In order to reach completion targets associated with woodlands occurring on ridges and hills, there will be a requirement to ensure an appropriate diversity and density of trees and shrubs are incorporated into the planning and implementation of future rehabilitation areas."*

4.6.5 Conclusion

The Rehabilitation and Offset Management Plan (in conjunction with the requirements of the Land Management Plan and Mining Operations Plan) provide a basis for the rehabilitation of the CGM site. The application of the rehabilitation methods outlined in the management plans and MOP have proved an ordeal on the CGM site due to the influence of the extreme weather conditions experienced (both wet during 2010-2011 and dry in 2012-2014).

Rehabilitation trials on the CGM site have continued to determine suitable substrates and procedures for the stabilisation and revegetation. The rehabilitation trials have exhibited variability of results of vegetative establishment on the blends of rock, subsoil, gypsum and mulches, and the results of the trails have also been affected by the weather conditions experienced during the 2010 to May 2014 period.

The rehabilitation targets outlined in the MOP and reported in the AEMR's have generally not been met due to the influence of the extreme weather conditions on the establishment and succession of growth, however improvement was noted during this audit with the activities undertaken between May 2013 and May 2014 increasing the area of reshaped land where disturbance has been completed and the revegetation of these areas commenced to address the rehabilitation targets in the MOP.

Recommendation 2

The waste rock emplacements that have reached the areal and height criteria approved in the MOP and the Cowal Gold Project Environmental Assessment, should continue to be progressively reshaped and have the proven blends of rock, subsoil, gypsum, mulch and seed mixture (identified by the rehabilitation trials) applied, when the weather conditions are conducive with seed germination and establishment of a stabilising cover crop to meet the rehabilitation targets expressed in the MOP and AEMR predictions.

4.7 Bushfire Management

[Minister's Condition of Approval 3.8]

4.7.1 Bushfire Management Plan

The Bushfire Management Plan required under MCoA 3.8 was approved by DIPNR in 2003. The Plan was reviewed during 2009. The Bushfire Management Plan outlines fuel management and fire incident control measures implemented at CGM to reduce fire risk to the immediate rural area. The Bushfire Management Plan also describes response procedures to fires including assessment, control and clean-up, generally guided by the NSW Rural Fire Service (RFS).

Response capability available in the CGM area, additional to the CGM equipment and personnel, includes three regional RFS brigades (Wamboyne, Clear Ridge and Blow Clear).

The commitments outlined in the Bushfire Management Plan are summarised in Table 11.

Table 11: Bushfire Management Plan Commitments

Section/ Page No.	Bushfire Management Plan Commitments	Comments
s.5.2/p14	On-site "emergency firefighting unit" will be located prior to the commencement of significant construction works. Fuel management and hazard reduction works associated with the Project construction period will also commence at this time (MCoA 3.8(a) and (b) and section 6.4.4 of the EIS)	Barrick have two Category 7 fire tenders, two (2) trailer-mounted 1000L firewater tanks and fire hose units housed in the Rescue Station located near the main maintenance area workshops. Barrick also has two spill response units available on site. A first aid/ambulance vehicle is also permanently based on site and a first aid room is located in the administration building adjacent to the process plant.
	 **Plate 12: CGM Category 7 fire tenders**	 **Plate13: CGM Emergency Response Rescue Station**
s.5.3/p15	Barrick intends to have at least one trained and equipped fire response team within each shift at the project (section 4.1.1)	Permanent CGM Emergency Response Officers are employed on-site on a rotational shift basis. The CGM Emergency Response Team undertakes regular training sessions in firefighting skills and fire appliance familiarization and also receives regular training as members of RFS. General CGM staff fire training includes basic theory on the Emergency Response Plan, fire awareness theory and basic hose handling techniques.
s.5.4/p15	The project will have a fully functional and approved fire water supply designated to supply the mine offices, workshops and ancillary infrastructure. RFS brigades will contact the Project Emergency Response Coordinator if reticulated water is required for bushfire purposes.	RFS are able to draw water from Pond D6 or fill tankers from the Pond D6 pump off-take manifold or any other hydrant on site in the evnt of any fire incidents.
s.5.6/p15	Data from the site meteorological station will be used to determine whether conditions are suitable for fire management activities and bushfire fighting activities (MCoA 8.7)	Data from the site meteorological station is continually available to the CGM Emergency Response Officers for use during firefighting activities.
s.5.7/p16	A register will be maintained to outline the following within the Project area and Barrick-owned lands: • records of maintenance works undertaken in fire trails and the date the work was undertaken; • records of any fuel management measures undertaken and the dates the work was undertaken; and • details of the fire history of the project area, recorded as site observations.	A Fire Trail Register for the mine lease area is maintained on the CGM computer network. The register lists the location of the fire trails and the trails are also marked on a site map, action planned for fire trail maintenance, date of action required and completion dates.
s.6.2/p16	Strategies for fuel management will be adopted as appropriate and include: • grazing, slashing, pruning, mulching or other operations; • fuel management via burning where conventional fuel management strategies are inappropriate, impracticable or not successful; and	The bushfire management measures carried out include: • creation of firebreaks around the ML 1535 boundary by slashing and grading; • slashing of large open areas within ML 1535 with high fuel loads; • mowing and grounds maintenance of bore-field

Section/ Page No.	Bushfire Management Plan Commitments	Comments
	• maintenance of designated firebreaks around the project bore-field stations, the ML boundary and internally, around the mine (MCoA 3.8(a), section 6.4.4 of the EIS and the Bland Shire Local Disaster Plan).	stations; • conducting regular inspections of the ML 1535 area to identify any significant fire risks.
s.6.3/p17	Barrick will minimise removal of trees and vegetation and restrict clearing to areas occupied by mine activity, buildings, paved surfaces and areas necessary for fire control in accordance with the NVC act and MLRVMP with regard to fuel management work. (MCoA 3.1(B)).	Development of the CGM on ML 1535 has occurred with removal of trees and other vegetation restricted to areas required for by mine activity, buildings, paved surfaces and areas necessary for fire control.
s.6.3/p17	No disturbance of Belah Woodland in the DA area occurs and soil stockpiles should not be located in Wilga Woodland as identified in Figure 3-13 of the EIS (MCoA 3.1c and 3.1 (D)).	No disturbance of Belah Woodland has occurred with the development of the CGM.
s.7.1/p19	A fire hazard reduction audit of Barrick-owned lands will be conducted annually, in consultation with the NSW RFS to identify hazard reduction methods to be adopted on Barrick-owned lands each season.	A review of fire hazard across the Barrick owned lands is conducted annually to identify hazard reduction works required.
s.7.1/p19	A general hazard audit of the project will be conducted in accordance with hazardous industry planning and advisory paper no. 5 "Hazard Audit Guidelines" 12 months after commencement of operations and every three years thereafter (MCoA 5.4(e)).	A Hazard Audit is conducted by Dean Shewring of Pinnacle Risk Management Pty Ltd each 3 years. The initial Hazard Audit was conducted 12 months after commencement of operation of process plant (i.e. April 2007), a second Hazard Audit was conducted on 19-22 April 2010 and a third Hazard Audit was conducted on 8-12 April 2013.
s.7.2.1/p19	The width of firebreaks will be equivalent to adjoining tree height, where practicable, to account for the majority of short distance spotting for low and moderate fires. Firebreaks will be maintained by a combination of slashing or grading, and by spraying or cultivation. This approach to firebreak location and maintenance has been agreed by the BSC and NSW RFS and is considered adequate.	Firebreaks are established and maintained in accordance with these requirements and are entered onto the firebreak location register for maintenance to the satisfaction of BSC and NSW RFS.
s.7.2.1/p19	Firebreak maintenance will be undertaken as determined by monthly inspections and maintenance works will be recorded on the Fire Trail Register.	Regular inspection of firebreaks occurs by the CGM personnel and maintenance is conducted as required to ensure the fire breaks meet BSC and NSW RFS requirements.
s.7.2.3/p20	General fuel management measures and fire hazard reduction (e.g. grazing, mulching, slashing etc) will be implemented in accordance with the requirements of annual hazard reduction audit.	Fuel management by means other than burning have been implemented by CGM including grazing, slashing, pruning, mulching or other operations (e.g. ploughing, herbicide application and rolling).
s.7.2.3/p20	The Fire Safety Study, Hazard and Operability Study and Final Hazard Analysis will be conducted to assess and manage "offsite risk to people and the biophysical environment" (MCoA 5.4(a)).	A Fire Safety Study prepared by Pinnacle Risk Management for CGM was submitted to the Commissioner of the NSW Fire Brigade and DIPNR for approval in Dec 2004 in accordance with MCoA 5.4. A Hazard and Operability Study prepared by Aker Kvaerner Australia Pty Ltd for the main plant area was submitted to DIPNR in Dec 2004. The Final Hazard Analysis was submitted to DIPNR on 22 Dec 2004 and approved in March 2005.
s.10/p23	An AEMR will be prepared in accordance with the requirements of project MCoA 9.2 and DMR requirements and submitted to the director general. Bushfire related issues to be reported in the AEMR.	Annual Environmental Management Reports (AEMR) prepared by CGM in accordance with MCoA 9.2 includes bushfire management and actions in AEMR section 3.16.

4.7.2 Conclusion

The Bushfire Management Plan and Memorandum of Understanding with the NSW Rural Fire Service provide a sound basis for the management of CGM MLA and Barrick owned land in relation to control

of vegetation fuel sources and firefighting ability by the CGM staff. CGM has dedicated fire and hazard response equipment housed in the Emergency Response / Rescue Station located near the administration block, process plant and maintenance facilities on the site.

4.8 Land Management

[Minister's Condition of Approval 3.10(A)(i)]

4.8.1 Land Management Plan

[Minister's Condition of Approval 3.10(A)(i)]

The Land Management Plan prepared to satisfy MCoA 3.10(A)(i) was approved by DIPNR in 2003. A review of the Plan in 2009 indicated that a revision was not necessary as there had not been any changes to applicable guidelines, environmental requirements or operational practices that would necessitate a revision/update of the Plan. The Land Management Plan outlines the management strategies and measures for all of the Barrick land holdings.

The Commitments outlined in the Land Management Plan are summarised in Table 12.

Table 12: Land Management Plan Commitments

Section/ Page No.	Land Management Plan Commitments	Comments
P11/s.3.2	Barrick-owned land outside the project area will continue to be utilised for farming/agricultural production by Barrick and/or licensees that sign agreements to conduct agricultural activities on Barrick-owned land	Management of Barrick owned land outside the ML 1535 area is arranged through agreements with specific farmers and/or organisations.
P13/s.4.1	The relocated TSR will be separated by fencing from Barrick's mining operations to ensure the unimpended movement of stock in the relocated reserve. Pastures on the relocated TSR will be managed by the CRLPB	The relocated Travelling Stock Route is separated from the CGM ML 1535 boundary with fencing that restricts movement of stock onto the ML area but does not restrict stock movement on the relocated TSR.
P14/s.4.3	Barrick will manage stock in enhancement areas in order to encourage the natural regeneration of native plant species as recommended by the LWMPLC, MLRVMP, JLWMP and the NSW Wetlands Management Policy through fencing control and the application of grazing management.	Four exclusion fences are established around the remnant vegetation areas on the Hillgrove property to assess the long term impact of kangaroos on pasture. Additional fencing has also been erected on the Thornton and Lake Cowal properties to reduce the impact of sheep grazing on remnant vegetation.
P14/s.4.3	Barrick will require Licensees of each property to prepare a Farm Management Plan. If in the future Barrick intended to farm these properties then a farm manager would prepare plans, to cover all Barrick owned property	A Farm Management Plan has been prepared for the 'Lake Cowal" property dated 13 March 2013. Other Barrick owned properties are being rested and a Farm Management Plan will be prepared for each when they become active again for grazing or cropping.
P15/s.4.4	Barrick-owned land will be managed to avoid overgrazing and subsequent damage to native pastures. This will be achieved by implementing a Tactical Grazing approach as described in Section 4.3	Implementation of tactical grazing with 'crash grazing with sheep and cattle' has occurred to minimise fire risk at Hillgrove, Lakeside, Lake Cowal and Thornton.
P15/s.4.5	Paddocks requiring pasture renovation or re-establishment and those paddocks suitable for harvesting of the aforementioned pasture seeds will be identified. Fertilisers and tillage techniques may be utilised on improved pastures. Direct drilling and minimum tillage techniques will be preferentially used to minimise soil disturbance and fertilisers may be applied periodically to improve soil fertility. The Tactical Grazing approach will be implemented for improved pastures on Barrick-owned land.	Pasture renovation or re-establishment, and paddocks suitable for harvesting have been implemented at Hillgrove and Corringle properties.

Section/ Page No.	Land Management Plan Commitments	Comments
P15/s.4.6	Areas of Barrick-owned land will continue to be available for pastures and other agricultural uses following mine closure. The areas available for different types of land-use will be determined by land ownership and consultation and agreements with regulatory agencies	To be determined following mine closure by land ownership and consultation and agreements with regulatory agencies.
P16/s.5.1	In accordance with consent condition 3.4(a)(vii) which requires the protection and enhancement of existing retained habitats within the mining lease area and 3.1(B) which requires the minimisation of removal of trees and other vegetation from the mine site, a Vegetation Clearance Protocol (VCP) has been developed for the Project. All vegetation clearance activities required by the project will be conducted in accordance with the VCP.	The Vegetation Clearance Protocol is implemented prior to any vegetation disturbance on any area within the MLA where clearance is proposed. Exclusion fences have been established around the remnant vegetation area on the Hillgrove property to assess the long term impact of kangaroos on pasture, and additional fencing has also been erected on the Thornton and Lake Cowal properties to reduce the impact of sheep grazing on remnant vegetation.
P16/s.5.1	In accordance with consent condition 3.1(B) and the FFMP, clearance activities within the mining lease area will be restricted to the areas occupied by mine activities, buildings and paved surfaces, and those necessary for fire control. The VCP is consistent with the JLWMP and LWMPLC to minimise vegetation clearance in the region.	The Vegetation Clearance Protocol is implemented prior to vegetation disturbance on any area where clearance is proposed, to ensure clearance activities within ML 1535 are restricted to the areas required for mine activities.
P16/s.5.2	In accordance with consent condition 3.1c and the FFMP, topsoil stockpiles within the ML will not be located within any area of the remnant Wilga Woodland. Avoidance of Wilga areas within the ML will reduce the area of some soil stockpiles in comparison to the stockpiles shown on Figure 5-2 of the Project Environmental Impact Statement (EIS)	No soil stockpiles have been located within any area of remnant Wilga Woodland.
P17/s.5.3	A number of management measures will be implemented within the compensatory wetland and remaining areas of wetland within ML1535 including: prevention of livestock from entering the enhancement areas to encourage the natural regeneration of native plants; measures to minimise the spread of weeds and competition with native flora; measures to minimise the occurrence of feral pests; and limiting vehicular access.	Management measures to protect the compensatory wetland areas have been implemented in accordance with the Compensatory Wetland Management Plan.
P19/s.5.4.1	In order to encourage the natural regeneration of native plant species, livestock will be controlled in enhancement areas 1 to 4 through fencing control and management. The management of livestock will vary between enhancement areas, as outlined in Table 1 (LMP).	Presence of livestock in the enhancement areas is controlled with fencing and farm management practices.
P20/s.5.4.1	Selective planting of native vegetation may be conducted in enhancement areas 1 to 4 to increase the quantity of remnant vegetation and to link areas of existing remnant vegetation, where practicable. Livestock will be prevented from entering any portions of the enhancement areas which have been revegetated with native plant species.	Livestock are prevented from entering any portions of the enhancement areas that have regenerated with native plant species, by fences erected by CGM.
P21/s.5.4.1	Revegetation activities will be implemented by a suitably qualified person(s) and coordinated by the Environmental Manager.	Revegetation activities in the remnant vegetation areas, is managed in co-operation with the Lake Cowal Foundation and DnA Environmental.
P21/s.5.4.2	Remnant vegetation monitoring will be conducted within the enhancement areas to:	Remnant vegetation monitoring is conducted annually by DnA

Section/ Page No.	Land Management Plan Commitments	Comments
	assess the progress of natural regeneration; determine whether vegetation planted within the enhancement areas is establishing; and determine the need for any maintenance and/or contingency measure (such as the requirement for revegetation, supplementary plantings and weed control).	Environmental to assess the status of the vegetation and determine the need for any maintenance and/or contingency measures in relation to the regeneration.
P21/s.5.4.2	A number of survey plots (50 x 20 m) will be established within each enhancement area to obtain quantitative data on species and abundance.	A research study of native grass recruitment utilising pasture cropping trials was set up on the Hillgrove property as a University of Sydney honours project. These trials were conducted and funded through the Lake Cowal Foundation.
P21/s.5.4.2	Visual observations will be made on a regular basis of areas revegetated with native plants to assess the establishment and the health of planted vegetation. This information will be utilised to determine the need for any supplementary plantings that may be required.	Remnant vegetation monitoring has been conducted annually by DnA Environmental since 2008. Reports have been prepared describing the status of the vegetation in each survey plot, with photo points established for each quadrat for recording the annual appearance.
P24/s.6.2	In accordance with BSC advice, Barrick will control weed species (African Boxthorn, Johnston Grass, Scotch/Illyrian Thistle, Silverleaf Nightshade, Spiny Burrgrass, St. Johns Wort, Wild Rash) in accordance with the Lachlan Valley Noixous Weeds Advisory Group weed management plans. The weed management plans are provided in LMP Appendix B.	Annual weed surveys and farm management assessment has been conducted by Carnegie Natives. Due to above average rainfall during 2010-11, exceptional growth of problem species occurred including South African Box Thorn, Bathurst and Galvanised Burr, Scotch Thistle, St John's Wort, Purple-Flowered Devil's Claw and St Barnaby's Thistle. On-going weed control measures are carried out on a daily or weekly basis as required.
P24/s.6.4	Preventative measures will be implemented on Barrick-owned land related to movement of stock, use of locally sourced stock feed, reduction of on-farm weed sources.	Restriction/management of stock movements, select stock feed purchases, and physical and/or chemical weed control measures are being employed by Barrick with an ongoing regular program.
P25/s.6.5	Physical removal and chemical application are the main weed control measures to be applied.	
P26/s.6.6	Barrick-owned land will be surveyed for weeds annually. Follow up inspections will also be made of specific areas following the implementation of weed control measures (to assess the success of the weed controls).	Annual weed surveys and farm management assessments have been conducted by Carnegie Natives. Due to above average rainfall during 2010-11, exceptional growth of problem species occurred including South African Box Thorn, Bathurst and Galvanised Burr, Scotch Thistle, St John's Wort, Purple-Flowered Devil's Claw and St Barnaby's Thistle.
P26/s.6.6	The BSC will be consulted for the suitable control of any new noxious weed species if encountered in the protect area to meet the requirements of the Noxious Weeds Act, 1993.	Consultation with BSC would occur if any new noxious weed species are encountered on the Barrck owned properties.
P28/s.7.2	Barrick will undertake pest control operations in conjunction with adjacent landholders in accordance with CRLPB and NSW Agriculture recommendations and regular consultation with the CRLPB and NSW Agriculture (prior to and following annual pest inspections) and local landholders and landholder groups through the CEMCC process.	A regular control program for foxes is conducted. Rodent control was implemented during 2011-2012 on the ML 1535 area and Barrick owned land. Control of spiders and black crickets has also occurred at 3 to 6 monthly intervals.

Section/ Page No.	Land Management Plan Commitments	Comments
P28/s.7.2	Barrick personnel responsible for land management will use the Vertebrate Pest Control Manual Appendix C (NSW Agriculture, 2003b) as a guide for pest control activities on Barrick-owned land in consultation with the CRLPB and NSW Agriculture.	Use of the NSW Agriculture Vertebrate Pest Control Manual for pest control activities occurs as necessary.
P30/s.8.2	Barrick will aim to prevent land degradation and rehabilitate previously degraded land or land affected by their activities where practicable. This aim is in accordance with the principles of the MLRVMP, JLWMP and LWMPLC to reduce soil erosion and damage to soil characteristics.	Rehabilitation of previously degraded land or land affected by Barrick activities occurs as practicable in accordance with the Land Management Plan.
P30/s.9.1	Mine rehabilitation works will be undertaken progressively as construction activities and mining proceed, in accordance with MCoA 3.6 and Section 5 of the EIS.	Rehabilitation trials as part of the progressive rehabilitation program have been undertaken on the disturbed areas of the ML 1535 site.
P31/s.9.2	Barrick will develop a strategy for the long-term (ie post mine closure) land-use of its landholdings, including the project area…..The strategy for long-term land-use of the project area and Barrick-owned land will be submitted by year 7 of mining operations or five years before mine closure, whichever is the earlier. The strategy will be developed in consultation with the DIPNR, EPA, NPWS, BSC, the CEMCC, and to the satisfaction of the D-G.	The long-term land-use strategy of the ML 1535 area and Barrick-owned land will be submitted five years before mine closure. The strategy will be developed in consultation with the DIPNR, EPA, NPWS, BSC, and CEMCC, with land owners and consultation and agreements with regulatory agencies.
P35/s.12	Prepare AEMR in accordance with the requirements of consent condition 9.2 and DMR requirements and submitter to the Director-General.	Annual Environmental Management Reports (AEMR) have been prepared by CGM in accordance with MCoA 9.2. Land management issues are reported in the AEMR sections: • Section 5 Barrick-owned land under license agreements • Section 3.9 weed and pest control • Section 3.7 – Flora - remnant vegetation management monitoring

4.8.3 Remnant Vegetation Enhancement Program

DnA Environmental conduct annual remnant vegetation enhancement monitoring for the CGM site. Permanent monitoring sites were established in areas of remnant woodland to measure a range of ecological features and track these changes as part of the Remnant Vegetation Enhancement Program (RVEP). Many sites have been inaccessible since the flooding of Lake Cowal in 2010, so only six RVEP sites were assessed during November 2013 survey (Hill01, Hill02, Hill03, Hill04, RVEP3 and RVEP RVEP4).

The wet weather that commenced in 2010 resulted in the inundation of Lake Cowal and water levels in Lake Cowal remained at very high with a peak flood event occurring March 2012. Since March 2012 there has been limited rainfall and most of 2013 was very dry with only 341.6mm recorded. This low rainfall has had a significant impact on the floristic diversity and composition in the remnant vegetation areas. The Lake water level has continued to recede and at the time of remnant vegetation monitoring (4-8th November 2013) the water was at RL 204.7m.

There have been overall minor changes in the mature tree populations with sites Hill01 and Hill03 on Fellman's Hill exhibiting medium density regrowth dominated by *Eucalyptus dwyeri* (Dwyer's Red Gum). Sites RVEP3 and RVEP4 are open woodland containing scattered old growth *E. camaldulensis* trees along the western foreshore and southern floodplain of Lake Cowal.

No consistent trend in changes in total ground cover have been noted since 2008 but typically most sites have demonstrated an overall improvement as a result of reduced grazing pressure combined with better seasonal conditions on Hill02 and Hill04 sites.

The prolonged dry conditions in 2012-2013 resulted in increased macropod grazing in some sites, especially Hill01 and Hill03. Within Hill02, the fenced exclosure has demonstrated that heavy macropod grazing can have significant effects on the recovery and health of the woodland vegetation. In the more open grassland areas the impacts were relatively minor and macropod grazing in these grassland areas is likely to be desirable to reduce herbage biomass, encourage new plant growth and maintain species diversity.

4.8.4 Conclusion

The Land Management Plan prepared to satisfy MCoA 3.10(A)(i) provides the basis for the long term management of the disturbed areas of ML 1535 and collates many of the commitments in other plans that also have associated long term management and rehabilitation strategies / processes for the ML are (e.g. Flora and Fauna Management Plan, Remnant Vegetation Enhancement Program, Rehabilitation and Offset Management Plan, Compensatory Wetland Management Plan etc).

4.9 Compensatory Wetland Management

[Minister's Condition of Approval 3.10(A)(ii)]

4.9.1 Compensatory Wetland Management Plan

The Compensatory Wetland Management Plan required under MCoA 3.10A(ii) was approved by DIPNR in 2003. The Compensatory Wetland Management Plan was reviewed in 2009 and as there had been no changes to the applicable guidelines, environmental requirements or operational practices no revision/update of the Plan was required.

The objectives of the Plan outline the compensation measures to be implemented for the loss of the 120ha of wetland that occurred during the mine development, through the enhancement of existing wetland within the CGM mining lease area during operation (and to continue following closure of the mine).

The Compensatory Wetland Management Plan includes Commitments that are listed in Table 13.

Table 13: Compensatory Wetland Management Plan Commitments

Section /Page No.	Compensatory Wetland Management Plan Commitments	Comments
s.6.1/p18	Wetland enhancement measures will be implemented within the Compensatory Wetland areas including: • the prevention of stock entry Into the enhancement area to encourage the natural regeneration of native plants; • measures to minimise the spread of weeds and competition with native flora; • measures to minimise the occurrence of feral pests; • provision of structural habitat for aquatic fauna; and • limiting vehicular access.	The compensatory wetland areas have been fenced to prevent stock entry, implementation of weed management , fox baiting, rodent and locust management measures have been introduced as required, and vehicle access to the compensatory areas is limited by fencing and gated access points.
s.6.1/p18	Planting of native wetland species within the compensatory wetland may be undertaken if monitoring indicates that doing so is necessary to enhance the regeneration of native vegetation within the area	Monitoring of the wetland areas occurs to assess native vegetation succession, particularly along the lake foreshore as the water recedes following filling of the lake on 2010-2011. Planting of native species has not yet occurred, but will occur if the survey results indicate enhancement of the compensatory areas can be achieved.
s.6.1.1/p19	Monitoring will be conducted to assess the regeneration of native vegetation within the compensatory wetland and to determine the need for any maintenance and/or contingency measures (such as the requirement for the planting of native species and weed/pest control).	
s.6.1.3/p19	Revegetation for the New Lake Foreshore will create a freshwater ecological community with a focus on the establishment of waterfowl habitat.	Filling of the lake in 2011-2012, followed by near drought conditions during 2012-2014 has compromised development of the establishment of waterfowl habitat.

Section /Page No.	Compensatory Wetland Management Plan Commitments	Comments
s.6.2.4/p25	The New Lake Foreshore will primarily be revegetated using native seedlings propagated on-site or obtained from a supplier	This has not been progressed as the New Lake Foreshore has not yet been established.
s.6.2.4/p26	Revegetation methods will be reviewed and revised annually in consideration of the results of revegetation trials.	Annual reviews of revegetation methods have been carried out by DnA Environmental and Carnegie Natives.
s.6.2.5/p26	Revegetation species for the New Lake Foreshore will also be selected in consideration of the lake's hydrological regime (wetting and drying cycles), species performance during revegetation trials and suitability to substrate conditions. Species selection will be an iterative process, whereby revegetation trials and monitoring will provide information as to the most appropriate species for revegetation	Selection of suitable species for revegetation of the New Lake Foreshore is considered during the assessment of the rehabilitation and compensatory wetland area monitoring. Revegetation has not progressed as the New Lake Foreshore has not yet been established.
s.6.2.6/p27	As a component of rehabilitation of the New Lake Foreshore, a number of revegetation trials will be undertaken. The revegetation trials will be drafted in the MOP and will include: evaluation of the relative revegetation establishment rates of native plant species; assessment of various establishment procedures and suitability of propagation methods; and determination of the New Lake Foreshores' suitability as revegetation media	Revegetation trials will be undertaken based on findings of annual DnA Environmental surveys.
s.7.2/p29	Weed control within ML 1535 wetland areas will be conducted in accordance with the applicable procedures detailed in the LMP to limit adverse weed effects at neighbouring private properties.	Carnegie Natives carries out annual weed surveys on the MLA and all Barrick owned land. Weed control is conducted regularly to reduce potential for weed invasion to private properties.
s.7.3/p31	The Barrick employees responsible for land management will implement pest control measures on Barrick-owned land, including wetland areas within ML 1535, in consultation with the CRLPB and NSW Agriculture, and in co-ordination with adjacent landholders. Pest control activities include: regular property inspections to assess the status of pest populations within Barick-owned land, including wetland areas within ML 1535, and the need for the implementation of appropriate control strategies;	Weed control, spraying for control of locust (APLs) infestation, and fox baiting programs have been implemented by CGM.
s.7.3/p31	Pest control for declared pests and foxes will occur in accordance with the RLP Act. Post control inspections to assess the effectiveness of the control measures implemented and review the need for alternative or additional control methods	Pest control inspections to assess effectiveness of the control measures have been conducted in accordance with the Rural Land Protection Act.
s.8.1/p33	Subsequent to the removal of livestock, monitoring will be conducted to determine whether natural regeneration is occurring within those areas subject to enhancement measures. The monitoring of natural regeneration will be conducted annually following the removal of livestock.	Annual monitoring of Barrick owned land has been carried out by DnA Environmental to assess natural regeneration within areas subject to enhancement measures.
s.8.1.2/p34	Monitoring will be conducted to determine whether vegetation planted within the new lake foreshore is establishing and to determine the need for any maintenance and/or contingency measures	Annual monitoring of the lake foreshore areas has been carried out by DnA Environmental. Monitoring of the New Lake Foreshore has not occurred as no revegetation of this area has yet commenced.
s.8.1.3/p34	Incidental observations of fauna activity within ML 1535 wetland areas will be documented during weekly inspections of ML 1535. Surveys will also be conducted to determine the usage of wetland areas by wildlife.	Incidental 'drive' around surveys are conducted weekly on the MLA by CGM Environmental staff and observations recorded.
s.8.1.3/p34	Waterbird surveys will be conducted by year 5 of mine operations within the compensatory wetland and remaining wetland areas within ML 1535, and thereafter, annually. A number of survey transects will be established within the compensatory wetland and remaining wetland areas within MML 1535 to survey waterbird diversity and abundance.	Lake Cowal Waterbird Monitoring Surveys have been conducted three times per year (in January, August and October) by Peter Gel and Paul Peake from the Centre for Environmental Management University of Ballarat.

Section /Page No.	Compensatory Wetland Management Plan Commitments	Comments
s.8.1.3/p34	Fish fauna surveys will be conducted within the compensatory wetland and remaining wetland areas within ML 1535, no more than annually, when the lake is full.	Annual fish surveys have been conducted by frc environmental, since the filling of Lake Cowal in 2011.
s.8.1.3/p34	A survey of terrestrial fauna will also be conducted of the New Lake Foreshore once vegetation has established and before year six of mine operations. Survey may include visual and opportunistic observations, active searches, spotlighting, identification of bird calls, identification of amphibian calls, Elliott trapping and electronic call detection.	Terrestrial fauna surveys have been included in the DnA Environmental reports. Specific monitoring of the New Lake Foreshore area has not yet been undertaken as the New Lake Foreshore area has not been established.
s.8.2/p34	Maintenance activities may be undertaken to facilitate the enhancement of wetland habitats. Routine maintenance measures may include: • supplementary plantings to replace any losses; • control of erosion and sedimentation; • the use of tree guards to provide protection against wind, frost, vermin and herbivores; • weed and pest control; and • limiting vehicle access	Maintenance activities in the wetland habitat areas around the lake foreshore temporary and permanent bunds, has occurred as required to reduce erosion and control weed infestation and pests.
s.9/p35	Prior to the cessation of mining operations, Barrick will develop a strategy for the long-term land-use of its landholdings, including the wetland areas within ML 1535. The strategy for long-term land-use of the Project area and Barrick-owned land will be submitted five years before mine closure. The strategy will be developed in consultation with the DLWC, environmental protection authority, NPWS, BSC and to the satisfaction of the Director-General.	Noted. Yet to be commenced.
s.12/p39	An AEMR will be prepared in accordance with the requirements of consent condition 9.2 and DMR requirements and submitted to the Director-General.	Annual Environmental Management Reports (AEMR) prepared by CGM in accordance with MCoA 9.2 address compensatory wetland management in section 3.7.

4.9.2 Compensatory Wetland Area Surveys

Surveys of the compensatory wetland area have been undertaken annually by DnA Environmental during late spring (October/November), since 2005. The latest report dated February 2014 concluded:

> *"The compensatory wetland regeneration monitoring has been undertaken to monitor changes in vegetation cover, species diversity and to determine the extent of regeneration if any, occurring within the main wetland areas within the Mining Lease.*
>
> *Due to above average rainfall conditions since 2010 which resulted in the inundation of Lake Cowal, only two of the twelve compensatory wetland monitoring sites have been assessed during 2010 to 2014.*
>
> *Sites CW3 and GW1 are located on the Lake Cowal foreshore and due to flooding of the lake these sites have undergone a significant transformation due to partial inundation, the receding water and substantial deposition of sand and vegetative debris. These effects resulted in a decline in total ground cover, especially at site CW3.*
>
> *There was considerable movement of large logs and branches around site GW1. There continued to be healthy population of skinks that inhabit the fallen branches and leaf litter indicating the importance of retaining these components as critical habitat requirements.*
>
> *Annual exotic species were abundant at both sites and had taken advantage of the disturbed and moist foreshore areas as the lake waters recede. Both sites exhibited significant recruitment with seedlings of E. camaldulensis and Glycyrrhiza acanthocarpa common along the receding lake foreshore area.*

The permanent photo points and general area photographs show a marked improvement in tree health in most areas around the Lake Cowal environment. The majority of areas that were typically subjected to high grazing pressure around the leased grazing lands in the past have significantly improved levels of ground cover due to a reduction in total grazing pressure.

In conclusion it appears grazing pressure and climatic influences have had a dramatic influence on the wetland communities with the early results indicating that improved management in the grazed wetland areas is required, particularly during the very dry years. The lake foreshores have provided a dynamic environment as a result of flood waters and active wave action and these have had a significant influence on the structure and composition of the two lake foreshore communities as quantified by the annual monitoring program."

4.9.3 Conclusion

The Compensatory Wetland Management Plan provides a comprehensive management and monitoring regime that is providing detailed reports on the status of the accessible compensatory wetland areas. The surveys and reports on the flora and fauna in the declared areas are indicating that the removal of livestock from grazing in the compensatory wetland areas and the climatic influences (particularly the heavy rainfall years and flooding of the Lake Cowal area), have had a significant positive influence on the structure and composition of the lake foreshore communities.

4.10 Water Management

[Minister's Condition of Approval 4.1/4.2]

4.10.1 Site Water Management Plan

The Site Water Management Plan was prepared to satisfy the requirements of MCoA 4.1, and approved by DIPNR in 2003. The Plan was subsequently amended in November 2004 and December 2006. A further review of the Plan was undertaken in 2009 and a revised Plan developed to reflect the approved Modifications to the Development Consent. The revised Plan includes changes to site water management, water supply and associated monitoring (e.g. water supply description, water supply schematic and groundwater monitoring, including the saline groundwater supply bore-fields); application of schematic programs to reflect the revised Surface Water, Groundwater, Meteorological and Biological Monitoring Programme (SWGMBMP) and incorporation of measures to evaluate water quality data obtained from monitoring as required by Development Consent Condition 8.2(a)(iii).

The consolidated revision of the Site Water Management Plan was completed in November 2010 following receipt of comments from NoW and DECCW. The Site Water Management Plan was further revised and submitted to DP&I in February 2012. Comments were received by Barrick from DP&I on 14 August 2012. The Site Water Management Plan was further revised in August 2014 and submitted to DP&I. No response had been received by Barrick from DP&I in relation to approval of the Plan at the date of this audit (May 2014).

Commitments in the Site Water Management Plan are listed in Table 14.

Table 14: Site Water Management Plan Commitments.

Section / Page No.	Site Water Management Plan Obligations	Comments
s.4/p.22	The Up-catchment Diversion System and Internal Catchment Drainage System provide for the diversion of upper catchment runoff and the containment of potentially contaminated water respectively.	The internal drainage system, Up-Catchment Diversion System, and settlement ponds were constructed in 2004 in accordance with the Site Water Management Plan.
s.4/p.22	Surface waters that collect within the Internal Catchment Drainage System will be managed by a series of contaminated water storages, bunds and drains. Internal Catchment Drainage System contained	Construction of the D1 and D4 water storages commenced during 2004 and were completed by January 2005. Water management pond D5 was completed adjacent to the process plant area in 2005.

Section / Page No.	Site Water Management Plan Obligations	Comments
	water storages for CGM runoff comprise storages D1, D2, D3, D4, D5, D8A and D8B. Contained water storages D1 to D5, D8A and D8B will be used to contain runoff from the waste emplacements and general site area. Water will be pumped to contained water storages D6 or D9 (process water storages) for consumption during ore processing.	Toe drains and contained water storages, D2, D3, D8A and D8B were constructed in stages around the waste emplacements and ore stockpile areas between 2005 and 2007. Water management pond D9 for temporary storage of water to supplement the bore water supply, was commissioned in June 2007. Permeability criteria for all water management ponds were approved by DEC.
s.4/p22	Residual cyanide levels in storage D6 are expected to be well below those levels expected in the tailings storage facilities. Recycled waters from the tailings thickener will go directly to the mill.	Monitoring of cyanide in the discharges to the tailings storage facility is conducted twice daily and has generally demonstrated CN_{WAD} levels of less than 20mg/L. Cyanide levels in the D6 storage are also less than the 20mg/L CN_{WAD} levels.
s.4/p23	D9 will contain make-up water from the Jemalong irrigation channels and the Bland Creek Palaeochannel bore-field, groundwater, site catchment water, pit dewatering water and incidental rainfall, but will not contain supernatant water from the tailings storage facilities. Water within contained water storage D9 will be pumped to D6 as required.	Water management pond D9, commissioned in June 2007, is used for temporary storage of water to supplement the bore water supply for the project and provide certainty of water supply for the process plant needs. Pond D9 held approximately 641.4 ML of groundwater (from the Bland Creek Paleochannel, saline groundwater de-watering/supply bore-fields and rainfall) and surface water (Regulated River water).
s.4/p23	The contained water storages will be managed in such a manner to minimise potential water quality impacts. Containment storages will be sized to contain all water to at least a 1 in 100 year average recurrence interval (ARI) rainfall event (or a 1 in 1,000 year ARI rainfall event for those storages containing runoff from the plant site and tailings storage facilities).	The contained water storages are sized to contain all water to at least a 1 in 100 year average recurrence interval (ARI) rainfall event (or a 1 in 1,000 year ARI rainfall event for those storages containing runoff from the plant site and tailings storage facilities).
s.4/p24	Management of the quantity and quality of groundwater within and around the mine site is primarily related to the operation of the Bland Creek Palaeochannel bore-field and saline groundwater supply bore-field and the pit dewatering system designed to isolate saline groundwater and manage industrial and river salinity as described in the ESCMP.	The site water management system is designed to contain and manage saline surface water, and manage industrial and river salinity as described in the ESCMP.
s.4.1/p26	The lake protection bund, site water and tailings storage facilities will be constructed to the requirements of the OoW, OEH and DSC (MCoA 4.1/4.2(c)(i)).	The lake protection bund, site water and tailings storage facilities were constructed in accordance with the requirements of the DLWC, EPA and DSC during 2004.
s.4.1.1/p28	The Up-catchment Diversion System will be constructed to simulate endemic drainage features that are known to be stable in the prevailing hydrological regime. Riparian vegetation will also be incorporated into the proposed diversion system (Gilbert and Sutherland, 1997).	The up-catchment diversion system was constructed to simulate endemic drainage features of the prevailing hydrological regime. The up-catchment diversion system has been constructed with rock stabilisation barriers to control flow rates down the channel following rainfall events.

Section / Page No.	Site Water Management Plan Obligations	Comments
	 **Plate 16: Up-Catchment diversion drain with rock stabilisation for flow control**	 **Plate 17: Ephemeral drainage line stabilisation – part of natural sequence farming process**
s.4.1.2/p28	The lake isolation system has been designed to hydrologically separate the open pit and Lake Cowal during Project development, mining and post-closure (North Limited, 1998a)…...	The constructed lake isolation system comprises a series of isolation embankments designed to prevent the inflow of water from Lake Cowal to the open pit development area during periods of high water levels. The lake isolation system comprises: • temporary isolation bund; • lake protection bund; and • perimeter waste emplacement.

Plate 18: Cowal Gold Mine pit showing temporary isolation bund, lake protection bund and perimeter waste emplacement.

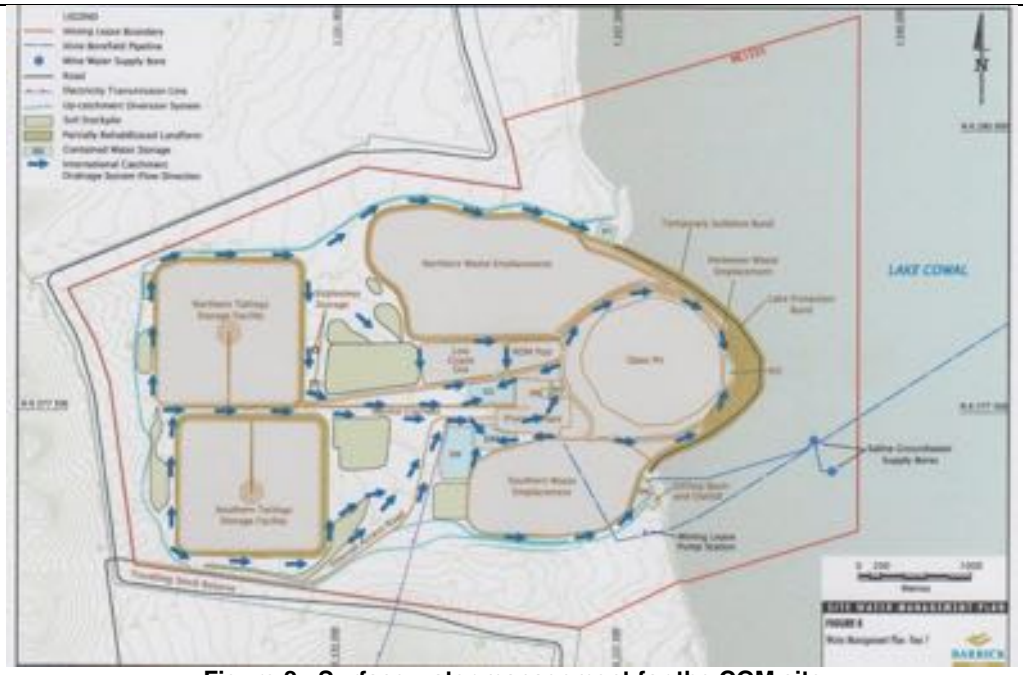

Figure 2: Surface water management for the CGM site

<table>
<tr><th>Section / Page No.</th><th>Site Water Management Plan Obligations</th><th>Comments</th></tr>
<tr><td>s.4.1.2/p29</td><td>The temporary isolation bund is a short-term feature that will be used to isolate the pit from the lake during the construction phase while the lake protection bund is constructed.
Accordingly, once the lake protection bund is constructed and revegetated, the isolation function of the temporary isolation bund will be superseded (North Limited, 1998a).</td><td>The temporary isolation bund was constructed in 2004 (when Lake Cowal was dry) to isolate the pit from the lake waters (if the lake filled during this construction period), while the lake protection bund was constructed.
Barrick have undertaken to raise the temporary isolation bund by 0.5 m following inundation in February 2012 (during the Lake Cowal inundation).</td></tr>
<tr><td>s.4.1.2/p30</td><td>The lake protection bund is a low permeability embankment designed to prevent water inflow (during periods of high lake water level) from the lake into the open pit development area over the life of the mine and over the long term (North Limited, 1998a).</td><td>The lake protection bund has been constructed to prevent water inflow (during periods of high lake water level) from the lake into the open pit development area.</td></tr>
<tr><td>s.4.1.2/p31</td><td>The perimeter waste emplacement will be constructed to RL 223 m and will surround the pit to the north, east and south. The emplacement will be located behind the lake protection bund and will be constructed from oxide mine waste rock with the outer face constructed from low salinity topsoils/soils.</td><td>The perimeter waste emplacement was constructed to RL 223m to the north, east and south of the CGM pit. The emplacement is located behind the lake protection bund.</td></tr>
<tr><td>s.4.1.3/32</td><td>During the construction and operation of the CGM surface water collected within the limits of the Internal Catchment Drainage System will be directed to the process water storage dam (D6) for use (as raw water, dust suppression and conditioning of construction materials) in the process plant.</td><td>Surface water collected within the limits of the Internal Catchment Drainage System is directed to the process water storage dam (D6) for use in the process plant.</td></tr>
<tr><td>s.4.1.4/p32</td><td>The CGM integrated erosion, sediment and salinity control system is presented in the ESCMP and is designed to prevent the discharge of sediment-laden runoff from the mine site to the lake (Barrick, 2003).</td><td>The quantity and quality of surface water runoff from mine landforms and disturbed areas is managed through the sizing of sediment control structures (as described in the ESCMP).</td></tr>
<tr><td>s.4.2.1/40</td><td>The quantity of water approved for extraction from the Bland Creek Palaeochannel is 15ML/d and 3,650 ML/annum (MCoA 4.4(a)).</td><td><table><tr><th>Year</th><th>Annual Water extraction from Bland Creek Palaeochannel Bore-field</th></tr><tr><td>2013</td><td>1379 ML</td></tr><tr><td>2012</td><td>1080 ML</td></tr><tr><td>2011</td><td>696 ML</td></tr><tr><td>2010</td><td>1089 ML</td></tr><tr><td>2009</td><td>2053 ML</td></tr><tr><td>2008</td><td>1658 ML</td></tr><tr><td>2007</td><td>1666 ML</td></tr><tr><td>2006</td><td>3263 ML</td></tr></table>The water extraction from the Bland Creek Palaeochannel bore-field has not exceeded 15 megalitres (ML)/day or 3650 ML/year, between 2006 and 2014.</td></tr>
</table>

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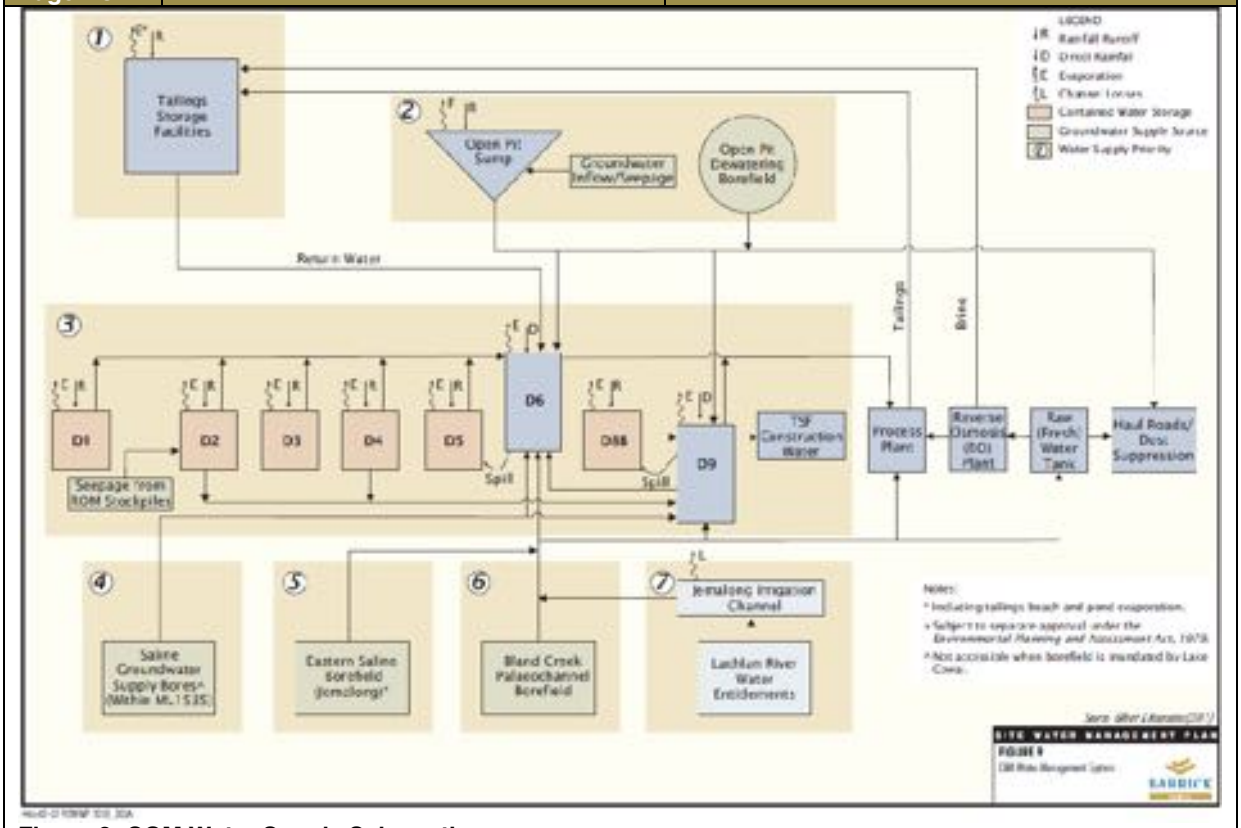		
Figure 3: CGM Water Supply Schematic		
s.4.2.1/p42	All bores from the Bland Creek Palaeochannel bore-field will be metered to ensure that the quantity of groundwater extracted from the Bland Creek Palaeochannel bore-field does not exceed the above limits.	The quantity of groundwater extracted from bores in the Bland Creek Palaeochannel bore-field, are metered to record the daily and annual extraction rates.
s.4.2.1/p45	The saline ground water supply bore-field would be operated during times when the bore-field is not inundated by Lake Cowal.	Two saline groundwater supply bores (WB01 and WB20) established during 2008 were approved as production bores by NoW (Water Licenses No. 70BL233231 and 70BL233233) in 2010. No extraction from the saline groundwater bores has occurred since April 2010 due to access restrictions resulting from the inundation of Lake Cowal.
2.4.2.2/p48	Waters that accumulate within the open cut will be managed in accordance with a pit dewatering program. The catchment area draining to the open pit during operation will be restricted to the pit itself and a small perimeter area enclosed by an external bund. Saline groundwater generated during open pit dewatering is pumped to the process plant for use in ore processing. The open pit design includes water management structures (face seepage collection drains) and in-pit sumps in the floor of the pit. A network of piezometers has also been installed to monitor drawdown levels during the life of the mine.	The open pit dewatering bore-field was established external to the perimeter of the CGM E42 Pit. A total of 6.33 ML was extracted from the open pit bore-field, and a further 940.42 ML from the open pit de-watering sumps (including ponds D4, D3, D8A and heavy rainfall) during 2011-2012 period. The water from the bore-field was mainly used in the process plant for ore treatment via Pond D6 and also for dust control on E42 Pit and TSF haul roads.

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 **Plate 19: CGM open pit dewatering sump. Dewatering borefield is located external to the perimeter of the open pit.**		
.4.2.5/p52	The process plant area has been bunded and graded such than any surface runoff, accidental spills of processing water or other potentially hazardous liquids will report to contained water storage D5.	The process plant area is bunded and any surface runoff, accidental spills of processing water or other potentially hazardous liquids report to contained water storage D5.
s.4.2.7/p53	Tailings storage facility water management at the CGM will continue to involve maximising water re-use through the under-drainage pipe network, decant towers and water return pipeline to the contained water storage (D6).	Reuse of supernatant water from the tailings storage facilities is maximised by recovery from the decant towers with the water returned to water storage D6 adjacent to the process plant.
s.4.2.7/53	Monitoring of EC and pH in the decant of the active tailings storage facility would be undertaken on a weekly basis.	Weekly monitoring of pH and EC occurs at the decant tower of the active tailings storage facility.
s.4.2.8/p54	A site sewage treatment facility has been installed. Treated sewage and sullage will continue to be disposed of to the satisfaction of Bland Shire Council (BSC) and the OEH and in accordance with the requirements of the NSW Department of Health (In accordance with Development Consent Condition 5.6).	The permanent on-site sewage management system was installed west of the Mine Workshop and Administration Complex in the 1st quarter 2006 in accordance with the requirements of the Department of Health.
s.4.3/p54	Sampling, handling and dispatch of all samples will be undertaken by suitably qualified and experienced staff or consultants to the satisfaction of the DP&I and OEH in accordance with MCoA 2(a)(iii). The type of sampling equipment and sample containers and the requirement for use of preservative will be in accordance with Section 4 of the relevant Part (Parts 4, 6, 10 and 11) of AS/NZS 5667: 1998.	Collection and handling of samples to ALS (NATA registered laboratory) for analysis is conducted using sample containers and preservation requirements in accordance with Section 4 of the relevant Part (Parts 4, 6, 10 and 11) of AS/NZS 5667: 1998, relevant to the parameters to be measured for dispatch in Esky(s) to the laboratory. All samples are collected and transported to the NATA registered laboratory using Chain-of-Custody controls.
s.4.3.1/p56	Meteorological monitoring will continue for the duration of the CGM to provide site specific meteorological data for the on-going assessment of the site's water balance and effectiveness of relevant impact mitigation strategies (MCoA 8.1).	The data from the meteorological station is available on the CGM computer network and is available to CGM personnel. The meteorological station is maintained and calibrated quarterly by Sentinel Pty Ltd.
s.4.3.2/p57	Surface water monitoring will continue to be undertaken at monitoring sites along the six transects used during the baseline monitoring program (described in the SWGWBMP) to enable evaluation of water quality data against records of baseline monitoring, in accordance with MCoA 4.1/4.2(a)(viii). Monitoring will be conducted at the monitoring locations when the water level in Lake Cowal is at or above 204.5 m AHD.	The surface water monitoring program has occurred with collection of water samples along transects in the Surface Water, Groundwater, Meteorological and Biological Monitoring Program when the water levels in Lake Cowal have been above 204.5 m AHD. EPL11912 was varied on 21 May 2014 to align condition M2.4 for Points 14, 15, 16, 17 and 18 to Lake level of 204.5 m AHD. Where practical Barrick has continued to take surface water samples below 204.5 m AHD.

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		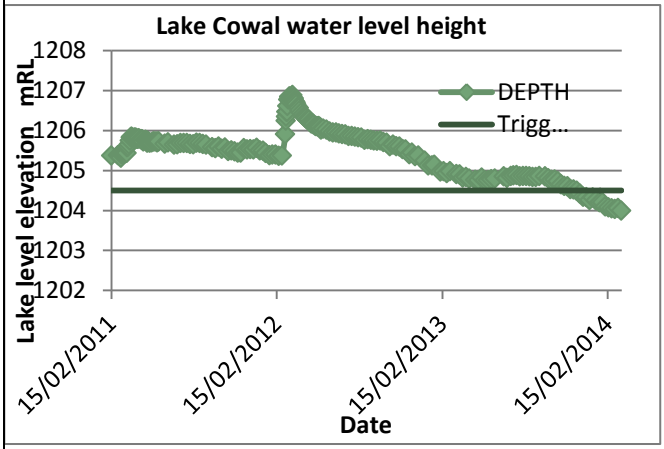 **Figure 4: Lake Cowal Water Levels February 2011 to February 2014**
		 **Figure 5: CGM Lake Cowal surface water monitoring transects.**
s.4.3.2/p59	Monitoring data will be entered on to the CGM monitoring database to assist reporting (such as AEMR reporting) and enable trends to be easily identified.	All monitoring data collected by CGM is entered into the Barrick EQuIS database system where the data is retained for reporting and filing. This system also generates reports as required within Barrick and monitoring reports for the AEMR, EPA/ DECC/OEH, DP&I and DTIRIS.
s.4.3.3/p59	Groundwater monitoring will continue to be undertaken at monitoring sites used during the baseline monitoring programme (described in the SWGWBMP) (where those sites are still operational) in accordance with Consent Condition 4.1/4.2(a)(viii).	Groundwater monitoring is undertaken at monitoring sites used during the baseline monitoring programme (where those sites are still operational). OoW and DECCW were consulted regarding the location of the CGM groundwater monitoring locations.
s.4.3.3/p60	Groundwater monitoring commenced upon licences being obtained under Part 5 of the Water Act, 1912 (NSW).	Licence for the groundwater monitoring bores have been obtained under Part 5 of the *Water Act*, 1912.
s.4.3.4/p62	The biological monitoring program has been developed in consultation with and to the satisfaction of DPI-Fisheries, considering the recommendations and implications of the IMP and Goldney et al. (1997).	The biological monitoring program is described in the SWGWBMP.
s.4.3.6/p64	Development Consent Condition 8.2(a)(v) requires the preparation of a monitoring program for the detection of any movement of the lake protection bund, water storage and tailings structures and pit/void walls during the life of the CGM, with particular emphasis on monitoring after any seismic events.	This program was prepared prior to the commencement of construction in consultation with the OoW and DTIRIS-DRE. The program for the detection of any movement in the lake protection bund, water storage and tailings structures and pit/void walls was approved by the Director-General on 9 October 2003. Monitoring points in the Lake Protection Bund (located every 200m on top of the banks) were installed in accordance with the program. No significant movement has been recorded at any of the monument survey points.

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s.5.3.2/p70	The operation phase water management measures to be adopted to prevent the degradation of waters within Lake Cowal will also be effective in preventing the degradation of surface waters outside the Internal Catchment Drainage System.	Operations are carried out in a manner that does not cause or aggravate air pollution, water pollution (including sedimentation) or soil contamination or erosion, . in accordance with an approved MOP (Condition 14 of the Conditions of Authority).
s.6.1/p.72	Water from the Lachlan River would continue to be accessed for the CGM by purchasing temporary water available from the regulated Lachlan River trading market.	Water has been purchased from the Lachlan Regulated River Water Source under Water Access Licences obtained by Barrick.
s.6.2.2/p74	The groundwater resource contained within the Bland Creek Palaeochannel is currently partially utilised by landholders in the area for irrigation and stock watering purposes. To monitor important background and predicted future water level draw-downs, monitoring piezometers have been installed. (The actual number and location of piezometers is presented in SWGMBMP). In the event that disruption to the efficiency of the closest registered stock and irrigation bores occurs, as indicated by monitoring, ameliorative measures will be implemented).	In the event that the groundwater level in GW036553 was below RL 137.5 m AHD, one or more of the following contingency measures would be implemented in consultation with the OoW: • investigate the groundwater level in the Trigalana bore (GW702286) or any other impacted stock and domestic bores; • determine the pump setting in relevant stock and domestic bores; • determine the drawdown rate in GW702286 and other impacted stock and domestic bores; • develop an impact mitigation plan for impacted stock and domestic bores; and/or • set up an alternative water supply for the owner of GW702286 and other owners of stock and domestic bores, if necessary. In the event that the groundwater level in GW036553 was below RL 134 m AHD, one or both of the following contingency measures would be implemented in consultation with the OoW: • alter the pumping regime to maintain the water level in the impacted stock and domestic bores; or • maintain a water supply to the owner/s of impacted stock and domestic bores.
s.6.2.2/p75	The groundwater level associated with the Bland Creek Palaeochannel Bore-field is monitored on a continuous basis by OoW's groundwater monitoring bore on Burcher Road (GW036553). Contingency measures have been developed for implementation when water levels reach either RL 137.5 m AHD or RL 134 m AHD. These trigger levels were developed in consultation with the OoW and other water users within the Bland Creek Palaeochannel including stock and domestic users and irrigators.	
s.7.3.2/p77	Barrick will provide compensation to affected landholders based on an assessment of the economic impact of any additional inundation of productive land. The long-term compensation package will be developed in consultation with the OoW and the OEH and to the satisfaction of the Director-General. Empirical data (e.g. measured changes to the Nerang Cowal flood regime and the consequent measured effect of the inundation of productive land) obtained from investigations undertaken to determine appropriate event based compensation will be utilised to determine an appropriate one-off long-term compensation package.	During 2010 Barrick met with landholders and developed short and medium to long term strategies for water management in the region. Components of the strategies were presented to the landowners and actions to be implemented were agreed in consultation with the OoW. The water management strategies agreed with the landowners have been implemented by Barrick.
s.9/p81	In accordance with Development Consent Condition 4.5, there will be no disposal of water from the Internal Catchment Drainage System to Lake Cowal (Section 4.1.3).	No water from the Internal Catchment Drainage System enters Lake Cowal. All water in the Internal Catchment Drainage System is reused on site in the process plant.
s.11/p.84	In accordance with Development Consent Condition 4.1/4.2 (b) a strategy for the decommissioning of water management structures, including water storages both in and around the mine site, the water pipeline from the Bland Creek Palaeochannel bore-field, and the long term management of the	Not yet required. The decommissioning plan for the CGM Project will be prepared five years before mine closure.

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	final void and lake protection bund will be submitted five years before mine closure in consultation with OoW, OEH, DTIRIS-DRE and CEMCC and to the satisfaction of the Director-General.	
s.12.2/p.85	The AEMR will be prepared in accordance with the requirements of the DTIRIS-DRE (Condition of Authority 26) (Section 2.1) and MCoA 9.2.	Annual Environmental Management Reports (AEMR) have been prepared by CGM in accordance with MCoA 9.2. The site water components are reported in the AEMR section3.3.

4.10.2 Water Monitoring and Water Balance Performance

The Site Water Management Plan has been implemented with all water management ponds constructed on the CGM site and surface water drainage structures completed for the CGM development.

- The Operational Water Budget is subject to annual review and revision by process plant staff.
- A total of 1379 mega-litres (ML) of water was extracted from the Bland Creek Paleochannel during January and December 2013 and zero (0)ML from the eastern saline bore-field during May 2013 to May 2014. Jemalong Irrigation extraction under Water Access Licences was 1102.1 ML in 2013 and 643.2 up to May 2014.
- The E42 open pit dewatering bore-field established external to the perimeter of the E42 Pit and water from the open pit de-watering sumps (including ponds D4, D3, D8A and heavy rainfall) is mainly used for plant ore treatment via Pond D6 and also for dust control on E42 Pit and TSF haul roads.
- The Short Term Strategy and matters implemented under the Medium-Long Term Strategy water management strategy have been regularly surveyed at the bore-field to determine if any measurable ground movement is occurring. Groundwater levels and quality data are monitored by an independent consultant. No discernible ground movement has been recorded.
- A groundwater level contingency plan was agreed between Barrick and DNR on 13 September 2006 as an interim measure. The Plan involved the agreement of trigger levels in borehole GW036553 of 137.5m AHD for water drawdown management actions, and actions to occur at 134m AHD for alternative water supply to impacted S/D bores if the drawdown reached the trigger values. Current water extraction from the Paleochannel bore-field sites is less than previous years and to date predicted guidelines for groundwater levels have been met with no exceedence of the trigger levels. Automatic loggers are installed in both monitoring bores and production bores. Due to the high lake water levels during 2011-2014, the lake floor saline bores were packed and infrastructure removed.
- Monitoring of groundwater commenced for the tailings storage facilities prior to placement of any tailings. The dewatering piezometers installed around the mine pit area have been sampled in accordance with the EPL and results reported to the DECCW/OEH in the EPA Annual Return and in the AEMR. The monitoring of groundwater quality has continued in piezometers that have been retained on the mine lease area to provide background data, in addition to the EPL specified monitoring points.
- Barrick contracted independent consultants Coffeys Geotechnics to review the collected groundwater monitoring data and to produce hydro-chemical diagrams following analysis of the information. The groundwater quality results and trends reported in this assessment illustrate that the water management control measures for full containment of mine site water and control of runoff from the TSF and waste rock emplacements appear to have been successful. Coffey's report for 2012-2013 concluded:

"• The zone of influence after nine years of mine dewatering is small (around 1 km in radius), indicating low lateral permeability;
• There has been a localised increase in groundwater levels south of the southern TSF and groundwater chemistry has remained relatively stable at monitoring bores MON02A and MON02B. A separate groundwater level investigation was conducted by Coffey to further assess the change in groundwater level in this area (Coffey, 2009b). It was concluded that increasing groundwater levels at bores MON02A and MON02B south of the southern TSF and northeast of the southern TSF at P412A-R are related to the movement of seepage from the TSF. The direction of seepage flow towards the open pit is consistent with the seepage flow direction predicted in the EIS and recent hydrogeological assessments (Coffey, 2011b and 2012); and
• Water management control measures appear to have successfully prevented groundwater contamination. (Coffey, May 2014."

- EPL trigger rainfall monitoring events (i.e. >20mm/24hrs) for the surface water monitoring program occurred on the following dates between May 2013 and May 2014 and surface water monitoring was conducted in accordance with the Site Water Management Plan monitoring program:

2 June 2013	26.6mm
12 June 2013	23.8mm
17 September 2013	54.4mm
1 March 2014	26.6mm

- Surface water sampling in Lake Cowal (i.e. points 14-18) and stormwater quality monitoring (points12-13) occurred following rainfall events during May 2013 to May 2014.

- Surface water and sediment monitoring of Lake Cowal was undertaken by David McMahon of McMahon Earth Science - D M McMahon Pty Ltd and reported in *"Surface Water and Sediment Sampling and Analysis Lake Cowal 2013"*.

- The results of the surface water monitoring reported for 2013 did not exhibit any trend that indicated a connection between the closed catchment of the CGM operations and Lake Cowal waters. The comparison of the 2013 Lake Cowal surface water quality results against the baseline water quality results from 1991 – 1992 and 2010-2012 indicates that the 2013 monitoring results are generally similar.

- A comparison of the 2013 Lake Cowal surface water quality results against the ANZECC and ARMCANZ (2000) default trigger values for surface water (lakes) indicates that the 2013 monitoring results (totals and dissolved) were below or marginally above the default trigger values. Nickel, Lead and Zinc levels all increased slightly from previous readings but this is a trend seen in both the lake and inflow results. Overall, the Turbidity and Suspended Solids are higher than previously recorded which is a trend seen across both the lake and inflow sites.

- A comparison of the 2013 Lake Cowal sediment results against the ANZECC and ARMCANZ (2000) recommended trigger values for sediment was undertaken. The monitoring results indicate that the 2013 extractable results were below the recommended trigger values and are similar to the 2010, 2011 and 2012 monitoring results. Overall Lead and Zinc levels have decreased slightly from data previously recorded in 2012

4.10.3 Conclusion

The Site Water Management Plan prepared to satisfy MCoA 4.1/4.2provides an adequate program for the management of water use by the CGM project and is controlling the surface water runoff from the disturbed areas of the CGM site that protecting the water quality in Lake Cowal. A revised Site Water Management Plan was lodged with DP&I on 17 February 2012 and August 2013. Barrick was still awaiting approval of the revised Site Water Management Plan from DP&I at the date of this audit.

Water monitoring has been conducted in accordance with the Site Water Management Plan and Surface Water, Groundwater, Meteorological and Biological Monitoring Program and monitoring data has been reviewed by independent consultants. The monitoring data did not exhibit results that indicate a connection between the closed catchment of the CGM operations and the waters of Lake Cowal. Extraction of water from the Bland Creek Paleochannel bore-field and water obtained from the Lachlan Regulated River Water Source did not exceed the allowable extraction rates or volumes during the May 2013 and May 2014 period.

4.11 Cyanide Management

[Minister's Condition of Approval 5.3]

3.11.1 Cyanide Management Plan

The Cyanide Management Plan prepared to satisfy MCoA 5.3(b) was approved by DoP on 9 January 2006. Addenda to the Cyanide Management Plan subsequently prepared and submitted to the DoP related to:

- Cyanide monitoring and regular water quality sampling for CN_{WAD} levels prepared in August 2007 and approved by DoP;
- Fauna death reporting requirements were revised in June 2008 and approved in October 2008 for changes approved in Modification to the Development Consent granted on 13 March 2008 under Section 96(1A) of the *Environmental Planning and Assessment Act, 1979*;
- Cyanide analysis method and on-line monitoring of CN_{FREE} submitted to DoP and DECCW in October 2009;
- Location of tailings slurry stream CN_{WAD} monitoring within the process plant, submitted in July 2010 and approved by DoP in December 2010.
- The management of cyanide transport, storage and use in the process plant has been implemented in accordance with the Cyanide Management Plan. A variation to the transportation route from the Queensland border to Dubbo was approved by the DoP Hazards Unit (dated 1 December 2010) and an emergency exemption was granted to allow use of the Cowra-Temora road whilst the Newell Highway was flooded in March 2012.

Commitments in the Cyanide Management Plan are listed in Table 15.

Table 15: Cyanide Management Plan Commitments

Section / Page No.	Cyanide Management Plan Commitments	Comments
s.4.1/p.12	Delivery and storage of cyanide on site will take place in a controlled area. Cyanide delivery and storage will be within a concrete-bunded area located away from general work areas and incompatible reagents.	Delivery of cyanide on site takes place in a controlled area within a concrete-bunded area.  **Plate 19: Cyanide delivery on bunded concrete area with high visibility signage.**
s.4.1/p.13	Storage areas, tanks, pipelines, pumps and valves will have high visibility labelling and will be inspected regularly for signs of leakage,presence of solution outside of the tanks in the bunded areas and integrity of	Storage areas, tanks, pipelines, pumps and valves have high visibility labelling and are inspected regularly for any sign of leakage, presence of solution outside the tanks in the bunded areas and integrity of containment. Inspection of storage areas and bunding occurs daily by

Section / Page No.	Cyanide Management Plan Commitments	Comments
	the containment. Any aspects requiring maintenance or repair will be noted and records documenting the inspection and corrective measures will be kept.	Barrick staff. Audits of the bunding are also conducted annually by an external consultant.
s.4.2.2/p.13	In accordance with MCoA 5.3(b)(ii), CN_{WAD} levels of the aqueous component of the tailings slurry stream will be maintained so that they do not exceed 20 mg/L CN_{WAD} (90 percentile over six months) and 30 mg/L CN_{WAD} (maximum permissible limit at any time) at the discharge point to the tailings storages. Cyanide destruction has been incorporated into the process to ensure CN_{WAD} levels at the discharge point to the tailings storages will be maintained to the levels stated above. Caro's Acid will be used to destroy cyanide.	Monitoring of the decant water quality and tailing discharge occurs twice daily with the samples analysed at the on-site laboratory. Check analyses are conducted by an external NATA registered laboratory. All results have been compliant with the condition criteria and did not exceed 20 mg/L CN_{WAD} (90 percentile over six months) or 30 mg/L CN_{WAD} (maximum permissible limit at any time) at the discharge point to the tailings storages.
s.4.2.3.1p.14	Tanks holding process solutions (e.g. leach tanks) will be located on bunded concrete containments. The processing plant has been designed such that process water containing cyanide is recycled and therefore kept within the area encompassed by the processing plant run-off collection drain and storage. In the event of spillages, all solutions will be contained within the process plant bunding	All tanks holding process solutions (e.g. leach tanks) are located within bunded concrete containments. Any leakage or spillage from the tanks or their fittings is contained within the plant bunds.
s.4.2.3.2/p.14	The tailings delivery and return water lines will be contained within a bunded pipeline corridor that will run parallel to the service corridor between the processing plant and tailings storage facilities. The tailings slurry will be pumped to the tailings storages at ground level. The bunded corridor will drain back to the processing plant and will contain any spills in the event of pipeline rupture/failure.	 **Plate 20: Tailings delivery/return water lines in a bunded pipeline corridor between the process plant and tailings storage facilities**.
s.4.2.3.3/p.15	As required by MCoA 4.1/4.2(c)(i) and 5.2(a) the tailings storages will be constructed to the requirements of DLWC, EPA, DMR and the NSW Dams Safety Committee (DSC). Further, the floor of the tailings storages will be constructed and compacted to a permeability acceptable to the DMR and EPA in consultation with DLWC, in accordance with MCoA 5.2(b).	The northern and southern tailings storage facilities were constructed in accordance with the requirements of DLWC, EPA, DMR and the NSW Dams Safety Committee. The floor of the tailings storages was constructed and compacted to approved permeability criteria acceptable to the DMR and EPA in consultation with DLWC.
s.4.2.3.3/p.15	Following tailings deposition, supernatant water will drain to the central pond and decant towers. The decant tower will be accessible via a causeway. An underdrainage pipe network will be installed to facilitate drainage of the tailings mass. The bulk of the water in each tailings storage will drain from the surface of the tailings and collect in the centre of each storage. This water as well as underdrainage water will be reclaimed and	Following tailings deposition, supernatant water collects in a central pond with decant towers, accessible via a constructed causeway into the TSF. The supernatant water is reclaimed for reuse within the processing plant

Section / Page No.	Cyanide Management Plan Commitments	Comments
	used within the processing plant. The decant system (including access causeway) will be progressively raised during the development of the tailings.	 **Plate 21: Causeway to the decant tower on Southern Tailings Storage Facility.**
s.4.2.3.4/p.15	Monitoring will be conducted for any movement of the tailings storages as described in the Monitoring Program for Detection of any Movement of Lake Protection Bund, Water Storage and Tailings Structures and Pit/Void Walls, as follows: • Visual assessments of the tailings structures will be undertaken routinely (i.e. weekly), following review of surface and groundwater monitoring data and following seismic events to identify the initial signs of movement. • Survey assessment of the tailings structures will be routinely undertaken at six monthly intervals or following visual assessments that indicate movement of a structure and/or following seismic events to determine and quantify any movement of these structures.	Quarterly Movement Monitoring reports have been prepared for the CGM Southern and Northern Tailings Storage Facilities infrastructure. The Tailings Storage Facilities had no significant visual erosion or subsidence issues from regular survey information. Minor remediation of cracks and small sinkholes has occurred as required. Substantial revegetation cover on all batters and augmentation lifts of the two tailings storage facilities has occurred. Rehabilitation of the outer batters of the tailings storage facilities has included native grass species trials (as requested by the Independent Monitoring Panel and review input by DII-MR and DII-Agriculture during the AEMR / MOP review process). Survey pillars were installed on the third and fourth augmentation crest of the STSF. Dr Neil Mattes of URS has provided independent oversight for the Cowal Gold Project Movement Monitoring Program of the Lake Protection Bund, Water Storage and Tailings Structures and Pit Void Walls.
s.5/p.16	The Flora and Fauna Management Plan and Implementation Plan to Protect Fauna from Interactions with the Tailings Storage Facilities will outline measures relevant to cyanide and wildlife management.	The Flora and Fauna Management Plan section 8 outlined contingency measures relevant to cyanide and wildlife management.
s.6.1/p.17	In accordance with Consent Condition 8.2(b) a summary of the cyanide monitoring results will be provided to EPA, DMR and the Director General for Planning, on a three monthly basis, unless otherwise agreed by the Director-General. All monitoring results will be included in the AEMR.	A summary of the cyanide monitoring results is provided to OEH (EPA), DT&I-DRE and DP&I, on a monthly basis. A summary of all monitoring results are also included in the AEMR section 3.5.3.
s.6.2.1/p.17	CN_{WAD} levels of the aqueous component of the tailings slurry stream will be monitored at the discharge point to the tailings storages twice daily (or as otherwise directed by the Director-General for Planning), in accordance with MCoA 8.2(b)(i). In accordance with MCoA 8.2(b)(ii), CN_{WAD} levels in the decant water of the tailings storages will be monitored twice daily (or as otherwise directed by the Director-General for Planning).	CN_{WAD} levels of the aqueous component of the tailings slurry stream are monitored in accordance with MCoA 8.2(b)(i) and MCoA 8.2(b)(ii). The relocation of the automated sampler from the discharge point at the tailings storage facilities, to the process plant occurred in July 2010 to improve accessibility to the sampler for maintenance and sample collection.
s.6.2.3.1/p.18	In accordance with MCoA 8.2(b)(iii) which requires provision of an on-site laboratory for quickly establishing CNWAD levels in the liquid at the discharge point to the tailings dams and in the decant ponds for monitoring purposes, CNWAD samples collected twice daily in accordance with the USEPA (1999) Method OIA-1677 at the discharge point to the tailings storages and	Free cyanide monitoring within the process plant area is conducted as part of the daily workplace monitoring program (refer to Cyanide Management Plan section 6.3). VELP distillation method using the Orion FS 3100 analyser for analysis of CNWAD, plus a picric acid method of analysis for analysis of cyanide at the on-site laboratory (was approved by the relevant agencies in

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	in the decant water of the tailings storages will be analysed at the on-site laboratory. The samples will be analysed for CNWAD in the on-site laboratory using an Orion Instruments Analytical CN Solution TM FS 3100 analyser (or other instrumentation considered appropriate in consultation with DMR, EPA and the Director-General for Planning). The Orion FS 3100 analyser complies with US EPA (1999) Method OIA-1677 requirements. The results of the Orion Instruments Analytical CN Solution TM FS 3100 analyser will be verified by the off-site laboratory analysis.	2007). The Cyanide Management Plan was amended in August 2007 to reflect the approval of the use of the picric acid method. CN results are verified by an off-site NATA registered laboratory in West Wyalong. Results are available to CGM within 24hours.
s.6.2.3.2/p.18	CN_{WAD} samples collected twice daily at the discharge point to the tailings storages and in the decant water of the tailings storages in accordance with AS/NZS 5667:1:1998 Water Quality – Sampling and APHA (1998 or subsequent version) Standard Methods for the Examination of Water and Wastewater will be analysed at an off-site NATA registered laboratory located in West Wyalong.	The samples of discharge from the process plant to the tailings storage facilities are collected in accordance with standard methods for cyanide analysis and transported on the same day to the NATA registered laboratory in West Wyalong for confirmatory analysis.
s.6.2.3.2/p.19	For samples sent to laboratories, a sample chain-of-custody (CoC) form will be completed for each sample collected. A copy of the CoC will be provided to the laboratory with the samples. A copy of the CoC will be held on site for the life of the Project.	Samples collected for cyanide analysis are forwarded to the NATA registered laboratory in West Wyalong with Chain-of-Custody forms. The results for analysis of cyanide at the external NATA registered laboratory provide confirmation of on-site laboratory testing with results available within 24 hours.
s.6.2.4/p.19	Data obtained by the monitoring of CN_{WAD} levels at the discharge point to the tailings storages and in the decant water of the tailings storages will be maintained on site by the Environmental Manager (or delegate).	Monitoring data for CN_{WAD} and CN_{FREE} is retained on site in the Barrick monitoring database.
s.6.3/p.19	MCoA 8.2(b)(iv) requires the on-line monitoring of CN_{FREE} levels at locations where employees are operating. The on-line (i.e. ambient) monitoring of HCN gas that will be undertaken with regard to employee safety	The ambient monitoring of CN_{FREE} levels provides continuous readings and displays the results in the process plant control centre. In addition to the ambient monitors, employees may carry personal monitoring units in designated areas.
s.6.4/p.20	MCoA 8.2(b)(v) requires a monitoring program to be established for the detection of cyanide movement beneath and adjacent to the tailings storages….. Monitoring of CN_{WAD} levels will be undertaken at a network of groundwater monitoring bores to monitor cyanide movement beneath and adjacent to the tailings storages, namely: • down-gradient bores P412 A & B, P414 A & B, P418 A & B; • up-gradient bores P555 A & B, P558; and • tailings storage monitoring bores MON-01 and MON-02.	A monitoring program for the detection of cyanide movement beneath and adjacent to the tailings storages has been implemented with a network of groundwater monitoring bores. Additional groundwater quality bores P415A, P415B, P416A, P416B, P417A and P417B are also monitored for CNWAD in accordance with EPL 11912.
s.6.4/p.20	In addition to the abovementioned bores, groundwater quality monitoring of bores P415A, P415B, P416A, P416B, P417A and P417B (Figure 3) will also be monitored for CN_{WAD} in accordance with EPL 11912. The	

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	CN_{WAD} results that are obtained for the groundwater bores will be recorded and retained as required by EPL 11912.	 **Figure 6: Groundwater bores for monitoring Cyanide (CN_{WAD}).**
s.7/p.22	Consent Condition 5.3(b) requires the CMP to provide contingency measures for reducing cyanide levels.	The Cyanide Management Plan section 7.1 provides contingency measures for: • reduction of HCN levels in areas where employees are operating; • section 7.2 provides contingency measures for reducing CN_{WAD} levels in the event CN_{WAD} levels exceed 20 mg/L (90 percentile over six months) or 30 mg/L (at any time) at the discharge point to the tailings storages, • section 7.3 outlines contingency measures for reducing cyanide levels in the tailings dams in the event it is established that fauna deaths are occurring from cyanide in tailings dam water, and • section 7.4 describes the process for EPA review of cyanide levels in the event of wildlife deaths occurring due to cyanide.
s.8.2.2/p.28	EPL 11912 Condition M4 requires Barrick to maintain a record of all complaints made in relation to pollution arising from any activity to which EPL 11912 applies.	CGM retain records of all complaints received on their community complaints line.
s.9.1/p.28	An AEMR will be prepared in accordance with the requirements of Condition of Authority 26 and MCoA 9.2 and submitted to the Director-General for Mineral Resources and the Director-General for Planning, respectively. The AEMR will report on cyanide management and use and the cyanide monitoring program. In accordance with MCoA 8.2(b).	Annual Environmental Management Reports (AEMR) have been prepared by CGM in accordance with MCoA 9.2. The cyanide management and monitoring program results are reported in the AEMR section 3.5.
s.9.3/p.29	In accordance with Consent Condition 8.2(b)(i), any CN_{WAD} measurements of the aqueous component of the tailings slurry stream at the discharge point to the tailings storages verified by the off-site laboratory in West Wyalong as exceeding 20 mg/L CN_{WAD} will be assessed daily (to ensure that CN_{WAD} levels do not exceed 20 mg/L [90 percentile over six months]) and reported monthly to the DMR and EPA, unless otherwise agreed by the Director-General.	The cyanide levels in the slurry stream have not exceeded <20mg CN_{WAD}/L (90%ile) between May 2013 and May 2014. Cyanide monitoring results have been forwarded to the DP&I, DRE and OEH monthly. and to the CEMCC quarterly between May 2013 and May 2014.

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s.10.1/p.30	In accordance with MCoA 5.4(e), 12 months after the commencement of operations Barrick will carry out a comprehensive hazard audit of the proposed development and submit a report of the audit to the Director-General. The audit will be carried out at by a duly qualified independent person or team approved by the Director-General prior to commencement of the audit. Further audits must be carried out every three years and a report of each audit will be submitted to the Director-General within a month of the audit. Hazard audits will be carried out in accordance with the Department's Hazardous Industry Planning Advisory Paper No. 5, "*Hazard Audit Guidelines*".	A Hazard Audit was conducted by Dean Shrewring of Pinnacle Risk Management Pty Ltd, 12 months after commencement of operation of process plant (i.e. April 2007). The Hazard Audit was accepted by DoP on 6 August 2007. The second Hazard Audit of the CGM operations was conducted on 19-22 April 2010. DoP received the Hazard Audit Report 2010 on 24 December 2010 and approved the report on 15 February 2011. A Third Hazard Audit of the CGM operations was conducted between 8 and12 April 2013.

4.11.2Cyanide Monitoring

Monitoring of cyanide in the discharges to the tailings storage facility is conducted twice daily.

During the May 2013 to May 2014 operational period no results exceeded the 20mg CN_{WAD}/L level (and no results exceeded the maximum 30mg CN_{WAD}/L level).

Donato Environmental Services prepare a six monthly report on wildlife visitation to the tailings storage facilities and no cyanide related wildlife deaths occurred on or near the tailings storage facilities during the May 2013 to May 2014 period. Recorded cyanide concentrations in the tailings facilities were below the level that would be expected to cause mortality throughout the reporting period.

One death (silver gull) occurred in November 2013 near a bund at the process plant and the autopsy results indicated the presence of cyanide in the eye fluid sent of analysis to the IDEXX Laboratories. The gull was found within the fenced area near the sump in the bund

No other wildlife deaths attributable to cyanide were recorded between May 2013 and May 2014.

4.11.3Conclusion

The Cyanide Management Plan required under MCoA 5.3(b) and subsequent addenda have been approved by DP&I. The management of cyanide at the CGM site and process plant is representative of best practice. CGM is a signatory to the *"International Cyanide Management Code for the Manufacture, Transport, and Use of Cyanide in the Production of Gold"* and regular third party audits of the site practices and record keeping have confirmed compliance with the requirements of the International Cyanide Management Code.

Between May 2013 and May 2014 no cyanide results exceeded the 20mg CN_{WAD}/L or the maximum 30mg CNWAD/L level. Donato Environmental Services reported on wildlife visitation to the tailings storage facilities and noted that the monitored cyanide concentrations were all below the level that would be expected to cause mortality.

4.12 Hazardous Waste and Chemical Management

[Minister's Condition of Approval 5.7]

4.12.1 Hazardous Waste and Chemical Management Plan

The Hazardous Waste and Chemical Management Plan was prepared to satisfy MCoA 5.7 and approved by the Director-General in 2003. The Hazardous Waste and Chemical Management Plan

was revised and updated in March 2006. Addenda to the Hazardous Waste and Chemical Management Plan have occurred related to:

- waste classification, treatment and/or disposal at CGM for hydrocarbon contaminated soil occurs at the Bioremediation Facility constructed and approved on the Project site in January 2008;
- waste tracking requirements have been revised in accordance with the *Protection of the Environment Operations (Waste) Regulation,* 2005;
- revision of waste classifications and proposed management measures for the area of historic contamination was approved in May 2009; and
- allowing the addition of a cyanide destruction method (i.e. the INCO process) as an alternative to Caro's Acid, and the associated introduction of sulphur dioxide (SO_2) as sodium metabisulphite (SMBS) to reflect the approved modification to the Development Consent MOD 8 that was prepared and submitted to the DoP in December 2009 and approved in March 2010; and
- an updated and revised Consolidated Hazardous Waste and Chemical Management Plan was prepared and submitted to DoP on 27 April 2011.

4.12.2 Hazardous Waste and Chemical Management Performance

The requirements of the Hazardous Waste and Chemical Management Plan were implemented (e.g. bunded fuel and lubricant storage, bunded chemical storage facilities) as the CGM has developed.

The approved Operations Emergency Response Plan (OERP) now forms part of the hazardous waste and chemical management procedures. The OERP was revised and submitted to DoP on 19 November 2010.

Two emergency response trailers are available on site and are operational.

The Emergency Response Team (ERT) and other members of the Barrick workforce receive training in emergency response procedures. Numerous training exercises have been carried out by ERT, including some with external emergency services personnel.

The Chem Alert III system is used for all existing chemicals on site and approval via the system applies to the acquisition of any new chemicals brought onto the CGM site (by Barick or its contractors).

The management and recycling / disposal of all chemical and hazardous wastes are managed under contract by J R Richards and Sons through the CGM waste storage and disposal area adjacent to the CGM maintenance workshop area.

4.12.3 Conclusion

The Hazardous Waste and Chemical Management Plan provides the processes and procedures implemented on site for the management of all hazardous chemicals transported to, stored on, used in the process plant, and hazardous wastes generated on site. The handling of fuels, oils, and chemicals on site is managed in accordance with the plans, audits and reporting required under MCoA 5.4, the CGM Emergency Response Management Plan and CGM Safety Management System. All wastes generated on site are managed under a waste management contract with JR Richards and Sons.

The Hazardous Waste and Chemical Management Plan has been revised regularly to address the changes in CGM operations under the various Modifications to the Development Approval. The management procedures and protocols have resulted in best practice for any chemicals transported to, stored and/or used on the CGM site.

4.13 Dust Management

[Minister's Condition of Approval 6.1]

4.13.1 Dust Management Plan

The Dust Management Plan prepared to satisfy MCoA 6.1 was approved by DIPNR in 2003. The Dust Management Plan dust deposition monitoring sites were amended in August 2007 and approved by DIPNR. An addendum to the Dust Management Plan related to the location of monitoring site DG2 submitted to DIPNR in December 2008 and approved in February 2009.

The Dust Management Plan has been implemented to suppress dust from the mining operations and includes the use of water trucks for disturbed surface areas and internal haulage roads, speed restriction of vehicles on unsealed surfaces (to 20kph), and limiting soil stripping to areas to those required immediately for the development of the mine activities.

The commitments in the Dust Management Plan are summarised in Table 16.

Table 16: Dust Management Plan Commitments

Section/ Page No.	**Dust Management Plan** Commitments	Comment
s.5.2/p12	Maintain and use equipment to apply water to unsealed and trafficked areas at a rate which minimises dust emissions (MCoA 6.2(i)).	Two (2) 80t water tankers are used in the pit and surrounds for dust suppression and other areas where mining activities occur (e.g. tailings emplacement walls, southern waste emplacement area etc). There are also two additional 20t water tanker units in the Tailings Storage Facility Depot area. Application of water emulsified bitumen (PetroTac) has also occurred during 2013 and 2014 to reduce dust generation from light vehicle traffic on access roads around the administration area, process plant and maintenance areas.
s.5.4/p14	Where practicable, seed disturbed areas and stabilise with groundcover immediately following construction ((MCoA 6.2 (ii)).	The disturbed areas completed on the batters of the waste emplacement areas have been subjected to trials to determine groundcover rehabilitation requirements.
s.7/p19	Dust monitoring will include sites outside of the Project MLA area to assist in management of dust generated from mine operations.	Dust deposition gauges DG1 to DG10, DG15, and McLintock Shed are located outside the project MLA.
s.7.1/p19	Data from the on-site meteorological station will be used to predict dust impacts on nearby residences and bird breeding areas (MCoA 8.1).	The on-site meteorological station located near the southern ML 1535 boundary provides meteorological data and measures real-time wind speed and direction, temperature (2m and 10 m), barometric pressure, humidity, solar radiation and rainfall (MCoA 8.1). The data is available is available to CGM personnel on the CGM computer network.
s.7.2/p20	Continue dust deposition monitoring for life of the mine.	Dust monitoring sites established for the EIS baseline program have continued and the dust deposition monitoring program was agreed in consultation with the EPA and NWPS.
s.7.2/p22	Dust deposition samples are analysed monthly for ash content, combustible matter and insoluble solids.	Dust samples collected monthly in the dust deposition gauges are analysed for ash content, combustible matter and insoluble solids.
s.7.2.1/p22	Analyse composite dust samples for select metals at six monthly intervals for comparison to average crustal abundance levels.	An independent consultant from the University of Sydney (Dr Stephen Cattle) reviews dust monitoring data for the CGM. Following the review of dust monitoring data during 2011-2012 by Dr Cattle, ICP-MS methodology was adopted for the analysis of dust samples to get lower detection limits. The change in methodology was notified to DECCW/OEH on

Section/ Page No.	**Dust Management Plan** Commitments	Comment
		27 April 2012.
s.7.2.3/p23	Assess Lake Cowal surface water quality results in conjunction with dust deposition data to provide assessment of possible impacts of dust on any surface waters (MCoA 8.3(b).	Monthly Lake Cowal water quality results are assessed with the dust deposition data by Dr Stephen Cattle, University of Sydney.
s.7.2.3/p24	Surface water monitoring data to be reported in the AEMR / Annual Review. Results to be reviewed and, if necessary, parameters and procedures revised annually as part of the AEMR process.	Lake Cowal surface water monitoring occurs monthly (when lake water is present), and the results are reported in the AEMR and EPA Annual Review.
s.7.3/p24	Monitoring TSP by high volume sampler in accordance with procedures established with the EPA namely Approved Methods for Sampling and Analysis of Air Pollutants in NSW will continue to be monitored for the life of the mine.	TSP is monitored using a high volume air sampler located at the Coniston Homestead, in accordance with the EPA guideline *"Approved Methods for the Sampling and Analysis of Air Pollutants in NSW"*.
s.7.4/p25	Results of the meteorological, TSP and dust deposition monitoring to be maintained in database. Results will be analysed and reviewed for comparison with respect to monitoring program.	All dust deposition, TSP and meteorological monitoring data is retained in the Barrick RIMS database and review of the data occurs for reporting in the AEMR.
s.10/p30	An Annual Environmental Management Report (AEMR) for submission to the Director-General and made available to the nominated authorities, and any other interested stakeholders on request (MCoA 9.2)	Annual Environmental Management Reports (AEMR) prepared by CGM in accordance with MCoA 9.2 included the results for dust management in AEMR section 3.10.

3.13.2 Dust Monitoring

Dust monitoring is carried out in accordance with the Dust Management Plan with eighteen (18) depositional (static or gravimetric) monitoring sites within and surrounding the CGM. Fourteen (14) of the dust deposition gauges are located at residential locations and bird breeding sites, and four (4) gauges are located within the MLA. The review and interpretation of the dust monitoring data for CGM is conducted in accordance with requirements of the Dust Management Plan by Dr Stephen Cattle of the University of Sydney.

The high-volume air sampler (HV1) at 'Coniston' Homestead to the north of the CGM monitors Total Suspended Particulate (TSP).

Table 18: CGM Dust monitoring sites (outside the MLA)

Dust Gauge	Site Location Rationale
DG 1	Coniston residence
DG 2	Bird breeding area
DG 3	General Monitoring Site (proximal to bird breeding area)
DG 4	Native flora area and Bird Breeding Area (Lake Cowal)
DG 5	Lake Cowal
DG 6	Gumbelah residence
DG 7	Lake Cowal residence
DG 8	Native flora area
DG 9	Hillgrove residence, native flora area
DG 10	Native flora area
McLintock's Shed	General monitoring site
Geology Site Office	General monitoring site
Lakeside	General monitoring site
I5	General monitoring site

Table19. Dust monitoring sites inside the CGM MLA

Dust Gauge	Site Location Rationale
DG 11	General monitoring site (proximal to site infrastructure areas)
DG 12	General monitoring site (proximal to site infrastructure areas)
DG 13	General monitoring site (proximal to site infrastructure areas)
Site 52	Continuation of baseline monitoring prior to development consent

- Directional dust deposition gauges (Frisbees) were added to the dust monitoring program in September 2009 to provide directional data and supplement the existing University of Sydney depositional dust gauges. Due to the increase in water levels in Lake Cowal between May 2011 and April 2012, monitoring of twelve (12) of the University of Sydney depositional dust gauges and six (6) dust Frisbees was suspended due to access problems and inundation.

- Temporal and spatial variation in monthly dust deposition in 2013 was lower than in 2012 with moderate correlation between monthly dust deposition and season in 2013.

- Compliance with the dust deposition average annual assessment criterion of 4 g/m^2/month was achieved at 13 of 14 gauges outside the ML during 2013. Compliance was achieved at all residences and bird-breeding and native fauna areas (i.e.DG1, DG2, DG4, DG6, DG7, DG8, DG9, DG10).

- For the single gauge external to the ML that exceeded the assessment criterion of 4 g/m^2/month (DGI5), the cause of the exceedence was three sampling periods with dust deposition of more than 10 g/m^2. (For each of these three deposits, more than 70% of the material was combustible matter, suggesting a large contribution of insects, bird droppings and vegetative matter to those deposits.

- Exclusion of the combustible fractions of these dust deposits would result in the annual average dust deposition rate for DGI5 below the assessment criterion).

- The HVAS, located to the north of the ML area, indicated an annual TSP level of 44 $\mu g/m^3$ during 2013 for all samples which is less than the relevant NSW EPA amenity criterion of 90 $\mu g/m^3$.

- The dust metal data collected from 2013 gauge samples show mean Al values less than typical soil and regolith materials, As, Cd, Pb and Se values generally typical of regolith materials, and Cu and Zn values greater than mean values for typical regolith materials . The Site 52 gauge, located inside the ML area and downwind (northeast) of the mine, recorded slightly elevated mean concentrations of As, Cd and Pb, suggesting a minor role of mine-derived dust in metal transport.

- Mean Cu and Zn concentrations measured in the 2013 dust samples has been assumed are due to either contamination or a measurement issue as has been the case in previous years.

- No complaints about dust were received from surrounding land owners between May 2013 and May 2014.

4.13.3 Conclusions

The Dust Management Plan prepared to satisfy MCoA has been implemented for the CGM operations and the dust data collected is reviewed annually by Dr Stephen Cattle of University of Sydney. Management of dust generation occurs in accordance with the Dust Management Plan and compliance was achieved at all residences and bird-breeding and native fauna areas. No complaints in relation to dust were received by CGM between May 2013 and May 2014.

4.14 Blast Management

[Minister's Condition of Approval 6.3]

4.14.1 Blast Management Plan

The Blast Management Plan was prepared to satisfy the requirements of MCoA 6.3 and approved by DIPNR in 2003. An Addendum to the Blast Management Plan (related to the location of a monitoring site BM04) was approved by DoP in April 2009.

The approved Blast Management Plan was activated when blasting commenced at the CGM in September 2005.

The commitments outlined in the approved Blast Management Plan are summarised in Table 17.

Table 17: Blast Management Plan Commitments

Section/ Page No.	Blast Management Plan Commitments	Comments
2.3.2 /7	If adverse bird breeding impacts are attributed to Project blasting activities, blast remedial measures will be implemented as directed by the EPA and in consultation with the NPWS(MCoA 6.3(i))	No demonstrable disturbance of bird breeding was noted during the 2013-2014 period. Ongoing independent observations of bird breeding areas have been conducted annually by Professor Peter Gell and Paul Peake in 2013 to 2014.
3/7	Residents within 2 km of the active mining area are to advised on a monthly basis, regarding future blasting events and of any changes to monthly blast programs (MCoA 6.3(ii))	No residents are currently within 2 km of the active mine area.
4/9	All blasts will be designed to minimise the probability of any one blast exceeding the 115 dB (Linear Peak) or 5 mm/s PVS criteria at the closest non-Company owned residences outside the DA area and bird breeding/roosting to less than 5% (MCoA 8.4(b)(ii))	Optimised blasts are designed to mitigate environmental impact. Pre-Splits are restricted to approximately 100 holes and blast events are separated by at least 1 minute for histogram analysis.
5.1/11	Monitoring of near-by residences and bird breeding areas will be undertaken for all blast events (MCoA 8.4(b)(i) and (v)).	Monitoring locations have been established to the satisfaction of the EPA and DRE (.
5.1/11	As part of the blast monitoring program, meteorological conditions (including temperature, wind speed and direction) will be monitored at the time of blasting and recorded for each blast.	Meteorological conditions are taken into account for each blast by the Blast Controller.
5.1/11	The blast monitoring programme is to be revised / updated annually, unless otherwise directed by the D-G, to reflect changing environmental requirements, significant changes in technology /operational practices and results from monitoring conducted (MC0A 8).	The Blast Management Plan was updated in May 2010. Revision of internal blasting practices is a continuing improvement activity. New SAROS Blast Hub technology has been installed with event logging when blast overpressure >115 dB(L) is triggered. Wind is generally the spurious blast event cause. Greater than 95 dB(L) over-pressure results have resulted from ambient wind on Sundays and Public Holidays. Detection of blast overpressure is being enhanced with the installation of next generation loggers since mid-2012 flood recovery works. SAROS intends to install next generation ancillary equipment that includes anemometers & wind direction measurements into the new loggers to better identify any localised environmental factors.
5.2.1/12	Data from the on-site meteorological station will be used to determine whether conditions are suitable for blasting. The meteorological monitoring station will be maintained for the life of the Project to:	All employees have access to CGM weather station data via employee login. During 2012 the Kattron real-time lightning detection array system was purchased for the

Section/ Page No.	Blast Management Plan Commitments	Comments
	• assist in the prediction of noise, dust and blast impacts at nearby residences/bird breeding areas; and • to provide data at the time of each blast as part of the blast design iterative process (MCoA 8.1)	Mining Dispatch, Main Gatehouse and Processing Control Room operations screens. E-mail alerts go out to all employees and are displayed as coloured flashing light status warnings around Site.
5.3/12	Barrick is required to undertake remedial measures if blasting overpressure demonstrably disturbs bird breeding (MCoA 6.3(i))	No demonstrable disturbance of bird breeding was noted during the 2013-2014 period by the ongoing independent observations of bird breeding areas conducted in January, August and October by Professor Peter Gell and Paul Peake, University of Ballarat.
5.3.1	Baseline surveys will be continued to provide monitoring data during project operations. The information from these surveys is essential to examine whether a demonstrable disturbance to bird breeding can be attributed to the mine's activities at any point during the life of the mine.	The initial 10 blasts conducted at the CGM were monitored to assess the potential impact on waterbirds - no impact was observed. Independent Lake Cowal waterbird usage surveys occur January, August and October each year by Professor Peter Gell and Paul Peake have occurred.
6/14	In the event that the >120 dB air-blast overpressure criteria is exceeded or demonstrable disturbance of bird breeding occurs, strategies (including a review of the strategy) and implementation of a response strategy and procedures to deal with these blasts will be applied (MCoA 6.3(i)).	No blast overpressure of greater than 120dBL occurred between May 2013 and May 2014.
7/15	All blasts will be designed to comply with applicable criteria but in the event that monitoring indicates air-blast overpressure at dwellings are in excess of 120dB or, if monitoring of bird breeding indicates demonstrable disturbance, mitigation measures will be considered and applied as directed by the EPA and in consultation with NPWS in relation to bird breeding disturbance (Blast Management Plan Section 5.3 and MCoA 6.3(i)).	If required implementation of mitigation measures directed by the EPA in consultation with NPWS, will occur in relation to bird breeding disturbance (Blast Management Plan Section 5.3). . No mitigation measures have been required by EPA/NPWS between 2013 and 2014.
7/16	Barrick will implement adaptive management of blasting and following the implementation of any remedial measures, continued blast monitoring will provide feedback on the effectiveness of the implementation of the remedial measures to determine if any additional measures are required. In the event of demonstrable bird breeding disturbance, the monitoring, review and response strategies will be continued, in consultation with NPWS, until bird breeding monitoring indicates any effects from blasting activities have been mitigated.	Revision of internal practices related to blasting has been occurring since mid-2011. New Saros Blast Hub technology has been installed with event logging when > 115 dB(L) is triggered. Detection of blast overpressure by newer technology with the next generation of SAROS equipment includes anemometers & wind direction measurements by the new loggers. CGM blasts are designed to mitigate environmental impact by optimising size of blast. Pre-Split blasts are restricted to around 100 holes and blast events separated by at least 1 minute to provide for histogram analysis. Additional remedial measures will be adopted if required.
17/22	Ensure AEMR is prepared and submitted	Annual Environmental Management Reports (AEMR prepared by CGM in accordance with MCoA 9.2 address Blast management and overpressure/ vibration in AEMR section 3.10.

4.14.2 Blast Monitoring

All blasts were monitored for overpressure and vibration at the following fixed locations, with one mobile/portable monitor available for random checks. Blast monitoring locations are:

- BM01 - Gumbelah residence and BM03 - Coniston Residence are categorised as 'residence on privately owned land' .
- BM02, BM04.1, BM05, BM06 and BM09 are positioned to assess the impacts on and around Lake Cowal.
- BM07 – Administration and

- BM10 Near Field Monitor

Enhanced technology has been installed in the land-based cabinets of blast monitoring units around Lake Cowal. Inundated blast monitoring units in Lake Cowal (i.e. BM04, BM05 and BM06) were replaced with enhanced technology units mounted on taller tripod stands in mid-2012.

- The Annual Review of Blast Monitoring Results (conducted by SAROS) concluded that Blast overpressure levels were compliant with the MCoA 6.3(a), EPL conditions L7.3 and L7.4, and Mining Lease condition 27 (i.e. less than 5% of total blasts must not exceed 115dBL).

Data for a total of 479 blasts during 2013 and 109 blasts between January and March 2014 indicated:

- No blast related events exceeded the maximum compliance level of 120dB(L);
- No blast related events exceeded the 115dB(L) level on normal weekdays and Saturdays;
- Five (5) blast related events exceeded the 95dB(L) level on Sundays and Public Holidays (refer to Tale 18). These exceedences of greater than 95 dB(L) over-pressure resulted from ambient wind speed and direction on Sundays and Public Holidays (as determined by meteorological data and assessed by The SAROS Group).

Table 18: Blast Monitoring Exceedences January 2013 to March 2014

Blast Monitoring Exceedences January 2013 to March 2014		
Overpressure Exceedence	**Location**	**Date**
BM01 (95.9dB(L))	BM01-Gumbelah Residence	Sunday, 7 July 2013
BM06 (98.8dB(L))	BM06-General Monitoring	Wednesday, 1 January 2014
BM01 (101.0dB(L))	BM01-Gumbelah Residence	Sunday, 26 January 2014
BM01 (95.9dB(L))	BM01-Gumbelah Residence	Sunday, 2 February 2014
BM01 (98.8 dB(L)), BM02 (97.5dB(L)), BM04.1 (98.8dB(L)), BM05 (95.9dB(L))	BM01 - Gumbelah Residence, BM02 – Hillgrove Residence, BM04.1 - Northern Bird Breeding, BM05 – Southern Bird Breeding area	Sunday, 9 March 2014

- 100% of ground vibration results were compliant with MCoA 6.3(a), EPL conditions L7.3 and L7.4, and Mining Lease condition 27 (i.e. ground vibration (peak particle velocity) to be less than 5mm/s).
- Blast complaints received between May 2013 and May 2014 were investigated and it was demonstrated that the blast overpressure from each event did not exceed the blast criteria.

4.14.3 Conclusion

The Blast Management Plan was prepared to satisfy MCoA 6.3 and the management of blasting has been undertaken in accordance with the Blast Management Plan. The Blast Management Plan required under MCoA 6.3 was revised in May 2010 and submitted to DP&I. Barrick was awaiting written approval from the DP&I of the May 2010 revision at the time of this audit (i.e. May 2014).
The Blast Management Plan provides a sound basis for the control of noise and vibration impacts from the mining activities and the procedures and blast methodology conform with best practice as outlined in current regulatory guidelines (*Technical Basis for Guidelines to Minimise Annoyance due to Blasting Overpressure and Ground Vibration*, ANZECC, *Assessing Vibration: a technical guideline* DECCW, and Australian Standards).

Blast overpressure and vibration monitoring has demonstrated compliance of all blasts conducted during weekdays and Saturdays with the criteria specified in the MCoA/EPL/ML conditions.

Exceedence of the 95dB(L) Sundays and Public Holidays criteria (MCoA 6.3(a)) occurred from five (5) blasts on between January 2013 and March 2014.

4.15 Noise Management

[Minister's Condition of Approval 6.4]

4.15.1Noise Management Plan

The Noise Management Plan was prepared to satisfy the requirements of MCoA 6.4(b) in consultation with the DEC, and approved by DIPNR in November 2004.

An addendum to the Noise Management Plan related to the location of a monitoring site NO4 was approved by DoP in August 2007. A further amendment to change to the mine operation noise limits to contemporise the Development Consent conditions for consistency with the Environment Protection Licence No. 11912 condition L6 and the NSW Industrial Noise Policy (EPA, 2000). The amendment was submitted to DoP in September 2009 and approved in April 2010.

Commitments in the Noise Management Plan are listed in Table 18.

Table 18: Noise Management Plan Commitments

Section/ Page No.	Noise Management Plan Commitments	Comments
s.6.2.2/p22	Monitoring will be undertaken in July and January, representing mid-winter and mid-summer, respectively to enable seasonal variations in noise impacts to be established.	Noise monitoring is conducted in January and July each year by SLR and reports provided to Barrick.
s.6.2.3/p22	The on-site meteorological station located near the southern ML 1535 boundary provides meteorological data for predicting noise impacts on nearby residences and bird breeding areas. and measures real-time wind speed / direction, standard deviation of wind direction, temperature (2m and 10 m), barometric pressure, humidity, solar radiation and rainfall (MCoA 8.1)	The on-site meteorological station located near the southern ML 1535 boundary provides meteorological data and measures real-time wind speed and direction, temperature (2m and 10 m), barometric pressure, humidity, solar radiation and rainfall (MCoA 8.1)
s.6.2.3/p22	Monitoring will be conducted at near-by residences and bird breeding areas to evaluate, assess and report the $LAeq_{(15\ minute)}$ noise emission levels due to normal operations of the mine.	Monitoring at near-by residences and bird breeding areas has been carried out by SLR and reported each six months during 2013 and -2014.
s.6.2.4/p26	The occurrence of any temperature inversions will be compared with noise complaint details to determine whether any higher level of impacts or patterns of temperature inversions have occurred.	Meteorological conditions are available on a continuous basis from the on-site meteorological station and this data is used during assessment of any noise complaints lodged with CGM.
s.6.2.6/27	Monitoring locations DECCW, 18 August 2009 were: • NO1 – New Lake foreshore; • NO2 – "Coniston" residence; • NO3 – bird breeding area; • NO4 – bird breeding area (location change approved in August 2007; • NO5 – "Gumbelah" residence; • NO6 – "Lake Cowal" residence; • NO7 – "West Lea" residence; and • NO8 – "McLintock" residence.	The noise monitoring locations approved in August 2009 have been retained for the six monthly monitoring conducted by SLR between May 2013 and May 2014.
s.6.2.7/p27	Operator attended noise monitoring will be conducted at six monthly intervals at the noise monitoring locations using an integrating averaging sound level meter over a 15 minute period on at least one occasion during the daytime (7.00 am to 6.00 pm) and evening (6.00 pm to 10.00 pm). During the survey, the operator will identify the character and duration of acoustically significant noise sources.	Six-monthly operator attended noise monitoring is conducted in January and July by SLR and the results including the character and duration of the noise sources reported in section 5 of the SLR reports.
s.6.2.9/p28	Should the independent review process outlined	This commitment and MCoA condition11.3

Section/ Page No.	Noise Management Plan Commitments	Comments
	in Consent Condition 11.3 (Section 15) require noise modelling or other studies to be conducted, modelling will be undertaken in accordance with the requirements of Section 6.2 of the Industrial Noise Policy.	have not been triggered between May 2013 and May 2014.
s.10.1.1	Traffic noise monitoring on the access road from West Wyalong will be undertaken on an annual basis by a suitably qualified person at: • TN1 - 140 Ungarie Road (near Dumaresq Street), 30m offset from the road • TN2 - "Clairview" Residence, Wamboyne Road, 45m offset from the road • TN3 - "Windstone" Residence, 150m offset from Wamboyne Road	Traffic noise monitoring is conducted annually during January/February by SLR at the three nominated sites.
s.10.1.3/p39	In order to allow timely response to traffic noise complaints from residences within 30m of the mine access road, Barrick will maintain suitable noise monitoring equipment on-site that can be deployed by environmental staff within 48 hours of complaint receipt.	A Type II Noise Meter is available on site in the Environment Section and is maintained with calibrated sources in readiness for any required monitoring related to noise complaints.
s.11/p44	A complaints register will be maintained by the Environmental Manager (MCoA 10.1(a)).	CGM has a 24hour complaints line (02) 6975 3454. CGM uses the External Communications component of the Responsibility Information Management System (RIMS) to track public complaints.
s.12.1/p45	A CEMCC will be set up for the CGM (MCoA 8.7).	The CEMCC was established in 2003 and the inaugural meeting of the CEMCC occurred on 15 October 2003 and has met quarterly since October 2003.
s.13/p47	At least three months prior to increasing the mobile equipment fleet as described in the E42 Modification – Modified Request Environmental Assessment (Barrick, 2009), Barrick will notify the landowners of "Coniston", "McLintock" and "West Lea" in writing that they have the right to acquire their land at any stage during the CGM operations (MCoA 11.1).	CGM acts on legal advice in relation to the E42 Modification Environmental Assessment (2009), that they have not triggered the requirement for notification of landowners under condition 11.1 or 6.4(f).
s.17/p53	The AEMR will be prepared (MCoA 9.2).	Annual Environmental Management Reports (AEMR) prepared by CGM in accordance with MCoA 9.2, include noise management and monitoring results in section 3.11.

3.15.2 Noise Monitoring

The Noise Management Plan provides the procedures to be implemented for the management of noise impacts from the CGM activities. Six monthly attended and unattended noise monitoring surveys have been conducted to monitor the impact of noise on wildlife, a program to be undertaken to survey and investigate the effectiveness of noise reduction measures implemented in relation to noisy activities from the operations, and the noise reduction procedures to be implemented in the event of exceedence of the MCoA and EPL noise criteria.

- Operations noise surveys were conducted by SLR six monthly, in January-February and July between May 2013 and May 2014. Results from the day-time, evening and night-time operator attended survey showed that the measured intrusive noise levels were compliant with the relevant noise assessment criteria at all measurement locations. The SLR Report March 2014 concluded that -*"All operator attended noise recordings were measured to be below the consent criteria during all periods of the day at all locations monitored. Consequently the CGM was observed to be in compliance with the frelevant noise requirements*

With regard to unattended noise logger data monitored in the January/February 2014 program SLR concluded that:

> *"Comparison of the noise levels indicates that the noise levels monitored in January/February 2014 were generally lower than the previous summer at all locations except at Gumbelah (No 5) where the levels were generally higher than the previous summer.*
>
> *A review of the earlier operator -attended noise monitoring results indicates that decrease in the ambient noise levels is not due to the CGM operations, rather, the decreased noise levels are due to decreased faunal activity (insects + birds + frogs), presumably due to the decreasing level of rainfall (and lake water level) experienced over the last 12 months."*

- No noise level exceedences were recorded during the May 2013 and May 2014 audit period.
- Additional monitoring was carried out for Barrick at the "Gumbelah", Cowal North and "Laurel Park" residences and Noise Mitigation Deeds were finalised with "Gumbelah", "Laurel Park" and "Cowal North" land owners in accordance with MCoA 6.4(c).

3.15.3 Conclusions

The Noise Management Plan prepared to satisfy the requirements of MCoA 6.4(b) has been implemented for the CGM operations. The revised Noise Management Plan was approved by DoP in April 2010.

The implementation of the control strategies outlined in the Noise Management Plan have minimised noise emissions from the CGM and are considered to be best practice and effective as demonstrated by the noise monitoring data and environmental performance indicators.

Operational noise surveys conducted by SLR in January / February and July each year during 2013 and 2014 have demonstrated that CGM is operating in compliance with the noise assessment criteria imposed in the Development Consent and EPL conditions, and commitments made in the Environmental Assessment. No operator attended noise monitoring results exhibited operational noise criteria exceedences during the May 2013 to May 2014 period.

4.16 Traffic Noise Management

[Minister's Condition of Approval 6.4(d)]

3.16.1 Traffic Noise Management Plan

The Traffic Noise Management Plan required under MCoA 6.4(d) was approved by DIPNR in 2003 and amendments approved in July 2007. The Traffic Management Plan was implemented for the CGM during construction mine. The components of the Traffic Noise Management Plan were incorporated into the revised Noise Management Plan 2010 (submitted to the DP&I for approval in July 2010.

Commitments in the Traffic Management Plan are listed in Table 19.

Table 19: Traffic Management Plan Commitments

Page No./section	Traffic Noise Management Plan Commitments	Comments
s.2.4/p8	Barrick will be responsible for ensuring Company-owned vehicles that operate on public roads are serviced and maintained in accordance with maintenance schedules and relevant statutory requirements to minimise noise emissions.	Barrick owned vehicles are serviced and maintained at the on-site workshops and meet relevant statutory requirements.
s.4.1/p11	Traffic noise will be undertaken in accordance with the following guiding documents that provide current monitoring practice. In accordance with Appendix A, traffic noise level monitoring will be undertaken	SLR Traffic Noise Monitoring Reports section 3 describe the attended and unattended monitoring procedures and the location of monitoring equipment

Page No./section	Traffic Noise Management Plan Commitments	Comments
	outside the residence some 1 m from the building facade that is most exposed to traffic and at a height of 1.5 m from floor level.	locations.
s.4.1.4p14	Traffic noise monitoring on the Project access road will be undertaken on an annual basis by a suitably qualified person (MCoA 6.4(c)(i))	Annual Traffic Noise Monitoring has been conducted by SLR in January-February each year.
s.8/p21	An AEMR will be prepared in accordance with the requirements of the DMR and Consent Condition 9.2 and submitted to the Director General	Annual Environmental Management Reports (AEMR) prepared by CGM in accordance with MCoA 9.2 includes traffic management in section 3.10.

3.16.2 Traffic Noise Monitoring Results

SLR conduct traffic survey and attended traffic noise monitoring at 130 Ungarie Road (TN1), "Clearview" residence Wamboyne Road (TN2) and Windstone" residence on Wamboyne Road (TN3).

SLR traffic noise monitoring results for the February 2014 exhibited:

- TN1 140 Ungarie Road
  The five-day average calculated $LA_{eq(1hour)}$ mine generated traffic noise at TN1 during the daytime (1700 hours to 1800 hours) was 57 dBA (i.e. below the 65 dBA criterion). The five-day average calculated $LA_{eq(1hour)}$ mine generated traffic noise at TN1 during the night-time (0600 hours to 0700 hours) was 56 dBA (i.e. below the 60 dBA criterion).
- TN2 "Clairview" Residence, Wamboyne Road
  The five-day average calculated $LA_{eq(1hour)}$ mine generated traffic noise at TN2 during the daytime peak (1700 hours to 1800 hours) was 46 dBA (i.e. below the 60 dBA criterion). The five-day average calculated $LA_{eq(1hour)}$ mine generated traffic noise at TN2 during the night-time peak (0600 hours to 0700 hours) was 51 dBA (i.e. below the 55 dBA criterion).
- TN3 "Windstone" Residence, Wamboyne Road
  The five-day average calculated $LA_{eq(1hour)}$ mine generated traffic noise at TN3 during the daytime peak (1700 hours to 1800 hours) was 44 dBA (i.e. below the 55 dBA criterion). The five-day average calculated $LA_{eq(1hour)}$ mine generated traffic noise at TN3 during the night-time peak (0600 hours to 0700 hours) was 45 dBA (i.e. below the 50 dBA criterion).

: SLR traffic noise monitoring results for the February 2013 exhibited:

- TN1 -140 Ungarie Road**:**
  The three-day average calculated $LA_{eq(1hour)}$ mine generated traffic noise at TN1 during the daytime (1700 hours to 1800 hours) was 54 dBA (i.e. below the 60 dBA criterion). The three-day average calculated $LA_{eq(1hour)}$ mine generated traffic noise levels at TN1 during night-time (i.e. 0600 to 0700 hrs) was 55 dBA which meets the 55 dBA criterion.

- TN2 – "Clearview Residence Wamboyne Road:
  The three-day average calculated $LA_{eq(1hour)}$ mine generated traffic noise at TN2 during the daytime peak (1700 hours to 1800 hours) was 50 dBA (i.e. below the 55 dBA criterion). The three-day average calculated $LA_{eq(1hour)}$ mine generated traffic noise at TN2 during the night-time peak (i.e. 0600 to 0700 hrs) was 53 dBA (i.e. 3 dBA above the 50 dBA criterion).

- TN3 – "Windstone" Residence Wamboyne Road:
  The three-day average calculated $LA_{eq(1hour)}$ mine generated traffic noise at TN3 during the daytime peak (1700 hours to 1800 hours) was 47 dBA (i.e. below the 55 dBA criterion). The three-day average calculated $LA_{eq(1hour)}$ mine generated traffic noise at TN3 during the night-time peak (0600 hours to 0700 hours) was 48 dBA (i.e. below the 50 dBA criterion).

No complaints in relation to traffic noise were received by Barrick during the May 2013 to May 2014 period.

Barrick entered into Agreements in September 2012 with residents who may potentially be affected traffic noise attributable to the mine traffic with the following proposal:

> *"The Company proposes that a letter agreement be entered into with affected landowners on terms that exceedences of up to 5 dBA above the noise conditions of the Development Consent are permitted, however regular exceedences above 5 dBA will require the Company to enter into discussions with affected landowners to noise mitigation measures at their properties, such as provision of air conditioning."*

The Agreement letters were signed by each of the landowners notified, indicating acceptance of the above condition of Agreement and the Director-General of DP&I was notified of the terms of agreement on 3 September 2012. (No response or acknowledgement had been received from DP&I at the date of this audit).

Recommendation:

Barrick should communicate/consult with DP&I to obtain written acceptance of the Agreement conditions with the residents in relation to Barrick response to traffic noise exceedences.

4.16.3 Conclusion

Traffic noise monitoring is included in the revised Noise Management Plan. SLR conduct a traffic survey and attended traffic noise monitoring annually at 130 Ungarie Road (TN1), "Clearview" residence Wamboyne Road (TN2) and Windstone" residence on Wamboyne Road (TN3).

Noise results for the 2013 and 2014 traffic surveys indicate no traffic noise exceedence was at TN1, TN2 or TN3 between May 2013 and May 2014.

No complaints from residents regarding traffic noise were received during the period May 2013 to May 2014.

Barrick entered into Agreements with residents who may potentially be affected traffic noise attributable to the mine traffic, in September 2012.

4.17 Community Complaints

(Ministers Condition of Approval condition 10.1
Environment Protection Licence 11912 conditionsM4.2 and 4.3)

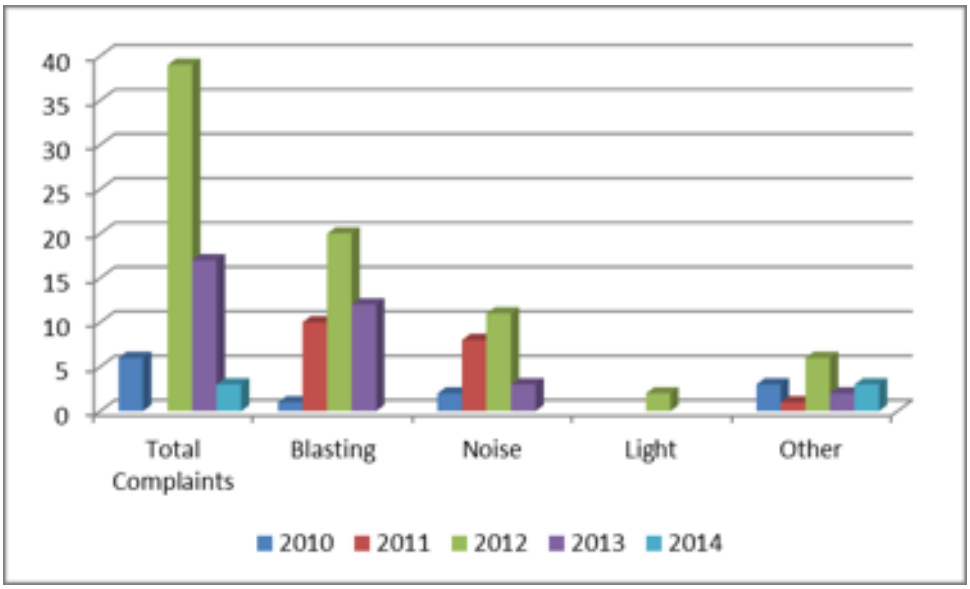
4.17.1 Complaints Procedure

Complaints received from the community on their 24hour complaints line (02) 6975 3454 by CGM are recorded in the External Communications component of the Responsibility Information Management System (RIMS).

The RIMS database records each complaint including details as required under EPL 11912 condition M4.2:

- date and time of the complaint;
- method by which the complaint was made;
- personal details of the complainant, as provided by the complainant or, if no such details were provided, a note to that effect. Complainants are not recorded by name in the reports submitted to the agencies, but are reported by resident identifier (e.g. Complainant A etc. to maintain complainant confidentiality);
- nature of the complaint; and
- action taken by CGM and outcome in relation to the complaint, including any follow-up contact with the complainant.

All complaints are retained within the RIMS database, compliant with the requirement of EPL 11912 condition M4.3 and six monthly summary reports of complaints received by CGM are prepared and submitted to OEH/BSC/DI&I/CEMCC and DP&I.



The pattern of complaints exhibits a significant decrease in blasting and noise complaints between May 2013 and May 2014, following agreements reached with three complainants in Q3 2013.

4.17.2 Conclusion

The complaints handling process and procedure for reporting of complaints and action taken by CGM / Barrick, comply with the requirements of MCoA 10.1 and EPL condition M4. The RIMS database includes all the information required by the approval conditions and details of each complaint and action taken by CGM in response to the complainant.

A significant reduction in blasting and noise complaints occurred in late 2013 after CGM finalised agreements with three complainants. All other complaint numbers dropped between May 2013 and May 2014.

4.18 Independent Monitoring Panel

The Independent Monitoring Panel established in accordance with MCoA 8.8(b) has prepared an Annual Report for the Cowal Gold Project with recommendations.

The IMP also review the Independent Environmental Audit prepared under MCoA 8.8(a) and have made the following comment:

> *"The independent environmental auditors reviewed the available documentation covering licenses and approvals granted by Government for the project as well as the environmental monitoring documentation held by Barrick at the mine site office in order to verify compliance with the conditions of approval.*
>
> *As mentioned in previous IMP reports, the independent environmental auditors established a logical framework for verifying compliance by setting out the entire list of requirements, in the separate management plans that have been prepared by Barrick, that cover environmental management under the Minister's Conditions of Approval."*

Barrick responses to the IMP Report recommendations and subsequent assessment of Barrick actions to the IMP are presented below.

Eighth IMP Report October 2012		
IMP Recommendation	**Barrick Response**	**IMP Assessment of Barrick Response to Recommendations**
2012 IMP Recommendation 1: CGM should endeavour to complete the Northern Waste Emplacement Trials as soon as required materials become available.	***Barrick response*** *Barrick with DnA Environmental has finalised the design of additional replicate trial plots on the northern batters of the Northern Waste Rock Emplacement. The trial aims to further assess the effectiveness of various treatments associates with the rock mulch/top soil/ hay rehabilitation cover system.*	During the mine visit, the IMP assessed the progress in implementing the Northern Waste Emplacement Trials against the schedule shown in Attachment B. It was noted that these trials have not commenced owing to the lack of suitable native pasture hay as a result of erratic rainfall during the previous growing season. Advice was received from mine personnel that reasonable rainfall during autumn/winter has resulted in good native pasture growth, and that hay will be harvested in October 2013. Concerns have been raised regarding the likelihood of natural regeneration of native woody vegetation on post mining landscapes through processes such as windblown seed, and the need to engage in active revegetation. The IMP discussed the trial design with mine staff and stressed the need to consider the inclusion of native shrubs and trees and the need to plan well ahead in terms of native pasture hay and native seed collection for large scale rehabilitation in the future. Direct seeding and planting of tube stock were two options discussed, although it was acknowledged that mass planting of tube stock may not be a feasible option for the whole site.
2012 IMP Recommendation 2: CGM should continue to monitor existing rehabilitation trials (and those planned for establishment in 2012) with a view to further refining its approach to achieve sustainable, post-mining landscapes.	***Barrick response*** *Barrick will continue to engage DnA Environmental to monitor the performance of CM rehabilitation areas including existing and planned rehabilitation trials to prepare an annual rehabilitation report that evaluates the status of rehabilitation at CGM. In accordance with the CGM Rehabilitation and Landscape Management Strategy (2009), Barrick will continue to refine and improve the CGM rehabilitation program based on the results from the trials, investigations and studies undertaken.*	The IMP noted in the Monitoring Report by DnA Environmental (January 2013) that the best performing treatments in terms of ecological sustainability appeared to be those that did not include subsoil. However examination of root growth of 2-year old Eucalypts showed that the roots penetrated subsoil but not oxide material. Given the importance of having sufficient satisfactory root growth material for all the future potential rehabilitation on the mine site, it is considered premature to discount the use of subsoil material as a substrate at this stage of investigation. Indeed there would appear to be a good opportunity for the benefits or otherwise of subsoil to be further explored in the Northern Waste Emplacement Trial that is yet to be established. Wider use of subsoil in rehabilitation may become a necessity should the available

		supply of topsoil be inadequate to meet the needs of the site. Subsoil ameliorated with organic matter (e.g. biosolids, and gypsum) may become a necessary planting medium.
2012 IMP Recommendation 3: CGM should continue to explore reasons for the anomalous metal concentrations on control soil and overburden samples being obtained from one of the laboratories used for analysis of dust samples.	***Barrick response*** *Due to unresolved anomalous metals results for monthly depositional dust samples provided to ALS Laboratory Group, Barrick commenced dispatching all dust gauge samples to the National Measurement Institute (NMI) in mid-2012. Barrick has requested ALS to review the laboratory procedures used for metals analysis and provide a justification for the anomalous metal concentrations provided to Barrick during 2012.*	The IMP noted in the 2012 AEMR that the values for copper and zinc in dust tended to decrease after about August 2012 when a new analysing laboratory was employed, but that there still tended to be elevated values that require closer scrutiny. The IMP also notes and commends the actions listed in the 2012 AEMR to improve the collection of dust samples and their analysis for metals and the ongoing involvement of the University of Sydney in advising on collection and analysis.
2012 IMP Recommendation 4: In the 2012 AEMR, CGM should not only provide figures showing groundwater contours around the pit, but discuss the implications for the surrounding environment.	***Barrick response*** *A description of the regional and local hydrogeological regime surrounding the CGM is provided in the approved Cowal Gold Mine E42 Modification Modified Request Environmental Assessment (2009). The Modified Request also included a hydrogeological assessment of the potential for the hydrogeological regime to change as a result of the Modified Request Project, which concluded that net potential hydrogeological impacts would be less than those described in the E42 Modification Project (2009).*	The discussion in the 2012 AEMR on the groundwater surfaces and potential impacts in the pit and tailings storage facilities areas satisfactorily addresses Recommendation 4 of the IMP.
2012 IMP Recommendation 5: CGM should ensure that copper is analysed on all surface water bodies, including Lake Cowal (along with the other metals and metalloids listed) and that these data are reported in the next AEMR.	***Barrick response*** *Copper concentration of Lake Cowal surface water during 2011-2012 is lower than the average total copper concentration in 1991/1992 (prior to construction of the CGM) and dissolved copper concentrations have remain relatively unchanged. Based on this Barrack considers the absence of copper as an analyte in the CGM surface water monitoring program is valid.* *Notwithstanding Barrick will continue to include copper in the Lake Cowal monitoring program until the anomalous dust analysis results have been resolved with ALS.*	The IMP is satisfied with the comprehensive reply by CGM to this recommendation.
2012 IMP Recommendation 6: CGM should be prepared for operational or advocacy requirements arising from progressive drying and emptying of Lake Cowal.	***Barrick response*** *Barrick considers that the environmental management controls currently in place at the CGM will adequately prepare the CGM for potential ecological occurrences and operations requirements associated with Lake Cowal drying cycle.* *……Notwithstanding, Barrick will consult with relevant agencies and the CEMCC regarding works proposed to address an ecological*	The IMP acknowledges the CGM response and awareness, and notes that public concerns regarding aspects of drying dynamics, for example on population viability and health of yabbies, may be misattributed to CGM.

	occurrence that may arise as a result of the Lake Cowal drying cycle as part of Barrick's ongoing stakeholder engagement, if necessary.	
Eighth IMP Report October 2013 (received by Barrick 2 June 2014)		
IMP Recommendation	**Barrick Response**	**IMP Assessment of Barrick Response to Recommendations**
2013 IMP Recommendation 1: CGM should complete the layout and planting of the Northern Waste Emplacement Trials as soon as possible and ensure that appropriate native species are included as direct seeded, tube stock, or fascine treatments.	*The Ninth Independent Monitoring Panel Report was received by Barrick on 2 June 2014. Response to the Ninth IMP Report recommendations will be prepared by Barrick for submission to the IMP.*	IMP assessment of responses to the recommendations and actions taken by Barrick during 2014 will be reported in the Tenth IMP Annual Report October 2014.
2013 IMP Recommendation 2: CGM will need to plan well ahead for collection of native pasture hay and native shrub and tree seed or fascines sufficient to meet the needs of large-scale rehabilitation.	*The Ninth Independent Monitoring Panel Report was received by Barrick on 2 June 2014. Response to the Ninth IMP Report recommendations will be prepared by Barrick for submission to the IMP.*	IMP assessment of responses to the recommendations and actions taken by Barrick during 2014 will be reported in the Tenth IMP Annual Report October 2014.
2013 IMP Recommendation 3: CGM should continue to monitor existing rehabilitation trials (and those planned for 2013) with a view to better define its approach to achieving sustainable, post-mining landscapes. Sampling and monitoring should be such as to provide more information on the benefits or otherwise of subsoil as a component of the root zone.	*The Ninth Independent Monitoring Panel Report was received by Barrick on 2 June 2014. Response to the Ninth IMP Report recommendations will be prepared by Barrick for submission to the IMP.*	IMP assessment of responses to the recommendations and actions taken by Barrick during 2014 will be reported in the Tenth IMP Annual Report October 2014.
2013 IMP Recommendation 4: CGM should continue with its efforts to improve the process of dust sample preparation and metal analysis (including liaising with the University of Sydney where necessary) to ensure valid results.	*The Ninth Independent Monitoring Panel Report was received by Barrick on 2 June 2014. Response to the Ninth IMP Report recommendations will be prepared by Barrick for submission to the IMP.*	IMP assessment of responses to the recommendations and actions taken by Barrick during 2014 will be reported in the Tenth IMP Annual Report October 2014.

4.18.2 Conclusion

The Independent Monitoring Panel (IMP) Reports prepared annually have provided a useful third party review of the status of the CGM activities in relation to environment and rehabilitation issues. Barrick has provided responses to the IMP recommendations and address the IMP requirements within the subsequent 12 month IMP review period.

5. CONCLUSION

The independent environmental audit was conducted between 28 April 2013 and 31 May 2014 to satisfy MCoA 8.8 and assessed compliance of the CGM operations for the mining and ore processing, for the period of 1 May 2013 to 1 May 2014.

Site inspections, document review and discussions with relevant CGM personnel were undertaken during 28 April 2013 and 3 May 2014. Additional information for verification of compliance with the MCoA was provided by Barrick as requested by the auditor following the site visit.

The files held by Barrick at the CGM site and information from CGM personnel on site provided the auditor with the required documentation for verification of implementation of the commitments in the environmental management plans and compliance with the MCoA and other statutory approvals.

The audit findings confirm an overall high standard of general compliance with the Minister's Conditions of Approval, Environment Protection Licence and requirements of the environmental conditions attached to the Mining Lease 1535.

The following recommendations are provided in relation to the findings of the audit:

Recommendation 1
To address MCoA 3.2, Barrick should request a response from DP&I in relation to revised management plans submitted DoP/DP&I during the 2010 and May 2014 period:

- Revised Rehabilitation and Offset Management Plan (lodged 21 August 2013)
- Flora and Fauna Management Plan - Threatened Species Management Strategy (lodged 13 November 2012)
- Revised Noise Management Plan (lodged 24 December 2012)
- Revised Site Water Management Plan (lodged 8 August 2013)
- Addendum Surface Water, Groundwater, Meteorological and Biological Management Programme (Mine Operations) (lodged 13 August 2013)
- Post Mine Operations SGWMBMP (lodged 10 October 2013)
- Revised Blast Management Plan (lodged 11 December 2012)
- Addendum to Flora Fauna Management Plan response sent 13 November 2012.

Recommendation 1
The management plans required under the MCoA are due for review each 5 years in accordance with MCoA 3.2. As a response from DP&I has not been received from DP&I on a number of the management plans submitted during the 2010-2014 period, it is recommended that the review of each of the management plans occur when the decision by DP&I on MOD11 for the CGM Project and approval conditions are finalised.

Recommendation 3
To meet the obligations under the Mining Operations Plan(s) and Development Consent condition 2.1 and 3.6 , the waste rock emplacement areas that have reached the areal and height criteria approved in the MOP's and the Development Consent for the Cowal Gold Project, should be contoured and rehabilitated with the proven blends of rock, subsoil, gypsum and mulch and seed mixture (identified by the rehabilitation trials) as soon as the weather conditions are conducive with seed germination and establishment of a stabilising cover crop.

Recommendation 4
To confirm compliance with MCoA 6.4(d), Barrick should communicate/consult with DP&I (and EPA) to obtain written acceptance of the Agreement conditions with the residents in relation to the Barrick response to traffic noise exceedences.

Recommendation 5
Barrick should clarify with DP&I the intent/requirement under MCoA 11.1 (related to maximum fleet numbers and land acquisition request(s) by land owners identified in the condition of consent). This issue should be clarified prior to finalisation of Modification to the Development Consent MOD11 conditions of approval.

GLOSSARY OF TERMS

AEMR	Annual Environmental Management Report
AR	Annual Return – EPA
BSC	Bland Shire Council
CEMCC	Community Environmental Monitoring and Consultative Committee
CGM	Cowal Gold Project
CN	Cyanide
CN_{WAD}	Cyanide weak acid dissociable
DA	Development Application
DECC	Department of Environment and Climate Change (formerly DEC)
DECCW	Department of Environment, Climate Change and Water (formerly DECC)
DII	Department of Industry and Investment (formerly DPI)
Director-General	Director-General of DP&I
DTIRIS	Department of Trade and Investment, Regional Infrastructure and Services
DLWC	Department of Land and Water Conservation
DMR	Department of Mineral Resources
DNR	Department of Natural Resources (now OoW)
DoP	Department of Planning (formerly DIPNR)
DP&E	Department of Planning and Environment (established April 2014)
DP&I	Department of Planning and Infrastructure (previously DoP / Planning NSW)
DRE	Division of Resources and Energy (part of DTIRIS)
DSC	Dam Safety Committee
DWE	Department of Water and Energy
EIS	Environmental Impact Statement – Cowal Gold Project 1998
EMP	Environmental Management Plan
EP&A Act	*Environment Planning and Assessment Act 1979*
EPA	NSW Environment Protection Authority
EPL	Environment Protection Licence
ETBC	Employment Training and Business Committee
FSC	Forbes Shire Council
LCF	Lake Cowal Foundation
MOP	Mining Operations Plan
NoW	NSW Office of Water
NPW Act	*National Parks and Wildlife Act 1974*
NPWS	National Parks and Wildlife Service
OEH	Office of Environment and Heritage
OERP	Operational Emergency Response Plan
OoW	NSW Office of Water
RTA	Roads and Traffic Authority (now RMS)
RIMS	Responsibility Information Management System
RMS	Roads and Maritime Services
SIS	Species Impact Statement
TSR	Travelling Stock Route
WAD	Weak acid dissociable
WAL	Water Access Licence
WCC	Wiradjuri Condobolin Corporation
WCC&HC	Wiradjuri Condobolin Culture and Heritage Company

ATTACHMENTS

Attachment A **Minister's Conditions of Approval (MCoA)**

Attachment B **Environment Protection Licence (EPL)**

Attachment C **Mining Lease Conditions (ML)**

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Red Type represents August 2003 Modification (Mod 1)
Green Type Represents December 2003 Modification (Mod 2)
Blue Type Represents August 2004 Modification (Mod 3)
Lavender Type Represents August 2006 Modification (Mod 4)
Brown Type Represents February 2008 Modification (Mod 5)
Orange Type Represents March 2010 Modification (Mod 6)
Grey Type Represents February 2009 Modification (Mod 7)
Purple Type Represents August 2009 Modification (Mod 8)
Turquoise Type Represents January 2011 Modification (Mod 9)
Violet Type represents 16 December 2010 s75W Modification (MOD 10)

No.	Minister's Condition of Approval	Verification	Comments	Compliance
1.1	Adherence to terms of DA, EIS, SIS, etc.			
	(a) The Development is to be carried out generally in accordance with: (i) EIS dated 13 Mar 1998, including the Statement of Intent by North Gold (WA) Ltd, and prepared by Resource Strategies, as amended by the plans in Appendix 2 of this consent; (ii) other relevant documentation, including the Applicant's primary submission, and submission to the Commission of Inquiry; (iii) modification application submitted by Barrick Australia Limited, dated 20 Jun 2003; (iv) modification application and supporting information submitted by Barrick Australia Limited, dated 13 Nov 2003; (v) modification application and supporting information submitted by Barrick Australia Limited, dated 22 Jun 2004; (vi) modification application and supporting documentation submitted by Barrick Australia Limited, dated 15 Aug 2006; (vii) modification application and supporting documentation submitted by Barrick Australia Limited, dated 24 Dec 2007; (viii) modification application and supporting documentation submitted by Barrick Australia Limited, dated 30 Jan 2009; (ix) modification application and supporting documentation submitted by Barrick (Cowal) Limited, dated 23 Jun 2009; (x) modification application dated 25 Mar 2008 and supporting EA submitted by Barrick Australia Limited; (xi) modification application dated 22 Nov 2010 and supporting letter submitted by Barrick (Cowal) Limited; and (xii) modification application dated 16 December 2010 (Mod 10) and supporting Environmental Assessment titled *Cowal Gold Mine Water Supply Modification (Section 75WModification)* and dated December 2010, submitted by Barrick (Cowal) Limited; and (xiii) conditions of this consent.	• EIS, North Gold (WA) Ltd, prepared by Resource Strategies, 13 Mar 1998; • Modification application Barrick Australia Limited, 20 Jun 2003; • Modification application, Barrick Australia Limited, 13 Nov 2003; • Modification application, Barrick Australia Limited, 22 Jun 2004; • Modification application, Barrick Australia Limited, 15 Aug 2006; • Modification application, Barrick Australia Limited, 24 Dec 2007; • Modification application, Barrick Australia Limited, 30 Jan 2009; • Modification application Barrick (Cowal) Limited, 23 Jun 2009; • Modification application Barrick (Cowal) Limited, 22 Nov 2010 • Modification application (Mod 10) and Environmental Assessment titled *Cowal Gold Mine Water Supply Modification (Section 75WModification)*, Barrick (Cowal) Limited, 16 December 2010	The CGM has been developed generally in accordance with the 1998 EIS, Commission of Inquiry submissions, supporting documentation, the Minister's Conditions of Approval (MCoA) and Modifications to the Development Consent granted under the *Environment Planning and Assessment Act 1979*, and E42 Modification Modified Request December 2010, as listed in MCoA 1.1.	**Compliant**

No.	Minister's Condition of Approval	Verification	Comments	Compliance
	(b) If there is any inconsistency between the above documents, the latter document shall prevail over the former to the extent of the inconsistency. However, the conditions of this consent shall prevail over all such documents to the extent of any inconsistency.			**Noted**
1.2	***Period of Approval/Project Commencement***			
	(i) Mining operations may take place until 31 December 2019. *Note: Under this approval, the Applicant is required to rehabilitate the site and perform additional undertakings to the satisfaction of the D-G and DII (Minerals). Consequently this approval will continue to apply in all other respects other than the right to conduct mining operations until the site has been properly rehabilitated.*	• Letter from DMR Mining Application No. 45 – Cowal Gold Project, 18 June 2003	Mining Lease (ML 1535) was granted on 13 June 2003 and mining operations commenced on 21 April 2005. The development consent will continue to apply until the site has been properly rehabilitated.	**Noted**
	(ii) At least one month prior to the commencement of construction, or within such period as agreed by the Director-General, the Applicant shall submit for the approval of the Director-General a compliance report detailing compliance with all the relevant conditions that apply prior to the commencement of construction.	• Pre-Construction Compliance Report 22 Dec 2003 • Supplement to Compliance Report, 7 April 2004	Pre-Construction Compliance Report was submitted to DIPNR and approved by the Director-General on 22 Dec 2003, prior to construction activities commencing. A supplementary Compliance Report was submitted on 7 April 2004 related to transfer of Lot 10 in DP1059150 to the Crown for the new Travelling Stock Route (TSR).	**Compliant Complete**
	(iii) At least one month prior to commissioning of the ore processing plant, or within such period as agreed by the Director-General, the Applicant shall submit for the approval of the Director-General a compliance report detailing compliance with all the relevant conditions that apply prior to the commissioning of the ore processing plant.	• Compliance Report submitted to Director-General, 20 January 2006 • Letter from DoP re Compliance with Condition 1.2(iii), 6 March 2006	A Compliance Report prior to the commissioning of the ore processing plant was submitted to the Director-General on 20 January 2006 and accepted by the Director-General on 6 March 2006.	**Compliant Complete**
	(iv) Date of commencement of construction works and date of commissioning of the ore processing plant are to be notified in writing to the Director-General and BSC, at least two weeks prior to commencement of construction works and commissioning of the ore processing plant respectively.	• Letter from BDW to D-G and BSC re Notice of Commencement of Works, 24 Dec 2003 • Letter to BSC/DoP re Notice of Commencement of Commissioning of the Ore Processing Plant, 16 Feb 2006	The commencement of construction was notified to the D-G and BSC on 24 December 2003 and construction activities started on 12 January 2004. Notification of date of commencement of commissioning of the ore processing plant on or about 13 March 2006 was provided to the Director-General and BSC on 16 February 2006.	**Compliant Complete**
	(v) No mine construction activity is to occur until the relevant approvals under the Environmental Planning and Assessment Act 1979 have been obtained for the construction of the transmission line from Temora to the mine site and the mine access road upgrade. This condition does not require approval to be obtained under the Environmental Planning and Assessment Act 1979 in relation to any rail crossing before mine construction activities can commence.	• Approval under Section 115(B) in relation to the Temora to Cowal 132KV Transmission Line, 3 Aug 1999 • Bland Shire Council Decision Notification of Approval of Cowal Gold Project Access Road Upgrade, 21 Apr 1999	Approval under Part 5 of the EP&A Act of the Temora Electrical Transmission Line (ETL) was granted to Great Southern Energy August 1999. The ETL was commissioned in January 2006 and is maintained and operated by Country Energy. Approval by the Bland Shire Council (BSC) and approval under Part 5 Approval of the EP&A Act was granted on 21 April 1999 for the upgrade of the access road to the CGM.	**Compliant Complete**
	(vi) If construction works have not commenced within two years of this development consent, the Applicant shall provide an annual report	• Letter from DIPNR re Application under Section 95B	Construction works for the CGM commenced in January 2004 and commissioning of the ore processing plant	**Compliant Complete**

No.	Minister's Condition of Approval	Verification	Comments	Compliance
	on the status of the project and any major changes to the environmental conditions of the site. If required, the first report shall be provided to the Director-General on the second anniversary of the granting of this consent.	of the EP&A Act, 12 May 2004	commenced in March 2006.	
1.3	***Dispute Resolution***			
	In the event that the Applicant and the BSC or a Government agency, other than the Department, cannot agree on the specification or requirements applicable under this consent, the matter shall be referred by either party to the Director-General or if not resolved, to the Minister for Planning, whose determination of the disagreement shall be final and binding on the parties.			**Noted**
1.4	***Security Deposits and Bonds***			
	Security deposits and bonds will be paid as required by DII (Minerals) under mining lease approval conditions.	• Confirmation of Security Certificate Ref:ALHS-602788, 8 Sep 2009 • Letter from DI&I re ML 1535 Security Deposit,16 Apr 2010 • Letter from Barrick to DI&I re Security Bond, 30 Apr 2010	The Security deposit for ML 1535 was amended by DI&I with the security required increased to $63,500,000 to take effect from 16 April 2010. Barrick advised DII on 30 April 2010 that the unconditional bank guarantee for the security bond had been lodged for the additional amount notified by DI&I on 16 April 2010.	**Compliant**
2	**MINE MANAGEMENT**			
2.1	***Mine Management Plan, Operations and Methods***			
	The Applicant shall submit to and have accepted by the DII(Minerals), a Mining Operations Plan in accordance with current guidelines issued by DII(Minerals), prior to commencement of mining. The Plan covers mining operations for a period of up to seven years. Changes in mining operations must be reflected in a revised Plan, which must be approved by DII (Minerals) prior to commencing the changed operations. The revised Plan addressing the changes in mining operations proposed in the modification application and supporting documentation submitted by Barrick Australia Limited, dated 30 January 2009, must include a geotechnical analysis and review of ongoing open pit development, the management of waste rock emplacements, and continued monitoring of the lake protection bund.	• Letter from DI&I re Approval of MOP Jan 2011 to Sep 2012, 30 Mar 2011 • Letter to DTIRIS re Variation to MOP, 5 Apr 2012 • MOP Oct 2012 to Jan 2014 • Letter to DT&I- DRE re Extension of MOP to 31 Jan 2015, 27 Sep 2013 • Letter from DT&I-DRE re Approval of MOP Extension, 4 Oct 2013 • Draft MOP April 2014 to April 2016	A MOP for January 2011 to September 2012 was submitted to DI&I and accepted on 30 March 2011. A Variation to the MOP was requested in a letter to DTIRIS on 5 April 2012 for the Southern Tailings Storage Facility (fourth lift) and the Northern Waste Rock Emplacement (storage volume elevation increase). On 4 October 2013, the D-G of the DTIRIS-DRE granted Barrick an extension to the term of the previous *Cowal Gold Mine Mining Operations Plan (ML 1535) October 2012 – January 2014*) to 31 January 2015 to align with the resubmission of the Modification before DP&I. A draft Mining Operations Plan (MOP) was prepared by Barrick in accordance with the requirements of the Mining Lease 1535 condition 25, MCoA 2.1 and the NSW Department of Trade and Investment, Regional Infrastructure and Services – Division of Resources and Energy (DTIRIS-DRE) *ESG3: Mining Operations Plan (MOP) Guidelines, September 2013* (the MOP Guidelines) (DTIRIS-DRE, 2013). This MOP (when approved) will replace the previous MOP and describes the proposed operational mining activities for the currently approved CGM for the period 30 April 2014 to 30 April 2016.	**Compliant**

No.	Minister's Condition of Approval	Verification	Comments	Compliance
2.2	***Ore, Waste and Concentrate Production***			
	The Applicant shall not transport ore or other excavated materials not required for either construction or maintenance works from other mines or locations to the mine site without the written approval of the relevant councils.		No ore or excavated materials from other mines or locations have been transported to the CGM site between May 2003 and April 2013.	**Compliant**
2.3	***Mine and Public safety***			
	The Applicant shall secure the mine site as described in section 2.10.5 of the EIS. The fence for the MLA boundary shall be designed to minimise the impact on water birds and aquatic species. (Refer also to condition 5.4(b)(ii)).		A 1.3m wire strand fence was erected around the Mining Lease Area in 2004 in accordance with the design requirements.	**Compliant**
3	**LAND AND SITE ENVIRONMENTAL MANAGEMENT**			
3.1	***Appointment of Environmental Officer***			
	(i) The Applicant shall employ an Environmental Officer to exclusively work for the Cowal gold mine and no other mine, whose qualifications are acceptable to the DII(Minerals) who shall report to the Mine Manager. The Officer shall be employed throughout the life of the mine, and shall: (a) be responsible for the preparation of the environmental management plans (refer condition 3.2) (b) be responsible for considering and advising on matters specified in the conditions of this consent and compliance with such matters; (c) be responsible for receiving and responding to complaints in accordance with condition 10.2(a); (d) facilitate an induction and training program for all persons involved with construction activities, mining and remedial activities; and (e) have the authority and independence to require reasonable steps to be taken to avoid or minimise significant environmental impacts which are not in accordance with this consent or the EIS and failing the effectiveness of such steps, to cease the activity causing the problem immediately if a significant impact on the environment is likely to occur.	• Letters to DMR, EPA, NPWS, DLWC, BSC and CEMCC re Appointment of Garry Pearson as Environmental Officer, 31 Aug 2006	DIPNR, DMR, EPA, NPWS, DLWC and BSC were notified on August 2006 of the appointment of Garry Pearson to the position of Environmental Manager on the CGM site. The duties and responsibilities outlined in the Job Description for the Environmental Manager address the requirements of MCoA 3.1 .	**Compliant**
	(ii) The Applicant shall notify the Director-General, DII (Minerals), DECCW, NoW, BSC and the CEMCC (refer condition 8.7) of the name and contact details of the Environmental Officer upon appointment and any changes to that appointment.	• Letters to DMR, EPA, NPWS, DLWC, BSC and CEMCC re Appointment of Garry Pearson as Environmental Officer, 31 Aug 2006	The authorities were advised of the appointment of Garry Pearson (replacing David Blaxland) as Environmental Manager to the CGM in August 2006.	**Compliant**
3.2	***Environmental Management Plans***			
	The Applicant shall prepare the following environmental management plans:	• Heritage Management Plan • Indigenous Archaeology &	Refer to the relevant conditions re documentation verification/comment.	**Compliant**

No.	Minister's Condition of Approval	Verification	Comments	Compliance
	• Heritage Management Plan (refer condition 3.3) • Indigenous Archaeology & Cultural Management Plan (refer condition 3.3) • Fauna management plan (refer condition 3.4) • Erosion and sediment control plan (refer condition 3.5(a)) • Soil stripping management plan (refer condition 3.5(b)) • Rehabilitation and Offset management plan (refer condition 3.6(d)) • Bushfire management plan (refer condition 3.8) • Land management plan (refer condition 3.10) • Compensatory wetland management plan (refer condition 3.11(v)) • Site water management plan (refer condition 4.1) • Cyanide management plan (refer condition 5.3(b)) • Hazardous waste & chemical management plan (refer condition 5.7) • Dust management plan (refer condition 6.1) • Blast management plan (refer condition 6.3) • Noise management plan (refer condition 6.4(g)) The management plans are to be revised/updated at least every five years, or as otherwise directed by the Director-General, in consultation with the relevant government authorities. They will reflect changing environmental requirements or changes in technology/operational practices. Changes shall be made and approved in the same manner as the initial environmental management plan. The plans shall also be made publicly available at BSC within two weeks of approval of the relevant government authority.	Cultural Management Plan • Flora and Fauna Management Plan • Erosion and Sediment Control Management Plan • Soil Stripping Management Plan • Rehabilitation and Offset management Plan • Bushfire Management Plan • Land Management Plan • Compensatory Wetland Management Plan • Site Water Management Plan • Cyanide Management Plan • Hazardous Waste and Chemical Management Plan • Dust Management Plan • Blast Management Plan • Noise Management Plan • Letter to DOP re Revised Rehabilitation/Blast/Noise Management Plans, Jul 2010 • Letter to DoP re Revised Site Water Management Plan, Nov 2010 and Feb 2012 • Letter to DP&I re Management Plan Submissions, 5 Apr 2012	The environmental management plans prepared and approved by the relevant government authorities were: Heritage Management Plan MCoA 3.3(a)(i) Indigenous Archaeology & Cultural Management Plan MCoA 3.3(a)(ii) Flora and Fauna Management Plan MCoA 3.4 Erosion and Sediment Control Management Plan MCoA 3.5(a) Soil Stripping Management Plan MCoA 3.5(b) Rehabilitation and Offset Management Plan MCoA 3.6(d) Bushfire Management Plan MCoA 3.8 Land Management Plan MCoA 3.10 Compensatory Wetland Management Plan MCoA 3.11(v) Site Water Management Plan MCoA 4.1 Cyanide Management Plan MCoA 5.3(b) Hazardous Waste and Chemical Management Plan Dust Management Plan MCoA 6.1 Blast Management Plan MCoA 6.3 Noise Management Plan MCoA 6.4(g) The management plans were reviewed during 2008 and revised as necessary for submission to DoP. The management plans have been reviewed and revised as necessary to address the requirements of Modifications granted between 2008 and 2014 and submitted to DP&I.	
3.3	***Heritage Assessment and Management***			
	(a) The Applicant shall prior to commencement of construction works: (i) prepare a Heritage Management Plan (HMP) to address non-indigenous cultural heritage issues. The HMP shall be prepared in consultation with Bland District Historical Society, BSC, and Lake landholders/residents, and to the satisfaction of the Director-General; (ii) prepare an Indigenous Archaeology and Cultural Management Plan (IACMP) to identify future salvage, excavation and monitoring of any archaeological sites within the DA area prior to and during development, and to address Aboriginal cultural heritage issues. The IACMP shall be prepared in consultation with NPWS, the Local Aboriginal Land Council, a consultant archaeologist, any other stakeholders identified by NPWS,	• Heritage Management Plan Sept 2003 • Letter from BSC re European Heritage Management Plan, 25 Sep 2003 • Letter from DIPNR re Approval of the Indigenous Archaeology and Cultural Heritage Management Plan, 11 Nov 2003	(a)(i) A Heritage Management Plan was prepared and approved on 25 September 2003 in consultation with the Bland District Historical Society, BSC, and Lake Cowal landholders/ residents. The Heritage Management Plan was reviewed during 2009 and no revision was necessary. (a)(ii) The Indigenous Archaeology and Cultural Management Plan prepared in consultation with the NPWS, Wiradjuri-Condobolin Cultural Heritage Company. Dr Colin Pardoe (Principal Consulting Archaeologist) was approved by DoP on 11 November 2003. The Indigenous Archaeology and Cultural Management Plan was reviewed in 2009 and no	**Compliant** **Compliant**

No.	Minister's Condition of Approval	Verification	Comments	Compliance
	and to the satisfaction of the Director-General; and (iii) retain a Cultural Heritage Officer approved by the West Wyalong Local Aboriginal Land Council who is to be available on site during construction earthworks.		revision was required. (a)(iii) Cultural Heritage Officers provided by WCC, (under Dr Colin Pardoe) undertake archaeological site survey/ investigations prior to any land disturbance or earthworks at the CGM mine lease site.	**Compliant**
	(b) The Applicant shall, prior to the commencement of construction works in a particular part of the DA area, submit to and have approved by the Director-General of NPWS, a Consent to Destroy application under Section 90 of the National Parks and Wildlife Act 1974 in relation to that particular part of the DA area for Aboriginal archaeological sites that have been identified to be damaged or destroyed as a result of the development prior to consent and/or by the IACMP.	• Indigenous Archaeology and Cultural Management Plan, Oct 2003 • Letter from DIPNR re Indigenous Archaeology and Cultural Heritage Management Plan, 11 Nov 2003	(b)Archaeological investigations and collection of artefacts from the areas proposed to be disturbed on the CGM site have been conducted under Section 87 and 90 Consents issued for the project by NPWS in 2002 and 2003.	**Compliant**
	Flora and Fauna Assessment and Management			
3.4	(a) The Applicant shall prior to commencement of construction prepare a fauna management plan to cover the mining lease area and monitoring of bird breeding areas as identified by the Applicant in consultation with DECCW. The plan shall be prepared in consultation with DII (Fisheries) and DECCW, and to the satisfaction of the D-G. The plan shall include, but not be limited to:	• Letter from DIPNR re Approval Flora and Fauna Management Plan, 30 Oct 2003 • Letter from DoP re Approval of the Amended Flora and Fauna Management Plan, 30 Oct 2008 • Flora and Fauna Management Plan (revised), Nov 2012	(a)A Flora and Fauna Management Plan was approved by the Director General on 30 October 2003. Barrick submitted an amended Flora and Fauna Management Plan to DoP on 12 August 2008 and DoP approved the amended plan on 30 October 2008. A revised Flora and Fauna Management Plan including a Threatened Species Management Strategy was submitted to DP&I in 13 November 2012. No response had been received by Barrick from DP&I at the date of this audit.	**Compliant**
	(i) methods for monitoring daily and seasonal fauna usage of tailings dams (e.g. species, number, location, habits), and whether deaths or other effects or incidents are occurring. Usage of the tailings dams shall be reported to the DECCW on a six monthly basis, unless otherwise directed by the Director-General;	• Seasonal Wildlife Use Pattern of the CGM Tailings Facility, Donato Environmental Services: ○ Apr 2011 and Sep 2011, ○ Oct 2011 and Mar 2012, ○ April 2012 to Oct 2012 ○ Nov 2012 to Mar 2013 ○ April 2013 to Sep 2013 ○ Oct 2013 to Mar 2014	(i)Section 6 of the Flora and Fauna Management Plan has the protocol for the reporting of any native fauna deaths or other incidents involving native fauna on the mining lease. Monitoring of the tailings storage facilities occurs twice a day and is conducted by process plant staff plus regular inspections by the Environment staff. The six-monthly Donato reports on seasonal wildlife use of the tailings facility have been submitted to DECCW/OEH and the reports conclude: *"No deaths on the tailings storage facilities have been recorded and cyanide concentrations have been consistently below the level that would expected to cause mortality"* (Donato 2013- 2014).	**Compliant**
	(i) development of a protocol for the reporting of any native fauna deaths or other incidents involving native fauna on the mining lease to the DECCW, DII(Minerals), CEMCC and in the case of fish, DII(Fisheries). Native fauna deaths (except those attributable to physical trauma such as vehicle strike) must be reported as per this protocol within 24 hours (or next working day).The Applicant shall maintain a record of any native fauna deaths or	• Letter from DoP re Fauna Death Reporting, 13 Mar 2008 • Flora and Fauna Management Plan, revised Nov 2008 • Letter from DoP re Approval of revised Flora and Fauna Management Plan, Nov 2008	(ii)The procedure for reporting of fauna deaths to the relevant authorities in the Flora and Fauna Management Plan was modified and approved by DoP on 13 March 2008. Fauna deaths are reported in the AEMR if cyanide is suspected as the causal agent. The Flora and Fauna Management Plan was amended to reflect this Modification and the Plan approved by DoP in	**Compliant**

No.	Minister's Condition of Approval	Verification	Comments	Compliance
	other incidents and this record shall be included in the AEMR;	• Letter from DECC re Fauna Deaths Status, 2 Feb 2009 • West Wyalong Veterinary Clinic Reports 2010 to Mar 2012	November 2008. CGM fauna reports and West Wyalong Veterinary Clinic reports were sighted for native fauna deaths recorded between May 2010 and May 2014.	
	(ii) provision for fauna autopsy facilities to enable the cause of any deaths to be quickly determined. The protocol required in sub clause (ii) above shall also detail collection and autopsy of fauna. This shall include but not be limited to collection and recording procedures, autopsy procedures and laboratory tests.	• Flora and Fauna Management Plan Section 6.3 • Letters to DPI/DECC/DoP re Native Fauna Incident Notifications, July 2008 to February 2009 • West Wyalong Veterinary Clinic Reports 2010 to Mar 2012	(iii) arrangement for conduct of fauna autopsies to determine the cause of death has been arranged with the West Wyalong Veterinary Clinic. Autopsy reports are prepared by the West Wyalong Veterinary Clinic and the reports were sighted for the May 2013 to May 2014 period. No deaths attributable to cyanide in the tailing storage areas were reported during the May 2010-April 2013 period.	**Compliant**
	(iii) provision of contingency measures for reducing cyanide levels in the tailings dams in the event it is established that fauna deaths are occurring from cyanide in tailings dam water (refer also condition 5.3(c));	• Flora and Fauna Management Plan Section 8 • Notification forms to DECC/DPI (Minerals) and CEMCC for May 2009 • Notification forms to DECC/DPI (Minerals) and CEMCC for May 2010 to April 2011 • 2011 AEMR, April 2012 • 2012 AEMR, 19 April 2013 • 2013 AEMR, draft	(iv)Cyanide levels in the discharge to the tailings storage facilities have been compliant with the approved concentration criteria for all samples collected between May 2013 and May 2014. No fauna deaths related to cyanide have been recorded for the tailings storage facilities on the CGM site.	**Compliant Ongoing**
	(iv) development of effective mechanisms to keep fauna and avifauna away from the tailings storages, which shall include, but not be limited to: - minimising the area of open water in the tailings dams; - fencing to prevent both medium and large fauna, terrestrial and amphibians, from entering the area. Mesh will have holes no greater than 5cm in diameter; - making the area non conducive to the establishment of wildlife habitats, as far as possible; - use of netting where practical; and - use of current best practice methods for avifauna deterrence;	• Flora and Fauna Management Plan Section 3 • Implementation Plan to Protect Fauna from Interactions with the Tailings Storage Facilities, Feb 2005 • Seasonal Wildlife Use Pattern of the CGM Tailings Facility, Donato Environmental Services: ○ Apr 2011 and Sep 2011, ○ Oct 2011 and Mar 2012, ○ April 2012 to Oct 2012 ○ Nov 2012 to Mar 2013 ○ April 2013 to Sep 2013 ○ Oct 2013 to Mar 2014	(v) A security fence was erected around the tailings storage facilities prior to tailings being discharged in 2005, to restrict the entry of fauna. The security fence entrance gate to the TSF is closed except during entrance of vehicles and equipment to the tailings facilities. Deterrent devices have been installed at the tailings storage facilities with radar activated audio units, sonic gas guns and other passive devices to scare any avifauna approaching or landing on the tailings water. These devices were installed in 2006 in accordance with the approaches outlined in the Implementation Plan. The monitoring of wildlife visitation to the tailings storage facilities has indicated no wildlife deaths due to cyanide and cyanide levels have been consistently below the level that would be expected to result in mortality. The six monthly Donato reports have been prepared to assess the requirements in the CGM Implementation Plan to protect fauna from interaction	**Compliant**

No.	Minister's Condition of Approval	Verification	Comments	Compliance
			with the Tailings Storage Facilities sites.	
	(v) development of plans for the rescue and rehabilitation of wildlife that may become bogged/sick/trapped in the tailings dams or elsewhere within the mining lease area;	• Flora and Fauna Management Plan Section 5	(vi) A small number of birds were rescued from the tailings storage facilities during 2010 and 2013. Management of water on the tailings storage facilities has kept the area of exposed water to a minimum, by returning supernatant water to the process plant. The number of birds attracted to the tailings has been small because of the lack of water on the storages.	**Compliant**
	(vi) methods to conserve and enhance wildlife values around Lake Cowal, within the mine lease area, including: protection and enhancement of existing retained habitats;	• Flora and Fauna Management Plan Section 9	Refer to section 4.3 of this report on the Flora and Fauna Management Plan and the section 4.8 Land Management Plan.	**Compliant**
	(vii) provision to continue fauna and flora, fish, and aquatic invertebrate monitoring of the Lake Cowal region as documented in the EIS and SIS including investigation of fauna deaths off the Mine Site if requested by the Director-General where it is considered the deaths are attributable to activities on the Mine Site;	• Surface, Groundwater, Meteorological and Biological Monitoring Program	(viii) No biological monitoring was conducted on Lake Cowal prior to April 2010 as there was no standing water in the lake at the trigger level of 204.5 AHD. Monitoring of fauna, flora, fish, and aquatic invertebrate in Lake Cowal occurred between May 2013 and May 2014 the Lake Cowal water level was above the 204.5 AHD trigger level.	**Compliant**
	(viii) details to relocate any threatened species and/or its habitat away from disturbed areas that are created by mine operations. This will include placement and maintenance of suitable types and numbers of artificial roosting boxes for bats such as the Greater Long-eared Bat and other animals (eg birds/possums) in undisturbed areas of the mine site;	• Flora and Fauna Management Plan Section 10, Oct 2008 • Flora and Fauna Management - Plan Threatened Species Management Protocol Nov 2012	(ix) The Threatened Species Management Protocol was initiated during 2006 and 2007 for the relocation of active Grey-Crowned Babblers (a threatened species under the NSW *Threatened Species Conservation Act*) nesting sites in an area where vegetation clearance was required. A revision of the Threatened Species Management Protocol for the Inland Forest Bat, Sloanes Froglet and Woodland birds was accepted by the DECCW on 23 February 2011 and submitted to DoP on 13 November 2012. No threatened species were identified in areas proposed for vegetation clearance between May 2013 and May 2014.	**Compliant**
	(x) details of monitoring the mine's impacts particularly on birdlife in bird breeding areas identified by the Applicant in consultation with DECCW, threatened fauna and flora, and fish and aquatic invertebrates around Lake Cowal, and outline contingency measures should impacts be identified as occurring	• Flora and Fauna Management Plan Section 11, Oct 2008 • Seasonal Wildlife Use Pattern of the CGM Tailings Facility, Oct 2009 to March 2010, Donato Environmental Services, Aug 2010 • Seasonal Wildlife Use Pattern of the CGM Tailings Facility, Apr 2010 to Oct 2010, Donato Environmental Services, Feb 2011 • Waterbird Monitoring Survey	(x) The fauna, flora, fish and aquatic invertebrates monitoring is conducted in accordance with the Surface Water, Groundwater, Meteorology and Biological Monitoring Program. Monitoring surveys of waterbirds and bird breeding areas has been conducted around the mine site and Lake Cowal area by Dr Peter Gell and Paul Peake, Centre for Environmental Management University of Ballarat, three times a year since the lake filled in 2010. The reports provide survey results of species and estimates of numbers of individual species identified at the monitoring locations. No monitoring of fish or aquatic invertebrates in Lake	**Compliant**

No.	Minister's Condition of Approval	Verification	Comments	Compliance
		Progress Report, Centre for Environmental Management University of Ballarat , Jan 2011 • Waterbird Monitoring Survey Progress Report, Centre for Environmental Management University of Ballarat , Aug 2011	Cowal occurred prior to April 2010 because there has been no standing water in Lake Cowal. A fish and aquatic invertebrate survey was conducted during February 2011 - the primary findings of the survey were that the fish communities in the study area were species-poor and were dominated by eastern gambusia that accounted for 98% of the catch; goldfish and the common carp. The Donato reports on seasonal wildlife use patterns at the CGM site did not provide evidence that suggested impacts from the mine operations on any threatened fauna on the site.	
	(b) The Applicant shall also implement a Threatened Species Management Protocol as outlined in Appendix 9 of the Department's primary submission to the Commission of Inquiry, which will include provisions for targeted searches prior to construction and proposed mitigation measures where threatened flora or fauna species are found;	• Threatened Species Management Protocol Appendix A Flora and Fauna Management Plan Oct 2003 • Letter from DoP re Inland Greybox Woodland, 10 Aug 2007 • Letter from DECC re Inland Greybox Woodland, 27 Aug 2007 • Letter from DECC re Myall Woodland, 29 Aug 2007 • Letter from DECC re Aquatic Ecological Community, 21 Sep 2007 • Letter from DoP re Myall Woodland, 24 Sep 2007 • Letter from DoP re Aquatic Ecological Community, 12 Oct 2007 • Letter from DECCW re Threatened Species Management Strategies for Inland Forest Bat, Sloanes Froglet and Woodland Birds, 23 Feb 2011	(b)A Threatened Species Management Protocol was prepared as part of the Flora and Fauna Management Plan and approved by the Director General on 30 October 2003. DECC, DPI (Minerals) and DoP accepted the implementation of the Vegetation Clearance Protocols related to the Inland Grey Box Woodland in August 2007, and Myall Woodland in August/ September 2007. DECC, DPI (Minerals) and DoP accepted the Threatened Species Management Strategy for the Aquatic Ecological Community in the natural drainage system of the Lowland Catchment of the Lachlan River in September 2007. The threatened species management strategies for the Inland Forest Bat, Sloanes Froglet and Woodland Birds were submitted to and accepted by DECCW without objections on 23 February 2011 and submitted to DP&I. The Threatened Species Management Protocol and Vegetation Clearance Protocol are current and implemented for any new areas where clearance of vegetation and/or disturbance of threatened species would occur.	**Compliant**
3.5	***Prevention of Soil Erosion***			
	The Applicant shall prepare prior to commencement of construction works, in consultation with DECCW and to the satisfaction of the D-G: (a) an erosion and sediment control management plan for the DA area which meets the requirements of DECCW. The plan shall include, but not be limited to: (i) details of temporary and permanent sediment and erosion	• Amended Erosion and Sediment Control Management Plan, 2004 • Revised and Amended Erosion and Sediment Control Plan Dec 2009	(a)The Erosion and Sediment Control Plan prepared for the CGM site development was approved in 2003, amended in 2004, and revised for submission to DoP on 23 December 2009. DoP approved the Plan on 10 March 2010. (i) Erosion and Sediment Control Plan section 3	**Compliant**

<table>
<tr><th>No.</th><th>Minister's Condition of Approval</th><th>Verification</th><th>Comments</th><th>Compliance</th></tr>
<tr><td></td><td>control systems to be used during both mine construction and operation, including for earthworks associated with landscaping;
(ii) details of salinity management; and
(iii) a program for reporting on the effectiveness of the sediment and erosion control systems and performance against objectives contained in the approved erosion and sediment control management plan, and EIS;</td><td>• Letter from DoP re Revised Erosion and Sediment Control Plan, 10 March 2010</td><td>addresses temporary and permanent sediment and erosion control systems to be used during both mine construction and operation;
(ii) Erosion and Sediment Control Plan section 6 addresses details of salinity management;
(iii) Erosion and Sediment Control Plan section 11 addresses reporting on the effectiveness and performance of sediment and erosion control systems.</td><td></td></tr>
<tr><td></td><td>(b) a soil stripping management plan for the DA area to the requirements of DII(Minerals) and DECCW which shall include, but not be limited to:
(i) details of the management of soil stockpiles, soil stripping techniques and scheduling; and
(ii) a program for reporting on the effectiveness of the soil stripping methods and performance against objectives contained in the soil stripping management plan, and EIS.</td><td>• Soil Stripping Management Plan Aug 2003
• Erosion and Sediment Control Management Plan Section 7.1
• Erosion and Sediment Control Management Plan Section 11
• Infill Sampling and Results CGM Environment File Jun 2005
• 2008 AEMR, Mar 2009
• 2009 AEMR, 19 Apr 2010
• 2010 AEMR, May 2011
• Topsoil-Subsoil Stockpile Map Apr 2010
• Topsoil-Subsoil Stockpile Map Mar 2011
• Topsoil-Subsoil Stockpile Map Mar 2012</td><td>(b)The Soil Stripping Management Plan was approve by DPNIR in 2003 and the requirements of the Soil Stripping Management Plan are used for any new areas of clearance (e.g. northern and southern waste emplacement areas and tailings storage facilities in 2010-2013).
(i) A CGM site topsoil stockpile database is maintained for recording topsoil clearance activities on site. The location and volume of topsoil present on each of the stockpiles is recorded and the locations shown on stockpile maps for the site.
(ii) The stripping of topsoil and stockpiles has been managed in accordance with the Soil Stripping Management Plan. The topsoil stockpile database is updated as new stockpile information is obtained, with a location map developed for the site. The segregation of topsoil and other infill material occurs as the material is stripped.</td><td>Compliant</td></tr>
<tr><td>3.6</td><td>Rehabilitation and Offset Management Rehabilitation and Offset</td><td></td><td></td><td></td></tr>
<tr><td></td><td>(a) The Applicant shall:
(i) progressively rehabilitate the mine site in a manner that is generally consistent with the final landform in the EA (as shown in Appendix 1);
(ii) maximise the salvage and beneficial use of resources in areas subject to disturbance; and
(iii) implement the biodiversity offset strategy as described in the EA, and summarised in Table 1 (and shown conceptually in Appendix 2), to the satisfaction of the Director-General and DII(Minerals).
Table 1: Offset Strategy
<table>
<tr><td>Area</td><td>Minimum Size</td></tr>
<tr><td>Offset Enhancement Area</td><td>110ha</td></tr>
<tr><td>Offset- Revegetation Area</td><td>100ha</td></tr>
<tr><td>Total</td><td>210ha</td></tr>
</table></td><td>• Rehabilitation and Offset Strategy, Dec 2010
• Letter to DP&I Requesting an Extension of Time for Long Term Security Arrangements of Offset Areas, 28 Oct 2011
• Letter from Barrick to DP&I re Long Term Security of Offset Areas (Voluntary Conservation Agreement), 12 Dec 2011
• Letter from Barrick to DP&I re Long Term Security of Offset Areas (Voluntary Conservation Agreement), 19 Jun 2012
• Letter to DP&I re Preparation of Long Term Strategies and Post</td><td>(a)The Rehabilitation and Offset Management Strategy addresses the requirements of the MCoA 3.6(a) and was submitted to DoP in December 2010:
(i) Section 3 addresses mine site rehabilitation
(ii) Section 3.2.10 and 3.2.11 – address collection and propagation of seed and salvage and reuse of material for habitat enhancement
(iii) Section 4 Offset strategy and proposed monitoring etc is addressed
(b)The proposed offset land is owned by Barrick (part of the 'Lakeview' and 'Hillview' properties) and is secured for the long term use as offset areas. CGM proposed preparation of a Voluntary Conservation Agreement in consultation with OEH in December 2011. The OEH responded on 17 May 2012 stating that "from a preliminary assessment the proposed Northern Offset</td><td>Compliant</td></tr>
</table>

No.	Minister's Condition of Approval	Verification	Comments	Compliance
	(b) By the end of December 2011, the Applicant shall make suitable arrangements to provide appropriate long term security for the offset areas to the satisfaction of the Director-General. (c) By the end of December 2010, the Applicant shall demonstrate that appropriate monetary bonds are, or will be, in place with applicable authorities to fully implement the offset strategy, to the satisfaction of the Director-General.	Mining Monitoring Program, 13 Nov 2012 • Letter from DECCW re Rehabilitation and Offset Management Plan, 22 Dec 2010 • Letter to DP&I re Long Term Security of Offset Areas (VCA Application), 19 Jun 2012 • Letter from OoW re Rehabilitation and Offset Management Plan and Long Term Strategy, 4 Jul 2013 • Letter to DP&I re VPA, 28 Apr 2014	Area appears to be of low conservation value and is not likely to be suitable for a Conservation Agreement. Barrick suggested to DP&I a Voluntary Planning Agreement (VPA) as an appropriate mechanism for securing the offset areas. Barrick submitted a draft Voluntary Planning Agreement for the offset areas to DP&I on 28 April 2014. (c)A proposed total offset bond amount of $339,570.00 for implementation for the offset strategy within the mine closure security bond was submitted to DII Titles as part of the MOP Rehabilitation bond (dated April 2010). The VPA submitted to DP&I on 28 April 2014 included a calculation of $1.7M determined by Greening Australia for an offsets bank guarantee to be lodged with DP&I. Barrick is awaiting a response from DP&I in relation to comment on the draft VPA, acceptance of the bank guarantee and acceptance that Barrick has satisfied the requirements of MCoA 3.6(c).	
	Rehabilitation and Offset Management Plan			
	(d) The Applicant shall prepare and implement a Rehabilitation and Offset Management Plan for the project to the satisfaction of DII and the Director-General. This plan must be prepared in consultation with DECCW, NoW and BSC, and be submitted to the Director-General and DII (Minerals) for approval by the end of July 2010. This plan must include: (i) the rehabilitation objectives for the mine site and offset areas; (ii) a description of the short, medium, and long term measures that would be implemented to: • rehabilitate the mine site; • implement the offset strategy; and • manage the remnant vegetation and habitat on the mine site and in the offset areas; (iii) detailed performance and completion criteria for the mine site rehabilitation and implementation of the offset strategy; (iv) a detailed description of the measures that would be implemented, including the procedures to be implemented for: • progressively rehabilitating disturbed areas; • implementing revegetation and regeneration within the disturbance areas and offset areas, including establishment of canopy, sub-canopy (if relevant), understorey and ground strata;	• Rehabilitation and Offset Management Plan, Dec 2010 • Letter from BSC re Rehabilitation and Offset Management Plan, 9 August 2010 • Letter from DII re Rehabilitation and Offset Management Plan, 18 Aug 2010 • Letter from NoW re Rehabilitation and Offset Management Plan, 27 Aug 2010 • Letter to DoP re Rehabilitation and Offset Management Plan, Dec 2010 • Letter from OoW re Rehabilitation and Offset Management Plan and Long Term Strategy, 4 Jul 2013 • Letter from DP&I re Comments on Rehabilitation and Offset Management Plan, 14 Aug 2012 • Letter from OEH re Rehabilitation and Offset Management Plan, 8 Aug 2013	(d)The Rehabilitation and Offset Management Plan was prepared in consultation with the relevant authorities. Bland Shire Council responded to Barrick re the Rehabilitation and Offset Management Plan submitted on 30 July 2010, NoW responded on 27 August 2010, and DECCW responded on 21 December 2010 with no objections and agreement that the plan was consistent with the development consent modification. The document was submitted to the DP&I and DII in December 2010 and comments were received from DP&I on 14 August 2012 and OoW on 4 July 2013. A Revised ROMP and draft long-term Land Use Strategy was distributed to the BSC, OoW, EPA and, CEMCC members. Comments were then collated and submitted to the DP&I and the DTRIS on 20 August 2013. Approval of the Rehabilitation and Offset Management Plan had had not been received by Barrick CGM from DP&I at the date of this audit (i.e. May 2014). (i) section 3.1.2 Rehabilitation Objectives (ii) Sections 3.2 and 4.2 Short, Medium and Long Term Measures (iii) Sections 3.3 and 4.4 Performance and Completion Criteria for Rehabilitation (iv) Procedures provided for: • Section 3.2.1Progressive Rehabilitation of	**Compliant**

No.	Minister's Condition of Approval	Verification	Comments	Compliance
	• protecting vegetation and soil outside the disturbance areas; • rehabilitating creeks and drainage lines on the site (both inside and outside the disturbance areas); • managing salinity; • conserving and reusing topsoil; • undertaking pre-clearance surveys; • managing impacts on terrestrial and aquatic fauna; • landscaping the mine site to minimise visual impacts; • collecting and propagating seed for rehabilitation works; • salvaging and reusing material from the mine site for habitat enhancement; • controlling weeds and feral pests, including terrestrial and aquatic species; • managing grazing and agriculture on site; • controlling access; and • bushfire management; (v) a program to monitor the effectiveness of these measures, and progress against the performance and completion criteria; (vi) a description of the potential risks to successful rehabilitation and/or revegetation, and a description of the contingency measures that would be implemented to mitigate these risks; and (vii) details of who would be responsible for monitoring, reviewing, and implementing the plan.		disturbed areas; • Sections 3.2.2 and 4.3.1 Implementation of revegetation and regeneration • Section 3.2.3 Protection of vegetation and soil outside disturbance areas • Section 3.2.5 Salinity management • Section 3.2.6 Topsoil conservation and reuse • Section 3.2.7 Pre-clearance surveys • Section 3.2.8 Management of impacts on terrestrial and aquatic fauna • Section 3.2.9 Mine site landscaping • Section 3.2.10 and 4.3.2 Collection and propagation of seed • Section 3.2.11 and 4.3 3 Salvage and Reuse of material for habitat enhancement • Section 3.2.12 ad 4.3.4 Weed and feral pest control • Section 3.2.15 and 4.3 7 Bushfire management (v) Section 3.4 and 4.5 Monitoring Program (vi) Section 5 Potential risks and risk treatment (vii) Section 6 Responsibilities for implementation, monitoring and review	
3.7	***Deleted***			
3.8	***Bushfire and other Fire Controls***			
	The Applicant shall: (a) prior to commencement of construction works prepare and submit for the approval of BSC, a bushfire management plan as outlined in section 6.4.4 of the EIS; and (b) provide adequate fire protection works on-site. This shall include one (1) emergency firefighting unit on site. (Refer also condition 5.4(a)(i)).	• Bushfire Management Plan, Aug 2003 • Letter from BSC re Bushfire Management Plan, 5 Aug 2003 • Memorandum of Understanding, Bland-Temora Rural Fire Zone NSW Rural Fire Service and Cowal Gold Mine, 20 Feb 2007	(a) A Bushfire Management Plan was prepared and the plan approved by DMR and BSC on 24 July 2003. The Bushfire Management Plan was reviewed during 2008 and no revision of the document was required. (b) CGM has two Category 7 fire tenders and two emergency firefighting units of approximately 1000L each housed in an Emergency Response Station on the CGM site near the main maintenance workshop.	**Compliant**
3.9	***Other Land Covenants and Agreements*** (a)			
	Relocation of Game Reserve			
	(a) The Applicant shall prior to the commencement of construction		(a) Barrick relocated a Game Reserve external to the	**Compliant**

No.	Minister's Condition of Approval	Verification	Comments	Compliance
	works relocate the existing game reserve in consultation with BSC, DECCW, DII(Fisheries), and lake residents and users as identified by BSC. Where public access arrangements are to be provided they shall be completed no later than the time of the reserve's relocation, to the requirements of BSC and DECCW. The total size of the new reserve(s) shall be no smaller than the existing reserve.		mining lease for "public access" and "environmental protection", on 7 November 2003. The reserve maintains public access to the lake and has an area of 123.4ha. The "Game Reserve" status of the Crown land within ML 1535 was revoked on 19 December 2003.	**Complete**
	Relocation of Travelling Stock Route			
	(b) The Applicant shall, prior to the commencement of construction works on the Travelling Stock Route (TSR), relocate the TSR in accordance with the EIS and the requirements of BSC, and the Condobolin Rural Lands Protection Board, and should include appropriate fencing and stock watering facilities.	• Letter from BDW re TSR 7 Apr 2004 • Part 3A Permit No. 703A01055 under the Rivers and Foreshores Improvement Act 1948	(b)Barrick obtained the requirements of BSC, DIPNR and the Condobolin Rural Lands Protection Board for the relocation of the TSR. The new road and TSR works were completed in the 1st quarter 2004, and Barrick transferred the land for the new TSR to the Crown as Lot 100 DP 1059150.	**Compliant Complete**
	(b) The Applicant is to ensure that all applications for road closures are finalised prior to the commencement of construction works on the land comprising the existing public roads which are to be closed. This will include the relocation of the public roads in use prior to commencement of construction works on the land comprising the existing public roads which are to be closed.	• Letter to BSC from Barrick re Closure of Council Roads, undated. • Orange Office - Notification of Closing of a Road, NSW Government Gazette, 16 April 2004	(c)Barrick lodged the road closure application with the Department of Lands for Road 1 (a public road within TSR17085 parallel to the western shore of Lake Cowal) and Road 2 (an unformed public road adjacent to the northern boundary of Portion 44). The road closures were gazetted in April 2004.	**Compliant Complete**
3.10	***Land Management***			
	The Applicant shall: (A) (i) prior to commencement of construction works prepare a Land Management Plan for all its land holdings to provide for proper land management in consultation with DECCW, NoW, DII(Agriculture), and BSC, and to the satisfaction of the Director-General . The plan shall be consistent with the fauna management plan (condition 3.4) and shall include, but not be limited to: (a) pastures and remnant vegetation management; (b) control of vermin and noxious weeds as required by the Rural Lands Protection Authority, the Prickly Pear Authority and other relevant authorities; (c) integration of the latest versions of the Jemalong Land and Water Management Plan and the Lake Cowal Land and Water Management Plan; and (d) feral animal control. (ii) prior to commencement of construction works prepare a Compensatory Wetland Management Plan. in consultation with DECCW, DII(Fisheries), Lake Cowal Landowners Association, and Lake Cowal Environmental Trust, and to the satisfaction of the Director-General . The plan shall detail compensation measures for the loss of 120 hectares of wetland, through the	• Land Management Plan Oct 2008 • Compensatory Wetland Management Plan Oct 2008 • Compensatory Wetland Management Plan Section 4 • Compensatory Wetland Management Plan, 2011 • Compensatory Wetland Monitoring Report, 2012 • Compensatory Wetland Regeneration Monitoring Results Report, DnA Environmental, 2013 • Compensatory Wetland Regeneration Monitoring Results Report, DnA Environmental, Feb 2014 • Compensatory Wetland Habitat and Fish Investigation, FRC environmental Report Mar 2011 • Section 9.7	A(i)The Land Management Plan was prepared by Barrick and approved by the Director General in October 2003. The Land Management Plan was reviewed in 2008 and no revision was required. The Lachlan River (Jemalong Gap to Condobolin) Floodplain Management Plan (dated January 2011) has been reviewed and any relevant requirements / measures that affect the CGM Land Management Plan have been included into the Site Water Management Plan (February 2012).The Land Management Plan A(i) includes: (a) sections 4 and 5 address pasture and remnant vegetation management; (b)sections 6 and 7 address control of vermin and noxious weed control; and (c) section 2 integration of the Jemalong and Lake Cowal Land and Water Management Plan; and (d) section 7 addresses feral animal control. A(ii) The Compensatory Wetland Management Plan was submitted and approved by the D-G on 25 September 2003. The Plan was reviewed in 2008 and no revision was required.	**Compliant**

No.	Minister's Condition of Approval	Verification	Comments	Compliance
	enhancement of at least the equivalent area of existing wetland within the mine lease area during operation and following closure of the mine. The plan shall include, but not be limited to: (a) a definition of wetland which shall be all land up to the high water mark of Lake Cowal recognising that river red gum habitat is below high water mark; (b) measures to manage the enhanced wetlands without adversely impacting adjoining private properties; and (c) measures to improve habitats for wildlife including waterbirds, fish, aquatic organisms etc, in the wetlands covered by the plan. (B) minimise the removal of trees and other vegetation from the mine site and restrict any clearance to the areas occupied by the mine activity, buildings and paved surfaces, and those areas necessary for fire control in accordance with BSC's requirements, and have regard to the draft Mid-Lachlan Regional Vegetation Management Plan (or its final version); (C) not locate topsoil stockpiles within any area of Wilga Woodland in the DA area as identified in figure 3-13 of the EIS; (D) not disturb any area of Belah Woodland in the DA area as identified in figure 3-13 of the EIS. (E) develop a strategy for the long term land use of the DA area on decommissioning of the mine site. The strategy shall include, but not be limited to: appropriate land uses within the DA area, which may include areas for conservation, agriculture or recreation, long term management of the area, environmental impacts of any uses and maintenance of necessary drainage characteristics and other features provided on the site. The strategy for long term land use of the DA area shall be submitted by Year 7 of mining operations or five years before mine closure, whichever is the sooner, in consultation with NoW, DECCW, BSC, CEMCC, and to the satisfaction of the Director-General.	• Vegetation Clearance Protocols: Southern Waste Emplacement, Mar 2007 • Soil Stockpile 6, Aug 2009 • Southern Waste Emplacement, Aug 2009 • Northern Waste Emplacement Aug 2009 • Soil Stockpile Areas, Nov 2012 • Northern & Southern Waste Emplacement Areas, 10 Mar 2013 • Soil Stockpile Areas, Nov 2013 •	(a) section 3 of the Compensatory Wetland Management Plan defines a wetland in accordance with the NSW Wetlands Management Policy; (b) section 7 addresses measures to manage the enhanced wetlands without adversely impacting adjoining private properties; and (c) section 6 addresses measures to improve habitats for wildlife in the wetlands covered by the plan. (B) The Vegetation Clearance Protocol (VCP) has ensured that clearance of vegetation has been restricted to areas required for mine development. The VCP has been triggered and the Vegetation Clearance Procedure instigated in areas of the project site where vegetation clearance was to occur between April 2007 and April 2012 and detailed reports on each of these areas are contained in, *Cowal Gold Project: Vegetation Clearance Protocol Reports* files. (C) No topsoil stockpiles had been located on Wilga Woodland areas at the time of this audit. (D) Belah Woodland areas within the DA had not been disturbed to the time of this audit. (E) The strategy for long term land use and closure plan for the mine is to be developed for submission to the relevant agencies five years before mine closure, in accordance with this condition.	
4	**WATER MANAGEMENT**			
4.1/4.2	***Surface Water Management & Ground Water Management***			
	The Applicant shall: (a) prior to the commencement of construction works shall prepare a site water management plan in consultation with NoW and DECCW, and to the satisfaction of the Director-General, which shall include, but not be limited to, the following matters: (i) management of the quality and quantity of surface and ground water within and around the mine site, including water in the up catchment diversion system, internal catchment drainage system,	• Revised Site Water Management Plan, Dec 2006 • Letter from DoP re Amendments to Environmental Management Plan, 8 April 2010 • Letter to DoP/DECCW/NoW re Revised Site Water Management Plan, 11 Jun 2010	(a)The Site Water Management Plan was approved by DoP in 2003 and amendments to the original plan were approved in December 2004 and December 2006. Revisions of thee Site Water Management Plan occurred in February 2012, and August 2013 and submitted to DP&I: DP&I provided comments on 14 August 2012. Barrick responded to the comments and submitted a revised Site Water Management Plan in August 2013.	**Compliant**

No.	Minister's Condition of Approval	Verification	Comments	Compliance
	dewatering bores, Bland Creek Palaeochannel bore-field and water supply pipeline from the bore-field, which shall include preparation of monitoring programs as provided by condition 8.2.; (ii) measures to prevent the quality of water in Lake Cowal or any surface waters being degraded below the relevant ANZECC water quality classification prior to construction due to the construction and/ or operation of the mine; (iii) identification of any possible adverse effects on water supply sources of surrounding land holders, and land holders near the Bland Creek Palaeochannel Bore-field as a result of the mining operations, and implementation of mitigation measures as necessary; (iv) identification of changes in flood regime on productive agricultural land in Nerang Cowal as a result of the mine perimeter bund intruding into Lake Cowal, and provision of appropriate compensation measures for affected landholders based on inundation of productive land caused by the changed flood regime; (v) construction and operation of water storages D1 and D4 as first flush systems with initial captured run-off waters from the outer batters of northern and southern emplacement dumps reporting to water storage D6; (vi) measures to manage and dispose of water that may be captured behind the temporary perimeter bund during construction of that bund; (vii) integration of the latest versions of the Jemalong Land and Water Management Plan and the Lake Cowal Land and Water Management Plan; (viii) measures to evaluate water quality data obtained from monitoring as required by condition 8.2(a)(iii) against records of baseline monitoring undertaken prior to development consent; and (ix) a program for reporting on the effectiveness of the water management systems and performance against objectives contained in the approved site water management plan, and EIS.	• Letter from DECCW re Site Water Management Plan, 1 July 2010 • Letter from NoW re Site Water Management Plan, 24 Aug 2010 • Site Water Management Plan revision, dated Nov 2010 • Site Water Management Plan revision, dated Jul 2011 • Letter to DoP/DECCW/NoW re Revised Site Water Management Plan, 25 November 2011. • Site Water Management Plan revision, dated Feb 2012 • Letter to DP&I re Addendum to Site Water Management Plan, 17 Feb 2012 • Letter from EPA re Revised Site Water Management Plan, 27 Jan 2012 • Letter from NoW re Site Water Management Plan Revision, 14 Feb 2012 • Letter from NoW re Site Water Management Plan Revision, 6 Jun 2013 • Site Water Management Plan revision, dated Aug 2013	DP&I approval had not been received for the revised Site Water Management Plan at the date of this audit (i.e. May 2014) (i) Site Water Management Plan section 4 addresses management of the quality and quantity of surface and ground water within and around the mine site; (ii) Site Water Management Plan section 5 addresses measures to prevent the quality of water in Lake Cowal or any surface waters; (iii) Site Water Management Plan section 6 addresses identification of any possible adverse effects on surrounding land holders water supply sources; (iv) Site Water Management Plan section 7 addresses identification of changes in flood regime on productive agricultural land in Nerang Cowal; (v) Site Water Management Plan section 8 addresses construction and operation of water storages; (vi) Site Water Management Plan section 9 addresses measures to manage and dispose of water captured behind the temporary perimeter bund; (vii) Site Water Management Plan section 10 addresses integration of the Jemalong Land and Water Management Plan and the Lake Cowal Land and Water Management Plan into the Site Water Management Plan; (viii) Site Water Management Plan section 12 addresses measures to evaluate water quality data obtained from monitoring; and (ix) Site Water Management Plan section 12 addresses program for reporting the effectiveness of the water management systems and performance.	
	(i) management of the quality and quantity of surface and ground water within and around the mine site, including water in the up catchment diversion system, internal catchment drainage system, dewatering bores, Bland Creek Paleochannel bore-field and water supply pipeline from the bore-field, which shall include preparation of monitoring programs as provided by condition 8.2.;	• Surface, Groundwater, Meteorological and Biological Monitoring Program, 10 Mar 2010 • Letter from DoP re Approval of the SGMBP, 10 Mar 2010 • Letter to DP&I re Addendum to Surface Water, Groundwater, Meteorological and Biological Monitoring Program, 20 Feb	The quality and quantity of surface and groundwater in and around the CGM operations has been monitored for the up-catchment diversion system, internal catchment drainage system, dewatering bores, and Bland Creek Palaeochannel bore-field and water supply pipeline, in accordance with the Surface, Groundwater, Meteorological and Biological Monitoring Program. Results are reported in Appendix B of the AEMR's. The Surface, Groundwater, Meteorological and Biological	**Compliant**

No.	Minister's Condition of Approval	Verification	Comments	Compliance
		2012 • Letter from DP&I re Approval of Surface Water, Groundwater, Meteorological and Biological Monitoring Program, 14 Aug 2012	Monitoring Program was reviewed in 2008 by Professor Fox (as a recommendation of the IMP). The Surface, Groundwater, Meteorological and Biological Monitoring Program was revised and approved by DoP on in July 2011. A further Addendum to the Surface, Groundwater, Meteorological and Biological Monitoring Program was submitted to DP&I on 20 February 2012 to address the groundwater monitoring program for the eastern saline bore-field to maintain consistency with the revised Site Water Management Plan dated 17 February 2012. This revision was approved by DP&I on 14 August 2012.	
	(ii)measures to prevent the quality of water in Lake Cowal or any surface waters being degraded below the relevant ANZECC water quality classification prior to construction due to the construction and/ or operation of the mine;	• Site Water Management Plan Section 5	Minimal water was present in Lake Cowal prior to April 2010, and no discharge of water from the mine site operational areas had occurred. Runoff from undisturbed lease areas outside the operational bunds did enter the Lake, south of D4 water storage. Monitoring of the water quality in accordance with the Surface, Groundwater, Meteorological and Biological Monitoring Program has occurred monthly with in-situ monitoring since April 2010 following filling of the Lake, with quarterly water quality monitoring for full parameter suite analysis and sediment monitoring in Lake Cowal conducted in accordance with the Plan.	**Compliant**
	(iii) identification of any possible adverse effects on water supply sources of surrounding land holders, and land holders near the Bland Creek Palaeochannel Bore-field as a result of the mining operations, and implementation of mitigation measures as necessary;	• Site Water Management Plan Section 6	Meetings have been held with the agencies and local landowners in relation to water levels and pumping from the Palaeochannel bores. Discussions with the West Trigilana Group have occurred since 2006 in relation to possible effects of the mine on groundwater resource and a short term and medium/Long Term Strategy was agreed with the DNR. Discussions and consultation continues with the agencies and landholders re water usage from the bore-field and implementation of the agreed strategies has occurred for ongoing water management.	**Compliant**
	(iv) identification of changes in flood regime on productive agricultural land in Nerang Cowal as a result of the mine perimeter bund intruding into Lake Cowal, and provision of appropriate compensation measures for affected landholders based on inundation of productive land caused by the changed flood regime	• Site Water Management plan Section 7	As there was no water in Lake Cowal between 2003 and February 2010, no assessment of changes to the flood regime was possible during this period. Rain events in December 2009, February and March 2010 resulted in some shallow water collecting in the lake-bed and this resulted in growth of low vegetation in the 'wet' areas. The perimeter bund had not affected the flood regime or had any impact on the productive agricultural	**Compliant**

No.	Minister's Condition of Approval	Verification	Comments	Compliance
			land. Discussions have continued between 2010 and 2014 with the land owners and no requirement for compensation measures had been requested in relation to flood impacts. The perimeter bund has not resulted in any changes to the flood regime that would affect productive land use.	
	(v) construction and operation of water storages D1 and D4 as first flush systems with initial captured run-off waters from the outer batters of northern and southern emplacement dumps reporting to water storage D6;	• Preliminary Earthworks for Mine Development , URS, 23 Apr 2004 • Contained Water Storage Facilities, URS 10 Jun 2004	Construction of the water storages D1 and D4 was completed by January 2005. Surface runoff from the disturbed areas around the waste emplacement dumps is captured in D1 and D4 and the water collected is recovered for use in the process plant or on site for dust suppression.	**Compliant**
	(vi) measures to manage and dispose of water that may be captured behind the temporary perimeter bund during construction of that bund;	• Site Water Management Plan Section 9	Water collected in the temporary perimeter bund between April 2007 and April 2010 was runoff from the waste emplacements and lake protection bund. No release of water to Lake Cowal occurred from the temporary perimeter bund, with any collected water pumped to D4 for recovery and use in the process plant. The water collected behind the temporary lake protection bund had encouraged vegetative growth within the bunded area and this controlled erosion of the bund walls and floor. The filling of Lake Cowal after 2010 resulted in water being trapped behind the temporary bund and the temporary bund protected the main mine bund from potential erosive action of wind and waves.	**Compliant**
	(vii) integration of the latest versions of the Jemalong Land and Water Management Plan and the Lake Cowal Land and Water Management Plan	• Site Water Management Plan Section 10	The Site Water Management Plan Section 10 considers the requirements of the Jemalong and the Lake Cowal Land and Water Management Plans.	**Compliant**
	(viii) measures to evaluate water quality data obtained from monitoring as required by condition 8.2(a)(iii) against records of baseline monitoring undertaken prior to development consent; and	• Surface, Groundwater, Meteorological and Biological Monitoring Program, Section 4.2 and 5.2 • Groundwater Monitoring Review 2013, Coffey, 26 May 2014	Evaluation of water quality data collected between May 2010 and May 2014 with the EIS baseline data has been conducted for inclusion in the AEMR. Independent assessment of the water quality data was also conducted by Coffey as part of the Part 3A assessment for CGM. In general the water quality has exhibited similar results to the EIS baseline/ background data with pH demonstrating slightly alkaline values (pH 8.6 to 9.3) that were not significantly different to the results collected in 1991/92 for the EIS when the lake last contained water (pH during the 1991-92 period, ranged from 8.27 to 8.67).	**Compliant**
	(ix) a program for reporting on the effectiveness of the water management systems and performance against objectives contained in the approved site water management plan, and EIS.	• Site Water Management Plan Section 12 • Notice of Modification, DoP, 23 Aug 2007 • Surface, Groundwater,	The production dewatering bore-field was established external to the perimeter of the open cut pit in 2005. A detailed water budget for the processing phase of the project was developed and the water budget is revised for the process plant operation.	**Compliant**

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		Meteorological and Biological Monitoring Report, Appendix B, draft AEMR 2007. • Site Water Management Revised, Nov 2010 • Site Water Management Plan Revised, Feb 2012	An amendment to the use of Jemalong water source was approved by a Notice of Modification granted on 23 August 2006. The CGM water management systems are monitored and assessed annually and reported in the AEMR. Revisions of the Site Water Management Plan occurred in 2010-12 were submitted to the relevant authorities for approval. Water management has occurred in accordance with the general objectives contained in the EIS and Site Water Management Plan.	
	(b) develop a strategy for the decommissioning of water management structures, including water storages both in and around the mine site, the water pipeline from the Bland Creek Palaeochannel borefield (refer condition 4.4), and long term management of final void and Lake protection bund. The strategy shall include, but not be limited to, long term monitoring of the water quality in the final void and stability of Lake protection bund and void walls, and options for alternate uses of the water pipeline. The strategy for the final void shall be submitted by Year 7 of mining operations or five years before mine closure, whichever is the sooner, in consultation with NoW, DECCW, DII (Minerals), and CEMCC, and to the satisfaction of the Director-General.	• Site Water Management Plan Section 11 • Strategy for Decommissioning of CGM Water Management Structures, May 2013	This matter will be addressed in the Mine Closure Plan for the project, when it is developed. A draft strategy for the decommissioning of the CGM water management structures was distributed to the DTIRIS, OoW, EPA, DPI-Fisheries and, CEMCC members. Comments were then collated and submitted to the DP&I on 8 August 2013.	**Noted**
	(c) (i) construct the Lake protection bund and site water and tailings storages to the requirements of NoW, DECCW and DSC; (ii) provide a geotechnical report on pit/void wall construction/ stability to DII(Minerals) prior to commencement of mining operations and construct pit/void in accordance with the requirements of DII(Minerals);	• Site Water Management Plan Section 4.1 • Lake Protection Bund Operation and Maintenance Manual, Jun 2005 • 2006 Surveillance Report for Lake Protection Bund, URS, 11 Dec 2006 • Rock Amour Suitability Geotechnical Assessment for the Cowal Gold Mine, Geo-Environmental Management, Dec 2008 • Geotechnical Assessment of Bund and Pit Walls, Dr Neil Matte URS, 2010-2013	A geotechnical report on the pit/void wall construction/ stability was prepared by URS and submitted to DPI in March 2005. A Lake Protection Bund Operation and Maintenance Manual was produced by URS in June 2005. Remedial maintenance works on the Lake Protection Bund to repair any eroded areas and the stabilisation of the access track have been undertaken and rock armouring of the bund walls occurred to stabilise and reinforce the walls of the bund. Several reports were commissioned by Barrick to investigate the stabilisation, rehabilitation and revegetation of the reactive surface materials on the bunds. The conclusions and recommendations in these reports were assessed and the optimal actions taken for the long term stabilisation of the bunds. A geotechnical assessment of the bund and pit walls is conducted annually by Dr Neil Matte of URS to assess stability.	**Compliant**
4.3	***Catchment Areas and Watercourses***			
	The Applicant shall as a landowner have on-going regard for the provisions of the latest versions of the Jemalong Land and Water Management Plan, Lake Cowal Land and Water Management Plan, Mid-Lachlan Regional Vegetation Management Plan, and any future	• Site Water Management Plan Section 10	The provisions in the Jemalong Land and Water Management Plan, Lake Cowal Land and Water Management Plan, and Mid-Lachlan Regional Vegetation Management Plan were considered and included where	**Compliant**

No.	Minister's Condition of Approval	Verification	Comments	Compliance
	catchment/land and water management plans that may become relevant to the area.		relevant in the Site Water Management Plan and its revisions.	
4.4	***Water Supply***			
	Bland Creek Palaeochannel water supply (a) The maximum daily extraction of water from the Bland Creek Palaeochannel shall not exceed 15ML/day, and not exceed 3650ML/year. A total extraction of 30,000ML shall not be exceeded for the life of the mine, unless otherwise agreed by the Director-General, in consultation with NoW. All bores from the Bland Creek Palaeochannel bore-field used for mine purposes must be metered.	• Bore Licence Certificates No. 70BL229248, 70BL229249, 70BL229250, and 70BL229251 (production bores)	Barrick was granted Bore License Certificates under Section 115 of the *Water Act 1912* for water supply from the Bland Creek Palaeochannel in 2003. The water extraction from the Palaeochannel is metered and recorded continuously, with the data collected daily by the CGM Process Engineer. Water extraction from the Bland Creek Palaeochannel bore-field has not exceeded 15ML/day or 3650 ML extracted in any year. Extraction from the Bland Creek Palaeochannel bore-field was significantly reduced during the May 2010 to May 2013 due to the increased rainfall, availability of water from the onsite storage ponds and recovery of supernatant from the tailings storage facilities.	**Compliant**
	(b) The water pipeline from the Bland Creek Palaeochannel bore-field to the mine site shall be: (i) constructed in accordance with the requirements of NoW, and in consultation with DII(Fisheries); and (ii) laid in such a way so as not to impede the passage of fish or other animals, or interfere with flood behaviour or the passage of boats and vehicles.	• Permit under Part 3A of the Rivers and Foreshores Improvement Act 1948 No. 703A010056	The pipeline construction across Lake Cowal and along the alignment to the east of the lake towards the production bores occurred in 2004 and involved the burial of the pipe 1.5 metres below the surface and refilling of the trench with the original excavated material compacted to the original ground level. The pipeline trench was backfilled and an access track along the route established to inspect the trench and pipeline and for access to the groundwater monitoring bores across the lake bed.	**Compliant (Complete)**
	(c) The water supply shall be installed with an automatic shutdown device so water pumping is immediately stopped in the event of any pipe rupture. The water supply shall not be restarted until the rupture is located and repaired.		Automatic shutdown devices are fitted to the water pipeline from the production bores to the process plant, and were tested prior to commencement of processing. No pipe ruptures had occurred between May 2013 and May 2014.	**Compliant**
	(d) Leases or private agreements shall be completed with the relevant landholders for the land requirement for pipeline infrastructure prior to commencement of water pipeline construction. (Refer condition 4.1/4.2(vi) for strategy for pipeline decommissioning).	• Part 3A Permit Application 24 Mar 2004 • Enclosure Permit No. 353669 DLWC • Deed of Agreement for Pipeline Easement, 19 June 2003	Easement Agreements were provided for land along the pipeline route for which Barrick was not the Registered Proprietor including: • Lot 18, DP753097, Lots 44, 45, 46 and 47, DP42918 • TSR84719 public roads vested in Forbes Shire Council	**Compliant**
4.4A	Saline Groundwater Supply Bore-field			
	(a) The water pipelines from the saline groundwater supply borefield to the mine site shall be: (i) constructed in accordance with the requirements of the NoW.	• Water Licence 70BL233231 dated 11 Jun 2011 • Water Licence 70BL233233 dated 11 Jun 2011	(i) Saline groundwater supply bores were established during 2011 and approval as production bores was obtained from NoW (Water Licence 70BL233231 and 70BL233233) dated 11 June 2011).	**Compliant Ongoing**

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	(ii) laid in such a way so as not to impede the passage of fish or other animals, or interfere with flood behaviour or the passage of boats and vehicles.		(ii)The saline bore supply pipeline has been constructed so as not to impede the passage of fish or other animals, or interfere with flood behaviour or the passage of boats and vehicles.	
	(b)The water supply shall be installed with an automatic shutdown device so water pumping is immediately stopped in the event of any pipe rupture. The water supply shall not be restarted until the rupture is located and repaired.		When the saline water supply was constructed, automatic shutdown devices were installed so water pumping could be immediately stopped in the event of a pipe rupture.	**Noted**
4.5	***Disposal of Excess Water***			
	There shall be no disposal of water from the internal catchment drainage system to Lake Cowal under any circumstances.	• Site Water Management Plan, Feb 2012	The Site Water Management Plan section 4.2.1 describes the lake isolation system for water management that is constructed to collect all water from the mine operations area and direct it to holding ponds for reuse within the process plant or on site for the mine operations (dust control etc). No release of water to Lake Cowal from the CGM internal catchment system occurred between May 2013 and May 2014. Water from Lake Cowal entered the area between the temporary isolation bund and the lake protection bund on 11 March 2012 due to the rise in lake water above the 206.70mRL. The Lake Cowal water levels in May 2014 had reduced to below the trigger level of 205.4mRL and the water level was again below the top of the Temporary Isolation Bund.	**Compliant**
5	**HAZARDOUS MATERIALS AND TAILINGS MANAGEMENT**			
5.1	***Waste Rock Emplacement and Management***			
	The Applicant shall construct and manage the waste rock emplacement as set out in the documentation listed in condition 1.1(a), and to the satisfaction of DI&I (Minerals).	• Mining Operations Plan Jan 2011 to Sep 2012, • Variation to MOP Jan 2011 to Sep 2012	The waste rock emplacements are being established in accordance with the MOP.	**Compliant**
5.2	***Tailings Emplacement and Management***			
	The Applicant shall: (a) construct the tailings dams to the requirements of, DII(Minerals), DECCW and DSC and in consultation with NoW; (b) construct and compact the floor of the tailings storages as required to a permeability acceptable to the DII(Minerals) and DECCW in consultation with NoW;	• Letter to DEC re Permeability Test Report for NTSF, Dec 2004 • Letter to DEC re Permeability Test Report for STSF, Dec 2005 • Letter from Dam Safety Committee re STSF Stage 2 Construction, 9 Jan 2009 • Reservoir D9, CGM, Dam Break and Probable Loss of Life,	(a) The NTSF and STSF were constructed in accordance with the requirements of the DECC (EPA) /DSC and DPI (Minerals). The STSF initially received tailings between March 2006 and April 2007. Tailings disposal then occurred to the NTSF while construction of the first lift of the STSF walls was occurring during 2008. When the Stage 2 STSF construction was complete, and Stage 2 lift on the NTSF commenced. The Dam Safety Committee provided a response to the Construction Report in January 2009 advising that the	**Compliant**

No.	Minister's Condition of Approval	Verification	Comments	Compliance
		Coffey Geotechnics, 19 Apr 2011 • Letter to DSC re Coffey Report, 21 Jun 2011 • Letter from DS re Endorsement of D9 Dam Type 2 Surveillance Report, 29 Jun 2011 • NTSF Surveillance Report 2013, URS, 18 Dec 2013 • STSF Surveillance Report, URS, 18 Mar 2014	review satisfies the Committee's requirements. The TSF's continue to be developed with the pumping of tailings being alternated between the NTSF and STSF as the facilities are filled and additional lifts are constructed. (b) Permeability Test Reports were submitted to DEC and DPI and DIPNR (LWC).	
5.3	***Management of Retained Water – Cyanide Management***			
	(a) Cyanide levels The Applicant shall ensure that cyanide levels of the aqueous component of the tailings slurry stream do not exceed: 20mg $_{CNWAD/L}$ (90 percentile over six months), and 30mg $_{CNWAD/L}$ (maximum permissible limit at any time), at the discharge point to the tailings storages.	• Letters and Data to DoP/DII-Minerals/DECC re Monthly Cyanide Monitoring, April 2007 to Mar 2010 • Letters to DII/DoP/DECCW re Monthly Cyanide Monitoring Results, April 2010 to March 2012	The cyanide levels in the slurry stream have not exceeded <20mg CN_{WAD}/L (90 percentile) or 30mg CN_{WAD}/L (maximum permissible limit) between May 2013 and May 2014. CN_{WAD} levels at the CGM STSF and NTSF have been forwarded to DP&I/DI&I-Minerals/OEH and the CEMCC quarterly between May 2010 and April 2013.	**Compliant**
	(b) Cyanide management The Applicant shall prepare a cyanide management plan for the monitoring and reporting of cyanide use on the site, in consultation with DII(Minerals), DECCW, and NoW, and to the satisfaction of the Director-General , prior to any use of cyanide on the site. The plan shall make provision for, but is not limited to: (i) containing cyanide contaminated waters entirely within the mine site; (ii) maintaining weak acid dissociable (WAD) cyanide levels at the discharge point to the tailings dams to the levels stated in condition 5.3(a); (iii) contingency measures for cyanide reduction. (Refer condition 8.2(b) for cyanide monitoring details).	• Letter from DECC re Addendum to Cyanide Management Plan, 24 Aug 2007 • Letter from DWE re Addendum to Cyanide Management Plan, 17 Sep 2007 • Letter from DWE re Addendum to Cyanide Management Plan, 21 Jul 2008 • Letter from DoP re Approval of Cyanide Management Plan, 30 October 2008 • Letter from DoP re Amendments to Cyanide Management Plan, 24 Mar 2010 • Letter from DECCW re Proposed Change to Cyanide Monitoring Point, 11 Jun 2010 • Letter from NoW re Addendum to Cyanide Management Plan, 23 Aug 2010 • Letter from DoP re Proposed Amendments to Cyanide Management Plan, 20 Dec 2010 • Letter from DoP re Addendum	The Cyanide Management Plan prepared in accordance with MCoA 5.3(b) was approved by the Director-General of DoP on 9 January 2006. Amendments to the Cyanide Management Plan monitoring program in relation to the analysis method (i.e. use of the picric acid analysis procedure) was agreed with the DPI in December 2006, and DECC in January 2007. Amendments to the Cyanide Management Plan were also accepted by DWE on 21 July 2008, approved by DoP on 30 October 2008 and accepted by DECC on 9 October 2009. Further amendments to the Cyanide Management Plan were approved by DoP on 24 March 2010. A change to the cyanide monitoring point was accepted by the DECCW on 11 June 2010 and approved by DoP on 20 December 2010. A change of the transport route between the Queensland Border and Dubbo (via Goondiwindi) was approved by DPI/DoP on 1 December 2010 and an emergency exemption was granted to allow use of the Cowra-Temora road whilst the Newell Highway was flooded in March 2012. The cyanide levels in the slurry stream have not exceeded 20mg CN_{WAD}/L (90 percentile) or 30mg CN_{WAD}/L (maximum	**Compliant**

No.	Minister's Condition of Approval	Verification	Comments	Compliance
		to Transport of Hazardous Material Study, 1 Dec 2010	permissible limit) between May 2013 and May 2014..	
	(c) In the event of wildlife deaths occurring due to cyanide, review of cyanide levels shall occur by the DECCW in consultation with the Applicant and DII(Minerals). Any decision to require cyanide reduction shall include, but not be limited to, consideration of the number of fauna deaths, the species involved, antecedent condition of species, methods employed at the time to prevent use of tailings dams by fauna, and antecedent climatic and surface water conditions of the Lake and surrounding area. The Applicant shall notify the CEMCC of any reductions in cyanide levels as soon as practicable.	• Letter from DECC re Fauna Reporting Protocol, Feb 2009 • Seasonal Wildlife Use Pattern of the CGM Tailings Facility, Donato Environmental Services: ○ Apr 2010 to Sep 2010 ○ Oct 2010 to March 2011 ○ Apr 2011 to Sep 20110 ○ Oct 2011 to March 2012 ○ Apr 2012 to Sep 2012 ○ Oct 2012 to March 2013	Barrick environmental and processing personnel have attended avifauna training workshops presented by Donato Environmental Services on Wildlife Monitoring and the International Cyanide Management Code. The training module provided procedures, reporting requirements, observation records and species list/reference images. No wildlife deaths attributable to cyanide in the tailings storage facilities have occurred between May 2013 and May 2014.	**Compliant**
5.4	***Fuel, Oil and other Chemical Handling***		*Note: The development consent conditions under 5.4(a)-(f) are related to offsite risk to people and the biophysical environment. The safety of all persons and operations on site is the responsibility of the DII(Minerals) under the Mines Inspection Act and Dangerous Goods Act.*	
	(i) Fire Safety Study This study shall cover all aspects detailed in the Department's Hazardous Industry Planning Advisory Paper No. 2, "Fire Safety Study Guidelines" and the New South Wales Government's "Best Practice Guidelines for Contaminated Water Retention and Treatment Systems". The study shall also be submitted for approval to the New South Wales Fire Brigades. The study should, in particular, address the fire related issues associated with the storage and use of Ammonium Nitrate, Sodium Isobutyl xanthate, and Cyanide.	• Letter to NSW Fire Brigades – Submission of Fire Safety Study for approval, 22 Dec 2004 • Letter to DIPNR – Submission of Fire Safety Study, 22 Dec 2004 • Letter from NSW Fire Brigades re Satisfaction with the Fire Safety Study, 15 September 2005	Fire Safety Study prepared by Pinnacle Risk Management for CGM was submitted to the Commissioner of the NSW Fire Brigade for approval and then submitted to DIPNR in December 2004 in accordance with MCoA 5.4. The NSW Fire Brigades provided a letter expressing satisfaction with the fire safety measures within the study in September 2005. The Final Hazard Analysis was approved by DIPNR in March 2005 and a Fire Hazard Audit of the CGM site and facilities was carried out in November 2008.	**Compliant Complete**
	(ii) Hazard and Operability Study The study is to be chaired by an independent qualified person approved by the Director-General prior to the commencement of the study. The study shall be carried out in accordance with the Department's Hazardous Industry Planning Advisory Paper No. 8, "HAZOP Guidelines". The HAZOP shall in particular address the monitoring, control, alarm and shutdown systems associated with xanthate and cyanide process streams.	• Letter to DIPNR – Submission of HAZOP Study, 22 Dec 2004 • Letter from DoP re HAZOP Supplementary Studies, Sep 2005 • Letter from Barrick to DoP re HAZOP Study Action Closeout Status, 16 Jan 2006HAZOP Supplementary Studies	The Hazard and Operability Study for the main plant area was prepared and submitted to DIPNR in Dec 2004 and the HAZOP Study Action Item Closeout Status Report (Action Program) prepared by Aker Kvaerner Australia Pty Ltd, was submitted in Dec 2004. Supplementary HAZOP Studies for the oxygen system, LPG system and cyanide leach package was notified to be to the satisfaction of the Director-General in Jan 2006.	**Compliant Complete**
	(iii) Final Hazard Analysis The analysis should be prepared in accordance with the Department's Hazardous Industry Planning Advisory Paper No. 6, "Guidelines for Hazard Analysis".	• Final Hazard Analysis, 2004 • Letter to DIPNR – Submission of Final Hazard Analysis, 22 Dec 2004 • Letter from DIPNR re Fire Hazard Analysis, 30 Mar 2005	The Final Hazard Analysis was prepared by CGM and submitted to DIPNR on 22 December 2004. The Final Hazard Analysis was approved by DIPNR in March 2005.	**Compliant Complete**

No.	Minister's Condition of Approval	Verification	Comments	Compliance
	(b) Pre-Commissioning Studies			
	The Applicant shall prepare and submit for the approval of the Director-General the studies set out under subsections 5.4(b)(i) to 5.4(b)(iii) (the pre-commissioning studies), no later than two months prior to the commencement of commissioning of the proposed development, or within such period as the Director-General may agree. Commissioning shall not commence until approval has been given by the Director-General.	See references below	The pre-commissioning studies were conducted and reports prepared and submitted to the Director-General. Approval of the studies and plans by the D-G was obtained prior to commencement of the plant commissioning.	**Compliant Complete**
	(i) *Transport of Hazardous Materials* The study comprises arrangements covering the transport of hazardous materials including details of routes to be used for the movement of vehicles carrying hazardous materials to or from the proposed development. The study shall be carried out in accordance with the Department's draft "Route Selection" guidelines. Suitable routes identified in the study shall be used except where departures are necessary for local deliveries or emergencies. The study should also address (1) the issues associated with spills, clean-up procedures, training of clean-up teams, communication, and liaison with organisations such as the fire brigades, District Emergency Management Coordinator (and Committee), Local Emergency Management Committee(s), and state emergency services; (2) inspection and monitoring procedures for chemicals such as explosives, xanthates and cyanides prior to commencement of a trip, to verify the integrity of the packaging; and (3) measures to be taken to ensure that the temperature of the materials does not rise above safe levels	• Transport of Hazardous Material Study, 2006 • Letter from DoP re Approval of Transport of Hazardous Materials Plan, 9 Jan 2006 • Letter from DoP re Approval for Transport of Flotation Chemicals, 28 Feb 2007 • Letter re Interim Approval from DoP re Transport of SIBX, 20 Sep 2007 • Letter from DoP re Addendum to Transport of Hazardous Materials Study, 13 Oct 2010 • Letter from DoP re Addendum to Transport of Hazardous Materials Study, 1 Dec 2010 • Letter from DP&I re Notification of Change to Transport of Hazardous Chemicals (Ammonium Nitrate), 13 Jan 2012 • Emails to DP&I re Emergency Routing of Sodium Cyanide to CGM due to Road Conditions, Mar 2012	Route evaluation for hazardous materials studies conducted and consultation with the affected Councils occurred in accordance with Guideline No.9. The Transport of Hazardous Materials Study was approved by the D-G on 9 January 2006 and transport of flotation chemicals was approved by DoP in February 2007. A temporary amendment to the Transport of Hazardous Materials Study to allow the substitution of SiBX for PAX (due to an unexpected short supply of PAX) was approved by DoP on 20 September 2007. An amendment of the Transport of Hazardous Materials Study in relation to an alternative storage transfer location at Botany Bay commenced, and consultation with the relevant Council(s) and government departments occurred in 2009. An amendment to the route for the transport of hydrogen peroxide from the Solvay Interox Banksmeadow facility to CGM was proposed and accepted by DoP on 13 October 2010. Approval for a variation to the transport route for hydrogen peroxide from the Queensland border to Dubbo (via Goondiwindi) was granted by DoP on 1 December 2010. Approval for a change to the transport route for Ammonium Nitrate by road from Maxam Australia Depot Goulburn to CGM endorsed by DP&I on 13 January 2012. Emergency route change permission was sought and granted by DP&I in November 2011, and in January and March 2012 due to road conditions following heavy rainfall events.	**Compliant**
	(ii) *Emergency Plan* A comprehensive emergency plan and detailed emergency procedures for the proposed development. This plan shall include detailed procedures for the safety of all people outside of the development who may be at risk from the development. The plan should be in accordance with the Department's Hazardous Industry Planning	• Letter from DoP re Approval of the Operations Emergency Management Plan, 14 Dec 2005 • Emergency Response Plan Cowal Gold Project, Mar 2007 • Letter from DoP re updated	The Operations Emergency Plan was approved by DoP on 14 December 2005. A comprehensive review of the Emergency Response Plan was undertaken in February 2007 and the revised plan was submitted to DoP on 23 March 2007.	**Compliant**

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	Advisory Paper No. 1, "Industry Emergency Planning Guidelines", and include procedures for spillage, cleanup, control and protection, and rescue of wildlife during the emergency.	Emergency Plan, 18 Jun 2008 • Emergency Response Plan, 4 Oct 2013 • Letter to DP&I re Emergency Response Plan Revision, 4 Oct 2013	The CGM Emergency Plan was revised and updated in April 2008 and DoP approved the updated plan on 18 June 2008. No revisions of the Emergency Response Plan occurred during May 2013 and May 2014.	
	(iii) *Safety Management System* A document setting out a comprehensive safety management system, covering all operations on-site and associated transport activities involving hazardous materials. The document shall clearly specify all safety related procedures, responsibilities and policies, along with details of mechanisms for ensuring adherence to procedures. Records shall be kept on-site and should be available for inspection by the Director-General upon request. The safety management system should be developed in accordance with the Department's Hazardous Industry Planning Advisory Paper No. 9, "Safety Management".	• Safety Management System Oct 2005 • Letter from DoP re Approval of the Safety Management System, 14 Dec 2005 • Revised Safety Management System Feb 2007 • Safety Management Plan Cowal Gold Project, Mar 2007 • Letter from DoP re updated Safety Management System, 18 Jun 2009	The Safety Management System for CGM was approved by DoP on 14 December 2005 and a major review of the Safety Management System was conducted by Barrick in February 2007 and submitted to DoP. The Safety Management System was updated and DoP approved the updated plan on 18 June 2009. No further updates to the Safety Management System occurred between May 2013 and May 2014.	**Compliant**
	(c) Compliance Reports One month prior to the commencement of operation of the plant, the Applicant shall submit to the Director-General, a compliance report detailing compliance with conditions 5.4(a) and 5.4(b), including: (i) dates of study submission, approval, commencement of construction and commissioning; (ii) actions taken or proposed, to implement recommendations made in the studies; and (iii) responses to each requirement imposed by the Director-General under condition 5.4(f).	• Pre-Operation Compliance Report, Feb 2006 • Letter to Director-General re Pre-operation Compliance Report, 16 Feb 2006. • Letter from Director-General re Acceptance of Compliance Report, 6 Mar 2006	The Compliance Report was prepared and submitted to the Director-General on 16 February 2006 in accordance with MCoA 5.4(c) prior to the commencement of operation of the plant.	**Compliant Complete**
	(d) Incident Report Within 24 hours or the next working day of any incident or potential incident with actual or potential significant off-site impacts on people, or the biophysical environment (including wildlife), report shall be supplied to the Director-General outlining the basic facts and mitigation measures undertaken at the time. A further detailed report shall be prepared and submitted following investigations of the causes and identification of necessary additional preventative measures. The report must be submitted to the Director-General no later than 14 days after the incident or potential accident. The Applicant shall maintain a register of such accidents, incidents, and potential incidents. The register shall be made available for inspection at any time by the independent hazard auditor and the Director-General.		No incidents related to on-site activities with actual or potential for significant off-site impact were reportable to DoP/DP&I between May 2013 and May 2014.	**Compliant Ongoing**

No.	Minister's Condition of Approval	Verification	Comments	Compliance
	(e) Hazard Audit Twelve months after the commencement of operations of the proposed development or within such further period as the Director-General may agree, the Applicant shall carry out a comprehensive hazard audit of the proposed development and submit a report of the audit to the Director-General. The audit shall be carried out at the Applicant's expense by a duly qualified independent person or team approved by the Director-General prior to commencement of the audit. Further audits shall be carried out every three years or as determined by the Director-General and a report of each audit shall within a month of the audit be submitted to the Director-General. Hazard audits should be carried out in accordance with the Department's Hazardous Industry Planning Advisory Paper No. 5, "Hazard Audit Guidelines".	• Hazard Audit Report, Cowal Gold Project, Pinnacle Risk Management Pty Ltd, 6 Jun 2007 • Letter from DoP re Approval of the 2010 Hazard Audit Report, 15 Feb 2011 • Hazard Audit Report Cowal Gold Project, Pinnacle Risk Management Pty Ltd, 11 Apr 2013	A Hazard Audit was conducted by Dean Shewring of Pinnacle Risk Management Pty Ltd, 12 months after commencement of operation of process plant (i.e. April 2007). The Hazard Audit was accepted by DoP on 6 August 2007. The second Hazard Audit of the CGM operations was conducted on 19-22 April 2010. The third Hazard Audit Report of the CGM operations was conducted on 11 April 2013.	**Compliant**
	(f) Further requirements The Applicant shall comply with all reasonable requirements of the Director-General in respect of the implementation of any measures arising from the approvals given in respect of conditions 5.4(a) - 5.4(e) above, within such time as the Director General may agree.		No further requirements in relation to MCoA 5.4(a) – 5.4(e) were advised by the Director-General between May 2013 and May 2014.	**Noted**
5.5	***Domestic Waste***			
	The Applicant shall dispose of all solid waste and putrescible matter from the site to the satisfaction of BSC		All solid waste and putrescible matter from the site activities is collected by JJ Richards waste contractor, for disposal at an approved landfill.	**Compliant**
5.6	***Sewage and Associated Waste Management***			
	The Applicant shall install the site sewage treatment facility, and dispose of treated sewage and sullage to the satisfaction of BSC and DECCW, and in accordance with the requirements of the Department of Health.	• Construction Certificate No.6, 4 Apr 2005 for Package Sewage Treatment Plant, DIPNR	The permanent on-site sewage management system was installed west of the Mine Workshop and Administration Complex in the 1st quarter 2006 in accordance with the requirements of the Department of Health, BSC and DECCW.	**Compliant**
			 **CGM Package Sewage Treatment Plant**	

No.	Minister's Condition of Approval	Verification	Comments	Compliance
5.7	***Asbestos and Other Hazardous or Toxic Waste Management***			
	The Applicant shall prior to commencement of construction works prepare a Hazardous Waste and Chemical Management Plan as set out in section 6.4.1 of the EIS in consultation with DECCW and BSC, and to the satisfaction of the Director-General.	• Letter from DECC re Addendum to HWCMP, 6 Dec 2007 • Letter from DECC re Hazardous Waste Management Plan, 30 Apr 2009 • Letter from DECC re Hazardous Waste Management Plan, 22 Dec 2009 • Letter from DoP re Amended Hazardous Waste Management Plan, 10 Mar 2010 • Letter from DECCW re Hazardous Waste and Chemical Management Plan, 23 Feb 2011 • Letter from DP&I re Update to Hazardous Waste and Chemical Management Plan, 13 May 2011 • Letter from BSC re Update to Hazardous Waste and Chemical Management Plan, 19 Apr 2011	The Hazardous Waste and Chemical Management Plan approved by the Director General in October 2003, was revised by Barrick and the changes were accepted by DECC/DECCW in December 2007, and April and December 2009. Amendments to the Hazardous Waste and Chemical Management Plan were approved by DoP on 10 March 2010. DECCW responded on 3 February 2011 to the revised Hazardous Waste and Chemical Management Plan with no objections to the changes. BSC accepted the revised Hazardous Waste and Chemical Management Plan on 19 April 2011 and DP&I approved the revised document on 13 May 2011.	**Compliant**
6	**AIR QUALITY, BLAST, NOISE AND LIGHT MANAGEMENT**			
6.1	***Air Quality Management***			
	(a) The Applicant shall prior to commencement of construction works prepare a dust management plan detailing air quality safeguards and procedures for dealing with dust emissions in consultation with the DECCW and to the satisfaction of the Director-General. The management plan shall be updated as required by the Director-General and/or DECCW. The plan shall include, but not be limited to, details of: locations for dust monitoring (in accordance with Australian Standard), including location gauges near the Gumbelah residence, and bird breeding and native flora areas determined by the Applicant in consultation with the DECCW;	• Amendment to Dust Management Plan, Dec 2008 • Letter from DoP re Dust Management Plan Amendment Approval, 25 Feb 2009 • Dust Management Plan 2009	(a)A Dust Management Plan was approved by the Director- General in August 2003. Amendments to the Dust Management Plan were approved by DoP in August 2007 and February 2009.	**Compliant**
	(b) methods to determine when and how the mine operation is to be modified to minimise the potential for dust emissions. (c) measures to continue baseline monitoring undertaken prior to development consent. (Refer condition 8.3 for air quality monitoring details)	• Dust Management Plan S. 5 • Dust Management Plan S. 7	(b)Dust monitoring has continued and the results are independently reviewed annually by Dr Stephen Cattle and reported in the AEMR. (c) Baseline monitoring of dust has continued with the dust deposition gauges maintained and samples collected each month. Dust monitoring results are reviewed by Dr Stephen Cattle (University of Sydney) annually and the results of the review and monitoring data are	**Compliant**

<table>
<tr><th>No.</th><th>Minister's Condition of Approval</th><th>Verification</th><th>Comments</th><th>Compliance</th></tr>
<tr><td></td><td></td><td></td><td>included in the AEMR's section 3.1.3.1. Dust monitoring has continued at the sites specified in EPL condition P1.1.</td><td></td></tr>
<tr><td></td><td>(d) The Applicant shall ensure that the dust emissions generated by the development do not cause additional exceedances of the air quality impact assessment criteria listed in Tables 2, 3 and 4 at any residence on privately-owned land, or on more than 25% of privately-owned land not located within Lake Cowal, as shown in Appendix 3.
(e)
Table 2: Long term impact assessment criteria for particulate matter
<table>
<tr><th>Pollutant</th><th>Averaging Period</th><th>Criterion</th></tr>
<tr><td>Total suspended particulate (TSP) matter</td><td>Annual</td><td>90 µg/m^3</td></tr>
<tr><td>Particulate matter <10µm (PM_{10})</td><td>Annual</td><td>30 µg/m^3</td></tr>
</table>
Table 3: Short term impact assessment criterion for particulate matter
<table>
<tr><th>Pollutant</th><th>24 hour</th><th>Criterion</th></tr>
<tr><td>Particulate matter <10µm (PM_{10})</td><td>24 hour</td><td>50 µg/m^3</td></tr>
</table>
Table 4: Long term impact assessment criteria for deposited dust
<table>
<tr><th>Pollutant</th><th>Averaging Period</th><th>Max increase in deposited dust level</th><th>Max total deposited dust level</th></tr>
<tr><td>Deposited dust</td><td>Annual</td><td>2g/m^2/mth</td><td>4g/m^2/mth</td></tr>
</table></td><td>• Interpretation and Discussion of 2010 Air Quality Monitoring Results, CGM, Prof. Stephen Cattle Uni of Sydney
• Interpretation and Discussion of 2011 Air Quality Monitoring Results, CGM, Prof. Stephen Cattle Uni of Sydney
• Interpretation and Discussion of 2012 Air Quality Monitoring Results, CGM, Prof. Stephen Cattle Uni of Sydney</td><td>Dust management from the CGM operations continues to control emissions from the site in accordance with the Dust Management Plan to within the criteria specified in MCoA 6.1(c).

Monitoring of dust deposition and PM_{10} as outlined in the Dust Management Plan and the Surface Water, Groundwater, Meteorological and Biological Monitoring Program continues with review of the data annually by Dr Stephen Cattle, University of Sydney and reported in the AEMR.

The dust monitoring results have generally been compliant with the criteria in MCoA 6.1(d).

The eight dust gauges external to the mine lease area have exhibited significant proportion of combustible matter such as insects, bird droppings and vegetative matter that if removed from the total deposition data demonstrate annual average dust deposition results that are less than the assessment criterion of 4g/m^2/mth.

The HVAS located north of the mine lease area demonstrated TSP levels below the criterion in Table 2 (i.e. less than 90µg/m^3) between May 2013 and May2014.</td><td>Compliant</td></tr>
<tr><td>6.2</td><td>Dust Suppression and Control</td><td></td><td></td><td></td></tr>
<tr><td></td><td>The Applicant shall:

(i) maintain and use sufficient equipment with the capacity to apply water to all unsealed trafficked areas at a rate which minimises dust emissions;
(ii) ensure the prompt and effective rehabilitation of all disturbed areas to minimise generation of wind erosion dust, in accordance with the requirements of DII(Minerals);
(iii) keep the surface of all stockpiles sufficiently treated to minimise windblown dust.</td><td>• Letter from DoP re Addendum to Dust Management Plan, 31 August 2007.
• Amendment to Dust Management Plan, Dec 2008
• Letter to DoP re Amendment to Dust Management Plan, 19 Dec 2008
• Letter from DoP re Dust Management Plan Amendment Approval, 25 Feb 2009</td><td>Water tankers are available on site for the control of dust on roads and other disturbed areas subject to traffic movements.
DoP accepted the amendments to the Dust Management Plan in 2007, 2008 and 2009 in relation to monitoring locations and dust mitigation techniques for the site.
PetroTac surface treatment has been applied to the internal roads near the entrance to the operational site area and in front of the administration building for dust control. PetroTac treatment is generally applied to these areas each 1-2 months.</td><td>Compliant</td></tr>
</table>

<table>
<tr><th>No.</th><th>Minister's Condition of Approval</th><th>Verification</th><th>Comments</th><th>Compliance</th></tr>
<tr><td></td><td>Vibration</td><td></td><td></td><td></td></tr>
<tr><td></td><td>Blasting Impact Assessment Criteria</td><td></td><td></td><td></td></tr>
<tr><td>6.3</td><td>(a) The Applicant shall ensure that blasting at the project does not exceed the criteria in Table 5.
Table 5: Blasting impact assessment criteria
<table>
<tr><th>Location</th><th>Time of Blasting</th><th>Air-blast over pressure dBL</th><th>Ground Vibration mm/s</th><th>Allowable exceedance</th></tr>
<tr><td rowspan="5">Residence on privately owned land</td><td>Any time</td><td>120</td><td>10</td><td>0%</td></tr>
<tr><td>Day</td><td>115</td><td>5</td><td rowspan="4">5% of total number of blasts over a period of 12 months</td></tr>
<tr><td>Evening</td><td>105</td><td>2</td></tr>
<tr><td>Night</td><td>95</td><td>1</td></tr>
<tr><td>Sundays& Public Holidays</td><td>95</td><td>1</td></tr>
</table></td><td>• Blast Monthly Reports – January, February and March 2014
• Review of Blast Monitoring Report 2013, The Saros Group, Mar 2014
• Review of Blast Monitoring Report 2012, The Saros Group, Mar 2013</td><td>The blast monitoring conducted at the fixed monitor locations around the CGM site has demonstrated compliance with the overpressure and vibration Day and Evening criteria in MCoA 6.3(a).
No blast overpressure results exceeded 120dBL, and overpressure results greater than 115dBL accounting for less than 5% of the total blasts.
No night time blasts have occurred between May 2013 and May 2014.
Exceedence of the 95dB(L) criteria (MCoA 6.3(a)) occurred from five (5) blasts on Sundays and Public Holidays between May 2013 and May 2014.</td><td>Compliant</td></tr>
<tr><td></td><td>Blast Management Plan</td><td></td><td></td><td></td></tr>
<tr><td>6.3</td><td>(b) The Applicant shall prepare and implement a Blast Management Plan for the project in consultation with DECCW and to the satisfaction of the D-G. This plan must be submitted to the D-G for approval by the end of July 2010 and include provisions to:
(i) evaluate blasting impacts on, and demonstrate compliance with the blasting criteria in this approval for privately-owned residences and structures;
(ii) implement best blasting practice to:
• protect the safety of people, property, public infrastructure, and livestock; and
• minimise disturbance to bird breeding. and
(iii) ensure that blast monitoring data is assessed regularly, and that operations are relocated, modified and/or stopped as required to ensure compliance with the relevant blast criteria.</td><td>• Revised Blast Management Plan 2009
• Letter from DECC re revised Blast Management Plan, 30 April 2009
• Letter to DECCW re Revised Blast Management Plan, 11 Jun 2010</td><td>The Blast Management Plan was revised in 2009 to ensure that the requirements of amended condition 6.3(b) were addressed. The revised Blast Management Plan was submitted to the relevant authorities on 11 June 2010 and was accepted by DECCW and DII. Barrick had not received notification of approval of the revised Blast Management Plan from DP&I at the date of this audit (i.e. May 2014).</td><td>Compliant</td></tr>
<tr><td></td><td>Public Notice</td><td></td><td></td><td></td></tr>
<tr><td>6.3</td><td>(c) The Applicant shall advise residents within two (2) kilometres of the active mining area of future blasting events on a monthly basis, and of any changes to monthly programs.
(d) Upon written request of the owner of any dwellings located within two (2) kilometres of the active mining area, the Applicant shall arrange at its own costs, for the inspection by a technically qualified person agreed to by both parties, to record the material condition of any structure on such property within 14 days of</td><td></td><td>There are no private dwellings located within 2 kilometres of the current active mining area.</td><td>Compliant</td></tr>
</table>

<table>
<tr><th>No.</th><th>Minister's Condition of Approval</th><th>Verification</th><th>Comments</th><th>Compliance</th></tr>
<tr><td></td><td>receipt of the request. The Applicant shall supply a copy of any inspection report, certified by the person who undertook the inspection, to the relevant property owner within fourteen (14) days of receipt of the report.</td><td></td><td></td><td></td></tr>
<tr><td></td><td>Acquisition Upon Request</td><td></td><td></td><td></td></tr>
<tr><td>6.4</td><td>(a) Upon receiving a written request for acquisition from the owner of any land listed in Table 6 following landholder notification in accordance with condition 11.1 of schedule 2, the Applicant shall acquire the land in accordance with the procedures in condition 11 of schedule 2.
Table 6: Land subject to acquisition upon request
Coniston
McLintock
West Lea.</td><td></td><td>This condition had not been activated at the date of this audit. There had been no exceedence of the criteria. No requests for acquisition have been received by CGM up to April 2013.</td><td>Not activated</td></tr>
<tr><td>6.4</td><td>(b) If the noise generated by the development exceeds the criteria in Table 7 at any residence on privately-owned land, or on more than 25 % of privately-owned land not located within Lake Cowal (as shown in Appendix 3), the Applicant shall, upon receiving a written request for acquisition from the landowner, acquire the land in accordance with the procedures in If the noise generated by the development exceeds the criteria in Table 7 at any residence on privately-owned land, or on more than 25 % of privately-owned land not located within Lake Cowal (as shown in Appendix 3), the Applicant shall, upon receiving a written request for acquisition from the landowner, acquire the land in accordance with the procedures in condition 11 of Schedule 2.
Table 7: Land acquisition criteria dB(A) LAeq (15min)
<table>
<tr><th>Location</th><th>Day/Evening/Night</th></tr>
<tr><td>All privately-owned land (excluding land in Table 6)</td><td>40</td></tr>
</table></td><td></td><td>This condition had not been activated at the date of this audit. There has been no exceedance of the criteria.
The quarterly noise monitoring has demonstrated that the noise levels at the residences listed in Table 6 have not exceeded 40dB(A) during the 2010 to 2013 period.</td><td>Not activated</td></tr>
<tr><td></td><td>Noise Impact Assessment Criteria</td><td></td><td></td><td></td></tr>
<tr><td>6.4</td><td>(c) The Applicant shall ensure that the noise generated by the development does not exceed the noise impact assessment criteria in Table 8 at any residence on privately-owned land, or on more than 25 % of privately-owned land not located within Lake Cowal.
Table 8: Noise Impact Assessment Criteria dB(A) LAeq (15min)
<table>
<tr><th>Location</th><th>Day/Evening/Night</th></tr>
<tr><td>Bungabulla</td><td>39</td></tr>
<tr><td>Coniston</td><td>44</td></tr>
<tr><td>Cowal North</td><td>38</td></tr>
<tr><td>Gumbelah</td><td>39</td></tr>
</table></td><td>• Cowal Gold Mine – Mine Operations Noise Monitoring, Jul 2012, SLR
• Noise Mitigation Deed – 'Laurel Park', 13 Aug 2012
• Cowal Gold Mine – Mine Operations Noise Monitoring, Jan-Feb 2013, SLR
• Noise Mitigation Deed – 'Gumbelah', 9 Dec 2013
• Letter to DP&I re Noise Mitigation Deed- Gumbelah', 16 Dec 2014</td><td>The quarterly SLR monitoring reports for mine operation noise between 2010 and 2014 have concluded that:
"The CGM was observed to be in conformance with the relevant noise requirements during all periods of the operator attended monitoring at all measurement locations."

Noise Mitigation Deeds were agreed and signed between Barrick and the owners of 'Gumbelah' (dated 6 December 2013, "Cowal North' (dated 16 January 2014, and "Laurel Park' (dated 13 August 2012).</td><td>Compliant</td></tr>
</table>

<table>
<tr><th>No.</th><th>Minister's Condition of Approval</th><th>Verification</th><th>Comments</th><th>Compliance</th></tr>
<tr><td></td><td>
<table>
<tr><td>Lake Cowal (non-Barrick</td><td>38</td></tr>
<tr><td>Laurel Park</td><td>39</td></tr>
<tr><td>Mattiske</td><td>36</td></tr>
<tr><td>McLintock</td><td>41</td></tr>
<tr><td>The Glenn</td><td>38</td></tr>
<tr><td>West Lea</td><td>41</td></tr>
<tr><td>All other residences</td><td>35</td></tr>
</table>

To interpret the locations referred to in Table 8, see Appendix 3.
Noise generated by the project is to be measured in accordance with the relevant requirements, and exemptions (including certain meteorological conditions), of the NSW Industrial Noise Policy.
The noise limits do not apply if the Applicant has an agreement with the relevant owner/s of these residences/land to generate higher noise levels, and the Applicant has advised the Department in writing of the terms of this agreement.

</td><td>

Noise Mitigation Deed – 'Cowal North', 16 Jan 2014
Letter to DP&I re Noise Mitigation Deed- Cowal North, 17 Jan 2014
Letter to DP&I re Noise Mitigation Deed – Laurel Park, 3 Feb 2014

</td><td></td><td></td></tr>
<tr><td></td><td>Traffic Noise Impact Assessment Criteria</td><td></td><td></td><td></td></tr>
<tr><td>6.4</td><td>(d) The Applicant shall take all reasonable and feasible measures to ensure that the traffic noise generated by the project does not exceed the traffic noise impact assessment criteria in Table 9.
Table 9: Traffic noise criteria dB(A) LAeq (1 hour)
<table>
<tr><th>Road</th><th>Day/Evening</th><th>Night</th></tr>
<tr><td>Ungarie Road</td><td>60</td><td>55</td></tr>
<tr><td>Wamboyne Rd, Blow Clear Rd, Carrawandool-Warroo Rd, Burcher Rd, Condobolin Rd, Lake Cowal Rd</td><td>55</td><td>50</td></tr>
</table>
Note: Traffic noise generated by the project is to be measured in accordance with the relevant procedures in DECCW's Environmental Criteria for Road Traffic Noise.</td><td rowspan="2">

Cowal Gold Mine – Traffic Noise Monitoring, Jan-Feb 2012, SLR
Cowal Gold Mine – Traffic Noise Monitoring, Jan-Feb 2013, SLR
Letter to Director-General DP&I re Agreements with Residents Affected by Traffic Noise, 3 Sep 2012
Letters of Agreement re Traffic Noise Exceedence, dated 27 Aug 2012 signed by:

Mr Maitland and Ms Davies,142 Ungarie Road
Mr & Mrs O'Connor Mid-Western Highway
Mr & Mrs Kremer 116 Ungarie Road
Mr Bischoff 88 Wamboyne Road
Mrs Anderson 56 Wamboyne Road
Mr & Mrs Apolony 156 Ungarie Road
Mr Jamieson & Ms Ridley 154 Ungarie Road

</td><td rowspan="2">The monitoring of traffic noise has been conducted annually by SLR in January 2012 and January / February 2013.

Barrick has implemented reasonable and feasible measures to reduce mine related traffic noise, such as restricting delivery times to the site to outside of the peak staff changeover times and providing bus transport from West Wyalong to the site for employees to reduce the number of private vehicles travelling to and from the mine site.

No traffic noise complaints were received during the period May 2013 to May 2014.

Barrick entered into Agreements with potentially affected residents in September 2012 and notified DP&I of the terms of agreement on 3 September 2012. No response or acknowledgement had been received from DP&I at the date of this audit.</td><td rowspan="2">Compliant</td></tr>
<tr><td></td><td></td></tr>
</table>

No.	Minister's Condition of Approval	Verification	Comments	Compliance
6.4	(e) Truck movements for material delivery purposes will be restricted as far as practicable to the day and evening periods.			Noted
	Additional Noise Mitigation Measures			
6.4	(f) Upon receiving a written request from: • the landowner of the properties in Table 6 (unless the landowner has requested acquisition); • the landowner of the properties identified as: • Bungabulla; • Gumbelah; • Laurel Park; • The Glen; • Cowal North; and • Lake Cowal (non-Barrick). • the landowner of privately-owned land where subsequent operational noise monitoring shows the noise generated by the project exceeds the noise limits in Table 8 by more than: o 1 dB(A), in the case of the location identified as Mattiske; and o 2 dB(A), in the case of all other locations; the Applicant shall implement additional noise mitigation measures such as double glazing, insulation, and/or air conditioning at any residence on the land in consultation with the landowner. In the event that other landowners consider that noise at their dwelling which is located along the mine access road between the Mid-Western Highway and the mine site, is in excess of the relevant criteria in Table 9, and the Director-General, in consultation with the DECCW, is satisfied that an investigation is required, the Applicant shall upon receipt of a written request: • appoint a qualified independent person to undertake direct discussions with the landowners affected to ascertain their concerns and to plan and implement an investigation to quantify the impact and determine the sources of the effect, and • where the project is identified as the cause/source bear the cost of the independent investigation and if exceedences are identified implement additional noise mitigation measures such as double glazing, insulation, and/or air conditioning at any residence on the land in consultation with the landowner. These additional mitigation measures shall be approved by BSC prior to implementation These additional mitigation measures must be reasonable and feasible. If, within 3 months of receiving this request from the landowner, the Applicant and the landowner cannot agree on the measures to be implemented, or there is a dispute about the implementation of these measures, then either party may refer the matter to the Director-General for resolution.	Communication with DP&I (Executive Director Sam Haddad) and Shane Goodwin Barrick COW.400.05.2885SG, 5 Sept 2012	No written requests to activate this condition have been received by Barrick. Barrick entered into Agreements with residents affected by traffic noise in September 2012 and notified DP&I of the terms of agreement on 3 September 2012 (see comments in 6.4(d) above).	Not activated

No.	Minister's Condition of Approval	Verification	Comments	Compliance
	At least 3 months prior to increasing the mobile equipment fleet as described in the EA, the Applicant shall notify the following landowners that they may be entitled to receive additional noise mitigation measures, to the satisfaction of the Director-General: • Bungabulla; • Gumbelah; • Laurel Park; • The Glen; • Cowal North; and • Lake Cowal (non-Barrick).			
	Noise Management Plan			
6.4	(g) The Applicant shall prepare and implement a Noise Management Plan for the project in consultation with DECCW and to the satisfaction of the Director-General. This plan must be submitted to the Director-General for approval by the end of July 2010 and include provisions to: (i) evaluate noise impacts on privately-owned residences (ii) demonstrate compliance with the noise impact assessment criteria in Table 8; (iii) implement all reasonable and feasible noise mitigation measures; (iv) investigate ways to reduce the noise generated by the project, including: • off-site road noise; and • noise levels which may result in sleep disturbance and disturbance to bird breeding behaviour; and (iv) report on these investigations and the implementation and effectiveness of these measures in the AEMR	• Letter from DoP re Amendments to Noise Management Plan, August 2007 • Letter from DECC re Addendum to Noise Management Plan, 21 Sep 2009 • Letter from DoP re Amendment to the Noise Management Plan, 8 April 2010 • Noise Management Plan, July 2010	The Noise Management Plan approved in 2003 was revised and amended in 2007 and 2009. The 5 year revision of the Noise Management Plan was submitted to the DoP on 28 September 2009 and approved on 8 April 2010. Further revision of the Noise Management Plan related to the Modification granted in March 2010 and inclusion of traffic noise management was submitted to DoP on 30 July 2010. Comments were received from DP&I at on 14 August 2012. A revised Noise Management Plan addressing the DP&I comments was submitted to DP&I on 24 December 2012. No response had been received by Barrick from DP&I at the date of this audit.	**Compliant**
6.5	***Visual Amenity and Lighting***			
	The Applicant shall take all reasonable and feasible measures, in consideration of Australian Standard *AS 4282-1997 Control of the obtrusive effects of outdoor lighting*, to mitigate visual and off-site lighting impacts of the project, to the satisfaction of the Director-General.	• Complaints Register 2012	No other complaints related to lighting were received between May 2013 and May 2014	**Compliant**
7	**TRANSPORT AND UTILITIES**			
7.1	**Road Transport**			
	Mine site access road (i) The Applicant shall use its best endeavours to ensure that the preferred mine access road routes as described in the EA are the only routes used by employees and contractors travelling to and from the mine site. (ii) The mine access road upgrade shall be undertaken in accordance with the approval issued by BSC under Part 5 of the Environmental Planning and Assessment Act, 1979.	• Bland Shire Council Decision - Notification of Approval of CGM Access Road Upgrade, 21 Apr 99 • Letter to BSC re Mine Access Road, 31 Jan 05	The access road route to the mine site from West Wyalong was approved by the Bland Shire Council in 1999 and the road works were completed and in use in 2006. Access to the CGM site by employees and contractors has been along the new road since late 2006.	**Compliant**

No.	Minister's Condition of Approval	Verification	Comments	Compliance
	(Refer also to conditions 2.2 and 5.4(b)).			
8	**MONITORING/AUDITING**			
	Monitoring programs in conditions 8.1 - 8.6 below are to be revised/updated annually, unless otherwise directed by the Director-General, to reflect changing environmental requirements significant changes in technology/operational practices and results from monitoring conducted. Changes shall be made and approved through the AEMR process. All monitoring programs shall also be made publicly available at BSC within two weeks of approval of the relevant government authority.	• Independent Monitoring Panel Report, March 2006 • Independent Monitoring Panel Report, August 2007 • Fourth Independent Monitoring Panel Report, October 2008 • Letter from DoP re Approval of Surface and Groundwater, Meteorological and Biological Monitoring Program – Operations Phase, 10 March 2010	An independent review of the Surface Water, Groundwater, Meteorological & Biological Monitoring Plan was conducted by Professor David Fox (Environmetrics, Melbourne), as recommended by the Independent Monitoring Panel (IMP Report 2006-2007), and the review submitted to Barrick in June 2008. The Program was further reviewed by Dr David Goldney and the revised Program approved by DoP in March 2010. Development of investigative triggers and effective responses to any detected adverse effects (as recommended by the IMP Report), were included in the revised Surface Water, Groundwater, Meteorological and Biological Monitoring Program – Operations Phase, 10 March 2010. The approved Surface Water, Groundwater, Meteorological and Biological Monitoring Program March 2010 has been implemented.	**Compliant**
8.1	***Meteorological***			
	The Applicant shall continue meteorological monitoring by utilising and maintaining the existing weather station on site. The data shall be particularly used for predicting noise, dust and blasting impacts on nearby residences, and bird breeding areas identified by the Applicant in consultation with DECCW.	• Cowal Calibration Report, Sentinel Pty Ltd, Jul, Sep, Dec 2013 and Mar 2014 • Monthly Weather Station Reports – January 2013 to March 2014, Sentinel Pty Ltd	The permanent meteorological station installed on the southern side of the mine lease in June 2004 continues to operate provides continuous monitoring results for use by the site operators. The meteorological station is checked and calibrated quarterly by Sentinel Pty Ltd and a monthly summary report of the meteorological data is provided to CGM.	**Compliant**
8.2	***Surface and Ground Water and Cyanide***			
	(a)Water monitoring (i)The Applicant shall construct and locate: (a) surface water monitoring positions in consultation with NoW and DECCW, and to the satisfaction of the Director-General , at least three months prior to the commencement of construction works unless otherwise directed by the Director-General; and (b) groundwater monitoring positions in consultation with NoW and DECCW, and to the satisfaction of the Director-General at least six months prior to the commencement of construction works unless otherwise directed by the Director-General.	• Letter re DoP Approval of Surface Water, Groundwater, Meteorological & Biological Monitoring Program, 10 Mar 2010 • Letter from DPI-NoW re Post-Mine Surface Water, Groundwater, Meteorological and Biological Monitoring Program, 6 Jun 2013 • Letter from DPI-NoW re Post-Mine Surface Water,	(a)(i)(a)Surface and groundwater monitoring locations were approved by the Director-General in March 2003. (a)(i)(b)Groundwater monitoring has been conducted in accordance with the EPL conditions P1.3 and M2.1. The independent review of the Surface Water, Groundwater, Meteorological & Biological Monitoring Program as recommended by the Independent Monitoring Panel concluded: *"it provides a robust program of monitoring that will contribute to the assessment of the effectiveness of environmental impact mitigation measures during the*	**Compliant**

No.	Minister's Condition of Approval	Verification	Comments	Compliance
		Groundwater, Meteorological and Biological Monitoring Program, 16 Sep 2013	*operations phase of the Project".* Conformance with the water monitoring program has occurred between May 2013 and May 2014 with water sampling on the mine site and in the Lake Cowal area conducted in accordance with the revised Surface Water, Groundwater, Meteorological & Biological Monitoring Program.	
	(ii) The Applicant shall prepare a detailed monitoring program in respect of ground and surface water, including water in the up catchment diversion system, internal catchment drainage system, dewatering bores, Bland Creek Palaeochannel borefield and water supply pipeline from borefield, pit/void, Lake Cowal, and any other waters in and around the mine site, during construction works, mine operations and post mine operations in consultation with NoW, DECCW, DII (Fisheries) and to the satisfaction of the Director-General . The monitoring program during construction works shall be prepared prior to commencement of construction. The monitoring program during mine operation shall be prepared prior to commencement of mine operation. The monitoring program post mine operations shall be prepared by year 7 of mine operations.	• Surface Water, Groundwater, Meteorological and Biological Monitoring Program – Mining Operation Phase, Mar 2010 • Letter from DoP re Approval of Revised Surface Water, Groundwater, Meteorological and Biological Monitoring Program, Mar 2010	The Surface Water, Groundwater, Meteorological and Biological Monitoring Program - Mining Operations Phase approved by DoP in 2003 was revised and approved by DoP on 10 March 2010. The ground and surface water monitoring program for the mine site and in the Lake Cowal area has been conducted in accordance with the Surface Water, Groundwater, Meteorological & Biological Monitoring Program and MCoA 8.2(a)(ii).	**Compliant**
	(iii) The monitoring program will include the development of adequate chemical and biological monitoring in the waters of Lake Cowal, when water is present, by suitably qualified and experienced staff or consultants to the satisfaction of the NoW and DECCW, and in the case of biological monitoring DII(Fisheries). NoW and DECCW must be satisfied as to sampling design, including sample locations, sample frequency, sample handling, transport and analysis, sampling parameters and reporting of analysis results.	• Surface Water, Groundwater, Meteorological and Biological Monitoring Program – Operations Phase, Mar 2010	The Surface Water, Groundwater, Meteorological and Biological Monitoring Program was revised and approved by DoP on 10 March 2010. Surface water and biological monitoring of Lake Cowal waters has been conducted since the water in the lake reached the trigger level of 204.5m AHD. The rainfall events between May 2010 and April 2013 resulted in the water levels in Lake Cowal above the trigger level. The Lake water level in May 2014 was less than the trigger level on 204.5mAHD and the monitoring programs were being reviewed to account for the low water level.	**Compliant**
	(iv) The results and interpretation of surface and ground water monitoring (including biological monitoring) are to be provided by the Applicant in an approved form to the NoW, DECCW and DII(Fisheries) on a three monthly basis during construction and the first 12 months of ore processing operations and thereafter on an annual basis, unless otherwise agreed by the Director-General. The results are also to be contained and analysed in the Annual Environmental Management Report (Condition 9.2(a)).	• Monitoring Data Reports to DECC, DoP and DPI - Jan to Mar, Apr-Jun, Jul-Sep, Oct-Dec 2007 to 2009 • Cyanide Monitoring Reports to DECC, DoP and DPI (Minerals), monthly May 2007 to Mar 2010	The surface and groundwater monitoring results have been provided to the EPA/DECCW/OEH, DoP/DP&I and DII (Fisheries) in accordance with this condition. Reporting of all monitoring results (including cyanide monitoring) also occurs to the relevant authorities in the AEMR and EPA Annual Return.	**Compliant**
	(v) the Applicant shall prior to commencement of construction works prepare in consultation with NoW and DII(Minerals) and to the satisfaction of the Director-General, a monitoring program for the detection of any movement of the Lake protection bund, water storage and tailings structures and pit/void walls during the life of	• Monitoring Program for the Detection of any Movement of the Lake Protection Bund, Water Storage and Tailings Structures and Pit/Void Walls,	The program for the detection of any movement in the lake protection bund, water storage and tailings structures and pit/void walls was approved by the Director-General on 9 October 2003.	**Compliant**

<table>
<tr><th>No.</th><th>Minister's Condition of Approval</th><th>Verification</th><th>Comments</th><th>Compliance</th></tr>
<tr><td></td><td>the mine, with particular emphasis on monitoring after any seismic events.</td><td>Dec 200
• 2009 AEMR 19 April 2010
• 2010 draft AEMR May 2011</td><td>Monitoring points in the Lake Protection Bund (located each 200m on top of the banks) were installed in accordance with the program. No significant movement has been recorded at any of the monument survey points.</td><td></td></tr>
<tr><td></td><td>(b) Cyanide monitoring</td><td></td><td></td><td></td></tr>
<tr><td></td><td>The Applicant shall prior to any tailings disposal prepare a cyanide monitoring program in consultation with the DECCW and DII(Minerals), and to the satisfaction of the Director-General . The plan shall include, but not be limited to, provision for:</td><td></td><td>The cyanide monitoring program required under MCoA 8.2(b) was approved as part of the Cyanide Management Plan (MCoA 5.3(b) by DoP on 9 January 2006.</td><td rowspan="3">Compliant</td></tr>
<tr><td></td><td>(i) monitoring of CN_{WAD} levels of the aqueous component of the tailings slurry stream at the discharge point to tailings dams twice daily or as otherwise directed by the Director-General, with any increases above 20mg CNWAD/L to be assessed daily to ensure compliance and reported monthly to the DII(Minerals) and DECCW, unless otherwise agreed by the Director- General. If the CNWAD levels of 30mg/L are exceeded in the liquid at any time, discharge to the tailings dams shall cease until CNWAD levels can be achieved below the levels stated in condition 5.3(a) and such exceedance shall be reported to the DECCW within 24 hours;
(ii) monitoring CNWAD levels in the decant water of the tailings dams twice daily or as otherwise directed by the Director-General;</td><td>• Cyanide Management Plan, section 6.2
• Process Plant Cyanide Monitoring Data, Barrick Cyanide Management Plan, section 6.2
• Cyanide Monitoring Results, Monthly Reports, April 2010 to March 2011
• Cyanide Monitoring Results, Monthly Reports, April 2011 to March 2012</td><td>Monitoring of the decant water quality and tailing discharge occurs twice daily with the samples analysed at the on-site laboratory.

All cyanide results were >20mg CN_{WAD}/L between May 2013 and May 2014

<table><tr><th>Period</th><th>>20mg CN_{WAD}/L</th><th>>30mg CN_{WAD}/L</th></tr><tr><td>Mar-Jun 2013</td><td>0</td><td>0</td></tr><tr><td>Jun-Sep2013</td><td>0</td><td>0</td></tr><tr><td>Sep–Dec2013</td><td>0</td><td>0</td></tr><tr><td>Jan-Mar2014</td><td>0</td><td>0</td></tr></table></td></tr>
<tr><td></td><td>(v) an on-site laboratory for quickly establishing CN_{WAD} levels in the liquid at the discharge point to tailings dams and in the decant ponds for monitoring purposes;</td><td>• Cyanide Management Plan, section 6.3</td><td>Free cyanide monitoring within the process plant area is conducted as part of the daily workplace monitoring program (refer to section 6.3 of the Cyanide Management Plan).</td><td>Compliant</td></tr>
<tr><td></td><td>(vi) on-line monitoring of $CN_{(FREE)}$ at locations where employees are operating</td><td>• Cyanide Management Plan, section 6.4</td><td>Cyanide Management Plan section 6.4 describes the quarterly groundwater monitoring program designed to detect cyanide movement beneath and adjacent to the tailings storage facilities. No cyanide has been detected in the groundwater monitoring bores between May 2013 and May 2014.</td><td>Compliant</td></tr>
<tr><td></td><td>A summary of the cyanide monitoring results shall be provided to the Director-General, DECCW and DII(Minerals) on a three monthly basis, unless otherwise agreed by the Director-General. All results shall be included in the AEMR.</td><td>• 2009 AEMR 19 Apr 2010
• Letters to DoP, DECCW, DII re Monthly Cyanide Monitoring Results, May 2010 to April 2013</td><td>The reporting of the cyanide monitoring results occurs on a monthly basis to the DII (Minerals)/DTIRIS-DRE, DECCW/ OEH and DP&I. (Cyanide monitoring started in May 2006 following commencement of use of cyanide in the process plant).
All results have demonstrated compliance with the criteria. (Note: If any results were detected in excess of 20mg CN_{WAD} /L they would be reported immediately to the DRE and OEH).</td><td>Compliant</td></tr>
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8.3	***Air Quality and Dust***			
	The Applicant shall: (a) undertake monitoring at locations described in the dust management plan (condition 6.1); (b) monitor dust deposition rates and concentrations of total suspended particulates (TSP) for the life of the mine, including monitoring impacts of dust on any surface water within the high water mark of Lake Cowal; and (c) provide all results and analysis of air quality monitoring in the AEMR including a determination of the dust deposition rate in gm/m^2/month, which shall be plotted in the AEMR.	• Letter to DoP re Amended Dust Management Plan, 9 August 2007 • Dust Management Plan Feb 2009 • 2009 AEMR, May 2010 • 2010 AEMR, Aug 2011 • 2011 AEMR, Jul 2012 • 2012 AEMR, draft Apr 2013 • Interpretation and Discussion of Air Quality Monitoring Results, Uni of Sydney, Dr Stephen Cattle 2010 2011, 2011, 2012	(a)Dust deposition gauges have been installed at the locations identified in the Dust Management Plan. Some dust deposition gauges and 'frisbees' were recovered due to the depth of water in Lake Cowal after the lake filled in 2010. A high volume air sampler operates at the nearest residences (sensitive receptor) and operates on a 6 day cycle for TSP. (b)Dust deposition and TSP monitoring related to Lake Cowal water quality was not activated from 2007 to 2010 as there was no water in the lake. Dust monitoring around the CGM area is reported in the AEMR. Dust deposition monitoring at six sites and PM_{10} monitoring at the locations specified in the EPL condition P1.1, has continued. The dust monitoring results are reviewed annually by Dr Stephen Cattle, University of Sydney and results are presented in the AEMR and reported to Barrick. (c)The dust monitoring results, independently reviewed by Dr Stephen Cattle, University of Sydney, are presented in the AEMR.	**Compliant**
8.4	***Deleted***			
8.5	***Fauna and Flora Monitoring***			
	The Applicant shall monitor the effectiveness of measures outlined in the fauna management plan and Threatened Species Protocol (condition 3.4). A summary of monitoring results shall be included in the AEMR.	• Flora and Fauna Management Plan Nov 2012 • Threatened Species Management Protocol, Nov 2012 • Vegetation Clearance Protocol Implementation Report, Sep 2005 • 2009 AEMR, 19 Apr 2010 • 2010 AEMR, May 2011 • 2011 AEMR May 2012 • 2012 AEMR Apr 2013 • 2013 AEMR draft	The management of flora and fauna under the Flora and Fauna Management Plan and the Threatened Species Management Protocol is reported in the AEMR in sections 3.7 and 3.8 respectively. Vegetation clearance activities have been conducted in accordance with the Vegetation Clearance Protocol, and weed and pest management and flora monitoring in accordance with the FFMP.	**Compliant**
8.6	***Cultural Heritage Monitoring***			
	The Applicant shall monitor the effectiveness of measures outlined in the archaeology and heritage management plan (condition 3.3). A summary of monitoring results shall be included in the AEMR.	• Indigenous Archaeology and Cultural Heritage Management Plan 2003 • 2010 AEMR, May 2011	The management of Aboriginal heritage has been undertaken in accordance with the Indigenous Aboriginal and Cultural Heritage Management Plan. The management actions and registered sites/items are	**Compliant**

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		• 2011 AEMR May 2012 • 2012 AEMR Apr 2013 (draft) • Letter from Bland Shire Council re Heritage Advisors Report, 6 March 2009	reported in the AEMR section 3.13. European Heritage is managed under the Heritage Management Plan with any actions reported in section 3.14 of the AEMR's. During 2010-11 the homestead and other buildings on the CGM lease site north of the southern waste emplacement area were monitored and plans to dismantle and recover sections of the structures for restoration were developed. The Shearing Shed was dismantled during 2011/12 and relocated to the Lake Cowal Foundation site at Hillgrove for re-construction. Re-construction was completed in April 2013.	
8.7	***Community Consultative Committee***			
	Community Environmental Monitoring and Consultative Committee The Applicant shall: (i) establish a Community Environmental Monitoring and Consultative Committee and ensure that the first meeting is held before the commencement of construction works. Selection of representatives shall be agreed by the Director-General and the appointment of an independent Chairperson shall be to the satisfaction of the Director-General in consultation with the Applicant and BSC. The Committee shall comprise two (2) representatives of the Applicant (including the Environmental Officer), one (1) representative of BSC, one (1) representative of the Lake Cowal Environmental Trust (but not a Trust representative of the Applicant), four community representatives (including one member of the Lake Cowal Landholders Association), to monitor compliance with conditions of this consent and other matters relevant to the operation of the mine during the term of the consent. Representatives from relevant government agencies (including DUAP) may be invited to attend meetings as required by the Chairperson. The Committee may make comments and recommendations about the implementation of the development and environmental management plans. The Applicant shall ensure that the Committee has access to the necessary plans for such purposes. The Applicant shall consider the recommendations and comments of the Committee and provide a response to the Committee and Director-General. (ii) The Applicant shall, at its own expense: a) nominate two (2) representatives to attend all meetings of the Committee; b) provide to the Committee regular information on the progress of work and monitoring results; c) promptly provide to the Committee such other information as the Chair of the Committee may reasonably request concerning the	• Charter of the CEMCC • CEMCC Minutes 3 Mar 2010 • CEMCC Minutes 9 Jun 2010 • CEMCC Minutes 1 Sep 2010 • CEMCC Minutes 1 Dec 2010 • CEMCC Minutes 2 Mar 2011 • CEMCC Minutes 9 Jun 2011 • CEMCC Minutes 1 Sep 2011 • CEMCC Minutes 5 Dec 2011 • CEMCC Minutes 29 Feb 2012 • CEMCC Minutes 9 May 2012 • CEMCC Minutes Sep 2012 • CEMCC Minutes 5 Dec 2012 • CEMCC Minutes 6 Mar 2013 • CEMCC Minutes 5 Jun 2013 • CEMCC Minutes 5 Sep 2013 • CEMCC Minutes 5 Dec 2013 • CEMCC Minutes 5 Mar 2014	(i)The Community Environmental Monitoring and Consultative Committee (CEMCC) was established in 2003 and the inaugural meeting of the CEMCC occurred on 15 October 2003. The CEMCC meets quarterly and the meeting minutes are made available at Bland Shire Council library for public inspection. (ii)(a) Garry Pearson (Environment Manager), Bronwyn Flynn (Environmental Co-ordinator) and Shane Goodwin (Community Relations Manager) nominated Barrick representatives. (b) Copies of complaints and other relevant documentation is provided as required to the CEMCC. (c) Barrick supply information to the Committee as requested, on environmental performance. (d) Site inspections are arranged as requested by the CEMCC (e) The CEMCC Meetings are held at the CGM site offices. (iii) Chair of CEMCC Margaret MacDonald-Hill. Barrick pay an annual contribution of $2000 (plus CPI) to Bland Shire Council, and the funds are held in trust for the purpose of the CEMCC. (iv) Not yet applicable.	**Compliant**

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	environmental performance of the development; d) provide access for site inspections by the Committee; e) provide meeting facilities for the Committee, and take minutes of Committee meetings. These minutes shall be available for public inspection at BSC within 14 days of the meeting. (iii) The Applicant shall establish a trust fund to be managed by the Chair of the Committee to facilitate the functioning of the Committee, and pay $2000 per annum to the fund for the duration of gold processing operations. The annual payment shall be indexed according to the Consumer Price Index (CPI) at the time of payment. The first payment shall be made by the date of the first Committee meeting. The Applicant shall also contribute to the Trust Fund reasonable funds for payment of the independent Chairperson, to the satisfaction of the Director-General. (vii) At least four years prior to mine closure the Applicant shall, in consultation with the CEMCC, identify and discuss post-mining issues, particularly in relation to reduced employment and consequent impacts on West Wyalong, and develop a mine workforce phase out plan. This plan shall be reviewed and updated in consultation with the CEMCC at the commencement of the final year of mine operations. The Applicant shall, in consultation with the CEMCC, develop appropriate strategies to support activities which promote special interest tourism related to the co-existence of mining and the Lake Cowal environment.			
8.8	***Third Party Monitoring/Auditing***			
	(a) An Independent Environmental Audit shall be completed: • six monthly during construction; • 12 months after commencement of ore processing; • then every three years thereafter until decommissioning of the mine and ore processing operations respectively, or as otherwise directed by the Director-General. The Applicant shall conduct an environmental audit of the mining and infrastructure areas of the development in accordance with ISO 14010 - Guidelines and General Principles for Environmental Auditing, and ISO 14011 - Procedures for Environmental Auditing (or the current versions), and in accordance with any specifications required by the Director-General. Copies of the report shall be submitted by the Applicant to the Director-General, BSC, DECCW, NoW, DII(Minerals) and CEMCC within two weeks of the report's completion for comment. (i) The audit shall: a. assess compliance with the requirements of this consent, licences and approvals; b. in the event of any non-compliance, report on the effectiveness	• Independent Environmental Audit Report, May 2007 • Independent Environmental Audit Report, May 2008 • Independent Environmental Audit Report, May 2009 • Independent Environmental Audit, Trevor Brown & Associates, April 2010 • Independent Environmental Audit, Trevor Brown & Associates, April 2011 • Letters to DP&I, BSC, OEH, NoW, DI&I (Minerals) re Independent Environmental Audit, 20 May 2011 • Independent Environmental Audit, Trevor Brown & Associates, April 2012	(a) An Independent Third Party Environmental Audit has been conducted to address the requirements if condition 8.8 and the reports submitted to DP&I, BSC, DECCW/OEH, NoW, DI&I (Minerals) and CEMCC within 2 weeks of finalisation of the report by the independent auditors and submission to CGM. An Independent Environmental Audit of the CGP was conducted in 2008 and 2009 at the request of Barrick, to meet the recommendation of the IMP. An Independent Audit was conducted for the period April 2007 to April 2010, and 2011 to 2013,to satisfy MCoA 8.8(a). The Independent Environmental Audits of the CGP have continued to be conducted annually at the request of Barrick Australia.	**Compliant**

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	of the environmental management of the mine as it may relate to the area of non-compliance; c. be carried out at the Applicant's expense; and d. be conducted by a duly qualified independent person or team approved by the Director-General in consultation with BSC and CEMCC. (i) The Director-General may, after considering any submission made by the relevant government agencies, BSC and CEMCC on the report, notify the Applicant of any requirements with regard to any recommendations in the report. The Applicant shall comply with those reasonable requirements within such time as the Director-General may require.			
	(b) Independent Monitoring Panel (i) The Applicant shall at its own cost establish an Independent Monitoring Panel prior to commencement of construction. The Applicant shall contribute $30,000 per annum for the functioning of the Panel, unless otherwise agreed by the Director-General. The annual payment shall be indexed according to the Consumer Price Index (CPI) at the time of payment. The first payment shall be paid by the date of commencement of construction and annually thereafter. Selection of the Panel representatives shall be agreed by the Director-General in consultation with relevant government agencies and the CEMCC. The Panel shall at least comprise two duly qualified independent environmental scientists and a representative of the Director-General.	• Eighth Independent Monitoring Panel Report, Oct 2012 • Ninth Independent Monitoring Panel Report, Oct 2013 (received by Barrick 2 Jun 2014)	The Independent Monitoring Panel was established by Barrick with two independent environmental scientists nominated by the Director-General. The current members are: Dr Craig Miller CSIRO Sustainable Ecosystems Emeritus Prof. Clive Bell University of Queensland. Barrick deposits $30,000 (plus CPI) annually into a special account (Independent Panel Monitoring Trust) for the functioning of the panel. The IMP prepares a report for the DoP/DP&I annually: • Eighth IMP Report was provided to Barrick on • Ninth IMP Report was submitted to DoP and provided to CGM on 2 June 2014	**Compliant**
	(b) Independent Monitoring Panel (ii) The panel shall: (a) provide an overview of the independent audits required by condition 8.8(a) above; (b) regularly review all environmental monitoring procedures undertaken by the Applicant, and monitoring results; and (c) provide an Annual State of the Environment Report for Lake Cowal with particular reference to the on-going interaction between the mine and the Lake and any requirements of the D-G. The first report shall be prepared one year after commencement of construction. The report shall be prepared annually thereafter unless otherwise directed by the D-G. Copies of the report shall be provided to those parties which receive the AEMR (condition 9.2) and shall be made publicly available at Bland Shire Council within two weeks of the report's completion	• Eighth IMP Report, Oct 2012 • Letter to DP&I re IMP Eighth Report, 7 Dec 2012 • Ninth IMP Report, Oct 2013 (received by Barrick 2 Jun 2014)	(b)(ii)(a) The Independent Monitoring Panel has commented on the Independent Environmental Audit in each of the annual reports; (b)(ii)(b) environmental monitoring procedures and monitoring results are commented on in the annual reports; (b)(ii)(c) The IMP have prepared an Annual Report for the Cowal Gold Project. The report is submitted to the Director-General and agencies that receive the AEMR. The report is also made publically available at the Bland Shire Council and on the Barrick website.	**Compliant**
9	**REPORTING**			
9.1	***Reports on Operations***			
	The Applicant shall report on mine operations in accordance with the	• MOP Jun 2007-Jun 2009, Jun	A MOP for 2009-2010 was submitted to DPI(Minerals) on	**Compliant**

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	mine operations plan (condition 2.1).	2007 • MOP Mar 2009-Dec 2010, Mar 2009 • Amended MOP 2009-2010, 18 Mar 2010 • Letter from DI&I re Approval of Amended MOP, 23 Nov 2010 • MOP Jan 2011 to Sep 2012 • Letter from DTIRIS re Approval of the MOP, 30 March 2011. • Letter to DTIRIS re Variation to the MOP, 5 Apr 2012 • MOP Apr 2014 to Apr 2016, Apr 2014	31 March 2009 and approved. An amendment to this MOP was submitted to DI&I and approved on 19 Mar 2010. A new MOP for the period January 2011 to September 2012 was approved by the DTIRIS (Minerals) on 30 March 2011. An extension of the 2009-2010 MOP until 31 March 2011 was granted by DI&I on 23 November 2010. A MOP for January 2011 to September 2012 was submitted to DII and accepted on 30 March 2011. A Variation to the MOP was requested in a letter to DTIRIS on 5 April 2012 for the Southern Tailings Storage Facility (fourth lift) and the Northern Waste Rock Emplacement (storage volume elevation increase). The draft MOP for April 2014 to April 2016 was prepared for submission to the authorities in April 2014.	
9.2	***Environmental Reporting***			
	Annual Environmental Management Report (AEMR) (i) The Applicant shall, throughout the life of the mine and for a period of at least five years after the completion of ore processing operations, prepare and submit an Annual Environmental Management Report (AEMR) to the Director-General. The AEMR shall review the performance of the mine against the environmental management plans (refer condition 3.2), Mining Operations Plan (refer condition 2.1), the conditions of this consent, and other licences and approvals relating to the mine. To enable ready comparison with EIS predictions, diagrams and tables, the report shall include, but not be limited to, the following matters: a) an annual compliance audit of the performance of the project against conditions of this consent and statutory approvals; b) a review of the effectiveness of the environmental management of the mine in terms of DECCW, NoW, DII(Minerals), DII(Fisheries), and BSC requirements; c) results of all environmental monitoring required under this consent or other approvals, which includes interpretation and discussion by a suitably qualified person; d) from results of fauna monitoring, records of any fauna deaths due to mine operations; e) a listing of any variations obtained to approvals applicable to the subject area during the previous year; f) the outcome of the water budget for the year and the quantity of water used from water storages and Bland Creek Palaeochannel bore-field;	• 2010 AEMR • 2011 AEMR • 2012 AEMR • 2013 AEMR (draft) • Letters to DECCW/OEH, NoW, DTIRIS (mineral Resources), DPI(Fisheries), DSC, BSC and CEMCC re 2010 AEMR, 25 Aug 2011 • Letters to DECCW/OEH, NoW, DTIRIS (Mineral Resources), DPI(Fisheries), DSC, BSC and CEMCC re 2011 AEMR, 4 July 2012 • Letters to DECCW/OEH, NoW, DTIRIS (Mineral Resources), DPI(Fisheries), DSC, BSC and CEMCC re 2012 AEMR, 20 Aug 2013	(i) The Annual Environmental Management Report (AEMR) has been prepared by CGM in accordance with the MCoA 9.2 and submitted to the Director-General: (a)AEMR section 3 Environmental Management and Performance addresses compliance with the consent conditions and statutory approvals; (b) AEMR section 3 Environmental Management and Performance addresses compliance with the consent conditions and statutory approvals and reviews the effectiveness of the environmental management of the mine in terms of DECCW, NoW, DII(Minerals), DII(Fisheries), and BSC requirements; (c) AEMR section 3 Environmental Management and Performance addresses compliance of the results of environmental monitoring required under this consent or other approvals and includes interpretation and discussion of the results; (d)AMR section 3.8 Fauna provides results of fauna monitoring, and records of fauna deaths due to mine operations; (e)AEMR section 1.1 Consents, Leases, Licences and Permits lists variations obtained to approvals during the previous year; (f)sections 3.3 and 3.3 address Surface Water and Groundwater outcomes related to the water budget and the quantity of water used from water storages and Bland Creek Palaeochannel bore-field;	**Compliant**

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	g) rehabilitation report; h) environmental management targets and strategies for the next year. (ii)In preparing the AEMR, the Applicant shall: a) consult with the Director-General during preparation of each report for any additional requirements; b) comply with any requirements of the Director-General or other relevant government agency; and c) ensure that the first report is completed and submitted within twelve (12) months of this consent, or at a date determined by the Director-General in consultation with DII(Minerals). (iii) The Applicant shall ensure that copies of each AEMR are submitted at the same time to the Director-General, DECCW, NoW, DII(Minerals), DSC, DII(Fisheries), the BSC and CEMCC, and be available for public information at the BSC within 14 days of submission to these authorities.		(g)section 5 Rehabilitation (h)section 6 Activities Proposed for the Next AEMR Period. (ii) The first AEMR was completed and submitted within 12 months of the date of this consent and occurred in consultation with the Director-General and other relevant authorities. (iii) Copies of the AEMR have been submitted to the Director-General, DECCW/OEH, NoW, DII(Minerals)/DRIRIS-DRE, DSC, DII(Fisheries), the BSC and CEMCC each year and a copy made available for public information at the BSC library within 14 days of submission to the authorities.	
10	**COMMUNITY CONSULTATION/OBLIGATIONS**			
	Community Consultation (including Aboriginal community)			
10.1	(a) Complaints			
	The Environmental Officer (refer condition 3.1) shall be responsible: (i) for receiving complaints with respect to construction works and mine operations on a dedicated and publicly advertised telephone line, 24 hours per day 7 days per week, entering complaints or comments in an up to date log book, and ensuring that a response is provided to the complainant within 24 hours; and (ii) providing a report of complaints received every six months throughout the life of the project to the Director-General, BSC, DECCW, DII(Minerals), and CEMCC, or as otherwise agreed by the Director-General. A summary of this report shall be included in the AEMR (condition 9.2(a)).	• Responsibility Information Management System (RIMS) • Letter to DP&I re Community Complaints Register for 30 Dec to 30 Jun 2011, 5 July 2011 • Letter to DP&I and other Agencies re Community Complaints Register for: ○ 3 Jan 2013 to 30 June 2013 ○ 1 Jul 2013 to 31 Dec 2011, ○ 3 Jan 2012 to 30 April 2014 2012,	(a)CGM/Barrick has a 24hour complaints line (02) 6975 3454. CGM uses the External Communications component of the Responsibility Information Management System (RIMS) to track public complaints. (b) Six monthly reports of complaints received by CGM are prepared and submitted to OEH/BSC/DI&I/CEMCC and DP&I.	**Compliant** **Compliant**
11	**NOTIFICATION OF LANDOWNERS**			
11.1	At least 3 months prior to increasing the mobile equipment fleet as described in the EA, the Applicant shall notify the landowners of the lands listed in Table 6 in writing that they have the right to require the Applicant to acquire their land at any stage during the development.		CGM acts on legal advice in relation to the E42 Modification - Environmental Assessment (2009), that they have not triggered the requirement for notification of landowners under MCoA 11.1 (or MCoA 6.4(f)). ***Recommendation*** Barrick should clarify with DP&I the intent/requirement under MCoA 11.1 related to maximum fleet numbers and land acquisition request(s) by land owners identified in the condition of consent. This issue should be clarified prior to of the conditions of Modification to the Development	**Noted**

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			Consent (MOD 11).	
11.2	If the results of monitoring required in Schedule 2 identify that impacts generated by the development are greater than the relevant impact assessment criteria, except where a negotiated agreement has been entered into in relation to that impact, then the Applicant shall, within 2 weeks of obtaining the monitoring results, notify the Director-General, the affected landowners and tenants (including tenants of mine-owned properties) accordingly, and provide quarterly monitoring results to each of these parties until the results show that the development is complying with the criteria in Schedule 2.		Consultation has occurred with landowners following complaints about noise and blasting. Monitoring results for noise and overpressure conducted by SLR for Barrick have demonstrated compliance with MCoA/EPL and ML conditional criteria, and results are made available to the landowners and reported on the Barrick website. No incidence of non-compliance has been identified by the monitoring programs at the properties / residences occupied by the complainant parties.	**Noted**
	Independent Review			
11.3	If a landowner of privately-owned land considers the development to be exceeding the impact assessment criteria in Schedule 2, then he/she may ask the Director-General in writing for an independent review of the impacts of the development on his/her land. If the Director-General is satisfied that an independent review is warranted, the Applicant shall within 2 months of the Director-General's decision: (a) consult with the landowner to determine his/her concerns; (b) commission a suitably qualified, experienced and independent person, whose appointment has been approved by the Director-General, to conduct monitoring on the land, to: • determine whether the development is complying with the relevant impact assessment criteria in Schedule 2; and • identify the source(s) and scale of any impact on the land, and the development's contribution to this impact; and (c) give the Director-General and landowner a copy of the independent review.		No requests for Independent Reviews have been made to Barrick in relation to exceedance of impact assessment criteria.	**Not activated**
11.4	If the independent review determines that the development is complying with the relevant impact assessment criteria in Schedule 2, then the Applicant may discontinue the independent review with the approval of the Director-General. If the independent review determines that the development is not complying with the relevant impact assessment criteria in Schedule 2, then the Applicant shall: (a) implement all reasonable and feasible measures, in consultation with the landowner, to ensure that the development complies with the relevant criteria, and conduct further monitoring to determine whether these measures ensure compliance; or (b) secure a written agreement with the landowner to allow exceedances of the relevant impact assessment			**Not activated**

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	criteria, to the satisfaction of the Director-General. If the further monitoring referred to under paragraph (a) above determines that the development is complying with the relevant impact assessment criteria, then the Applicant may discontinue the independent review with the approval of the Director-General.			
	Land Acquisition			
11.5	Within 3 months of receiving a written request from a landowner with acquisition rights, the Applicant shall make a binding written offer to the landowner based on: (a) the current market value of the landowner's interest in the property at the date of this written request, as if the property was unaffected by the development, having regard to the: existing and permissible use of the land, in accordance with the applicable planning instruments at the date of the written request; and presence of improvements on the property and/or any approved building or structure which has been physically commenced at the date of the landowner's written request, and is due to be completed subsequent to that date, but excluding any improvements that have resulted from the implementation of the 'additional noise mitigation measures' in condition 6.4(f) of Schedule 2; (b) the reasonable costs associated with: relocating within the same local government area, or to any other local government area determined by the D-G; obtaining legal advice and expert advice for determining the acquisition price of the land, and the terms upon which it is to be acquired; and (c) reasonable compensation for any disturbance caused by the land acquisition process. However, if at the end of this period, the Applicant and landowner cannot agree on the acquisition price of the land and/or the terms upon which the land is to be acquired, then either party may refer the matter to the Director-General for resolution. Upon receiving such a request, the Director-General shall request the President of the NSW Division of the Australian Property Institute to appoint a qualified independent valuer to: consider submissions from both parties;		No written requests for acquisition have been received by Barrick Cowal during the audit period.	**Not activated**

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	determine a fair and reasonable acquisition price for the land and/or the terms upon which the land is to be acquired, having regard to the matters referred to in paragraphs (a)-(c) above; prepare a detailed report setting out the reasons for any determination; and provide a copy of the report to both parties. Within 14 days of receiving the independent valuer's report, the Applicant shall make a binding written offer to the landowner to purchase the land at a price not less than the independent valuer's determination. However, if either party disputes the independent valuer's determination, then within 14 days of receiving the independent valuer's report, they may refer the matter to the Director-General for review. Any request for a review must be accompanied by a detailed report setting out the reasons why the party disputes the independent valuer's determination. Following consultation with the independent valuer and both parties, the Director-General shall determine a fair and reasonable acquisition price for the land, having regard to the matters referred to in paragraphs (a)-(c) above and the independent valuer's report. Within 14 days of this determination, the Applicant shall make a binding written offer to the landowner to purchase the land at a price not less than the D-G's determination. If the landowner refuses to accept the Applicant's binding written offer under this condition within 6 months of the offer being made, then the Applicant's obligations to acquire the land shall cease, unless the Director-General determines otherwise.			
11.6	The Applicant shall pay all reasonable costs associated with the land acquisition process described in condition 11.5 above.			**Noted**
11.7	If the Applicant and landowner agree that only part of the land shall be acquired, then the Applicant shall also pay all reasonable costs associated with obtaining Council approval for any plan of subdivision (where permissible), and registration of the plan at the Office of the Registrar-General.			**Noted**
12	**FURTHER APPROVALS AND AGREEMENTS**			
12.1	***Statutory Requirements***			
	The Applicant shall ensure that all statutory requirements including but not restricted to those set down by the Local Government Act 1993, Pollution Control Act 1970, Clean Air Act 1961, Clean Water Act 1970, Noise Control Act 1975, Protection of the Environment	• Environment Protection Licence No. 11912 (EPA) • Mining Lease No. 5135 (DMR) • Section 87 Permits No. 1361,	Barrick obtained approvals under the relevant statutory requirements for the construction and operation of the mine facilities at CGP including: Environment Protection Licence No. 11912 (EPA) Mining Lease No. 5135 (DMR)	**Noted**

No.	Minister's Condition of Approval	Verification	Comments	Compliance
	Administration Act 1991, Protection of the Environment Operations Act 1997, 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 BSC, DECCW, DII(Minerals), DSC, NoW, RTA, DII(Agriculture), DII(Fisheries), and RAC, are fully met.	1648 & 1681 (NPWS) • Section 90 Consents to Destroy No. 1467 & 1680 (NPWS) • Part 3A Permits No.703A01055 & 703A010056 (DLWC) • Bore Licence Certificates (DLWC) • Enclosure Permit No. 353669 (DLWC)	Section 87 Permits No. 1361, 1648 & 1681 (NPWS) Section 90 Consents to Destroy No. 1467 & 1680 (NPWS) Part 3A Permits No.703A01055 & 703A010056 (DLWC) Bore Licence Certificates (DLWC) Enclosure Permit No. 353669 (DLWC)	

Notes:

1. This approval does not relieve the Applicant of the obligation to obtain any other approval under the Local Government Act, 1993 as amended, the Regulations made thereunder including approval of building plans, or any other Act.
2. Any acceptable levels relating to noise, dust deposition rates, air blast overpressure and vibration etc, contained in this consent are maximum levels. Other agencies, such as the DECCW for example, may grant approvals/licences for certain aspects of the development, which may include consideration of matters such as noise levels etc.

These regulatory processes generally occur after development consent is granted. Some licences (such as Pollution Control Licences) are renewable annually. These approvals/licences may require emission levels that are more stringent than those contained in this consent. This may occur where an agency receives additional information indicating that the emission levels approved in the development consent, are not sufficiently stringent to protect social and/or natural environmental quality

Attachment B Environment Protection Licence

Attachment B - Environment Protection Licence No. 11912

EPL No.	EPL Condition	Audit Evidence	Comments	Compliance
A1	**What the licence authorises and regulates**			
A1.1	Not applicable			
A1.2	This licence authorises the carrying out of the scheduled activities listed below at the premises specified in A2. The activities are listed according to their scheduled activity classification, fee-based activity classification and the scale of the operation. Unless otherwise further restricted by a condition of this licence, the scale at which the activity is carried out must not exceed the maximum scale specified in this condition. **Scheduled Activity:** Mineral processing Concrete works Crushing, grinding or separating Extractive activities Mining for minerals		Scheduled activities undertaken at the Cowal Gold Mine are in accordance with the maximum scale specified in this condition.	**Compliant**
	Fee Based Activity Scale Mineral processing > 2000000 - T processed Mining for minerals > 5000000 - T obtained		Cowal Gold Mine has not exceeded the scale of minerals mined or mineral processed between May 2013 and May 2014.	**Compliant**
A1.3	Not applicable.			
A1.4	The licensee may carry out scheduled development works necessary for the activity of mineral processing to be undertaken at the premises.			**Noted**
A2	**Premises to which this licence applies**			
A2.1	Cowal Gold Project 38km North East of West Wyalong. Lake Cowal Road, West Wyalong NSW 2671 Premises include the land defined by ML 1535.			**Noted**
A3	**Other activities**			
A3.1	This licence applies to all other activities carried on at the premises, including: Chemical storage, contaminated soil treatment, sewage treatment, waste disposal (application to land)			**Noted**
A4	**Information supplied to the EPA**			
A4.1	Works and activities must be carried out in accordance with the proposal contained in the licence application, except as expressly provided by a condition of this licence. In this condition the reference to "the licence application" includes a			**Noted**

<table>
<tr><th>EPL No.</th><th>EPL Condition</th><th>Audit Evidence</th><th>Comments</th><th>Compliance</th></tr>
<tr><td></td><td>reference to:
(a) the applications for any licences (including former pollution control approvals) which this licence replaces under the Protection of the Environment Operations (Savings and Transitional) Regulation 1998; and
(b) the licence information form provided by the licensee to the EPA to assist the EPA in connection with the issuing of this licence.</td><td></td><td></td><td></td></tr>
<tr><td>A4.2</td><td>For the purposes of condition A4.1, the licence application includes:
1)Development Consent Cowal Project
2)Cowal Gold Project EIS
3)List of Initial development activities associated with the construction of the Cowal Gold Project.
4)Cowal Gold Project – SIS
5) Modifications to the Cowal Gold Project approved by the DoP.</td><td>• Development Consent Cowal Project and Modifications to the Cowal Gold Project approved by the Department of Planning
• Cowal Gold Project – EIS
• Cowal Gold Project – SIS
• Modifications 1-10 to Cowal Gold Project</td><td></td><td>Noted</td></tr>
<tr><td colspan="5">Discharges to air and water and applications to land</td></tr>
<tr><td>P1</td><td>Location of monitoring/discharge points and areas</td><td></td><td></td><td></td></tr>
<tr><td>P1.1</td><td>The following points referred to in the table are identified in this licence for the purposes of monitoring and/or the setting of limits for the emission of pollutants to the air from the point.</td><td rowspan="2">• EQuis/MP-5 database CGP Environment Department
• Quarterly Monitoring Reports to DECCW/OEH
• 2012 AEMR
• 2013 AEMR (draft)
• Dust Management Plan</td><td rowspan="2">The dust deposition gauges and high volume sampler monitoring has continued between May 2013 and May 2014 in accordance with the requirements of the EPL conditions at the locations nominated in EPL condition P1.1and the CGM Dust Management Plan.

Directional dust deposition gauges (Frisbees) were added to the dust monitoring program in September 2009 to provide directional data and supplement the existing University of Sydney depositional dust gauges.

Due to the increase in water levels in Lake Cowal between May 2011 and April 2012, monitoring of twelve (12) of the depositional dust gauges and six (6) dust Frisbees was suspended in the lake area due to access problems and inundation.</td><td>Compliant</td></tr>
<tr><td></td><td>Air
<table>
<tr><td>1</td><td>Dust Monitoring</td><td>Dust gauge located approximately 1km west of ML1535 boundary, labelled as "McLintock's Shed" in Figure 5 'Dust Monitoring Locations' of the addendum to the "Cowal Gold Project Dust Management Plan" dated August 2007.</td></tr>
<tr><td>2</td><td>Dust Monitoring</td><td>Dust gauge located south of the southern waste emplacement, labelled as "Site Office" in Figure 5 'Dust Monitoring Locations' of addendum to the "Cowal Gold Project Dust Management Plan" dated August 2007.</td></tr>
<tr><td>3</td><td>Dust Monitoring</td><td>Dust gauge located approximately 1.5km east of ML1535 boundary, labelled as "DG5" in Figure 5 'Dust Monitoring Locations' of the addendum to the "Cowal Gold Project Dust Management Plan" dated August 2007.</td></tr>
<tr><td>4</td><td>Dust Monitoring</td><td>Dust gauge located approximately 3.5km south of ML1535 boundary, labelled as "DG9" in Figure 5 'Dust Monitoring Locations' of the addendum to the "Cowal Gold Project Dust Management Plan" dated August 2007.</td></tr>
<tr><td>5</td><td>Dust Monitoring</td><td>Dust gauge located within ML1535 and north of the open pit, labelled as "Site 52" in Figure 5 'Dust Monitoring Locations' of the addendum to the "Cowal Gold Project Dust Management Plan" August 2007.</td></tr>
</table></td><td>Compliant</td></tr>
</table>

EPL No.	EPL Condition	Audit Evidence	Comments	Compliance
	6 Dust Monitoring: Dust gauge and high volume sampler located approximately 3.5 km north of ML1535 boundary, labelled as "DG1" and "HV1" in Figure 5 'Dust Monitoring Locations' of the addendum to the "Cowal Gold Project Dust Management Plan" dated August 2007.			
P1.2	The points referred to in the table are identified in this licence for the purposes of the monitoring and/or the setting of limits for discharges of pollutants to water from the point.	• Quarterly Monitoring Reports	CGM water monitoring was conducted at the EPL nominated locations and in accordance with the Site Water Management Plan and Surface Water, Groundwater, Meteorological and Biological Monitoring Program.	**Compliant**
	Water and Land 12 Stormwater quality monitoring: Northern waste emplacement contained water storage labelled as "D1" in Figure 8 'Water Management Plan Operations Phase Year 3' of the "Cowal Gold Project Addendum to Site Water Management Plan" dated December 2006. 13 Stormwater quality monitoring: Southern waste emplacement contained water storage labelled as "D4" in Figure 8 'Water Management Plan Operations Phase Year 3' of the "Cowal Gold Project Addendum to Site Water Management Plan" dated December 2006. 14 Ambient Water quality monitoring: Surface water point within Lake Cowal labelled as "P1" in Figure 6 'Lake Monitoring Sites' of the "Cowal Gold Project Surface Water, Groundwater, Meteorological and Biological Monitoring Programme – Mine Operations" dated April 2005. 15 Ambient Water quality monitoring: Surface water point within Lake Cowal labelled as "P2" in Figure 6 'Lake Monitoring Sites' of the "Cowal Gold Project Surface Water, Groundwater, Meteorological and Biological Monitoring Programme - Mine Operations" dated April 2005. 16 Ambient Water quality monitoring: Surface water point within Lake Cowal labelled as "P3" in Figure 6 'Lake Monitoring Sites' of the "Cowal Gold Project Surface Water, Groundwater, Meteorological and Biological Monitoring Programme - Mine Operations" dated April 2005. 17 Ambient Water quality monitoring: Surface water point within Lake Cowal labelled as "B1" in Figure 6 'Lake Monitoring Sites' of the "Cowal Gold Project Surface Water, Groundwater, Meteorological and Biological Monitoring Programme - Mine Operations" dated April 2005. 18 Ambient Water quality monitoring: Surface water point within Lake Cowal labelled as "B5" in Figure 6 'Lake Monitoring Sites' of the "Cowal Gold Project Surface	• Quarterly Monitoring Reports • CGP Site Rainfall Records • Surface Water Event Monitoring Field Sheets (for rainfall events of 20mm or greater). • Site Water Management Plan • Surface Water, Groundwater, Meteorological and Biological Monitoring Program • 2012 AEMR • 2013 AEMR (draft)	Surface water monitoring occurred following EPL trigger rainfall events (i.e. >20mm rainfall/24hrs) for the surface water monitoring program. Trigger events occurred on the following occasions between March 2013 and May 2014: 2 June 2013 26.6mm 12 June 2013 23.8mm 17 September 2013 54.4mm 1 March 2014 26.6mm Groundwater monitoring has been conducted from piezometers listed in P1.2 as EPA Identification Points 19-40, in accordance with the EPL requirements.	**Compliant**

EPL No.			EPL Condition	Audit Evidence	Comments	Compliance
			Water, Groundwater, Meteorological and Biological Monitoring Programme - Mine Operations" dated April 2005.			
	19	Groundwater monitoring	Piezometer located up gradient of southern tailings storage labelled as "P555A-R" in Figure 14 "Surface and Groundwater Monitoring Locations - Project ML Area" dated 30 March 2009.			
	20	Groundwater monitoring	Piezometer located up gradient of southern tailings storage labelled as "P555B" in Figure 14 "Surface and Groundwater Monitoring Locations - Project ML Area" dated 30 March 2009.			
	21	Groundwater monitoring	Piezometer located up gradient of northern tailings storage labelled as "P558A and R" in Figure 14 "Surface and Groundwater Monitoring Locations - Project ML Area" dated 30 March 2009.			
	22	Groundwater monitoring	Piezometer located down gradient of southern tailings storage labelled as "P412A-R" in Figure 14 "Surface and Groundwater Monitoring Locations - Project ML Area" dated 30 March 2009.			
	23	Groundwater monitoring	Piezometer located down gradient of southern tailings storage labelled as "P412B" in Figure 14 "Surface and Groundwater Monitoring Locations - Project ML Area" dated 30 March 2009.			
	24	Groundwater monitoring	Piezometer located down gradient of southern tailings storage labelled as "P414A" in Figure 14 "Surface and Groundwater Monitoring Locations - Project ML Area" dated 30 March 2009.			
	25	Groundwater monitoring	Piezometer located down gradient of southern tailings storage labelled as "P414B" in Figure 14 "Surface and Groundwater Monitoring Locations - Project ML Area" dated 30 March 2009.			
	26	Groundwater monitoring	Piezometer located near the process plant area labelled as "PP03" in Figure 14 "Surface and Groundwater Monitoring Locations - Project ML Area" dated 30 March 2009.			
	27	Groundwater monitoring	Piezometer located near the process plant area labelled as "PP04" in Figure 14 "Surface and Groundwater Monitoring Locations - Project ML Area" dated 30 March 2009.			
	30	Groundwater monitoring	Piezometer located down gradient of southern tailings storage labelled as "P417A" in Figure 14 "Surface and Groundwater			

EPL No.	EPL Condition			Audit Evidence	Comments	Compliance
			Monitoring Locations - Project ML Area" dated 30 March 2009.			
	31	Groundwater monitoring	Piezometer located down gradient of southern tailings storage labelled as "P417B" in Figure 14 "Surface and Groundwater Monitoring Locations - Project ML Area" dated 30 March 2009.			
	32	Groundwater monitoring	Piezometer located down gradient of northern tailings storage labelled as "P418A" in Figure 14 "Surface and Groundwater Monitoring Locations - Project ML Area" dated 30 March 2009.			
	33	Groundwater monitoring	Piezometer located down gradient of northern tailings storage labelled as "P418B" in Figure 14 "Surface and Groundwater Monitoring Locations - Project ML Area" dated 30 March 2009.			
	34	Groundwater monitoring	Piezometer located down gradient of northern tailings storage labelled as "TSFNA", "TSFNB" and "TSFNC" in Figure 14 "Surface and Groundwater Monitoring Locations - Project ML Area" dated 30 March 2009.			
	36	Groundwater monitoring	Pit dewatering bore labelled as "PDB1A and B" in Figure 14 "Surface and Groundwater Monitoring Locations - Project ML Area" dated 30 March 2009.			
	38	Groundwater monitoring	Pit dewatering bore labelled as "PDB3A and B" in Figure 14 "Surface and Groundwater Monitoring Locations - Project ML Area" dated 30 March 2009.			
	40	Groundwater monitoring	Pit dewatering bore labelled as "PDB5A and B" in Figure 14 "Surface and Groundwater Monitoring Locations - Project ML Area" dated 30 March 2009.			
	41	Northern waste emplacement leachate quality monitoring	Northern waste emplacement external toe drain. Exact site to be determined upon commencement of waste rock dump. Site will be designated by EPA monitoring point signage and will move as required with waste rock dump extensions.			
	42	Southern waste emplacement leachate quality monitoring	Southern waste emplacement external toe drain. Exact site to be determined upon commencement of waste rock dump. Site will be designated by EPA monitoring point signage and will move as required with waste rock dump extensions.			

<table>
<tr><th>EPL No.</th><th>EPL Condition</th><th>Audit Evidence</th><th>Comments</th><th>Compliance</th></tr>
<tr><td></td><td>
<table>
<tr><td>43</td><td>Perimeter waste emplacement leachate quality monitoring.</td><td>Perimeter waste emplacement external toe drain point. Exact site to be determined upon commencement of waste rock dump. Site will be designated by EPA monitoring point signage and will move as required with waste rock dump extensions.</td></tr>
<tr><td>44</td><td>Groundwater quality monitoring</td><td>Groundwater monitoring bore located to the east of the northern tailings storage labelled as "MON-01A and B" in Figure 14 "Surface and Ground water Monitoring Locations - Project ML Area" dated 30 March 2009.</td></tr>
<tr><td>45</td><td>Groundwater quality monitoring</td><td>Groundwater monitoring bore located to the south of the southern tailings storage labelled as "MON-02A and B" in Figure 14 "Surface and Ground water Monitoring Locations - Project ML Area" dated 30 March 2009.</td></tr>
<tr><td>48</td><td>Water quality monitoring point</td><td>Automated sampler at the process plant labelled as "Monitoring Point 48" on Figure 1 "Monitoring Location for CNwad levels in Tailings Slurry Stream at the Process Plant" submitted to the DECCW on 3-12-2010 held on file LIC07/2610-08</td></tr>
</table>
</td><td></td><td></td><td></td></tr>
<tr><td>P1.3</td><td>The utilisation areas referred to in the table if identified in this licence are for the purposes of the monitoring and/or the setting of limits for any application of solids or liquids to the utilisation area.</td><td></td><td></td><td>Noted</td></tr>
<tr><td colspan="5">P2 Weather monitoring</td></tr>
<tr><td>P2.1</td><td>The following points in the table are identified in this licence for the purposes of the monitoring of weather parameters at the point.
<table>
<tr><th>EPA No.</th><th>Type of Monitoring Point</th><th>Description of location</th></tr>
<tr><td>7</td><td>Weather analysis</td><td>Weather station labeled as "Meteorological Station" in Figure 5 'Dust Monitoring Locations' of the "Cowal Gold Project Dust Management Plan" August 2003.</td></tr>
</table>
</td><td>• Blast Management Plan Figure 1
• Cowal Calibration Report, Sentinel Pty Ltd, 21 Jul 2013
• Monthly Weather Station Reports – January 2010 to March 2013, Sentinel Pty Ltd
• Cowal Calibration Report, Sentinel Pty Ltd, 21 Sep 2013
• Cowal Calibration Report, Sentinel Pty Ltd, 21 Dec 2013
• Cowal Calibration Report, Sentinel Pty Ltd, 21 Mar 2014</td><td>The meteorological station installed at the CGM site provides continuous 15-minute data recording for each parameter, and this data is downloaded daily to the CGM computer system.
The meteorological station is checked quarterly for calibration and maintenance by Sentinel Pty Ltd and a monthly summary report of the meteorological data is provided to CGM by Sentinel.</td><td>Compliant</td></tr>
<tr><td colspan="5">3 Limit conditions</td></tr>
<tr><td>L1</td><td>Pollution of waters</td><td></td><td></td><td></td></tr>
<tr><td>L1.1</td><td>Except as may be expressly provided in any other condition of this</td><td></td><td></td><td>Noted</td></tr>
</table>

<table>
<tr><th>EPL No.</th><th>EPL Condition</th><th>Audit Evidence</th><th>Comments</th><th>Compliance</th></tr>
<tr><td></td><td>licence, the licensee must comply with section 120 of the Protection of the Environment Operations Act 1997.</td><td></td><td></td><td></td></tr>
<tr><td>L2</td><td>Load limits – Not applicable</td><td></td><td></td><td></td></tr>
<tr><td>L3</td><td>Concentration limits</td><td></td><td></td><td></td></tr>
<tr><td>L3.1</td><td>For each monitoring/discharge point or utilisation area specified in the tables the concentration of a pollutant discharged at that point or applied to the area, must not exceed the concentration limits specified for that pollutant in the table.</td><td></td><td></td><td>Noted</td></tr>
<tr><td>L3.2</td><td>Where a pH quality limit is specified in the table, the specified percentage of samples must be within the specified ranges.</td><td></td><td></td><td>Noted</td></tr>
<tr><td>L3.3</td><td>To avoid any doubt, this condition does not authorise the pollution of waters by any pollutant other than those specified in the table/s.</td><td></td><td></td><td>Noted</td></tr>
<tr><td></td><td>Point 48
<table>
<tr><th>Pollutant</th><th>Units of measure</th><th>90percentile concentration limit</th><th>100 percentile concentration limit</th></tr>
<tr><td>CN_{WAD}</td><td>mg/l</td><td>20</td><td>30</td></tr>
</table></td><td>• Cyanide Management Plan 2010, (revision)
• Cyanide Management Plan, revision , Dec 2010
• Monthly Cyanide Monitoring Results, May 2013 to May 2014</td><td>Monitoring of the discharge to the tailings storage facilities is conducted twice daily. All results of the cyanide monitoring have been < 20mg CN_{WAD}/L (90 percentile) and no CN_{WAD} results have exceeded the 30mg CN_{WAD} /L for the May 2013 to May 2014 period. The cyanide results are reported to the DECCW/OEH (and DI&I/DTIRIS and DP&I) on a monthly basis.</td><td>Compliant</td></tr>
<tr><td colspan="5">Waste</td></tr>
<tr><td>L5.1</td><td>The licensee must not cause, permit or allow any waste generated outside the premises to be received at the premises for storage, treatment, processing, reprocessing or disposal or any waste generated at the premises to be disposed of at the premises, except as expressly permitted by the licence.</td><td></td><td>No waste material from any outside premises has been received onto the CGM site.</td><td>Compliant</td></tr>
<tr><td>L5.2</td><td>For the purposes of condition L5.1:
(a) Effluent, waste rock and tailings generated at the premises are not defined as “waste”.</td><td></td><td></td><td>Noted</td></tr>
</table>

EPL No.	EPL Condition	Audit Evidence	Comments	Compliance
	(b) Waste generated at the premises described in Attachment A 'Cowal Gold Project Proposed Bioremediation Facility' of the licence variation application supplementary material received by DECC on 16 June 2008 and classified as general solid waste (putrescible) in accordance with the *Waste Classification Guidelines* (DECC, 2008) is permitted by this licence to be disposed of at the premises. Disposal of this waste must be undertaken in accordance with the methods described in Attachment A of the licence variation application supplementary material received by DECC on 16 June 2008, and the *Cowal Gold Project - Hazardous Waste and Chemical Management Plan*.	• Email to DECC/DPI-Minerals re Bioremediation Facility, 10 Dec 2008 • *Waste Classification Guidelines* (DECC, 2008) • EPL Variation 6 Apr 2009 • Waste Classification Report – Bioremediation Area, Barson, Mar 2012	The location co-ordinates and layout plans for the on-site bioremediation treatment area were provided to DECC/DPI-Minerals in December 2008 following Cultural Clearance of the proposed area in November 2008. The CGM bioremediation bed involves contaminated soil being mixed with straw to promote biological breakdown of hydrocarbons. The bioremediation treatment area continues to be used for treatment and management of minor amounts of hydrocarbon contaminated soils from the site. A Waste Classification Report – Bioremediation Area CGM (Barson, dated March 2012) concluded that: "*Based on the findings of this waste classification, tested soils collected from cell A and cell C on the 14 February 2012 are suitable for on-site disposal at Cowal Gold Mine, in accordance with all relevant disposal conditions and practices".*	**Compliant**
	(c) Waste generated at the premises described in Attachment B 'Cowal Gold Project Proposed Trash Screen Oversize Waste Management' of the licence variation application supplementary material received by DECC on 16 June 2008 and classified as general solid waste (putrescible) in accordance with the *Waste Classification Guidelines* (DECC, 2008) is permitted by this licence to be disposed of at the premises. Disposal of this waste must be undertaken in accordance with the methods described in Attachment B of the licence variation application supplementary material received by DECC on 16 June 2008, and the *Cowal Gold Project - Hazardous Waste & Chemical Management Plan*.	• Waste Classification Report – Bioremediation Area, Barnson, Mar 2012	All waste described in Attachment B of the licence variation application received by DECC on 16 June 2008 has been managed at the CGM premises in accordance with EPL condition L5.2(c).	**Compliant**
	(d) Waste generated at the premises described in Attachment D 'Cowal Gold Project Proposed On-site Waste Management' of the licence variation application supplementary material received by DECC on 16 June 2008 and classified as general solid waste (putrescible) and/or general solid waste (non-putrescible) in accordance with the *Waste Classification Guidelines* (DECC, 2008) is permitted by this licence to be disposed of at the premises. Disposal of this waste must be undertaken in accordance with the conditions of this licence and within the waste rock emplacements only.	• Waste Classification Report – Bioremediation Area, Barson, Mar 2012	All waste described in Attachment D of the licence variation application received by DECC on 16 June 2008 is disposed of at the CGM premises in accordance with EPL condition L5.2(d).	**Compliant**

<table>
<tr><th>EPL No.</th><th>EPL Condition</th><th>Audit Evidence</th><th>Comments</th><th>Compliance</th></tr>
<tr><td>L6</td><td>Noise Limits</td><td></td><td></td><td></td></tr>
<tr><td></td><td>Noise generated from the premises must not exceed criteria outlined in Table 1 at any residence on privately owned land, or on more than 25 per cent of privately owned land not located within Lake Cowal as shown on the plan Appendix 3 of the Cowal Gold Mine development consent DA14/98, as modified from time to time.

<table><tr><th>Location</th><th>Day/Evening/Night dB(A) LAeq(15 minute)</th></tr><tr><td>Bungabulla</td><td>39</td></tr><tr><td>Coniston</td><td>44</td></tr><tr><td>Cowal North</td><td>38</td></tr><tr><td>Gumbelah</td><td>39</td></tr><tr><td>Lake Cowal (non-Barrick)</td><td>38</td></tr><tr><td>Laurel Park</td><td>39</td></tr><tr><td>Mattiske</td><td>36</td></tr><tr><td>McLintock</td><td>41</td></tr><tr><td>The Glen</td><td>38</td></tr><tr><td>West Lea</td><td>41</td></tr><tr><td>All other residences</td><td>35</td></tr></table>
Where LAeq means the equivalent continuous noise level – the level of noise equivalent to the energy average of noise levels occurring over a measurement period.</td><td>Noise Management Plan, November 2004
Operating Noise Monitoring, SLR, Jan 2012
Operating Noise Monitoring, SLR, Jul 2012
Operating Noise Monitoring, SLR, Jan 2013
Operating Noise Monitoring, SLR, Jul 2013
Operating Noise Monitoring, SLR, Jan 2014</td><td>Barrick has approval for the E42 Modification to CGM in accordance with the requirements of Modification to Development Consent (DA 14/98 Mod 6) dated 10 March 2010.
Barrick revised the CGM Noise Management Plan (NMP) dated July 2010 as required by Consent Condition 6.4(g) and engaged SLR Consulting Australia Pty Ltd to conduct six monthly mine operating noise monitoring during January-February and July each year in accordance with the approved NMP.

Results from the day-time, evening and night-time operator attended survey showed that the measured intrusive noise levels were reported to be compliant with the relevant noise assessment criteria at all measurement locations. The SLR Report March 2014 concluded that -“All operator attended noise recordings were measured to be below the consent criteria during all periods of the day at all locations monitored. Consequently the CGM was observed to be in compliance with the relevant noise requirements</td><td>Compliant</td></tr>
<tr><td>L6.2</td><td>Noise generated from the premises is to be measured in accordance with the relevant requirements and exemptions of the "NSW Industrial Noise Policy".</td><td></td><td>The noise monitoring procedures are consistent with and in accordance with the NSW Industrial Noise Policy.</td><td>Compliant</td></tr>
<tr><td>L6.3</td><td>The noise criteria identified in condition L6.1 apply under meteorological conditions of temperature inversion conditions of up to 8.0°C/100 metres and wind speed up to 1 metre per second at 10 metres above ground level.
The 1 metre per second drainage-flow wind applies where the development is at higher altitude than the residential receiver, with no intervening higher ground. These criteria will not apply during rainfall.</td><td>Operating Noise Monitoring, Heggies, Jul 2010
Operating Noise Monitoring, Heggies , Jan 2011
Operating Noise Monitoring, SLR, Jul 2011
Operating Noise Monitoring, SLR, Jan 2012
Operating Noise Monitoring, SLR, Jul 2012
Operating Noise Monitoring, SLR, Jan 2013</td><td>The meteorological conditions of temperature inversion conditions of up to 8.0°C/100 metres and wind speed up to 1 metre per second at 10 metres above ground level. Weather conditions are noted during noise surveys and reported in the monitoring reports.</td><td>Compliant</td></tr>
<tr><td>L7</td><td>Blasting Limits</td><td></td><td></td><td></td></tr>
</table>

EPL No.	EPL Condition	Audit Evidence	Comments	Compliance
L7.1	The airblast overpressure level from blasting operations at the premises at residences on privately owned land, when measured at the locations defined in condition M7.1 must not exceed 120 dB(Lin Peak) at any time at any noise sensitive locations. Error margins associated with any monitoring equipment used to measure this are not to be taken into account in determining whether or not the limit has been exceeded.	• Blast Management Plan, August 2003 • Review of Blast Monitoring Report 2010, The Saros Group, Feb 2011 • Review of Blast Monitoring Report 2011, The Saros Group, Mar 2012 • Review of Blast Monitoring Report 2012, The Saros Group, Mar 2013 • Review of Blast Monitoring Report 2012, The Saros Group, Apr 2014	Monitoring of blasts between January 2013 and March 2014 demonstrated compliance with the overpressure and vibration Day and Evening criteria. Five blast events exceeded the 95dBL criteria on Sundays and Public Holidays, during January 2013 to March 2014. No blasts occurred at night.	**Compliant**
L7.2	The overpressure level from blasting operations at the premises at residences on privately owned land, when measured at the locations defined in condition M7.1 must not exceed 115dB (Lin Peak) during the day for more than five per cent of the total number of blasts over a period of 12 months. The overpressure level from blasting operations at the premises at residences on privately owned land, when measured at the locations defined in condition M7.1 must not exceed 105dB (Lin Peak) during the evening for more than five per cent of the total number of blasts over a period of 12 months. The overpressure level from blasting operations at the premises at residences on privately owned land, when measured at the locations defined in condition M7.1 must not exceed 95dB (Lin Peak) at night or on Sundays and public holidays (24 hours) for more than five per cent of the total number of blasts over a period of 12 months. Error margins associated with any monitoring equipment used to measure this are not to be taken into account in determining whether or not the limit has been exceeded.			
L7.3	Ground vibration peak particle velocity from the blasting operations at the premises at residences on privately owned land, when measured at the locations defined in condition M7.1 must not exceed 10 mm/sec at any time at any noise sensitive locations. Error margins associated with any monitoring equipment used to measure this are not to be taken into account in determining whether or not the limit has been exceeded.	• Blast Management Plan August 2003 • Review of Blast Monitoring Report 2010, The Saros Group, Feb 2011 • Review of Blast Monitoring	No blasts between January 2013 and March 2014 exceeded the ground vibration (ppv) criteria of 5mm/sec at any of the fixed monitor locations.	**Compliant**

EPL No.	EPL Condition	Audit Evidence	Comments	Compliance
L7.4	Ground vibration peak particle velocity from the blasting operations at the premises at residences on privately owned land, when measured at the locations defined in condition M7.1 must not exceed 5 mm/sec during the day for more than five per cent of the total number of blasts over a period of 12 months. Ground vibration peak particle velocity from the blasting operations at the premises at residences on privately owned land, when measured at the locations defined in condition M7.1 must not exceed 2 mm/sec during the evening for more than five per cent of the total number of blasts over a period of 12 months. Ground vibration peak particle velocity from the blasting operations at the premises at residences on privately owned land, when measured at the locations defined in condition M7.1 must not exceed 1 mm/sec at night and on Sundays and public holidays (24 hours) for more than five per cent of the total number of blasts over a period of 12 months. Error margins associated with any monitoring equipment used to measure this are not to be taken into account in determining whether or not the limit has been exceeded.	Report 2011, The Saros Group, Mar 2012 • Review of Blast Monitoring Report 2012, The Saros Group, Mar 2013 • Review of Blast Monitoring Report 2012, The Saros Group, Apr 2014		**Compliant**
L8	**Potentially Offensive Odour**			
L8.1	No condition of this licence identifies a potentially offensive odour for the purposes of section 129 of the *Protection of the Environment Operations Act 1997*.		No odour complaints have been received in relation to the operation of the process plant.	**Compliant**
Operating conditions				
O1	**Activities must be carried out in a competent manner**			
O1.1	Licensed activities must be carried out in a competent manner. This includes: (a) the processing, handling, movement and storage of materials and substances used to carry out the activity; and (b) the treatment, storage, processing, reprocessing, transport and disposal of waste generated by the activity.			**Noted**
O2	**Maintenance of plant and equipment**			
O2.1	All plant and equipment installed at the premises or used in connection with the licensed activity: (a) must be maintained in a proper and efficient condition; and (b) must be operated in a proper and efficient manner.		All equipment used for the mining operations is maintained by CGM in the onsite Maintenance Workshops, with noise and vehicle emission controlled to meet the vehicle and equipment specifications. Blast monitoring equipment undergoes maintenance and annual calibration in February/March by the Saros Group. Calibration of the meteorological station equipment occurs quarterly - Sentinel Pty Ltd.	**Compliant**

EPL No.	EPL Condition	Audit Evidence	Comments	Compliance
O2.2	All persons associated with the licensee including employees, agents' licensee, contractors and subcontractors must be advised of their responsibilities and liabilities under the *Protection of the Environment Operations Act* 1997.	• Barrick Induction Training package • Training Course Register for Barrick personnel • Training Course Summary for Barrick CGM • CGM Environmental Awareness Handbook • CGM Oil and Chemical Spill Response Awareness Handbook	Training of Barrick personnel in the responsibilities and liabilities under the *Protection of the Environment Operations Act* is conducted annually. Induction occurs for all CGM personnel and contractors and the Environmental Awareness Handbook and Oil and Chemical Spill Response Awareness Handbook, prepared by the CGM, are provided to all CGM personnel.	**Compliant**
Bunding Requirements				
O3.1	All above ground storage facilities containing flammable and combustible liquids must be bunded in accordance with Australian Standard AS1940:2004.	• Chemical Storage Bund Audit, Extrin, Apr 2010 • Chemical Storage Bund Audit, Extrin, Apr 2011 • Chemical Storage Bund Audit, 2012 • Chemical Storage Bund Audit, Extrin, 29 Jul 2013 • Chemical Storage Bund Audit, Extrin, 30 May 2014	The aboveground diesel storage facilities are bunded in accordance with AS1940 and the tank in the contractor's area is a double skinned tank constructed to AS1692 required to be placed on a concrete containment area with a sump (completed in May 2009) to reduce potential for spillage of fuel to the ground during filling and vehicle refuelling. Audits of the status of bunding on the CGM site and process plant area have been conducted annually by Extrin. The audits of the bunds have identified a number of minor maintenance issues (mainly associated with concrete cracking or minor failure of bund materials) that have been addressed by Barrick following each audit.	**Compliant**
Waste Rock Emplacements, Tailings Facilities and Water Storage Facilities				
O4.1	The waste rock emplacement areas and the perimeter waste emplacement must be located on a base drainage control zone with a minimum slope towards the open pit of 1 (vertical 1:200 (horizontal) and be designed to ensure all seepage from beneath the waste rock emplacement areas and the perimeter waste emplacement is directed towards the open pit.		Any seepage from the northern and southern waste emplacement areas is directed to the internal water collection system. All waste emplacement areas have been designed to ensure that runoff and seepage is directed and collected in the site water management ponds for reuse in the process plant or for onsite dust control.	**Compliant**
O4.2	The tailings storage facilities and contained water storage facilities must have a basal barrier or impermeable liner with an equivalent permeability of $1x10^{-9}$ metres per second over a thickness of 1 metre.	• Letter from Dam Safety Committee re STSF, Jun 2010 • Tailings Storage Facility Surveillance Report, URS,	Surveillance Reports have been prepared by URS for the Tailings Storage Facilities (TSF) in accordance with the Dams Safety Committee requirements for the High C category TSF.	**Compliant**

EPL No.	EPL Condition	Audit Evidence	Comments	Compliance
		Mar 2012 • Tailings Storage Facility Surveillance Report, URS, Mar 2013 • NTSF Surveillance Report, URS, Dec 2013 • STSF Surveillance Report, URS, Mar 2014	The Construction Report for the Stage 2 lifts of the STSF and NTSF were submitted to the NSW Dam Safety Committee (DSC) and the DSC provided a response in June 2010 advising that the review satisfies the Committee's requirements. The NTSF and STSF continue to be assessed annually by Dr Neil Matte of URS to satisfy the requirements of the DSC and annual reports are prepared and sub mitted to the DSC.	
O5	**Dust**			
O5.1	Activities occurring in or on the premises must be carried out in a manner that will minimise the generation or emission from the premises, of wind-blown or traffic generated dust.		No dust complaints have been received between May 2013 and May 2014.	**Noted**
5	**Monitoring and recording conditions**			
M1.1	The results of any monitoring required to be conducted by this licence or a load calculation protocol must be recorded and retained as set out in this condition.	• Environmental Management File 5.09 - Monitoring		**Noted**
M1.2	All records required to be kept by this licence must be: (a) in a legible form, or in a form that can readily be reduced to a legible form; (b) kept for at least 4 years after the monitoring or event to which they relate took place; and (c) produced in a legible form to any authorised officer of the EPA who asks to see them.	• Environmental Management File 5.09 - Monitoring • EQuIS / RIMS database	All monitoring data collected by CGP is entered into the Barrick EQuIS database system where the data is retained for reporting and filing. This system also generates reports as required within Barrick and monitoring reports for the EPA/ DECC/OEH, DP&I and DTIRIS.	**Compliant**
M1.3	The following records must be kept in respect of any samples required to be collected for the purposes of this licence: (a) the date(s) on which the sample was taken; (b) the time(s) at which the sample was collected; (c) the point at which the sample was taken; and (d) the name of the person who collected the sample.	• EQuIS / RIMS database	All monitoring data collected by CGM to meet the requirements of the EPL is entered into the Barrick EQIS computerised database and includes all information required by this condition.	**Compliant**
M2	**Requirement to monitor concentration of pollutants discharged**			
M2.1	For each monitoring/discharge point or utilisation area specified (by a point number), the licensee must monitor (by sampling and obtaining results by analysis) the concentration of each pollutant specified in Column 1. The licensee must use the sampling method, units of measure, and sample at the frequency, specified opposite in the other columns. **POINTS 1,2,3,4,5** **Pollutant** | **Units** | **Frequency** | **Sampling Method**	• Sentinel Pty Ltd • Monthly Weather Reports, Apr 2013 to May 2014, Sentinel Pty Ltd	All monitoring conducted by CGM is undertaken in compliance with the requirements of the EPL. All sampling occurs in accordance with the frequency specified in EPL condition M2.1 using standard methods and analysis is conducted by NATA registered laboratories. Surface water monitoring occurred following EPL trigger (i.e. >20mm rainfall/24hrs) for the	**Compliant**

EPL No.	EPL Condition	Audit Evidence	Comments	Compliance

Aluminium Arsenic Cadmium Copper Lead	mg/kg	Every 6 months	Representative sample
Particulates - deposited matter	$g/m^2/mth$	Monthly	AM-19
Selenium	mg/kg		
Zinc	mg/l	Every 6 months	Representative sample

POINT 6

Pollutant	Units	Frequency	Sampling Method
Aluminium Arsenic Cadmium Copper Lead	mg/kg	Every 6 months	Representative sample
Particulates - deposited matter	$g/m^2/mth$	Monthly	AM-19
Selenium	mg/kg		
Total suspended particles	$\mu g/m^3$	Every 6 days	AM-18
Zinc	mg/l	Every 6 months	Representative sample

POINTS 12,13

Pollutant	Units	Frequency	Sampling Method
Conductivity	µS/cm	Monthly	In situ
Total suspended particles	mg/l	Quarterly	Representative sample
pH	pH units	Monthly	In situ

POINTS 14,15,16,17,18

Pollutant	Units	Frequency	Sampling Method
Alkalinity (as $CaCO_3$) Antimony Arsenic Cadmium	mg/l	Quarterly	Representative sample
Conductivity	µS/cm	Monthly	In situ

surface water monitoring program during May 2011 and April 2013.

2 June 2013	26.6mm
12 June 2013	23.8mm
17 September 2013	54.4mm
1 March 2014	26.6mm

Monitoring data and results are reported in the AEMR and EPA Annual Return.

EPL No.	EPL Condition	Audit Evidence	Comments	Compliance

Copper Lead Mercury Selenium	mg/l	Quarterly	Representative sample
Total suspended particles Zinc	mg/l	Quarterly	Representative sample
pH	pH units	Monthly	In situ

POINTS 19,20,21,22,23,24,25,30,31,32,33,44,45

Pollutant	Units	Frequency	Sampling Method
Alkalinity (as $CaCO_3$) Antimony Arsenic Cadmium Calcium Chloride	mg/l	Quarterly	Representative sample
Conductivity	µS/cm	Monthly	In situ
Copper	mg/l	Quarterly	Representative sample
Cyanide (weak acid dissociable)	mg/l	Quarterly	WAD cyanide from water samples - CN-1 recovery by 20th Ed APHA 4500-CN-1 method Alternative method and analysis by 20th Ed. APHA 4500-CN-1 method E, D or F
Lead Magnesium Potassium Selenium Sodium	mg/l	Quarterly	Representative sample
Standing water level	metres	Monthly	In situ
Sulfate Total Hardness Total suspended particles	mg/l	Quarterly	Representative sample

EPL No.	EPL Condition	Audit Evidence	Comments	Compliance

Zinc			
pH	pH units	Monthly	In situ

POINTS 34,36,38,40, 41,42,43

Pollutant	Units	Frequency	Sampling Method
Alkalinity (as $CaCO_3$) Antimony Arsenic Cadmium Calcium Chloride	mg/l	Quarterly	Representative sample
Conductivity	µS/cm	Monthly	In situ
Copper Lead Magnesium Potassium Selenium Sodium	mg/l	Quarterly	Representative sample
Standing water level	metres	Monthly	In situ
Sulfate Total Hardness Total suspended particles Zinc	mg/l	Quarterly	Representative sample
pH	pH units	Monthly	In situ

POINT 48

Pollutant	Units	Frequency	Sampling Method
Cyanide (total)	mg/l	Weekly	Total cyanide from water samples CN-1 recovery by 20th Ed APHA 4500-CN-1 method B3.I. Alternative method and analysis by 20th Ed APHA 4500 - CN-1 method E, D or F
Cyanide (weak acid dissociable)	mg/l	2x daily during discharge	WAD cyanide from water samples CN-1 recovery by 20th Ed. APHA 4500-

EPL No.	EPL Condition	Audit Evidence	Comments	Compliance
	<table><tr><td></td><td></td><td></td><td>CN-1 method Alternative method and analysis by 20th Ed. APHA 4500-CN-1 method E, D or F</td></tr></table> For the purposes of the table(s) above • Special Frequency 1 means the collection of samples weekly and following rainfall events of 20mm or greater in a 24 hour period. • At Monitoring Points 14, 15, 16, 17, and 18, monitoring is not required in the absence of any available surface water. • At Monitoring Points 34, 36, 38 and 40, monitoring is not required where a piezometer is lost or destroyed as a result of mine growth.			
M2.4	For the purposes of the table(s) above • Special Frequency 1 means the collection of samples weekly and following events of 20mm or greater in any 4 hour period. • At monitoring Points 14, 15, 16, 17, and 18, monitoring is not required when the monitoring site is dry or if the water level of Lake Cowal is at or below 204.5 metres Australian Height Datum. • At monitoring points 34, 36, 38 and 40, monitoring is not required where a piezometer is lost or destroyed as a result of mine growth.	• Weekly Cowal Mine surveyor m AHD level readings for Lake Cowal (whilst water is across ML1535 boundary fence). • EPL Variation: 21 May 2014 Notice Number 1522063.	The surface water monitoring program has occurred with collection of water samples along transects in the Surface Water, Groundwater, Meteorological and Biological Monitoring Program when the water levels in Lake Cowal have been above 204.5 m AHD. EPL11912 was varied on 21 May 2014 to align condition M2.4 for Points 14, 15, 16, 17 and 18 to Lake level of 204.5 m AHD. Where practical Barrick has continued to take surface water samples below 204.5 m AHD.	**Compliant**
M3	**Testing methods - concentration limits**			
M3.1	Monitoring for the concentration of a pollutant emitted to the air required to be conducted by this licence must be done in accordance with: (a) any methodology which is required by or under the Act to be used for the testing of the concentration of the pollutant; or (b) if no such requirement is imposed by or under the Act, any methodology which a condition of this licence requires to be used for that testing; or (c) if no such requirement is imposed by or under the Act or by a condition of this licence, any methodology approved in writing by the EPA for the purposes of that testing prior to the testing taking place. ***Note:*** The Protection of the Environment Operations (Clean Air) Regulation 2002 requires testing for certain purposes to be conducted in accordance with test methods contained in the publication "Approved Methods for the Sampling and Analysis of Air Pollutants in NSW".	• Approved Methods for the Sampling and Analysis of Air Pollutants in NSW • Interpretation and Discussion of 2012 Air Quality Monitoring Results, Prof Stephen Cattle, University of Sydney, 12 Apr 2013 • Interpretation and Discussion of 2013 Air Quality Monitoring Results, Prof Stephen Cattle, Uni of Sydney, 31 May 2014	Analysis of dust deposition samples has been carried out by Australian Laboratory Services (ALS) and in 2012-2013 by , a NATA registered laboratory for analysis of all the parameters required to be tested by CGM to meet the regulatory requirements. Ecowise Environmental Pty Ltd supply a high volume air sampler for the TSP program and ALS conduct the analysis of the collected dust using ICP-MS for metals for the CGM. Dust data id reviewed annually by Dr Stephen Cattle of University of Sydney. The results of the monitoring and dust analysis program are reported in the AEMR and EPA Annual Report.	**Compliant**

EPL No.	EPL Condition	Audit Evidence	Comments	Compliance
M3.2	Subject to any express provision to the contrary in this licence, monitoring for the concentration of a pollutant discharged to waters or applied to a utilisation area must be done in accordance with the Approved Methods Publication unless another method has been approved by the EPA before any tests are conducted.		Analysis of water samples collected by CGM is conducted by NATA registered Australian Laboratory Services (ALS), using approved methods for analysis of the parameters required to be tested by the CGM to meet regulatory requirements.	**Compliant**
M4	**Recording of pollution complaints**			
M4.1	The licensee must keep a legible record of all complaints made to the licensee or any employee or agent of the licensee in relation to pollution arising from any activity to which this licence applies.	• Responsibility Information Management System (RIMS)	A complaints register, including responses to complainants, is maintained by Barrick in accordance with the condition. A summary of the complaints is provided in the AEMR and the EPL Annual Environment Report.	**Compliant**
M4.2	The record must include details of the following: (a) the date and time of the complaint; (b) the method by which the complaint was made; (c) any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect; (d) the nature of the complaint; (e) the action taken by the licensee in relation to the complaint, including any follow-up contact with the complainant; and (f) if no action was taken by the licensee, the reasons why no action was taken.	• Letters to DoP/DP&I, DPI/DII, DECC/OEH , BSC and CEMCC re Complaints Register: ○ Jan to Jul 2013 ○ Jul to Dec 2013	Complaints are recorded in the CGM Complaints register and include information in accordance with each of the requirements of this condition. A summary of the Complaints is submitted to the relevant authorities each 6 months and a full summary included in the AEMR each year.	**Compliant**
M4.3	The record of a complaint must be kept for at least 4 years after the complaint was made.		All complaints received by Barrick are retained on the site computer system Complaints Register.	**Compliant**
M4.4	The record must be produced to any authorised officer of the EPA who asks to see them.			**Noted**
Telephone complaints line				
M5.1	The licensee must operate during its operating hours a telephone complaints line for the purpose of receiving any complaints from members of the public in relation to activities conducted at the premises or by the vehicle or mobile plant, unless otherwise specified in the licence.	• Responsibility Information Management System (RIMS) • Letters to DECC/OEH re Complaints Register: ○ Jan and Jul 2013 ○ Jan to May 2014	(a)A 24hour complaints line (02) 6975 3454 for CGM was established in 2003. CGM uses the External Communications component of RIMS to track public complaints. (b)Six monthly reports of complaints received by CGM are prepared and submitted to OEH/BSC/DI&I/CEMCC and DP&I	**Compliant**
M5.2	The licensee must notify the public of the complaints line telephone number and the fact that it is a complaints line so that the impacted community knows how to make a complaint.		The complaints line is advertised in the West Wyalong Advocate on a regular basis and is available on the CGM community newsletters.	**Compliant**

<table>
<tr><th>EPL No.</th><th>EPL Condition</th><th>Audit Evidence</th><th>Comments</th><th>Compliance</th></tr>
<tr><td>M5.3</td><td>Conditions M5.1 and M5.2 do not apply until 3 months after:
(a) the date of the issue of this licence or
(b) if this licence is a replacement licence within the meaning of the Protection of the Environment Operations (Savings and Transitional) Regulation 1998, the date on which a copy of the licence was served on the licensee under clause 10.</td><td></td><td></td><td>Noted</td></tr>
<tr><td>M7</td><td>Blasting monitoring</td><td></td><td></td><td></td></tr>
<tr><td>M7.1</td><td>To determine compliance with condition(s) L7.1, L7.2, L7.3 and L7.4:
a) Airblast overpressure and ground vibration levels must be measured at nearby residences labelled as "BM01", "BM02" and "BM03", at bird breeding areas labelled as "BM04" and "BM05", and at the general monitoring site "BM06" in Figure 2 'Blast Monitoring Locations' of the revised "Cowal Gold Project Blast Management Plan" received by DECCW on the 01.06.2010 and on DECCW file LIC07/2610-08 for all blasts carried out in or on the premises; and
b) Instrumentation used to measure the air-blast overpressure and ground vibration levels must meet the requirements of Australian Standard AS 2187.2-2006.</td><td>• Blast Management Plan August 2003
• Review of Blast Monitoring Report 2012, The Saros Group, Mar 2013
• Review of Blast Monitoring Report 2013, The Saros Group, Mar 2014</td><td>(a) All blasts were monitored for overpressure and vibration at the following fixed locations, with one mobile/portable monitor available for random checks. Blast monitoring locations are:
○ BM01 - Gumbelah residence and BM03 - Coniston Residence are categorised as ‘residence on privately owned land’ .
○ BM02, BM04.1, BM05, BM06 and BM09 are positioned to assess the impacts on and around Lake Cowal.
○ BM07 – Administration and BM10 Near Field Monitor in the Blast Management Plan.
(b) Blast monitoring equipment undergoes maintenance and annual calibration in February/March by the Saros Group.</td><td>Compliant</td></tr>
<tr><td>M8</td><td>Requirement to monitor weather</td><td></td><td></td><td></td></tr>
<tr><td>M8.1</td><td>For each monitoring point specified in the table below, the licensee must monitor (by sampling and obtaining results by analysis) the parameters specified in Column 1. The licensee must use the sampling method, units of measure, averaging period and sample at the frequency.
Point 7
<table>
<tr><th>Parameter</th><th>Units</th><th>Continuous Averaging Period</th><th>Method</th></tr>
<tr><td>Rainfall</td><td>mm</td><td>24hr</td><td rowspan="2">AM-4</td></tr>
<tr><td>Temperature @ 2m</td><td></td><td rowspan="6">15min</td></tr>
<tr><td>Temperature @ 10m</td><td></td><td rowspan="2">AM-4</td></tr>
<tr><td>Wind speed @ 10m</td><td>m/s</td><td>AM-2 & AM-4</td></tr>
<tr><td>Wind direction @ 10m</td><td>o</td><td>AM-2 & AM-4</td></tr>
<tr><td>Sigma theta @ 10m</td><td>o</td><td>AM-2 & AM-4</td></tr>
<tr><td>Solar radiation</td><td>W/m^2</td><td>AM-4</td></tr>
<tr><td>Siting</td><td colspan="2"></td><td>AM-1 &AM-4</td></tr>
<tr><td>Measurement</td><td colspan="2"></td><td>AM-2 & AM-4</td></tr>
</table></td><td>• Download/Calibration of the Automatic Weather Station, Sentinel April 2010 to Jan 2012
• Cowal Calibration Report, Sentinel Pty Ltd, 21 Jul 2013
• Cowal Calibration Report, Sentinel Pty Ltd, Sep 2013
• Cowal Calibration Report, Sentinel Pty Ltd, Dec 2013
• Cowal Calibration Report, Sentinel Pty Ltd, Mar 2014</td><td>The meteorological station installed at CGM is equipped with the required instrumentation to provide 15minute continuous data to the CGM site for the parameters in EPL condition M8.1.
Data is downloaded and reported monthly to CGM by Sentinel.
Calibration of the meteorological station equipment occurs quarterly by Sentinel Pty Ltd.</td><td>Compliant</td></tr>
</table>

EPL No.	EPL Condition	Audit Evidence	Comments	Compliance
	Reporting Conditions			
R1	**Annual return documents**			
R1.1	**What documents must an Annual Return contain?** The licensee must complete and supply to the EPA an Annual Return in the approved form comprising: (a) a Statement of Compliance; and (b) a Monitoring and Complaints Summary. Before the end of each reporting period, the EPA will provide to the licensee a copy of the form that must be completed and returned to the EPA.	• Annual Return to EPA 23 Dec 2011to 22 Dec 2012, submitted 20 Feb 2013 • Annual Return to EPA 23 Dec 2011to 22 Dec 2012, submitted 17 Feb 2014	(a) The Annual Returns have been prepared by CGM on the approved EPA forms by CGM and submitted to the EPA /OEH in accordance with condition R1.1 complete with a Statement of Compliance. (b) The Monitoring and Complaints summaries have been included with the Annual Returns.	**Compliant**
R1.2	**Period covered by Annual Return** An Annual Return must be prepared in respect of each reporting period, except as provided below. Note: The term "reporting period" is defined in the dictionary at the end of this licence. Do not complete the Annual Return until after the end of the reporting period.	• Annual Return to OEH 23 Dec 2011 to 22 Dec 2012, submitted 20 Feb 2013 • Annual Return to EPA 23 Dec 2011to 22 Dec 2013, submitted 17 Feb 2014	The Annual Returns for CGP cover the period of 23 December to 22 December in accordance with EPL condition R1.2. The Annual Return for 23 December 2013 to 22 December 2011 was submitted to the EPA on 17 February 2014 complete with the monitoring and complaints summary, in accordance with EPL condition R1.2.	**Compliant**
R1.5	**Deadline for Annual Return** The Annual Return for the reporting period must be supplied to the EPA by registered post not later than 60 days after the end of each reporting period or in the case of a transferring licence not later than 60 days after the date the transfer was granted (the 'due date').		The Annual Returns for the CGM for the period 23 December to 22 December have been submitted to the EPA/ OEH in accordance with the requirement of EPL condition R1.5 for 2010 to 2012.	**Compliant**
R1.7	**Licensee must retain copy of Annual Return** The licensee must retain a copy of the Annual Return supplied to the EPA for a period of at least 4 years after the Annual Return was supplied to the EPA.		A copy of each Annual Return is retained within the Barrick document system in the DECCW-EPA/OEH file.	**Compliant**
R1.8	**Certifying of Statement of Compliance and Signing of Monitoring and Complaints Summary** Within the Annual Return, the Statement of Compliance must be certified and the Monitoring and Complaints Summary must be signed by: (a) the licence holder; or (b) by a person approved in writing by the EPA to sign on behalf of the licence holder.		The 2012 and 2013 Annual Returns were completed and certified by senior Barrick Managers as required by EPL R.18.	**Compliant**
Notification of environmental harm				
R2.1	*Note: The licensee or its employees must notify the EPA of*		No notifiable incidents were reported by CGM	**Noted**

EPL No.	EPL Condition	Audit Evidence	Comments	Compliance
	incidents causing or threatening material harm to the environment as soon as practicable after the person becomes aware of the incident in accordance with Part 5.7 of the Act. *Notifications must be made by telephoning the EPA's Pollution Line service on 131 555.*		to have occurred between May 2013 and May 2014.	
R2.2	The licensee must provide written details of the notification to the EPA within 7 days of the date on which the incident occurred.	• Letter from EPA re New Requirements for All Licensees, 16 Jan 2012 • Pollution Incident Response Management Plan (PIRMP) submitted to the EPA in Sep 2012 • PIRMP placed on website Fen 2014	Changes to the environment protection legislation in relation to notification of pollution incidents, was advised to Barrick on 16 January 2012. The changes required the preparation of a Pollution Incident Response Management Plan. The Plan was submitted to the EPA in September 2012.	**Noted**
Written report				
R3.1	Where an authorised officer of the EPA suspects on reasonable grounds that: (a) where this licence applies to premises, an event has occurred at the premises; or (b) where this licence applies to vehicles or mobile plant, an event has occurred in connection with the carrying out of the activities authorised by this licence, and the event has caused, is causing or is likely to cause material harm to the environment (whether the harm occurs on or off premises to which the licence applies), the authorised officer may request a written report of the event.		Not triggered	**Noted**
R3.2	The licensee must make all reasonable inquiries in relation to the event and supply the report to the EPA within such time as may be specified in the request.		Not triggered	**Noted**
R3.3	The request may require a report which includes any or all of the following information: (a) the cause, time and duration of the event; (b) the type, volume and concentration of every pollutant discharged as a result of the event; (c) name, address, business hours telephone, number of employees or agents of the licensee, or a specified class who witnessed the event; (d) the name, address and business hours telephone number of every other person (of whom the licensee is aware) who witnessed the event, unless the licensee has been unable to obtain that information after making reasonable effort;		Not triggered	**Noted**

EPL No.	EPL Condition	Audit Evidence	Comments	Compliance
	(e) action taken by the licensee in relation to the event, including any follow-up contact with any complainants; (f) details of any measure taken or proposed to be taken to prevent or mitigate against a recurrence of such an event; (g) any other relevant matters.			
R3.4	The EPA may make a written request for further details in relation to any of the above matters if it is not satisfied with the report provided by the licensee. The licensee must provide such further details to the EPA within the time specified in the request.		Not triggered	**Noted**
Reporting of blasting monitoring				
R4.1	The results of the blast monitoring required by condition M7.1 must be submitted to the EPA at the end of each reporting period.	• Review of Blast Monitoring Report 2010, The Saros Group, Feb 2011 • Review of Blast Monitoring Report 2011, The Saros Group, Mar 2012 • Review of Blast Monitoring Report 2012, The Saros Group, Mar 2013 • Review of Blast Monitoring Report 2012, The Saros Group, Apr 2014	Blast monitoring results for CGM are recorded and summarised in an annual report prepared by The Saros Group for submission to the relevant authorities.	**Compliant**
R4.2	The licensee must report any exceedence of the licence blasting limits to the regional office of the EPA as soon as practicable after the exceedence becomes known to the licensee or to one of the licensee's employees or agents.		Blasts monitoring results have not exceeded the Daytime and Evening overpressure or vibration criteria between May 2013 and May 2014.. Five (5) blast related events exceeded the 95 dB(L) level for Sundays and Public Holidays, but this was less than 5% of the total number of blast between May 2013 and May 2014.	**Compliant**
General conditions				
Copy of licence kept at the premises				
G1.1	A copy of this licence must be kept at the premises to which the licence applies.		A copy of the EPL is kept in the Environment Section at the Cowal Gold Project site administration offices and workplace copies are in Crib Rooms and Office areas.	**Compliant**
G1.2	The licence must be produced to any authorised officer of the EPA who asks to see it.			**Noted**
G1.3	The licence must be available for inspection by any employee or agent working at the premises.			**Noted**

ATTACHMENT C MINING LEASE CONDITIONS

ATTACHMENT C MINING LEASE CONDITIONS

No.	ML 1535 Condition	Audit Evidence	Comments	Compliance
1	**Notice to Landholders**			
	The lease-holder must serve on each landholder of the land a notice in writing indicating that this lease has been granted / renewed and whether the lease includes the surface.		Barrick is the registered proprietor of all the land on which the mining lease is located.	**Not applicable**
6	**Reports**			
	The lease holder shall provide within a period of 28 days after each anniversary of the date this lease has effect …. a progress report to the satisfaction of D-G……..		Progress Reports have been prepared for submission to DPI/DTIRIS-DRE annually and also submits the AEMR as required under MCoA 9.2.	**Compliant**
11	**Safety**			
	Operations are to be carried out in a manner that ensures safety of persons or stock in the vicinity of the operations…….		Protective fences have been constructed around the active mine areas, tailing storage facilities, process plant, and the mine lease boundary to restrict entry of persons and stock.	**Compliant**
12	**Rehabilitation**			
	Land disturbed must be rehabilitated to a stable and permanent form suitable for a subsequent land use acceptable to the Director-General and in accordance with the Mining Operations Plan……	• MOP Jan 2011 to Sep 2012 • Letter from DTIRIS re MOP Oct 2012 to Jan 2014, 19 Dec 2012 • MOP Oct 2012 to Jan 2014 • Letter to DT&I- DRE re Extension of MOP to 31 Jan 2015, 27 Sep 2013 • Letter from DT&I-DRE re Approval of MOP Extension, 4 Oct 2013 • MOP (revised) 31 January 2014 to 31 January 2015 • MOP (draft) Apr 2014 to Apr 2016, dated Apr 2014	The proposed rehabilitation activities during each MOP term are described in section 4 of the MOP's. The MOP October 2012 to January 2014 was approved by the DTIRIS-DRE on 19 December 2012. Barrick requested an extension to the MOP to 31 January 2015 to align with the resubmission of the Modification before DP&I to include rehabilitation of: • Fourth lifts to the NTSF and STSF; • Eastern and southern outer batters slopes and Shaping and rehabilitation of northern section of the Southern Waste Rock Emplacement; • Remaining areas along the upper outer slopes of the Perimeter Waste Rock Emplacement; • Preparation and implementation of rehabilitation trial areas on the outer northern slops of the Northern Waste Rock Emplacement.	**Compliant**
13	The lease holder must comply with any direction given by the D-G regarding the stabilisation and revegetation of any mine residues, tailing or overburden dumps situated on the lease area.			**Noted**
14	**Prevention of Soil Erosion and Pollution**			
	Operations must be carried out in a manner that does not cause or aggravate air pollution, water pollution (including sedimentation) or soil contamination or erosion unless otherwise authorised by a relevant approval and in accordance with the Mining Operations Plan……	• Erosion and Sediment Control Management Plan, revised Dec 2009 • Dust Management Plan, revised Feb 2009	The operations were observed as being undertaken in accordance with the Erosion and Sediment Control Management Plan and other environmental management plans, Mining Operations Plan and Addenda.	**Compliant**

No.	ML 1535 Condition	Audit Evidence	Comments	Compliance
15	**Transmission lines, Communication lines and Pipelines**			
	Operations must not interfere with or impair the stability or efficiency of any transmission line, communications line or pipeline or other utility on the area ……		Relocation of Telstra cables and power lines within the ML boundary occurred during construction in the 1st quarter of 2004.	**Compliant**
16	**Fences and gates**			
	(a) Activities on the lease must not interfere with or damage fences without the prior written approval of the owner …..		Barrick is the registered proprietor of the all land on which the mining lease is located.	**Not applicable**
17	**Roads and Tracks**			
	Operations must not affect any road unless in accordance with an accepted Mining Operations Plan or with the prior approval of the Director-General…… The lease holder must pay the local council, DLWC or the RTA the cost incurred in fixing any damage to roads caused by the operations carried out under this lease……		The external road access route to the CGM site from West Wyalong as approved in the Development Consent, is complete and in use for all traffic to and from the mine site.	**Compliant**
18	Access tracks must be kept to a minimum and be positioned so that they do not cause any unnecessary damage to the land……		Access tracks within the mining lease area have been established in accordance with the mine plan development and any temporary access tracks are rehabilitated when they are no longer required.	**Noted**
19	**Trees and Timber**			
	The lease holder must not cut, destroy, ringbark or remove any timber or other vegetative cover on the lease except such as directly obstructs or prevents the carrying out of operations…..	• Vegetation Clearance Protocol Nov 2008 • Letter from DoP re Inland Greybox Woodland, 10 Aug 2007 • Letter from DECC re Inland Greybox Woodland, 27 Aug 2007 • Letter from DECC re Myall Woodland, 29 Aug 2007	Barrick is retaining any trees within the mining lease not in the path of the project development. Approval to remove any trees or vegetative cover within the mining lease area is obtained from the Environmental Manager prior to removal of any vegetation. DECC, DPI and DoP accepted the implementation of the Vegetation Clearance Protocols related to the Inland Grey Box Woodland, dated 9 August 2007, and Myall Woodland dated 20 August 2007.	**Compliant**
24	**Mine Safety Plan**			
	Prior to commencement of any construction activities on the lease area and as required by the Director-General the lease holder must prepare a Mine Safety Plan to ensure the Mine Safety General Rule 2000 is adhered to.	• CGM Mine Safety Plan, Jun 2009	The Safety Management System for CGM was approved on 14 December 2005 and a major review of the Safety Management System was conducted by Barrick in February 2007 and the Safety Management System updated and approved on 18 June 2009. No further updates to the Safety Management System occurred between May 2010 and April 2013.	**Compliant**
25	Mining Rehabilitation, Environmental Management Process (MREMP) Mining Operations Plan (MOP)	• Letter from D&I re MOP Jan 2011 - Sep 2012, 30 Mar 2011 • MOP Jan 2011-Sep 2012 • Letter to DTIRIS re Variation to MOP, 5 Apr 2012 • Letter from DTI-DRE re Approval of Variation to MOP, 14 May 2012	An annual meeting is held of the Mining, Rehabilitation and Environmental Management Process Committee (MREMP) to discuss the Annual Environmental Management Report (AEMR). The participants include DPI (Minerals), DECC, DWE, Councils, and Dam Safety Committee representatives. Mining Operations Plans for the CGM operations have been prepared and approved by Division of Resources and Energy during the 2013 to 2014 period.	**Compliant**

No.	ML 1535 Condition	Audit Evidence	Comments	Compliance
	(1) Mining operations, including mining purposes, must be conducted in accordance with the MOP satisfactory to the Director-General……	• MOP Oct 2012-Jan 2014 • Letter from DTI-DRE re Approval of MOP for Oct 2012 to Jan 2014, 19 Dec 2012 • Letter to DT&I- DRE re Extension of MOP to 31 Jan 2015, 27 Sep 2013 • Letter from DT&I-DRE re Approval of MOP Extension, 4 Oct 2013 • MOP (revised) 31 January 2014 to 31 January 2015 • MOP (draft) Apr 2014 to 2016, dated Apr 2014	An extension of the 2009-2010 MOP until 31 March 2011 was granted by DI&I on 23 November 2010. A MOP for January 2011 to September 2012 was submitted to DI&I and accepted on 30 March 2011. A Variation to the MOP was requested in a letter to DTIRIS on 5 April 2012 for the Southern Tailings Storage Facility (fourth lift), temporary isolation bund by 0.5m to provide for future lake filling events and the Northern Waste Rock Emplacement (storage volume elevation increase). Response from DTIRIS approved the STSF fourth lift but not the increase in height of the Northern Waste Rock Emplacement. The October 2012 to January 2014 MOP was and approved by the DTIRIS-DRE on 19 December 2012. Barrick requested an extension to the MOP to 31 January 2015 to align with the resubmission of the Modification before DP&I. A draft MOP for April 2014 to April 2016 has been prepared by Barrick for submission to DRE.	**Compliant**
	(2) An Initial Mining Operations Plan must be submitted prior to commencement of construction on the site ……..	• Initial Mining Operations Plan Cowal Gold Project Mar 2004	The Initial Mining Operations Plan was submitted to DMR prior to commencement of construction of the mine on the CGP site.	**Compliant**
26	**Annual Environmental Management Report (AEMR)**			
	(1) Within 12 of the commencement of mining operations and thereafter annually ….. the lease holder must lodge an AEMR with the Director-General.	• 2009 AEMR, April 2010 • 2010 AEMR, April 2011 • 2011 AEMR, April 2012 • 2012 AEMR April 2013 • 2013 AEMR (draft)	The AEMR's for the CGP have been prepared in accordance with the agency Guidelines. A presentation of the AEMR has been provided to the relevant government authorities each year.	**Compliant**
27	**Blasting**			
	(a) Ground Vibration The lease holder must ensure that ground vibration peak particle velocity generated by any blasting within the lease area does not exceed 10mm/sec and does not exceed 5mm/sec in more than 5% of the total number of blasts over a period of 12 months at any dwelling or occupied premises, not owned by the lease holder or a related corporation, unless determined otherwise by the EPA.	• Blast Management Plan 2009 • Review of Blast Monitoring Report 2013, The Saros Group, Mar 2014 • Blast Monthly Monitoring Reports, January, February and March 2014	Blast overpressure and vibration monitoring has demonstrated compliance of all blasts with the Day and Evening criteria specified in the MCoA/EPL/ML conditions. Exceedence of the 95dB(L) criteria (MCoA 6.3(a)) occurred from five (5) blasts on Sundays and public Holidays between January 2013 and March 2014. The 5 blast results greater than 95dB (Lin peak) overpressure criteria between May 2013 and May 2014, was less than 5% of the total blasts.	**Compliant**

No.	ML 1535 Condition	Audit Evidence	Comments	Compliance
	(b) Blast Overpressure The lease holder must ensure that the blast overpressure noise level generated by any blasting within the lease area does not exceed 120dB (linear) and does not exceed 115 db(linear) in more than 5% of the total number of blasts over a period of 12 months, at any dwelling or occupied premises, not owned by the lease holder or a related corporation, unless determined otherwise by the EPA.		The total number of blast results between May 2013 and May 2014 indicated that less than 5% of the blasts exceeded the 115dB (Lin peak) overpressure criteria for the 12 month period.	**Compliant**
28	**Use of Cyanide**			
	The lease holder must not use cyanide or any solution containing cyanide for the recovery of minerals on the lease area without the prior written approval of the Minister and subject to any conditions he may stipulate.	• Letter from DPI re Approval of Cyanide Use on Mining Lease 1535, Cowal Gold Mine, 17 Jan 2006	Letter of approval received from DPI in January 2006 for use of cyanide in the CGP process plant.	**Compliant**
29	**Control of Operations**			
	(a) If an Environmental Officer of the DMW believes that the lease holder is not complying with any provision of the Act or any condition of this lease relating to the working of the lease, he may direct the lease holder to: (i) cease working the lease; (ii) cease that part of the operation not complying with the Act or conditions; Until in the opinion of the Environmental Officer the situation is rectified. The lease holder must comply with any written direction given. The Director-General may confirm, vary or revoke any such direction. A written direction referred to in this condition may be served on the Mine Manager.			**Noted**

APPENDIX B

DUST MONITORING DATA

COWAL GOLD MINE

Depositional Dust and Hi Volume Dust Monitoring Report

23 December 2013 – 22 December 2014

INTRODUCTION

This report contains results of Depositional Dust and Hi-Volume Dust monitoring at Cowal Gold Mine for the period 23 December 2013 – 22 December 2014. Refer to section 3.1 of the main report for a summary of results.

The data contained in this report is intended to compliment summary reports contained in the 2014 Annual Environmental Management Report. Please refer to figure 8 in the main report to view all Depositional Dust and Hi-Volume Dust locations.

SAMPLE COLLECTION METHODOLOGY AND QA/QC PROCEDURES

Employees at Cowal Gold Mine collect environmental monitoring samples in accordance with procedures developed specifically for the tasks. These procedures adhere to AS 5667:1998 and APHA guidelines on the collection and preservation of samples and include specific direction pertaining to:

- Methods for collection of samples from lake water and lake sediment;
- Use of measurement and sampling equipment;
- Sample identification;
- Sample containers and preservation methods;
- Sample filtration, storage and holding times;
- Sample transport;
- Chain of Custody (COC) documentation and laboratory analytical scheduling; and
- Data management and QA/QC checks.

LABORATORY ANALYTICAL METHODS AND QA/QC PROCEDURES

Depositional Dust samples were sent to National Measurement Institute (NMI) during the 2013/2014 reporting period (switched from ALS, Newcastle to NMI for dust analysis in mid-2012).

All Hi-Volume samples were sent to NMI, Sydney for analysis. In accordance with Cowal Gold Mine environmental monitoring procedures, trip blank and duplicate samples are collected throughout the course of the monitoring program for analysis by NMI. The results of these and other QA checks are not contained in this report.

NOTES ON THE 2014 DEPOSITIONAL DUST DATASET

1. Sample analysis was performed by the National Measurement Institue
2. EPA Licence monitoring points include McLintock's Shed, Site Office, DG5, DG9, Site 52.
3. Indication is given where no biannual metals results were obtained, and, when monitoring points were inaccessible.
4. Indication is given where an EPL licence monitoring point exceeds the NSW EPA Impact Assessment Criterion of 4g/m2/month

Station Name	Unit	DG1															
Sample Month		January	February	March	April	May	June	July	August	September	October	November	December				
Sample Start Date		24/12/2013	29/01/2014	24/02/2014	31/03/2014	29/04/2014	26/05/2014	25/06/2014	29/07/2014	27/08/2014	24/09/2014	28/10/2014	25/11/2014				
Sample End Date		29/01/2014	24/02/2014	31/03/2014	29/04/2014	26/05/2014	25/06/2014	29/07/2014	27/08/2014	24/09/2014	28/10/2014	25/11/2014	30/12/2014	COUNT	MIN	MAX	MEAN
Aluminium	mg/kg			-			-			-			9750	1	9750	9750	9750
Arsenic	mg/kg			-			-			-			3.2	1	3.2	3.2	3
Ash Content over Time	mg/m2/mth	424	522	534	410	189	226	250	527	667	699	667	485	12	189	699	467
Cadmium	mg/kg			-			-			-			74	1	74	74.0	74
Combustible Matter	mg/m2/mth	424	196	776	410	377	396	100	293	546	1248	364	728	12	100	1248	488
Copper	mg/kg			-			-			-			810	1	810	810	810
Lead	mg/kg			-			-			-			42	1	42	42	42
Selenium	mg/kg			-			-			-			3.3	1	3.3	3.3	3
Total Insoluble Matter	mg/m2/mth	849	718	1358	820	566	622	350	820	1213	1947	1091	1213	12	350	1947	964
Total Solids	mg/m2/mth	6140	3498	5613	2582	2716	3580	2063	2097	1766	3022	3488	4918	12	1766	6140	3457
Total Soluble Matter	mg/m2/mth	5268	2763	4269	1781	2196	2952	1708	1281	574	1056	2409	3519	12	574	5268	2481
Zinc	mg/kg			-			-			-			7480	1	7480	7480	7480

Station Name	Unit	DG2															
Sample Month		January	February	March	April	May	June	July	August	September	October	November	December				
Sample Start Date		30/12/2013	3/02/2014	24/02/2014	31/03/2014	29/04/2014	26/05/2014	25/06/2014	29/07/2014	27/08/2014	26/09/2014	28/10/2014	25/11/2014				
Sample End Date		3/02/2014	24/02/2014	31/03/2014	29/04/2014	26/05/2014	25/06/2014	29/07/2014	27/08/2014	26/09/2014	28/10/2014	25/11/2014	30/12/2014	COUNT	MIN	MAX	MEAN
Aluminium	mg/kg			-			-			-			9040	1	9040	9040	9040
Arsenic	mg/kg			-			-			-			4.7	1	4.7	4.7	5
Ash Content over Time	mg/m2/mth	728	1051	340	468	126	622	200	585	622	796	849	631	12	126	1051	585
Cadmium	mg/kg			-			-			-			23	1	23.00	23.00	23
Combustible Matter	mg/m2/mth	4317	1940	485	468	440	340	150	234	566	796	2001	1407	12	150	4317	1095
Copper	mg/kg			-			-			-			1000	1	1000	1000	1000
Lead	mg/kg			-			-			-			52	1	52	52	52
Selenium	mg/kg			-			-			-			8.3	1	8.3	8.3	8
Total Insoluble Matter	mg/m2/mth	4850	2991	825	878	629	905	350	878	1188	1592	2850	2037	12	350	4850	1664
Total Solids	mg/m2/mth	7496	7063	3699	4138	3270	4310	1817	2017	2253	3397	6763	6509	12	1817	7496	4394
Total Soluble Matter	mg/m2/mth	2450	4067	2864	3234	2515	3368	1454	1149	1060	1798	3906	4557	12	1060	4557	2702
Zinc	mg/kg			-			-			-			3420	1	3420	3420	3420

Station Name	Unit	DG3															
Sample Month		**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**				
Sample Start Date		23/12/2013	31/01/2014	25/02/2014	2/04/2014	29/04/2014	26/05/2014	27/06/2014	1/08/2014	28/08/2014	30/09/2014	28/10/2014					
Sample End Date		31/01/2014	26/02/2014	2/04/2014	29/04/2014	26/05/2014	27/06/2014	1/08/2014	28/08/2014	30/09/2014	28/10/2014	27/11/2014		**COUNT**	**MIN**	**MAX**	**MEAN**
Aluminium	mg/kg			-			-			-			-	-	-	-	-
Arsenic	mg/kg			-			-			-			-	-	-	-	-
Ash Content over Time	mg/m2/mth	609	718	1179	113	377	424	388	440	463	849	736	-	11	113	1179	572
Cadmium	mg/kg			-			-			-			-	-	-	-	-
Combustible Matter	mg/m2/mth	784	1306	2877	503	252	212	194	1006	617	2122	1415	-	11	194	2877	1026
Copper	mg/kg			-			-			-			-	-	-	-	-
Lead	mg/kg			-			-			-			-	-	-	-	-
Selenium	mg/kg			-			-			-			-	-	-	-	-
Total Insoluble Matter	mg/m2/mth	1393	1959	4056	629	629	637	534	1446	1080	3032	2150	-	11	534	4056	1595
Total Solids	mg/m2/mth	8414	4897	9757	3655	1888	2739	1401	11039	3874	5153	4919	-	11	1401	11039	5249
Total Soluble Matter	mg/m2/mth	7005	2950	5706	3026	1266	2123	848	9545	2793	2144	2774	-	11	848	9545	3653
Zinc	mg/kg			-			-			-			-	-	-	-	-

Station Name	Unit	DG4															
Sample Month		**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**				
Sample Start Date		30/12/2013	6/02/2014	25/02/2014	1/04/2014	1/05/2014	29/05/2014	3/07/2014				28/07/2014					
Sample End Date		28/01/2014	25/02/2014	1/04/2014	1/05/2014	29/05/2014	3/07/2014	28/07/2014				25/11/2014		**COUNT**	**MIN**	**MAX**	**MEAN**
Aluminium	mg/kg			-			-			-			-	-	-	-	-
Arsenic	mg/kg			-			-			-			-	-	-	-	-
Ash Content over Time	mg/m2/mth	351	1072	728	1358	546	534	407		-		3880	-	8	351	3880	1110
Cadmium	mg/kg			-			-			-			-	-	-	-	-
Combustible Matter	mg/m2/mth	644	804	679	396	303	291	136		-		18189	-	8	136	18189	2680
Copper	mg/kg			-			-			-			-	-	-	-	-
Lead	mg/kg			-			-			-			-	-	-	-	-
Selenium	mg/kg			-			-			-			-	-	-	-	-
Total Insoluble Matter	mg/m2/mth	995	1876	1407	1754	849	825	543		-		22433	-	8	543	22433	3835
Total Solids	mg/m2/mth	5839	6452	7784	4561	3395	4200	1516		-		25843	-	8	1516	25843	7449
Total Soluble Matter	mg/m2/mth	4838	4544	6353	2795	2425	3392	965		-		3456	-	8	965	6353	3596
Zinc	mg/kg			-			-			-			-	-	-	-	-

Station Name	Unit	DG5															
Sample Month		**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**				
Sample Start Date		30/12/2013	6/02/2014	25/02/2014	1/04/2014	1/05/2014	29/05/2014	3/07/2014									
Sample End Date		28/01/2014	25/02/2014	1/04/2014	1/05/2014	29/05/2014	3/07/2014	28/07/2014						**COUNT**	**MIN**	**MAX**	**MEAN**
Aluminium	mg/kg			-			-			-			-	-	-	-	-
Arsenic	mg/kg			-			-			-			-	-	-	-	-
Ash Content over Time	mg/m2/mth	585	361	437	226	303	243	272		-			-	7	226	585	347
Cadmium	mg/kg			-			-			-			-	-	-	-	-
Combustible Matter	mg/m2/mth	761	289	485	226	243	194	136		-			-	7	136.0	761	333
Copper	mg/kg			-			-			-			-	-	-	-	-
Lead	mg/kg			-			-			-			-	-	-	-	-
Selenium	mg/kg			-			-			-			-	-	-	-	-
Total Insoluble Matter	mg/m2/mth	1346	650	873	453	546	437	407		-			-	7	407	1346	673
Total Solids	mg/m2/mth	5528	1581	5314	1875	1787	3491	1031		-			-	7	1031	5528	2944
Total Soluble Matter	mg/m2/mth	4180	930	4418	1401	1227	3077	627		-			-	7	627	4418	2266
Zinc	mg/kg			-			-			-			-	-	-	-	-

No biannual metals results due to a monitoring system error

No Sample taken - location inaccessible

Station Name	Unit	DG6															
Sample Month		**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**				
Sample Start Date		23/12/2013	31/01/2014	26/02/2014	2/04/2014	29/04/2014	26/05/2014	27/06/2014	1/08/2014	28/08/2014	23/09/2014	28/10/2014	27/11/2014				
Sample End Date		31/01/2014	26/02/2014	2/04/2014	29/04/2014	26/05/2014	27/06/2014	1/08/2014	28/08/2014	23/09/2014	28/10/2014	27/11/2014	5/01/2015	**COUNT**	**MIN**	**MAX**	**MEAN**
Aluminium	mg/kg			-			-			-			2380	1	2380	2380	2380
Arsenic	mg/kg			-			-			-			3.8	1	3.8	3.8	4
Ash Content over Time	mg/m2/mth	348	979	4074	440	1195	1326	534	503	3395	1116	2037	1132	12	348	4074	1423
Cadmium	mg/kg			-			-			-			26	1	26.00	26	26
Combustible Matter	mg/m2/mth	1045	1306	3395	1761	1006	2865	631	1698	522	2619	1302	5659	12	522	5659	1984
Copper	mg/kg			-			-			-			490	1	490	490	490
Lead	mg/kg			-			-			-			30	1	30	30	30
Selenium	mg/kg			-			-			-			5.7	1	5.7	5.7	6
Total Insoluble Matter	mg/m2/mth	1393	2351	7276	2201	2201	4191	1164	2201	3918	3735	3339	6965	12	1164	7276	3411
Total Solids	mg/m2/mth	7756	5840	10331	4161	4527	7760	3973	3150	4493	4440	4939	18282	12	3150	18282	6638
Total Soluble Matter	mg/m2/mth	6398	3573	2838	1937	2264	3599	2816	923	592	710	1627	11318	12	592	11318	3216
Zinc	mg/kg			-			-			-			4700	1	4700	4700	4700

Station Name	Unit	DG7															
Sample Month		**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**				
Sample Start Date		24/12/2013	29/01/2014	24/02/2014	31/03/2014	29/04/2014	26/05/2014	25/06/2014	29/07/2014	27/08/2014	26/09/2014	27/10/2014	25/11/2014				
Sample End Date		29/01/2014	24/02/2014	31/03/2014	29/04/2014	26/05/2014	25/06/2014	29/07/2014	27/08/2014	26/09/2014	27/10/2014	25/11/2014	30/12/2014	**COUNT**	**MIN**	**MAX**	**MEAN**
Aluminium	mg/kg			-			-			-			4450	1	4450	4450	4450
Arsenic	mg/kg			-			-			-			1.8	1	1.8	1.8	2
Ash Content over Time	mg/m2/mth	849	5289	4511	1405	1195	2603	150	117	1132	2629	585	1795	12	117	5289	1855
Cadmium	mg/kg			-			-			-			120	1	120	120.0	120
Combustible Matter	mg/m2/mth	3254	7835	8731	4683	2955	14713	799	878	792	2902	937	5335	12	792	14713	4485
Copper	mg/kg			-			-			-			650	1	650	650	650
Lead	mg/kg			-			-			-			16	1	16	16	16
Selenium	mg/kg			-			-			-			2.5	1	2.5	2.5	3
Total Insoluble Matter	mg/m2/mth	4103	13712	13096	5854	4150	17542	949	1054	1924	5586	1522	7276	12	949	17542	6397
Total Solids	mg/m2/mth	16000	21547	14598	12209	6530	31322	5868	2033	3054	7573	3659	18432	12	2033	31322	11902
Total Soluble Matter	mg/m2/mth	11898	8403	1746	9105	2317	14286	4965	969	1112	2063	2122	11156	12	969	14286	5845
Zinc	mg/kg			-			-			-			4210	1	4210	4210	4210

Station Name	Unit	Site Office															
Sample Month		**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**				
Sample Start Date		24/12/2013	29/01/2014	24/02/2014	31/03/2014	29/04/2014	26/05/2014	25/06/2014	29/07/2014	27/08/2014	26/09/2014	27/10/2014	25/11/2014				
Sample End Date		29/01/2014	24/02/2014	31/03/2014	29/04/2014	26/05/2014	25/06/2014	29/07/2014	27/08/2014	26/09/2014	27/10/2014	25/11/2014	30/12/2014	**COUNT**	**MIN**	**MAX**	**MEAN**
Aluminium	mg/kg			-			-			-			4240	1	4240	4240	4240
Arsenic	mg/kg			-			-			-			3.2	1	3.2	3.2	3
Ash Content over Time	mg/m2/mth	660	1110	1019	878	440	1019	649	234	1075	1095	527	1164	12	234	1164	823
Cadmium	mg/kg			-			-			-			54	1	54	54.0	54
Combustible Matter	mg/m2/mth	755	3199	2571	761	1069	4867	849	644	1924	6024	1639	6306	12	644	6306	2551
Copper	mg/kg			-			-			-			750	1	750	750	750
Lead	mg/kg			-			-			-			23	1	23	23	23
Selenium	mg/kg			-			-			-			2	1	2	2	2
Total Insoluble Matter	mg/m2/mth	1363	4244	3589	1639	1446	5659	1498	878	2943	7119	2166	7276	12	878	7276	3318
Total Solids	mg/m2/mth	6232	8177	9171	4010	4527	11572	4988	2778	6306	9814	5723	18742	12	2778	18742	7670
Total Soluble Matter	mg/m2/mth	4879	3862	5613	2372	3018	5665	3483	1904	3381	2698	3526	11408	12	1904	11408	4317
Zinc	mg/kg			-			-			-			4410	1	4410	4410	4410

No biannual metals results due to a monitoring system error

Station Name	Unit	DG9															
Sample Month		**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**				
Sample Start Date		24/12/2013	29/01/2014	24/02/2014	31/03/2014	29/04/2014	26/05/2014	25/06/2014	29/07/2014	27/08/2014	26/09/2014	27/10/2014	25/11/2014				
Sample End Date		29/01/2014	24/02/2014	31/03/2014	29/04/2014	26/05/2014	25/06/2014	29/07/2014	27/08/2014	26/09/2014	27/10/2014	25/11/2014	30/12/2014	**COUNT**	**MIN**	**MAX**	**MEAN**
Aluminium	mg/kg			-			-			-			2560	1	2560	2560	2560
Arsenic	mg/kg			-			-			-			2.3	1	2.3	2.3	2
Ash Content over Time	mg/m2/mth	283	718	1310	878	503	1867	1049	176	566	329	761	1746	12	176	1867	849
Cadmium	mg/kg			-			-			-			17	1	17	17	17
Combustible Matter	mg/m2/mth	236	914	6306	6439	4276	7357	799	644	226	602	1581	8246	12	226	8246	3136
Copper	mg/kg			-			-			-			600	1	600	600	600
Lead	mg/kg			-			-			-			15	1	15	15	15
Selenium	mg/kg			-			-			-			1.5	1	1.5	1.5	2
Total Insoluble Matter	mg/m2/mth	519	1632	7761	7025	4779	9054	1847	820	792	931	2400	10186	12	519	10186	3979
Total Solids	mg/m2/mth	4977	2045	7459	11725	7948	15419	5557	33532	1107	2169	4044	23748	12	1107	33532	9978
Total Soluble Matter	mg/m2/mth	4382	431	82	4546	3229	6524	3733	2509	314	1212	1660	13853	12	82	13853	3540
Zinc	mg/kg			-			-			-			660	1	660	660	660

No biannual metals results due to a monitoring system error

Station Name	Unit	DG10															
Sample Month		**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**				
Sample Start Date		24/12/2013	29/01/2014	14/03/2014	31/03/2014	29/04/2014	26/05/2014	25/06/2014	29/07/2014	27/08/2014	26/09/2014	27/11/2014	25/11/2014				
Sample End Date		29/01/2014	24/02/2014	31/03/2014	29/04/2014	26/05/2014	25/06/2014	29/07/2014	27/08/2014	26/09/2014	27/10/2014	25/11/2014	30/12/2014	**COUNT**	**MIN**	**MAX**	**MEAN**
Aluminium	mg/kg			-			-			-			13000	1	13000	13000	13000
Arsenic	mg/kg			-			-			-			8.5	1	8.5	9	9
Ash Content over Time	mg/m2/mth	472	1110	599	234	314	283	3146	176	453	383	671	437	12	176	3146	690
Cadmium	mg/kg			-			-			-			38	1	38	38	38
Combustible Matter	mg/m2/mth	330	261	200	117	252	170	499	53	340	657	410	340	12	53	657	302
Copper	mg/kg			-			-			-			2090	1	2090	2090	2090
Lead	mg/kg			-			-			-			110	1	110	110	110
Selenium	mg/kg			-			-			-			3.8	1	3.8	3.8	4
Total Insoluble Matter	mg/m2/mth	802	1371	799	351	566	453	3645	234	736	1040	1711	776	12	234	3645	1040
Total Solids	mg/m2/mth	5421	2285	849	764	1358	1419	3771	555	1277	1486	1383	2053	12	555	5421	1885
Total Soluble Matter	mg/m2/mth	4606	927	34	418	770	968	110	332	549	470	236	1249	12	34	4606	889
Zinc	mg/kg			-			-			-			1540	1	1540	1540	1540

Station Name	Unit	DG11															
Sample Month		**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**				
Sample Start Date		24/12/2013	29/01/2014	24/02/2014	31/03/2014	30/04/2014	27/05/2014	26/06/2014	29/07/2014	27/08/2014	24/09/2014	27/10/2014	26/11/2014				
Sample End Date		29/01/2014	24/02/2014	31/03/2014	30/04/2014	27/05/2014	26/06/2014	29/07/2014	27/08/2014	24/09/2014	27/10/2014	26/11/2014	30/12/2014	**COUNT**	**MIN**	**MAX**	**MEAN**
Aluminium	mg/kg			-			-			-			3260	1	3260	3260	3260
Arsenic	mg/kg			-			-			-			2.8	1	2.8	3	3
Ash Content over Time	mg/m2/mth	990	653	1261	622	817	849	1338	1112	4911	977	679	1997	12	622	4911	1351
Cadmium	mg/kg			-			-			-			24	1	24	24	24
Combustible Matter	mg/m2/mth	5187	588	2910	1754	1195	1302	566	1346	6669	1646	1811	7989	12	566	7989	2747
Copper	mg/kg			-			-			-			250	1	250	250	250
Lead	mg/kg			-			-			-			45	1	45	45	45
Selenium	mg/kg			-			-			-			4.9	1	4.9	4.9	5
Total Insoluble Matter	mg/m2/mth	6130	1241	4171	2377	2012	2150	1903	2459	11520	2624	2433	9986	12	1241	11520	4084
Total Solids	mg/m2/mth	17215	4014	9235	6830	4245	6022	4844	7245	28930	4566	6072	18165	12	4014	28930	9782
Total Soluble Matter	mg/m2/mth	11207	2765	5093	4426	2213	3832	2942	4786	17145	1929	3605	8014	12	1929	17145	5663
Zinc	mg/kg			-			-			-			3840	1	3840	3840	3840

Station Name	Unit	DG12															
Sample Month		**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**				
Sample Start Date		24/12/2013	29/01/2014	24/02/2014	31/03/2014	30/04/2014	27/05/2014	25/06/2014	29/07/2014	27/08/2014	24/09/2014	27/10/2014	25/11/2014				
Sample End Date		29/01/2014	24/02/2014	31/03/2014	30/04/2014	27/05/2014	26/06/2014	29/07/2014	27/08/2014	24/09/2014	27/10/2014	26/11/2014	30/12/2014	**COUNT**	**MIN**	**MAX**	**MEAN**
Aluminium	mg/kg			-			-			-			9080	1	9080	9080	9080
Arsenic	mg/kg			-			-			-			18	1	18	18	18
Ash Content over Time	mg/m2/mth	1226	1828	2377	4640	1195	1811	899	2459	13339	4476	1471	2862	12	899	13339	3215
Cadmium	mg/kg			-			-			-			41	1	41	41	41
Combustible Matter	mg/m2/mth	3490	457	970	1019	189	1584	849	1522	4062	6688	566	4753	12	189	6688	2179
Copper	mg/kg			-			-			-			300	1	300	300	300
Lead	mg/kg			-			-			-			36	1	36.0	36	36
Selenium	mg/kg			-			-			-			6	1	6	6	6
Total Insoluble Matter	mg/m2/mth	4716	2285	3347	5659	1383	3395	1748	3922	17583	11318	2037	7761	12	1383	17583	5430
Total Solids	mg/m2/mth	7896	3900	8327	8854	2877	5386	3730	6533	21870	12985	3615	12854	12	2877	21870	8236
Total Soluble Matter	mg/m2/mth	3165	1596	4953	3202	1457	2024	2000	2599	4447	1886	1568	5090	12	1457	5090	2832
Zinc	mg/kg			-			-			-			2330	1	2330	2330	2330

Station Name	Unit	DG13															
Sample Month		**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**				
Sample Start Date		30/12/2013	6/02/2014	25/02/2014	1/04/2014	2/05/2014	29/05/2014	3/07/2014	28/07/2014	1/09/2014	29/09/2014	28/10/2014	26/11/2014				
Sample End Date		28/01/2014	25/02/2014	2/04/2014	1/05/2014	29/05/2014	3/07/2014	28/07/2014	1/09/2014	29/09/2014	28/10/2014	26/11/2014	30/12/2014	**COUNT**	**MIN**	**MAX**	**MEAN**
Aluminium	mg/kg			-			-			-			2270	1	2270	2270	2270
Arsenic	mg/kg			-			-			-			2.8	1	2.8	3	3
Ash Content over Time	mg/m2/mth	702	433	377	509	566	582	883	243	970	1288	937	1997	12	243	1997	791
Cadmium	mg/kg			-			-			-			14	1	14	14.0	14
Combustible Matter	mg/m2/mth	410	361	472	396	629	194	68	97	182	1756	702	11484	12	68	11484	1396
Copper	mg/kg			-			-			-			350	1	350	350	350
Lead	mg/kg			-			-			-			43	1	43	43	43
Selenium	mg/kg			-			-			-			2.8	1	2.8	2.8	3
Total Insoluble Matter	mg/m2/mth	1112	831	849	905	1132	776	951	340	1091	3044	1639	13481	12	340	13481	2179
Total Solids	mg/m2/mth	4908	1916	7111	3485	2603	3753	2265	674	2046	4978	3375	30048	12	674	30048	5597
Total Soluble Matter	mg/m2/mth	3777	1118	6253	2585	1540	2982	1339	328	931	1912	1726	16807	12	328	16807	3442
Zinc	mg/kg			-			-			-			1520	1	1520	1520	1520

Station Name	Unit	DG14															
Sample Month		**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**				
Sample Start Date		30/12/2013	6/02/2014	25/02/2014	1/04/2014	1/05/2014	29/05/2014	3/07/2014									
Sample End Date		6/02/2014	25/02/2014	1/04/2014	1/05/2014	29/05/2014	3/07/2014	28/07/2014						**COUNT**	**MIN**	**MAX**	**MEAN**
Aluminium	mg/kg			-			-			-			-	-	-	-	-
Arsenic	mg/kg			-			-			-			-	-	-	-	-
Ash Content over Time	mg/m2/mth	581	804	970	283	182	437	543		-			-	7	182	970	543
Cadmium	mg/kg			-			-			-			-	-	-	-	-
Combustible Matter	mg/m2/mth	447	536	679	113	182	194	95		-			-	7	95	679	321
Copper	mg/kg			-			-			-			-	-	-	-	-
Lead	mg/kg			-			-			-			-	-	-	-	-
Selenium	mg/kg			-			-			-			-	-	-	-	-
Total Insoluble Matter	mg/m2/mth	1028	1340	1649	396	364	631	611		-			-	7	364	1649	860
Total Solids	mg/m2/mth	4166	1731	2001	851	1339	1382	1347		-			-	7	851	4166	1831
Total Soluble Matter	mg/m2/mth	3152	388	364	447	976	752	717		-			-	7	364	3152	971
Zinc	mg/kg			-			-			-			-	-	-	-	-

Station Name	Unit	I5															
Sample Month		**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**				
Sample Start Date		23/12/2013	31/01/2014	26/02/2014	2/04/2014	29/04/2014	26/05/2014	27/06/2014	1/08/2014	28/08/2014	23/09/2014	28/10/2014	27/11/2014				
Sample End Date		31/01/2014	26/02/2014	2/04/2014	29/04/2014	26/05/2014	27/06/2014	1/08/2014	28/08/2014	23/09/2014	28/10/2014	27/11/2014	5/01/2015	**COUNT**	**MIN**	**MAX**	**MEAN**
Aluminium	mg/kg			-			-			-			4400	1	4400	4400	4400
Arsenic	mg/kg			-			-			-			1.5	1	1.5	2	2
Ash Content over Time	mg/m2/mth	392	1110	1310	314	692	531	388	755	588	825	2433	2438	12	314	2438	981
Cadmium	mg/kg			-			-			-			8.7	1	8.7	8.7	9
Combustible Matter	mg/m2/mth	958	1175	4705	2075	503	1326	388	440	522	1698	2773	6094	12	388	6094	1888
Copper	mg/kg			-			-			-			280	1	280	280	280
Lead	mg/kg			-			-			-			13	1	13	13	13
Selenium	mg/kg			-			-			-			1.7	1	1.7	1.7	2
Total Insoluble Matter	mg/m2/mth	1349	2285	5821	2326	1195	1804	776	1132	1110	2522	5263	8706	12	776	8706	2857
Total Solids	mg/m2/mth	5694	4131	10093	4078	3106	4507	2225	2358	1775	3818	6820	15967	12	1775	15967	5381
Total Soluble Matter	mg/m2/mth	4341	1911	4090	1735	1816	2692	1449	1201	630	1298	1575	7413	12	630	7413	2513
Zinc	mg/kg			-			-			-			3110	1	3110	3110	3110

Station Name	Unit	Lakeside															
Sample Month		**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**				
Sample Start Date		24/12/2013	29/01/2014	24/02/2014	31/03/2014	29/04/2014	26/05/2014	25/06/2014	29/07/2014	27/08/2014	26/09/2014	28/10/2014	25/11/2014				
Sample End Date		29/01/2014	24/02/2014	31/03/2014	29/04/2014	26/05/2014	25/06/2014	29/07/2014	27/08/2014	26/09/2014	27/10/2014	25/11/2014	30/12/2014	**COUNT**	**MIN**	**MAX**	**MEAN**
Aluminium	mg/kg			-			-			-			9540	1	9540	9540	9540
Arsenic	mg/kg			-			-			-			5.3	1	5.3	5.3	5
Ash Content over Time	mg/m2/mth	660	849	922	176	440	396	250	293	736	531	1576	1649	12	176	1649	707
Cadmium	mg/kg			-			-			-			32	1	32	32	32
Combustible Matter	mg/m2/mth	755	392	3977	293	692	566	200	176	396	531	2486	1358	12	176	3977	985
Copper	mg/kg			-			-			-			520	1	520	520	520
Lead	mg/kg			-			-			-			25	1	25	25	25
Selenium	mg/kg			-			-			-			3.2	1	3.2	3.2	3
Total Insoluble Matter	mg/m2/mth	1462	1241	4850	468	1069	905	449	410	1188	1061	4002	3007	12	410	4850	1676
Total Solids	mg/m2/mth	3697	1703	5013	2074	3345	4420	2090	1544	2185	2540	7167	6985	12	1544	7167	3564
Total Soluble Matter	mg/m2/mth	2254	438	147	1572	2289	3486	1660	1133	1020	1472	3149	3842	12	147	3842	1872
Zinc	mg/kg			-			-			-			12900	1	12900	12900	12900

Station Name	Unit	McLintock's Shed															
Sample Month		**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**				
Sample Start Date		24/12/2013	29/01/2014	24/02/2014	31/03/2014	29/04/2014	26/05/2014	25/06/2014	29/07/2014	27/08/2014	26/09/2014	28/10/2014	25/11/2014				
Sample End Date		29/01/2014	24/02/2014	31/03/2014	29/04/2014	26/05/2014	25/06/2014	29/07/2014	27/08/2014	26/09/2014	28/10/2014	25/11/2014	30/12/2014	**COUNT**	**MIN**	**MAX**	**MEAN**
Aluminium	mg/kg			-			-			-			8830	1	8830	8830	8830
Arsenic	mg/kg			-			-			-			4.3	1	4.3	4.3	4
Ash Content over Time	mg/m2/mth	2688	914	1455	2751	6036	3678	1598	585	905	3608	2061	3250	12	585	6036	2461
Cadmium	mg/kg			-			-			-			26	1	26	26	26
Combustible Matter	mg/m2/mth	2594	653	1164	468	1572	622	300	1112	1019	1963	1091	4462	12	300	4462	1418
Copper	mg/kg			-			-			-			630	1	630	630	630
Lead	mg/kg			-			-			-			20	1	20	20	20
Selenium	mg/kg			-			-			-			3.6	1	3.6	3.6	4
Total Insoluble Matter	mg/m2/mth	5187	1567	2619	3220	7545	4301	1897	1639	1924	5836	3153	7761	12	1567	7761	3887
Total Solids	mg/m2/mth	10352	4594	9412	4720	11239	6945	3956	4871	3871	9066	7478	18538	12	3871	18538	7920
Total Soluble Matter	mg/m2/mth	5070	2979	6797	1490	3678	2604	2046	3222	1953	3478	4327	10933	12	1490	10933	4048
Zinc	mg/kg			-			-			-			6780	1	6780	6780	6780

No biannual metals results due to a monitoring system error

Station Name	Unit	Site 52															
Sample Month		**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**				
Sample Start Date		24/12/2013	29/01/2014	24/02/2014	31/03/2014	30/04/2014	27/05/2014	25/06/2014	29/07/2014	27/08/2014	24/09/2014	27/10/2014	25/11/2014				
Sample End Date		29/01/2014	24/02/2014	31/03/2014	29/04/2014	27/05/2014	25/06/2014	29/07/2014	27/08/2014	24/09/2014	27/10/2014	26/11/2014	30/12/2014	**COUNT**	**MIN**	**MAX**	**MEAN**
Aluminium	mg/kg			-			-			-			14700	1	14700	14700	14700
Arsenic	mg/kg			-			-			-			30	1	30	30	30
Ash Content over Time	mg/m2/mth	1368	392	1892	1405	1132	644	1198	1932	2789	3807	1245	2147	12	392	3807	1663
Cadmium	mg/kg			-			-			-			36	1	36	36	36
Combustible Matter	mg/m2/mth	377	196	776	1639	1195	527	350	351	1031	3961	396	1298	12	196	3961	1008
Copper	mg/kg			-			-			-			390	1	390	390	390
Lead	mg/kg			-			-			-			620	1	620	620	620
Selenium	mg/kg			-			-			-			2.9	1	2.9	2.9	3
Total Insoluble Matter	mg/m2/mth	1745	588	2668	3044	2264	1171	1548	2283	3820	7717	1641	3445	12	588	7717	2661
Total Solids	mg/m2/mth	5564	608	6695	6194	5986	5532	3230	3805	4613	9042	3336	6551	12	608	9042	5096
Total Soluble Matter	mg/m2/mth	3817	8	4030	3151	3848	4303	1664	1463	820	1254	1692	2989	12	8	4303	2420
Zinc	mg/kg			-			-			-			8700	1	8700	8700	8700

No biannual metals results due to a monitoring system error

Appendix B - High Volume Dust

Monitoring Point: HV1. EPL11912 TSP Monitoring Point No. 6				
Sample Date	Analyte			
	Aluminium	Copper	Total Suspended Particulates	Zinc
	µg/m3	µg/m3	µg/m3	µg/m3
26/12/2013	1.24	0.0129	35.4	0.0229
1/01/2014	1.18	0.0125	44.5	0.0156
7/01/2014	2.10	0.0146	82.7	0.0223
13/01/2014	1.34	0.0135	59.0	0.0216
19/01/2014	2.03	0.0141	85.3	0.0288
25/01/2014	0.926	0.0120	43.6	0.0201
31/01/2014	1.86	0.0149	67.9	0.0215
6/02/2014	1.54	0.0137	69.0	0.0224
12/02/2014	2.94	0.0259	130	0.0371
18/02/2014	1.16	0.0132	50.8	0.0210
24/02/2014	1.50	0.0136	69.4	0.0247
2/03/2014	0.530	0.0107	10.6	0.0139
8/03/2014	0.163	0.0029	2.4	0.0073
14/03/2014	0.489	0.0053	14.7	0.0090
20/03/2014	2.62	0.0252	101	0.0315
26/03/2014	0.602	0.0111	16.4	0.0209
1/04/2014	0.706	0.0088	35.2	0.0184
7/04/2014	0.663	0.0090	20.9	0.0130
13/04/2014	0.632	0.0097	18.1	0.0154
19/04/2014	0.834	0.0112	28.9	0.0166
25/04/2014	1.41	0.0145	49.3	0.0204
1/05/2014	1.04	0.0114	24.1	0.0182
7/05/2014	0.689	0.0113	20.9	0.0173
13/05/2014	0.667	0.0102	15.5	0.0126
19/05/2014	0.809	0.0115	27.2	0.0186
25/05/2014	0.665	0.0101	19.0	0.0179
31/05/2014	0.458	0.0089	10.5	0.0161
6/06/2014	0.540	0.0097	14.3	0.0237
12/06/2014	0.560	0.0096	16.3	0.0176
18/07/2014	0.569	0.0086	8.0	0.0122
24/07/2014	0.618	0.0080	13.4	0.0118
30/07/2014	0.733	0.0080	15.7	0.0110
5/08/2014	1.00	0.0100	39.1	0.0156
11/08/2014	0.988	0.0093	36.4	0.0208
17/08/2014	0.626	0.0087	10.5	0.0121
23/08/2014	0.889	0.0100	25.1	0.0149
29/08/2014	0.990	0.0153	39.4	0.0251
4/09/2014	0.942	0.0132	38.4	0.0170
10/09/2014	0.648	0.0122	21.3	0.0173
16/09/2014	0.875	0.0133	33.1	0.0182
22/09/2014	0.880	0.0143	40.4	0.0243
28/09/2014	0.711	0.0103	30.1	0.0180
4/10/2014	1.77	0.0169	78.4	0.0391
10/10/2014	1.12	0.0114	43.6	0.0149
16/10/2014	0.777	0.0104	27.2	0.0173
22/10/2014	0.971	0.0117	44.3	0.0156
28/10/2014	1.5	0.0106	62.3	0.0201
3/11/2014	2.02	0.0145	85.4	0.0219
9/11/2014	2.36	0.0127	96.3	0.0193
15/11/2014	3.45	0.0141	172	0.0271
21/11/2014	1.79	0.0128	68.5	0.02
27/11/2014	1.4	0.0134	63.7	0.0222
3/12/2014	1.74	0.0124	65.4	0.0261
9/12/2014	1.22	0.0164	44.3	0.0313
15/12/2014	1.41	0.0131	57.3	0.0228
21/12/2014	1.44	0.0132	62.8	0.025
MIN	**0.16**	**0.0029**	**2.4**	**0.0073**
MAX	**3.45**	**0.0259**	**172**	**0.0391**
MEAN	**1.17**	**0.0121**	**44.7**	**0.0198**

Note: No TSP result for sample dates 18/6, 24/6, 30/6, 6/7, 12/7 as samples lost by postal service

APPENDIX C

SURFACE WATER, GROUNDWATER AND BIOLOGICAL MONITORING REPORT

COWAL GOLD MINE

SURFACE WATER, GROUNDWATER AND BIOLOGICAL MONITORING REPORT

23 December 2013 – 22 December 2014

CONTENTS

1.0 INTRODUCTION

Prior to development of the Cowal Gold Project, Barrick was required to:

> *"prepare a detailed monitoring program in respect of ground and surface water, including water in the up catchment diversion system, internal catchment drainage system, dewatering bores, Bland Creek Palaeochannel borefield and water supply pipeline from borefield, pit/void, Lake Cowal, and any other waters in and around the mine site during construction works, mine operations and post mine operations in consultation with DLWC (now DoPI), EPA, NSW Fisheries and to the satisfaction of the Director-General".*

The Cowal Gold Project Surface Water, Ground Water, Meteorological and Biological Monitoring Programme (SWGMBMP) were approved by the Department of Infrastructure, Planning and Natural Resources (DIPNR, now DoPI) in December 2003. Environmental monitoring under this programme commenced in 2004. The programme was updated to reflect mine operational activities in 2005, 2006, 2009, 2010 and November 2011.

In accordance with Development Consent Conditions 8.2 and 9.2, the results and interpretation of surface water, groundwater and biological monitoring were reported to the Department of Natural Resources (now DoPI), Department of Environment and Conservation (now EPA) and Department of Primary Industries (now DoPI) on a quarterly basis during the first 12 months of ore processing operations and thereafter on an annual basis. The final quarterly report was submitted in August 2007.

This report contains results and interpretation of surface water, groundwater and biological monitoring at Cowal Gold Mine for the period 23 December 2013 – 22 December 2014. The data contained in this report is intended to compliment summary reports contained in the 2014 Annual Environmental Management Report (refer to section 3.3 of the main report).

2.0 SAMPLE COLLECTION METHODOLOGY AND QA/QC PROCEDURES

Employees at Cowal Gold Mine collect environmental monitoring samples in accordance with procedures developed specifically for the tasks. These procedures adhere to AS 5667:1998 and APHA guidelines on the collection and preservation of samples and include specific direction pertaining to:

- Methods for collection of samples from dams and groundwater bores;
- Use of measurement and sampling equipment;
- Sample identification;
- Sample containers and preservation methods;
- Sample filtration, storage and holding times;
- Sample transport;
- Chain of Custody (COC) documentation and laboratory analytical scheduling; and
- Data management and QA/QC checks.

3.0 LABORATORY ANALYTICAL METHODS AND QA/QC PROCEDURES

Unless otherwise stated, all analytical work was conducted by ALS Environmental at their NATA-accredited Sydney laboratory. In accordance with Cowal Gold Mine environmental monitoring procedures, trip blank and duplicate samples are collected throughout the course of the monitoring program for analysis by ALS Environmental in Sydney. The results of these and other QA checks are not contained in this report.

4.0 MONITORING NON-COMPLIANCE SUMMARY

Below is a summary of the environmental monitoring that was not undertaken during the reporting period and reasons for the non-compliances.

EPA Monitoring Point as per EPL11912	Site Identification	Extent to which monitoring did not occur	Cause of non-compliance	Actions planned to prevent reoccurrence of non-compliance
6	HV1	No TSP result for sample date 1/5/2014.	A hire unit was replaced with the repaired unit on 29/4/2014. The TSP reading was unable to be calculated by the laboratory as the sample volume and unit run times were inaccurate.	Procedure for HV dust monitoring now includes appropriate methods for unit replacement.
6	HV1	No TSP result for sample dates 18/6, 24/6, 30/6, 6/7, 12/7	Samples lost by postal service	N/A
6	HV1	No TSP results for sample dates 3/12, 9/12, 15/12, 21/12.	Samples sent to the laboratory but returned to sender because of incorrect address details. Samples have been re-sent but results not obtained in time for inclusion in the 2014 Annual Return. Results will be communicated to the EPA by separate letter following submission of the 2014 Annual Return.	-
6	DG1	Results for metals were collected over three month sampling periods ending in March, June and October 2014, as well as a one month sample collected in December 2014.	Samples were collected at the end of the March, June and October quarters over a three month sampling period. A one month sample was collected in December 2014 and analysed for metals. These samples were not collected every six months as required in the licence.	Internal investigation conducted and number of actions identified to ensure this does not happen again.
1, 2, 4, 5	McLintock's Shed, Site Office, DG9, Site 52,	No results for all metals for biannual sampling undertaken in June 2014	Internal communication error. Samples were collected for each month but in June 2014, Cowal inadvertently failed to request metals analysis from the laboratory.	Internal investigation conducted and number of actions identified to ensure this does not happen again.

EPA Monitoring Point as per EPL11912	Site Identification	Extent to which monitoring did not occur	Cause of non-compliance	Actions planned to prevent reoccurrence of non-compliance
3	DG5	No results for particulates – deposited matter from August to December 2014	Samples not collected due to unsafe access to Lake Cowal.	Discussions initiated with the EPA in respect of this Monitoring Point. As a result, condition M2.4 of EPL 11912 was varied on 10 October 2014 to provide that at Monitoring Point 3 (dust gauge DG5), monitoring is not required when the water level in Lake Cowal is below 204.5 metres Australian Height Datum and/or when the monitoring site is unable to be accessed safely. The varied condition states that monitoring is required to recommence when the outcome of a risk assessment determines a low or acceptable risk is associated with accessing the monitoring site.
3	DG5	Results for metals were collected over a three month sampling period ending in March and June 2014	Samples were collected at the end of the March and June quarters, not every six months as required in the licence. Access to this monitoring point has been restricted since August 2014 due to the low water level in Lake Cowal.	Once monitoring recommences, metals analysis every six months will resume. It is noted condition M2.4 of EPL 11912 was varied on 10 October 2014 to provide that at Monitoring Point 3 (dust gauge DG5), monitoring is not required when the water level in Lake Cowal is below 204.5 metres Australian Height Datum and/or when the monitoring site is unable to be accessed safely.

EPA Monitoring Point as per EPL11912	Site Identification	Extent to which monitoring did not occur	Cause of non-compliance	Actions planned to prevent reoccurrence of non-compliance
13	D4	No results for all parameters for the majority of May 2014. Also, no results for parameters recorded for weeks beginning 24/2, 17/3, 21/4, 28/4, 15/12, 22/12	Insufficient water in dam to allow for sampling.	N/A.
15, 16	P2, P3	No results for TSS for the week beginning 10/2/14.	Samples inadvertently not collected for analysis from this location. However, it is noted that in any event the water level in Lake Cowal was recorded as 204.1m RL on the 10/2/2014, which is below the 204.5m RL trigger level for lake water sampling as inserted into EPL 11912 on 21 May 2014.	Discussions initiated with the EPA in respect of these Monitoring Points. As a result, condition M2.4 of EPL 11912 was varied on 21 May 2014 to provide that at Monitoring Points 14, 15, 16, 17, and 18, monitoring is not required when the monitoring site is dry or if the water level of Lake Cowal is at or below 204.5 metres Australian Height Datum.
14, 15, 16, 17, 18	P1, P2, P3,B1, B5	No results for all parameters for the majority of July 2014 – December 2014	Samples not collected due to unsafe access to Lake Cowal	N/A

EPA Monitoring Point as per EPL11912	Site Identification	Extent to which monitoring did not occur	Cause of non-compliance	Actions planned to prevent reoccurrence of non-compliance
14, 15, 16, 17, 18	P1, P2, P3, B1, B5	No results for conductivity, pH and TSS for the week beginning 6/1/2014.	Samples not collected due to inclement weather making it unsafe to conduct sampling on Lake Cowal. Water level in Lake Cowal was recorded as 204.26m RL on the 6/1/2014, which is below the 204.5m RL trigger level for lake water sampling as inserted into EPL 11912 on 21 May 2014.	Discussions initiated with the EPA in respect of these Monitoring Points. As a result, condition M2.4 of EPL 11912 was varied on 21 May 2014 to provide that at Monitoring Points 14, 15, 16, 17, and 18, monitoring is not required when the monitoring site is dry or if the water level of Lake Cowal is at or below 204.5 metres Australian Height Datum.
14, 15, 16, 17, 18	P1, P2, P3, B1, B5	No results for conductivity, pH and TSS for the week beginning 24/3/2014.	Samples not collected due to inclement weather making it unsafe to conduct sampling on Lake Cowal. Water level in Lake Cowal was recorded as 203.96m RL on the 24/3/2014, which is below the 204.5m RL trigger level for lake water sampling as inserted into EPL 11912 on 21 May 2014.	Discussions initiated with the EPA in respect of these Monitoring Points. As a result, condition M2.4 of EPL 11912 was varied on 21 May 2014 to provide that at Monitoring Points 14, 15, 16, 17, and 18, monitoring is not required when the monitoring site is dry or if the water level of Lake Cowal is at or below 204.5 metres Australian Height Datum.

EPA Monitoring Point as per EPL11912	Site Identification	Extent to which monitoring did not occur	Cause of non-compliance	Actions planned to prevent reoccurrence of non-compliance
20	P555B	No results for all parameters during the reporting period.	Depth of groundwater is below the extent of the constructed bore.	Cowal has initiated discussions with the EPA as to appropriate course of action in respect of this monitoring point (e.g. whether this monitoring point should be removed from the EPL if appropriate).
23	P412B	No results for all parameters during the reporting period.	Depth of groundwater is below the extent of the constructed bore.	Cowal has initiated discussions with the EPA as to appropriate course of action in respect of this monitoring point (e.g. whether this monitoring point should be removed from the EPL if appropriate).
41	Northern Waste Emplacement Toe Drain	No results for all parameters for quarters 1, 3 and 4. Standing water level also not recorded during the reporting period.	No water was present for sampling during quarters 1, 3 and 4. Standing water level cannot be recorded as this is not a groundwater bore.	Seepage monitoring will continue during the 2015 reporting period when water is available for sampling.
42	Southern Waste Emplacement Toe Drain	No results for all parameters during quarter 1. Standing water level also not recorded during the reporting period.	No water was present for sampling in quarter 1. Standing water level cannot be recorded as this is not a groundwater bore.	Seepage monitoring will continue during the 2015 reporting period when water is available for sampling.

EPA Monitoring Point as per EPL11912	Site Identification	Extent to which monitoring did not occur	Cause of non-compliance	Actions planned to prevent reoccurrence of non-compliance
43	Perimeter Waste Emplacement External Toe Drain	No results for all parameters during the reporting period.	No water present at this location.	Seepage monitoring will continue during the 2015 reporting period when water is available for sampling.
	BM04.1	Ground vibration and airblast-overpressure data not recorded during periods in April, May, June, July, August, December 2014	Network communications fault due to environmental and hardware factors.	Cowal will continue to monitor and rectify issues pertaining to blast monitor maintenance in 2015.
	BM06	Ground vibration and airblast-overpressure data not recorded during periods in May and July 2014	Network communications fault due to environmental and hardware factors.	Cowal will continue to monitor and rectify issues pertaining to blast monitor maintenance in 2015. It is noted that Cowal has removed BM06 in accordance with discussions with the EPA and that the EPL was varied by the EPA on 24 July 2014 to omit reference to BM06.
	BM01	Air blast overpressure level exceedance of condition L5.2 on 26 January 2014	Air blast overpressure exceeded the 95 dB (L) limit for blasting on a Sunday at BM01. Cowal remained in compliance with the 5% exceedance allowable within the 12 month moving window.	Cowal will continue to monitor overpressure levels in 2015.
	BM01	Air blast overpressure level exceedance of condition L5.2 on 2 February 2014	Air blast overpressure exceeded the 95 dB (L) limit for blasting on a Sunday at BM01. Cowal remained in compliance with the 5% exceedance allowable within the 12 month moving window.	Cowal will continue to monitor overpressure levels in 2015.
	BM01	Air blast overpressure level exceedance of condition L5.2 on 9 March 2014	Air blast overpressure exceeded the 95 dB (L) limit for blasting on a Sunday at BM01. Cowal remained in compliance with the 5% exceedance allowable within the 12 month moving window.	Cowal will continue to monitor overpressure levels in 2015.

EPA Monitoring Point as per EPL11912	Site Identification	Extent to which monitoring did not occur	Cause of non-compliance	Actions planned to prevent reoccurrence of non-compliance
	BM01	Air blast overpressure level exceedance of condition L5.2 on 19 April 2014.	Air blast overpressure exceeded the 95 dB (L) limit for blasting on a Saturday at BM01. Cowal remained in compliance with the 5% exceedance allowable within the 12 month moving window.	Cowal will continue to monitor overpressure levels in 2015.
	BM01	Air blast overpressure level exceedance of condition L5.2 on 1 June 2014.	Air blast overpressure exceeded the 95 dB (L) limit for blasting on a Sunday at BM01. Cowal remained in compliance with the 5% exceedance allowable within the 12 month moving window.	Cowal will continue to monitor overpressure levels in 2015.
	BM02	Air blast overpressure level exceedance of condition L5.2 on 9 March 2014.	Air blast overpressure exceeded the 95 dB (L) limit for blasting on a Sunday at BM02. Cowal remained in compliance with the 5% exceedance allowable within the 12 month moving window.	Cowal will continue to monitor overpressure levels in 2015.
	BM02	Air blast overpressure level exceedance of condition L5.2 on 19 April 2014.	Air blast overpressure exceeded the 95 dB (L) limit for blasting on a Saturday at BM02. Cowal remained in compliance with the 5% exceedance allowable within the 12 month moving window.	Cowal will continue to monitor overpressure levels in 2015.
	BM02	Air blast overpressure level exceedance of condition L5.2 on 2 November 2014 at 12:25pm.	Air blast overpressure exceeded the 95 dB (L) limit for blasting on a Sunday at BM02. Cowal remained in compliance with the 5% exceedance allowable within the 12 month moving window.	Cowal will continue to monitor overpressure levels in 2015.
	BM02	Air blast overpressure level exceedance of condition L5.2 on 2 November 2014 at 12:28pm.	Air blast overpressure exceeded the 95 dB (L) limit for blasting on a Sunday at BM02. Cowal remained in compliance with the 5% exceedance allowable within the 12 month moving window.	Cowal will continue to monitor overpressure levels in 2015.
	BM03	Air blast overpressure level exceedance of condition L5.2 on 19 April 2014.	Air blast overpressure exceeded the 95 dB (L) limit for blasting on a Saturday at BM03. Cowal remained in compliance with the 5% exceedance allowable within the 12 month moving window.	Cowal will continue to monitor overpressure levels in 2015.
	BM03	Air blast overpressure level exceedance of condition L5.2 on 20 July 2014.	Air blast overpressure exceeded the 95 dB (L) limit for blasting on a Sunday at BM03. Cowal remained in compliance with the 5% exceedance allowable within the 12 month moving window.	Cowal will continue to monitor overpressure levels in 2015.

EPA Monitoring Point as per EPL11912	Site Identification	Extent to which monitoring did not occur	Cause of non-compliance	Actions planned to prevent reoccurrence of non-compliance
	BM04	Air blast overpressure level exceedance of condition L5.2 on 9 March 2014.	Air blast overpressure exceeded the 95 dB (L) limit for blasting on a Sunday at BM04. Cowal remained in compliance with the 5% exceedance allowable within the 12 month moving window.	Cowal will continue to monitor overpressure levels in 2015.
	BM04	Air blast overpressure level exceedance of condition L5.2 on 6 April 2014.	Air blast overpressure exceeded the 95 dB (L) limit for blasting on a Sunday at BM04. Cowal remained in compliance with the 5% exceedance allowable within the 12 month moving window.	Cowal will continue to monitor overpressure levels in 2015.
	BM04	Air blast overpressure level exceedance of condition L5.2 on 19 April 2014.	Air blast overpressure exceeded the 95 dB (L) limit for blasting on a Saturday at BM04. Cowal remained in compliance with the 5% exceedance allowable within the 12 month moving window.	Cowal will continue to monitor overpressure levels in 2015.
	BM05	Air blast overpressure level exceedance of condition L5.2 on 9 March 2014.	Air blast overpressure exceeded the 95 dB (L) limit for blasting on a Sunday at BM05. Cowal remained in compliance with the 5% exceedance allowable within the 12 month moving window.	Cowal will continue to monitor overpressure levels in 2015.
	BM05	Air blast overpressure level exceedance of condition L5.2 on 6 April 2014.	Air blast overpressure exceeded the 95 dB (L) limit for blasting on a Sunday at BM05. Cowal remained in compliance with the 5% exceedance allowable within the 12 month moving window.	Cowal will continue to monitor overpressure levels in 2015.
	BM06	Air blast overpressure level exceedance of condition L5.2 on 1 January 2014.	Air blast overpressure exceeded the 95 dB (L) limit for blasting on a public holiday (Wednesday) at BM06. Cowal remained in compliance with the 5% exceedance allowable within the 12 month moving window.	Cowal will continue to monitor overpressure levels in 2015. It is noted that Cowal has removed BM06 in accordance with discussions with the EPA and that the EPL was varied by the EPA on 24 July 2014 to omit reference to BM06.

TABLES

Table 1: DWE Groundwater Bores - Standing Water Level

GW090093/3		
Quarter	**Date**	**SWL (mBTOC)**
1	15/01/2014	18.82
	18/02/2014	19.03
	12/03/2014	19.10
2	15/04/2014	18.96
	16/05/2014	18.78
	16/06/2014	18.61
3	8/07/2014	18.57
	11/08/2014	18.64
	18/09/2014	18.70
4	23/10/2014	19.44
	14/11/2014	19.86
	23/12/2014	20.25

GW036523/2		
Quarter	**Date**	**SWL (mBTOC)**
1	15/01/2014	23.88
	18/02/2014	24.02
	12/03/2014	23.52
2	15/04/2014	23.15
	16/05/2014	22.95
	16/06/2014	22.78
3	8/07/2014	22.95
	11/08/2014	22.96
	18/09/2014	23.70
4	23/10/2014	25.01
	14/11/2014	25.68
	23/12/2014	25.04

GW036523/3		
Quarter	**Date**	**SWL (mBTOC)**
1	15/01/2014	7.82
	18/02/2014	8.16
	12/03/2014	8.13
2	15/04/2014	7.82
	16/05/2014	7.67
	16/06/2014	7.50
3	8/07/2014	7.44
	11/08/2014	7.41
	18/09/2014	7.58
4	23/10/2014	8.89
	14/11/2014	8.90
	23/12/2014	9.32

Table 1: DWE Groundwater Bores - Standing Water Level

GW036524/1		
Quarter	**Date**	**SWL (mBTOC)**
1	-	-
	26/02/2014	5.85
	-	-
2	-	-
	-	-
	19/06/2014	5.85
3	-	-
	13/08/2014	5.87
	18/09/2014	5.80
4	23/10/2014	5.85
	19/11/2014	5.87
	-	-

GW036528/1		
Quarter	**Date**	**SWL (mBTOC)**
1	15/01/2014	5.18
	18/02/2014	5.08
	12/03/2014	5.19
2	15/04/2014	5.25
	16/05/2014	5.58
	16/06/2014	5.31
3	8/07/2014	5.43
	11/08/2014	5.63
	18/09/2014	5.26
4	23/10/2014	5.17
	14/11/2014	5.31
	-	-

GW036528/2		
Quarter	**Date**	**SWL (mBTOC)**
1	15/01/2014	6.37
	18/02/2014	6.40
	12/03/2014	6.45
2	15/04/2014	6.45
	16/05/2014	6.50
	16/06/2014	6.40
3	8/07/2014	6.40
	11/08/2014	6.44
	18/09/2014	6.80
4	23/10/2014	7.62
	14/11/2014	7.48
	-	-

Table 1: DWE Groundwater Bores - Standing Water Level

GW036528/3		
Quarter	**Date**	**SWL (mBTOC)**
1	15/01/2014	7.63
	18/02/2014	7.73
	12/03/2014	7.76
2	15/04/2014	7.78
	16/05/2014	7.75
	16/06/2014	7.66
3	8/07/2014	7.65
	11/08/2014	7.60
	18/09/2014	9.05
4	23/10/2014	11.76
	14/11/2014	11.36
	-	-

GW036551/1		
Quarter	**Date**	**SWL (mBTOC)**
1	15/01/2014	4.46
	18/02/2014	4.48
	12/03/2014	4.55
2	15/04/2014	4.57
	16/05/2014	4.67
	16/06/2014	4.61
3	8/07/2014	4.59
	11/08/2014	4.68
	18/09/2014	4.67
4	23/10/2014	4.76
	14/11/2014	4.78
	23/12/2014	4.79

GW036551/2		
Quarter	**Date**	**SWL (mBTOC)**
1	15/01/2014	6.01
	18/02/2014	6.18
	12/03/2014	6.22
2	15/04/2014	6.19
	16/05/2014	6.09
	16/06/2014	5.99
3	8/07/2014	6.01
	11/08/2014	5.92
	18/09/2014	8.44
4	23/10/2014	9.84
	14/11/2014	11.41
	23/12/2014	8.52

Table 1: DWE Groundwater Bores - Standing Water Level

GW036552/1		
Quarter	**Date**	**SWL (mBTOC)**
1	15/01/2014	5.31
	18/02/2014	5.30
	12/03/2014	5.35
2	15/04/2014	5.43
	16/05/2014	5.58
	16/06/2014	5.46
3	8/07/2014	5.44
	11/08/2014	5.56
	18/09/2014	5.43
4	23/10/2014	5.57
	14/11/2014	5.64
	-	-

GW036552/2		
Quarter	**Date**	**SWL (mBTOC)**
1	15/01/2014	6.96
	18/02/2014	7.17
	12/03/2014	7.22
2	15/04/2014	7.12
	16/05/2014	7.00
	16/06/2014	6.85
3	8/07/2014	6.81
	11/08/2014	6.77
	18/09/2014	7.75
4	23/10/2014	9.78
	14/11/2014	9.70
	-	-

GW036552/3		
Quarter	**Date**	**SWL (mBTOC)**
1	15/01/2014	16.84
	18/02/2014	17.08
	12/03/2014	17.06
2	15/04/2014	16.87
	16/05/2014	16.67
	16/06/2014	16.49
3	8/07/2014	16.44
	11/08/2014	16.45
	18/09/2014	16.63
4	23/10/2014	17.88
	14/11/2014	18.27
	-	-

Table 1: DWE Groundwater Bores - Standing Water Level

GW036553/1 (Bland Creek Paleochannel Borefield)			
Quarter	**Date**	**SWL (mBTOC)**	**Trigger Level (mBTOC)**
1	15/01/2014	50.03	71.87
	26/02/2014	48.63	71.87
	14/03/2014	52.63	71.87
2	28/04/2014	49.45	71.87
	19/05/2014	52.61	71.87
	19/06/2014	55.65	71.87
3	18/07/2014	54.18	71.87
	13/08/2014	56.55	71.87
	18/09/2014	59.03	71.87
4	23/10/2014	54.01	71.87
	19/11/2014	50.17	71.87
	-	-	71.87

** Please note – the trigger level referred to in the above table is the 137.5m AHD trigger and assumes the TOC is at 209.37m*

GW036594/1		
Quarter	**Date**	**SWL (mBTOC)**
1	15/01/2014	7.45
	26/02/2014	7.42
	14/03/2014	7.43
2	28/04/2014	7.46
	19/05/2014	7.47
	19/06/2014	7.48
3	18/07/2014	7.39
	13/08/2014	7.50
	18/09/2014	7.40
4	23/10/2014	7.43
	19/11/2014	7.44
	-	-

GW036594/2		
Quarter	**Date**	**SWL (mBTOC)**
1	15/01/2014	15.17
	26/02/2014	15.17
	14/03/2014	15.13
2	28/04/2014	15.15
	19/05/2014	15.10
	19/06/2014	15.08
3	18/07/2014	15.10
	13/08/2014	15.11
	18/09/2014	15.03
4	23/10/2014	15.15
	19/11/2014	15.18
	-	-

Table 1: DWE Groundwater Bores - Standing Water Level

GW036595/1		
Quarter	**Date**	**SWL (mBTOC)**
1	15/01/2014	14.62
	26/02/2014	14.63
	14/03/2014	14.64
2	28/04/2014	14.68
	19/05/2014	14.70
	19/06/2014	14.70
3	18/07/2014	14.69
	13/08/2014	14.75
	18/09/2014	14.77
4	24/10/2014	14.81
	19/11/2014	14.85
	-	-

GW036596/1		
Quarter	**Date**	**SWL (mBTOC)**
1	15/01/2014	20.10
	26/02/2014	20.20
	14/03/2014	20.13
2	28/04/2014	20.12
	19/05/2014	20.03
	19/06/2014	19.93
3	18/07/2014	19.95
	13/08/2014	22.57
	18/09/2014	22.68
4	24/10/2014	23.25
	19/11/2014	24.50
	-	-

GW036596/2		
Quarter	**Date**	**SWL (mBTOC)**
1	15/01/2014	33.45
	26/02/2014	33.65
	14/03/2014	33.49
2	28/04/2014	33.43
	19/05/2014	33.19
	19/06/2014	33.01
3	18/07/2014	33.11
	13/08/2014	40.96
	18/09/2014	40.03
4	24/10/2014	42.16
	19/11/2014	44.95
	-	-

Table 1: DWE Groundwater Bores - Standing Water Level

GW036597/1 (Billabong Area)		
Quarter	**Date**	**SWL (mBTOC)**
1	15/01/2014	33.82
	26/02/2014	37.03
	14/03/2014	39.81
2	28/04/2014	34.67
	19/05/2014	35.46
	19/06/2014	33.08
3	-	-
	19/06/2014	39.3
	-	-
4	-	-
	19/11/2014	49.06
	-	-

GW036597/2		
Quarter	**Date**	**SWL (mBTOC)**
1	15/01/2014	34.21
	26/02/2014	37.20
	14/03/2014	40.25
2	28/04/2014	34.97
	19/05/2014	35.89
	19/06/2014	33.46
3	-	-
	19/06/2014	40.03
	-	-
4	-	-
	19/11/2014	49.79
	-	-

GW036604/1		
Quarter	**Date**	**SWL (mBTOC)**
1	7/01/2014	35.78
	26/02/2014	35.60
	14/03/2014	35.60
2	28/04/2014	35.87
	19/05/2014	35.96
	19/06/2014	35.73
3	18/07/2014	35.59
	13/08/2014	35.65
	18/09/2014	35.85
4	24/10/2014	35.79
	19/11/2014	36.21
	-	-

Table 1: DWE Groundwater Bores - Standing Water Level

GW036605/1		
Quarter	**Date**	**SWL (mBTOC)**
1	7/01/2014	33.18
	26/02/2014	33.23
	14/03/2014	33.24
2	28/04/2014	33.29
	19/05/2014	33.30
	19/06/2014	33.26
3	18/07/2014	33.21
	13/08/2014	33.23
	18/09/2014	33.26
4	24/10/2014	33.51
	19/11/2014	33.80
	-	-

GW036609/1		
Quarter	**Date**	**SWL (mBTOC)**
1	15/01/2014	49.84
	26/02/2014	48.45
	14/03/2014	51.58
2	28/04/2014	48.94
	19/05/2014	53.10
	19/06/2014	54.31
3	18/07/2014	52.67
	13/08/2014	57.07
	18/09/2014	59.82
4	23/10/2014	54.10
	19/11/2014	50.67
	-	-

GW036610/1		
Quarter	**Date**	**SWL (mBTOC)**
1	15/01/2014	28.12
	26/02/2014	28.11
	14/03/2014	28.11
2	28/04/2014	28.15
	19/05/2014	28.16
	19/06/2014	28.14
3	18/07/2014	28.12
	13/08/2014	28.15
	18/09/2014	28.23
4	24/10/2014	28.40
	19/11/2014	28.54
	-	-

Table 1: DWE Groundwater Bores - Standing Water Level

GW036611/1 (Maslin Area)		
Quarter	**Date**	**SWL (mBTOC)**
1	15/01/2014	36.72
	26/02/2014	36.86
	14/03/2014	36.71
2	28/04/2014	36.63
	19/05/2014	36.39
	19/06/2014	36.23
3	18/07/2014	36.38
	13/08/2014	46.82
	18/09/2014	43.25
4	24/10/2014	48.41
	19/11/2014	50.37
	-	-

GW036613/1		
Quarter	**Date**	**SWL (mBTOC)**
1	15/01/2014	17.57
	26/02/2014	17.58
	14/03/2014	17.60
2	28/04/2014	17.64
	19/05/2014	17.66
	19/06/2014	17.63
3	18/07/2014	17.60
	13/08/2014	17.66
	18/09/2014	17.63
4	24/10/2014	17.68
	19/11/2014	17.72
	-	-

GW036632/1		
Quarter	**Date**	**SWL (mBTOC)**
1	7/01/2014	44.39
	26/02/2014	44.27
	14/03/2014	44.20
2	28/04/2014	44.10
	19/05/2014	44.08
	19/06/2014	44.00
3	18/07/2014	43.92
	13/08/2014	43.94
	18/09/2014	43.89
4	24/10/2014	43.89
	19/11/2014	43.87
	-	-

Table 1: DWE Groundwater Bores - Standing Water Level

GW036700/1		
Quarter	**Date**	**SWL (mBTOC)**
1	26/02/2014	16.17
	-	-
	-	-
2	-	-
	-	-
	19/06/2014	16.17
3	-	-
	13/08/2014	16.24
	-	-
4	-	-
	19/11/2014	16.30
	-	-

GW039379/1		
Quarter	**Date**	**SWL (mBTOC)**
1	7/01/2014	35.42
	26/02/2014	35.50
	14/03/2014	35.47
2	28/04/2014	35.50
	19/05/2014	35.52
	19/06/2014	35.50
3	18/07/2014	35.46
	13/08/2014	35.43
	18/09/2014	35.44
4	24/10/2014	35.64
	19/11/2014	35.95
	-	-

GW090093/1		
Quarter	**Date**	**SWL (mBTOC)**
1	15/01/2014	6.58
	18/02/2014	6.58
	12/03/2014	6.56
2	15/04/2014	6.63
	16/05/2014	6.68
	16/06/2014	6.63
3	8/07/2014	5.58
	11/08/2014	6.62
	18/09/2014	6.54
4	23/10/2014	6.57
	14/11/2014	6.62
	23/12/2014	6.69

Table 1: DWE Groundwater Bores - Standing Water Level

GW090093/2		
Quarter	**Date**	**SWL (mBTOC)**
1	15/01/2014	6.59
	18/02/2014	6.92
	12/03/2014	6.94
2	15/04/2014	6.67
	16/05/2014	6.49
	16/06/2014	6.32
3	8/07/2014	6.24
	11/08/2014	6.22
	18/09/2014	6.33
4	23/10/2014	7.73
	14/11/2014	7.75
	23/12/2014	8.23

Note: Data above was provided by the NSW Office of Water.

Table 2: Groundwater Bores - Water Quality

P412A					
Quarter	**Date**	**SWL (mBTOC)**	**pH-Field**	**EC-Field (µS/cm)**	**Interpretation**
1	14/01/2014	13.164	6.60	42010	SWL and pH remained relatively constant throughout the reporting period. EC remained constant throughout the reporting period with the exception of November.
	12/02/2014	13.081	6.61	41200	
	14/03/2014	13.048	6.40	40790	
2	30/04/2014	13.035	6.16	41800	
	19/05/2014	13.062	6.87	42170	
	17/06/2014	13.068	6.75	42190	
3	23/07/2014	12.966	6.81	41720	
	14/08/2014	13.027	6.67	41600	
	24/09/2014	12.867	6.55	43300	
4	9/10/2014	12.883	6.68	43300	
	25/11/2014	12.812	6.60	48090	
	4/12/2014	12.746	6.58	42310	

P412A-R					
Quarter	**Date**	**SWL (mBTOC)**	**pH-Field**	**EC-Field (µS/cm)**	**Interpretation**
1	14/01/2014	11.886	6.47	44090	SWL and pH remained relatively constant throughout the reporting period. EC remained constant throughout the reporting period with the exception of November.
	12/02/2014	11.874	6.14	44860	
	14/03/2014	11.863	6.27	42590	
2	30/04/2014	11.913	5.99	44110	
	19/05/2014	11.911	6.71	44240	
	17/06/2014	11.853	6.62	44270	
3	23/07/2014	11.773	6.66	43900	
	14/08/2014	11.795	6.50	43730	
	24/09/2014	11.596	6.40	45400	
4	9/10/2014	11.591	6.54	45100	
	25/11/2014	11.597	6.38	50550	
	4/12/2014	11.557	6.52	44550	

P412B					
Quarter	**Date**	**SWL (mBTOC)**	**pH-Field**	**EC-Field (µS/cm)**	**Interpretation**
1	Dry				The bore has been dry since 2005 due to hydrologic conditions.
2	Dry				
3	Dry				
4	Dry				

Table 2: Groundwater Bores - Water Quality

P414A					
Quarter	**Date**	**SWL (mBTOC)**	**pH-Field**	**EC-Field (µS/cm)**	**Interpretation**
1	15/01/2014	13.305	6.62	40350	SWL and pH remained relatively constant throughout the reporting period. EC remained constant throughout the reporting period with the exception of November.
	12/02/2014	13.227	6.26	41030	
	7/03/2014	13.265	6.70	39110	
2	8/04/2014	13.405	6.70	39810	
	14/05/2014	13.253	6.70	40360	
	16/06/2014	13.210	6.72	40420	
3	22/07/2014	13.152	6.78	40130	
	14/08/2014	13.025	6.67	39900	
	17/09/2014	13.037	6.66	42000	
4	7/10/2014	13.016	6.70	41300	
	26/11/2014	13.059	6.47	46130	
	3/12/2014	12.990	6.61	40630	

P414B					
Quarter	**Date**	**SWL (mBTOC)**	**pH-Field**	**EC-Field (µS/cm)**	**Interpretation**
1	22/01/2014	13.305	6.91	40450	SWL and pH remained relatively constant throughout the reporting period. EC remained relatively constant throughout the reporting period.
	13/02/2014	13.254	6.52	41990	
	13/03/2014	13.352	6.68	38770	
2	16/04/2014	13.272	6.49	39920	
	14/05/2014	13.282	6.92	40950	
	26/06/2014	13.240	6.88	40710	
3	17/07/2014	13.144	6.70	39960	
	20/08/2014	13.194	6.53	40300	
	23/09/2014	13.130	6.53	42200	
4	3/10/2014	13.107	6.65	41100	
	12/11/2014	13.042	6.75	40700	
	5/12/2014	12.692	6.29	40710	

P417A					
Quarter	**Date**	**SWL (mBTOC)**	**pH-Field**	**EC-Field (µS/cm)**	**Interpretation**
1	7/01/2014	12.860	6.45	44150	SWL and pH remained relatively constant throughout the reporting period. EC remained relatively constant throughout the reporting period.
	6/02/2014	12.846	6.53	40080	
	5/03/2014	12.837	6.59	42630	
2	14/04/2014	13.174	6.58	43790	
	14/05/2014	12.871	6.63	44080	
	10/06/2014	12.847	6.67	43450	
3	22/07/2014	12.820	6.65	43760	
	13/08/2014	12.846	6.54	43510	
	23/09/2014	12.790	6.58	45300	
4	7/10/2014	12.753	6.61	45100	
	14/11/2014	12.728	6.63	44650	
	4/12/2014	12.741	6.52	44420	

Table 2: Groundwater Bores - Water Quality

P417B					
Quarter	**Date**	**SWL (mBTOC)**	**pH-Field**	**EC-Field (µS/cm)**	**Interpretation**
1	22/01/2014	12.814	6.94	39250	SWL and pH remained relatively constant throughout the reporting period. EC remained relatively constant throughout the reporting period.
	12/02/2014	12.792	7.21	39630	
	13/03/2014	12.803	6.80	37670	
2	16/04/2014	12.801	6.73	38680	
	14/05/2014	12.831	6.75	37880	
	26/06/2014	12.798	7.01	40170	
3	17/07/2014	12.745	6.88	39270	
	20/08/2014	12.775	6.88	38870	
	23/09/2014	12.762	6.52	41000	
4	3/10/2014	12.749	6.75	40500	
	12/11/2014	12.723	6.77	40700	
	5/12/2014	12.692	6.63	39960	

P418A					
Quarter	**Date**	**SWL (mBTOC)**	**pH-Field**	**EC-Field (µS/cm)**	**Interpretation**
1	7/01/2014	10.667	6.44	44710	SWL and pH remained relatively constant throughout the reporting period. EC remained relatively constant throughout the reporting period.
	6/02/2014	10.660	6.45	45210	
	4/03/2014	10.658	6.44	43090	
2	9/04/2014	10.636	6.54	43830	
	6/05/2014	10.621	6.41	44450	
	17/06/2014	10.585	6.59	44660	
3	8/07/2014	10.492	6.53	44810	
	12/08/2014	10.538	6.47	44420	
	11/09/2014	10.488	6.46	48200	
4	7/10/2014	10.465	6.56	46300	
	14/11/2014	10.470	6.56	45300	
	3/12/2014	10.490	6.42	45300	

P418B					
Quarter	**Date**	**SWL (mBTOC)**	**pH-Field**	**EC-Field (µS/cm)**	**Interpretation**
1	7/01/2014	10.635	6.47	41480	SWL was slightly lower in April however both SWL and pH remained relatively constant throughout the reporting period. EC remained relatively constant throughout the reporting period.
	6/02/2014	10.617	6.52	41890	
	4/03/2014	10.623	6.45	40170	
2	9/04/2014	12.710	6.57	40420	
	6/05/2014	10.593	6.43	41510	
	6/06/2014	10.547	6.46	40830	
3	8/07/2014	10.464	6.51	41530	
	12/08/2014	10.502	6.39	41050	
	11/09/2014	10.456	6.45	44500	
4	7/10/2014	10.431	6.50	42700	
	14/11/2014	10.434	6.56	41850	
	3/12/2014	10.443	6.46	41990	

Table 2: Groundwater Bores - Water Quality

P555A					
Quarter	**Date**	**SWL (mBTOC)**	**pH-Field**	**EC-Field (µS/cm)**	**Interpretation**
1	Dry				The bore has been dry since 2005 due to natural hydrologic conditions.
2	Dry				
3	Dry				
4	Dry				

P555A-R					
Quarter	**Date**	**SWL (mBTOC)**	**pH-Field**	**EC-Field (µS/cm)**	**Interpretation**
1	7/01/2014	21.105	6.66	30860	SWL and pH remained relatively constant throughout the reporting period. EC remained relatively constant throughout the reporting period.
	6/02/2014	21.115	6.65	31490	
	7/03/2014	21.120	6.67	29750	
2	14/04/2014	21.113	6.73	30490	
	6/05/2014	21.143	6.58	30640	
	10/06/2014	21.171	6.81	30280	
3	8/07/2014	21.030	6.72	30790	
	12/08/2014	21.133	6.67	30390	
	11/09/2014	21.065	6.66	32800	
4	7/10/2014	21.035	6.78	31600	
	17/11/2014	21.070	6.81	31080	
	4/12/2014	21.043	6.63	30990	

P555B					
Quarter	**Date**	**SWL (mBTOC)**	**pH-Field**	**EC-Field (µS/cm)**	**Interpretation**
1	Dry				The bore has been dry since 2005 due to natural hydrologic conditions.
2	Dry				
3	Dry				
4	Dry				

P558A-R					
Quarter	**Date**	**SWL (mBTOC)**	**pH-Field**	**EC-Field (µS/cm)**	**Interpretation**
1	7/01/2014	19.573	6.60	32420	SWL and pH remained relatively constant throughout the reporting period. EC remained relatively constant throughout the reporting period.
	6/02/2014	19.622	6.67	33180	
	5/03/2014	19.620	6.73	31910	
2	14/04/2014	21.683	6.71	32340	
	6/05/2014	19.642	6.62	33200	
	10/06/2014	19.716	6.81	32900	
3	8/07/2014	19.618	6.74	33530	
	12/08/2014	19.677	6.68	33150	
	11/09/2014	19.615	6.64	35900	
4	7/10/2014	19.566	6.75	34300	
	17/11/2014	19.562	6.82	34070	
	4/12/2014	19.550	6.63	33930	

Table 2: Groundwater Bores - Water Quality

P561A					
Quarter	**Date**	**SWL (mBTOC)**	**pH-Field**	**EC-Field (µS/cm)**	**Interpretation**
1	7/01/2014	10.282	Not Monitored	Not Monitored	
	6/02/2014	10.312			
	4/03/2014	10.339			
2	9/04/2014	10.316			
	6/05/2014	10.285			
	6/06/2014	10.265			
3	8/07/2014	10.145			
	12/08/2014	10.182			
	11/09/2014	10.15			
4	7/10/2014	10.132			
	5/11/2014	10.187			
	3/12/2014	10.243			

P561B					
Quarter	**Date**	**SWL (mBTOC)**	**pH-Field**	**EC-Field (µS/cm)**	**Interpretation**
1	7/01/2014	10.286	Not Monitored	Not Monitored	
	6/02/2014	10.323			
	4/03/2014	10.37			
2	9/04/2014	10.37			
	6/05/2014	10.327			
	6/06/2014	10.303			
3	8/07/2014	10.202			
	12/08/2014	10.229			
	11/09/2014	10.177			
4	7/10/2014	10.163			
	5/11/2014	10.227			
	3/12/2014	10.274			

TSFNA					
Quarter	**Date**	**SWL (mBTOC)**	**pH-Field**	**EC-Field (µS/cm)**	**Interpretation**
1	13/01/2014	13.042	6.60	47500	SWL and pH remained relatively constant throughout the reporting period. EC remained relatively constant throughout the reporting period with the exception of November.
	11/02/2014	13.252	6.58	48090	
	13/03/2014	13.014	6.62	45940	
2	9/04/2014	13.020	6.67	46660	
	19/05/2014	12.924	6.77	47490	
	16/06/2014	12.915	6.66	47450	
3	24/07/2014	12.893	6.77	47110	
	13/08/2014	12.912	6.60	46870	
	17/09/2014	12.860	6.61	49200	
4	16/10/2014	12.878	6.65	47200	
	28/11/2014	12.907	6.57	54190	
	11/12/2014	12.892	6.59	47710	

Table 2: Groundwater Bores - Water Quality

TSFNB					
Quarter	**Date**	**SWL (mBTOC)**	**pH-Field**	**EC-Field (µS/cm)**	**Interpretation**
1	13/01/2014	13.194	6.50	45040	SWL and pH remained relatively constant throughout the reporting period. EC remained relatively constant throughout the reporting period with the exception of November.
	11/02/2014	13.158	6.47	45690	
	13/03/2014	13.187	6.48	43490	
2	9/04/2014	13.198	6.51	43680	
	19/05/2014	13.203	6.70	44860	
	16/06/2014	13.153	6.54	44860	
3	24/07/2014	13.146	6.56	44650	
	13/08/2014	13.180	6.44	44310	
	17/09/2014	13.073	6.45	45700	
4	16/10/2014	13.093	6.50	44800	
	28/11/2014	13.077	6.38	51250	
	11/12/2014	13.025	6.54	45180	

TSFNC					
Quarter	**Date**	**SWL (mBTOC)**	**pH-Field**	**EC-Field (µS/cm)**	**Interpretation**
1	13/01/2014	13.392	6.08	46100	SWL and pH remained relatively constant throughout the reporting period. EC remained relatively constant throughout the reporting period with the exception of November.
	11/02/2014	13.346	6.07	47160	
	13/03/2014	13.372	6.09	46300	
2	9/04/2014	13.383	6.09	47160	
	19/05/2014	13.411	6.22	47710	
	16/06/2014	13.371	6.16	42770	
3	24/07/2014	13.320	6.27	47300	
	13/08/2014	13.406	6.17	47630	
	17/09/2014	13.261	5.96	50800	
4	16/10/2014	13.293	6.01	48200	
	28/11/2014	13.306	5.86	54600	
	11/12/2014	13.207	6.46	48380	

MON01A					
Quarter	**Date**	**SWL (mBTOC)**	**pH-Field**	**EC-Field (µS/cm)**	**Interpretation**
1	7/01/2014	12.051	6.41	45980	SWL and pH remained relatively constant throughout the reporting period. EC remained relatively constant throughout the reporting period.
	10/02/2014	12.048	6.50	46550	
	13/03/2014	12.046	6.50	44330	
2	14/04/2014	12.042	6.55	45450	
	14/05/2014	12.044	6.57	45620	
	11/06/2014	11.985	6.62	45090	
3	22/07/2014	11.945	6.59	45340	
	14/08/2014	11.970	6.48	45220	
	23/09/2014	11.910	6.33	47400	
4	7/10/2014	11.853	6.52	47200	
	25/11/2014	11.863	6.41	52280	
	15/12/2014	11.842	6.43	45940	

Table 2: Groundwater Bores - Water Quality

MON01B					
Quarter	**Date**	**SWL (mBTOC)**	**pH-Field**	**EC-Field (µS/cm)**	**Interpretation**
1	22/01/2014	13.620	5.35	39860	SWL and pH remained relatively constant throughout the reporting period. EC remained relatively constant throughout the reporting period.
	13/02/2014	13.593	6.62	41990	
	13/03/2014	13.640	6.11	40110	
2	16/04/2014	13.622	5.71	42020	
	14/05/2014	13.660	6.00	40060	
	26/06/2014	13.615	5.72	42690	
3	17/07/2014	13.544	5.75	44470	
	20/08/2014	13.574	6.69	43160	
	23/09/2014	13.578	4.80	47400	
4	3/10/2014	13.543	5.03	44800	
	12/11/2014	13.480	4.92	46500	
	5/12/2014	13.436	6.38	46540	

MON02A					
Quarter	**Date**	**SWL (mBTOC)**	**pH-Field**	**EC-Field (µS/cm)**	**Interpretation**
1	14/01/2014	12.645	6.59	39480	SWL and pH remained relatively constant throughout the reporting period. EC remained relatively constant throughout the reporting period.
	7/02/2014	12.649	6.65	40310	
	13/03/2014	12.577	6.67	38400	
2	15/04/2014	12.543	6.76	39300	
	12/05/2014	12.338	6.76	39580	
	16/06/2014	12.123	6.71	39700	
3	23/07/2014	11.943	6.83	39370	
	14/08/2014	11.973	6.66	39140	
	11/09/2014	11.778	6.59	41500	
4	28/10/2014	11.720	6.73	40700	
	17/11/2014	11.672	6.83	40360	
	4/12/2014	11.618	6.57	39850	

MON02B					
Quarter	**Date**	**SWL (mBTOC)**	**pH-Field**	**EC-Field (µS/cm)**	**Interpretation**
1	14/01/2014	12.816	6.74	31100	SWL and pH remained relatively constant throughout the reporting period. EC dropped at the end of quarter 2 and into quarter 3.
	7/02/2014	12.742	6.78	32960	
	11/03/2014	12.684	6.90	24820	
2	15/04/2014	13.172	6.97	25250	
	12/05/2014	12.620	6.95	30070	
	16/06/2014	12.371	7.06	15370	
3	23/07/2014	12.241	7.09	19350	
	14/08/2014	12.253	6.84	28860	
	11/09/2014	12.103	6.75	35500	
4	9/10/2014	11.962	6.87	37200	
	17/11/2014	11.754	6.97	35180	
	4/12/2014	11.665	6.70	34260	

Table 2: Groundwater Bores - Water Quality

PDB1A					
Quarter	**Date**	**SWL**	**pH-Field**	**EC-Field**	**Interpretation**
1	13/01/2014	13.468	6.37	52160	SWL and pH remained relatively constant throughout the reporting period. EC remained relatively constant throughout the reporting period with the exception of November.
	6/02/2014	13.518	6.36	52810	
	14/03/2014	13.484	6.31	50370	
2	8/04/2014	13.545	6.43	51160	
	12/05/2014	13.518	6.48	52020	
	10/06/2014	13.578	6.55	51280	
3	8/07/2014	13.577	6.45	52140	
	13/08/2014	13.810	6.39	51450	
	17/09/2014	13.889	6.38	53700	
4	7/10/2014	13.971	6.45	53000	
	17/11/2014	14.108	6.50	53050	
	4/12/2014	14.162	6.32	52320	

PDB1B					
Quarter	**Date**	**SWL (mBTOC)**	**pH-Field**	**EC-Field (µS/cm)**	**Interpretation**
1	13/01/2014	5.871	6.18	48800	SWL and pH remained relatively constant throughout the reporting period. EC remained relatively constant throughout the reporting period.
	6/02/2014	5.895	6.13	49280	
	14/03/2014	5.896	5.96	47070	
2	8/04/2014	5.944	6.28	47860	
	12/05/2014	6.002	6.29	48610	
	10/06/2014	5.993	6.30	47950	
3	8/07/2014	5.953	6.15	48790	
	12/08/2014	6.100	6.23	48090	
	17/09/2014	6.084	6.08	50500	
4	7/10/2014	6.096	6.19	49900	
	17/11/2014	6.214	6.22	50420	
	4/12/2014	6.242	6.35	48990	

PDB3A					
Quarter	**Date**	**SWL**	**pH-Field**	**EC-Field**	**Interpretation**
1	8/01/2014	78.268	6.41	46930	SWL and pH remained relatively constant throughout the reporting period. EC remained relatively constant throughout the reporting period.
	13/02/2014	78.745	6.73	50410	
	5/03/2014	79.010	6.41	49780	
2	15/04/2014	79.390	6.45	51190	
	7/05/2014	79.548	6.93	51150	
	18/06/2014	80.766	6.70	49950	
3	24/07/2014	79.837	6.62	51450	
	20/08/2014	80.070	6.59	50010	
	30/09/2014	80.231	6.58	52300	
4	9/10/2014	80.336	6.60	52900	
	28/11/2014	80.620	6.41	47180	
	9/12/2014	80.650	6.79	51560	

Table 2: Groundwater Bores - Water Quality

PDB3B					
Quarter	**Date**	**SWL (mBTOC)**	**pH-Field**	**EC-Field (µS/cm)**	**Interpretation**
1	7/01/2014	17.677	5.98	49690	SWL and pH remained relatively constant throughout the reporting period. EC remained relatively constant throughout the reporting period with the exception of November.
	7/02/2014	17.745	6.00	50340	
	5/03/2014	17.796	6.16	47910	
2	15/04/2014	17.935	6.21	49000	
	19/05/2014	18.020	6.32	49390	
	11/06/2014	18.077	6.27	48680	
3	24/07/2014	18.158	6.48	49410	
	14/08/2014	18.207	6.20	48830	
	30/09/2014	18.291	6.00	50600	
4	9/10/2014	18.317	6.09	50500	
	28/11/2014	18.453	5.86	56230	
	15/12/2014	18.504	6.03	49960	

PDB5A					
Quarter	**Date**	**SWL**	**pH-Field**	**EC-Field**	**Interpretation**
1	14/01/2014	27.285	6.18	49320	SWL and pH remained relatively constant throughout the reporting period. EC remained relatively constant throughout the reporting period.
	11/02/2014	27.478	6.26	50250	
	11/03/2014	27.708	6.25	47910	
2	15/04/2014	27.993	6.31	48990	
	14/05/2014	28.331	6.34	49510	
	11/06/2014	28.514	6.43	48930	
3	22/07/2014	28.681	6.41	49310	
	13/08/2014	28.782	6.33	49100	
	10/09/2014	28.865	6.23	53100	
4	21/10/2014	29.110	6.24	49400	
	17/11/2014	29.263	6.40	51240	
	3/12/2014	29.494	6.30	49980	

PDB5B					
Quarter	**Date**	**SWL (mBTOC)**	**pH-Field**	**EC-Field (µS/cm)**	**Interpretation**
1	14/01/2014	10.900	5.88	48690	SWL became progressively lower over the reporting period. pH remained relatively constant throughout the reporting period. EC remained relatively constant throughout the reporting period.
	11/02/2014	11.341	5.93	49480	
	11/03/2014	11.971	5.92	47240	
2	15/04/2014	12.621	6.02	48430	
	14/05/2014	13.213	6.06	48690	
	11/06/2014	13.697	6.10	47990	
3	22/07/2014	14.135	6.10	48290	
	13/08/2014	14.378	6.00	48070	
	10/09/2014	14.552	5.87	52300	
4	21/10/2014	15.018	5.89	48500	
	17/11/2014	15.313	6.01	50270	
	15/12/2014	15.672	5.90	48970	

Table 2: Groundwater Bores - Water Quality

PP01					
Quarter	**Date**	**SWL (mBTOC)**	**pH-Field**	**EC-Field (µS/cm)**	**Interpretation**
1	23/01/2014	20.691	6.54	45940	SWL and pH remained relatively constant throughout the reporting period. EC remained relatively constant throughout the reporting period with the exception of November.
	14/02/2014	20.670	6.45	45290	
	17/03/2014	20.755	6.30	44320	
2	30/04/2014	20.757	6.02	45990	
	20/05/2014	20.810	6.69	45788	
	30/06/2014	20.690	6.43	46090	
3	17/07/2014	20.527	6.54	45560	
	18/08/2014	20.550	6.51	44920	
	30/09/2014	20.610	6.46	47200	
4	28/10/2014	20.674	6.45	46800	
	28/11/2014	20.608	6.18	53030	
	23/12/2014	20.610	6.83	45710	

PP02					
Quarter	**Date**	**SWL (mBTOC)**	**pH-Field**	**EC-Field (µS/cm)**	**Interpretation**
1	23/01/2014	17.630	6.54	43110	SWL and pH remained relatively constant throughout the reporting period. EC remained relatively constant throughout the reporting period with the exception of November.
	20/02/2014	17.675	6.60	43050	
	17/03/2014	17.714	6.42	43020	
2	15/04/2014	17.745	6.52	43860	
	20/05/2014	17.801	6.57	43740	
	30/06/2014	17.795	6.57	44760	
3	17/07/2014	17.765	6.72	44010	
	18/08/2014	17.788	6.44	43760	
	30/09/2014	17.822	6.52	45000	
4	28/10/2014	17.826	6.56	45000	
	28/11/2014	17.843	6.22	40260	
	5/12/2014	17.850	6.72	44610	

PP03					
Quarter	**Date**	**SWL (mBTOC)**	**pH-Field**	**EC-Field (µS/cm)**	**Interpretation**
1	23/01/2014	17.102	7.25	7406	SWL and pH remained relatively constant throughout the reporting period. EC remained relatively constant throughout the reporting period with the exception of December.
	20/02/2014	17.170	7.48	7329	
	17/03/2014	17.198	6.93	7248	
2	15/04/2014	17.643	6.96	7650	
	22/05/2014	17.338	7.36	7688	
	30/06/2014	17.398	7.80	7665	
3	17/07/2014	17.392	7.20	7744	
	18/08/2014	17.413	7.50	8679	
	30/09/2014	17.470	7.36	8330	
4	28/10/2014	17.479	7.33	8640	
	28/11/2014	17.275	7.16	7577	
	23/12/2014	17.296	7.53	3056	

Table 2: Groundwater Bores - Water Quality

PP04					
Quarter	**Date**	**SWL (mBTOC)**	**pH-Field**	**EC-Field (µS/cm)**	**Interpretation**
1	23/01/2014	15.806	6.56	45910	SWL and pH remained relatively constant throughout the reporting period. EC remained relatively constant throughout the reporting period with the exception of November.
	14/02/2014	15.858	6.54	45840	
	17/03/2014	15.917	6.41	45010	
2	30/04/2014	15.970	6.14	46390	
	7/05/2014	15.995	6.88	46420	
	30/06/2014	16.073	6.52	46820	
3	17/07/2014	16.056	6.51	46120	
	15/08/2014	16.084	6.54	46630	
	24/09/2014	16.126	6.43	48000	
4	28/10/2014	16.152	6.62	47300	
	28/11/2014	16.170	6.37	41270	
	12/12/2014	16.194	6.69	46740	

PP05					
Quarter	**Date**	**SWL (mBTOC)**	**pH-Field**	**EC-Field (µS/cm)**	**Interpretation**
1	23/01/2014	14.794	6.38	47000	SWL and pH remained relatively constant throughout the reporting period. EC remained relatively constant throughout the reporting period with the exception of November.
	20/02/2014	14.805	6.44	46220	
	21/03/2014	14.870	6.34	45740	
2	30/04/2014	14.906	5.98	47060	
	20/05/2014	14.955	6.40	47050	
	30/06/2014	14.973	6.43	47630	
3	24/07/2014	14.943	6.70	47050	
	15/08/2014	14.949	6.48	46680	
	30/09/2014	14.996	6.44	47650	
4	28/10/2014	14.995	6.57	48300	
	28/11/2014	15.033	6.36	54170	
	23/12/2014	15.036	6.69	46860	

PP06					
Quarter	**Date**	**SWL (mBTOC)**	**pH-Field**	**EC-Field (µS/cm)**	**Interpretation**
1	23/01/2014	15.675	6.06	45780	SWL and pH remained relatively constant throughout the reporting period. EC remained relatively constant throughout the reporting period with the exception of November.
	20/02/2014	15.703	6.26	44870	
	21/03/2014	15.751	6.08	44560	
2	30/04/2014	15.773	6.51	45740	
	16/05/2014	15.793	6.35	45870	
	30/06/2014	15.808	6.17	46300	
3	24/07/2014	15.745	6.49	45720	
	15/08/2014	15.795	6.20	45180	
	30/09/2014	15.884	6.21	46700	
4	28/10/2014	15.798	6.19	46600	
	28/11/2014	15.814	5.94	52620	
	23/12/2014	15.812	6.50	45610	

SWL = Standing Water Level
mBTOC = meters Below Top of Casing
EC = Electrical Conductivity
For monitoring locations refer to Figure 12 of 'Surface Water, Groundwater, Meteorological and Biological Monitoring Programme'.

Table 3: Bland Creek Palaeochannel Groundwater Bores - Water Quality

BLPR1					
Quarter	**Date**	**SWL (mBTOC)**	**pH-Field**	**EC-Field (µS/cm)**	**Interpretation**
1	22/01/2014	50.935	6.81	1959	SWL and pH remained relatively constant throughout the reporting period. EC remained relatively constant throughout the reporting period with the exception of November.
	4/02/2014	51.712	6.78	1998	
	6/03/2014	49.153	6.80	1917	
2	1/04/2014	53.145	6.73	1805	
	8/05/2014	53.987	6.77	1991	
	20/06/2014	57.664	6.91	1985	
3	14/07/2014	57.646	6.89	1983	
	19/08/2014	60.701	6.74	1981	
	18/09/2014	62.416	6.74	1974	
4	20/10/2014	57.845	6.74	1909	
	27/11/2014	52.065	6.62	2222	
	9/12/2014	51.217	6.79	1983	

BLPR2					
Quarter	**Date**	**SWL (mBTOC)**	**pH-Field**	**EC-Field (µS/cm)**	**Interpretation**
1	22/01/2014	49.025	7.21	3290	SWL and pH remained relatively constant throughout the reporting period. EC fluctuated slightly throughout the reporting period.
	5/02/2014	54.296	7.12	2160	
	12/03/2014	54.293	7.19	1941	
2	2/04/2014	49.484	7.10	2768	
	9/05/2014	49.408	7.04	1953	
	27/06/2014	49.271	7.20	2743	
3	14/07/2014	49.367	7.04	2514	
	19/08/2014	47.422	6.90	2068	
	19/09/2014	46.055	6.77	1881	
4	20/10/2014	54.907	7.17	2208	
	27/11/2014	49.998	6.69	4137	
	10/12/2014	49.083	7.26	3769	

BLPR3					
Quarter	**Date**	**SWL (mBTOC)**	**pH-Field**	**EC-Field (µS/cm)**	**Interpretation**
1	17/01/2014	22.785	6.25	5044	SWL and pH remained relatively constant throughout the reporting period. EC remained relatively constant throughout the reporting period with the exception of November.
	4/02/2014	22.745	6.32	5123	
	6/03/2014	22.961	6.38	4905	
2	2/04/2014	22.816	6.31	4487	
	9/05/2014	22.923	6.40	5057	
	20/06/2014	22.725	6.44	5050	
3	10/07/2014	23.073	6.41	5070	
	19/08/2014	23.935	6.31	5028	
	18/09/2014	24.393	6.24	5180	
4	20/10/2014	24.808	6.28	5010	
	27/11/2014	24.923	6.36	5412	
	9/12/2014	24.805	6.43	5068	

Table 3: Bland Creek Palaeochannel Groundwater Bores - Water Quality

BLPR4					
Quarter	**Date**	**SWL (mBTOC)**	**pH-Field**	**EC-Field (µS/cm)**	**Interpretation**
1	22/01/2014	49.905	6.84	1987	SWL fluctuated throughout the reporting period. pH remained relatively constant throughout the reporting period. EC remained relatively constant throughout the reporting period.
	4/02/2014	55.324	6.77	2022	
	6/03/2014	48.193	6.80	1931	
2	1/04/2014	52.374	6.72	1859	
	9/05/2014	51.293	6.82	2013	
	20/06/2014	59.957	6.90	2020	
3	10/07/2014	60.160	6.85	2033	
	19/08/2014	57.227	6.72	2037	
	18/09/2014	59.052	6.72	2016	
4	20/10/2014	56.254	6.77	1948	
	27/11/2014	52.435	7.00	2469	
	9/12/2014	49.598	6.86	2243	

BLPR5					
Quarter	**Date**	**SWL (mBTOC)**	**pH-Field**	**EC-Field (µS/cm)**	**EC-Field (µS/cm)**
1	17/01/2014	53.528	6.71	2416	SWL fluctuated throughout the reporting period. pH remained relatively constant throughout the reporting period. EC remained relatively constant throughout the reporting period.
	5/02/2014	50.934	6.75	2448	
	12/03/2014	49.962	6.73	2355	
2	1/04/2014	51.203	6.60	2196	
	8/05/2014	67.854	6.94	2418	
	27/06/2014	54.277	6.86	2441	
3	14/07/2014	53.990	6.80	2460	
	19/08/2014	72.725	6.70	2485	
	19/09/2014	77.553	6.56	2460	
4	20/10/2014	62.527	6.58	2370	
	27/11/2014	53.824	6.71	2769	
	9/12/2014	52.528	6.66	2448	

Table 3: Bland Creek Palaeochannel Groundwater Bores - Water Quality

BLPR6					
Quarter	**Date**	**SWL (mBTOC)**	**pH-Field**	**EC-Field (µS/cm)**	**Interpretation**
1	17/01/2014	50.733	6.75	1952	SWL fluctuated throughout the reporting period. pH remained relatively constant throughout the reporting period. EC remained relatively constant throughout the reporting period.
	4/02/2014	49.930	6.78	1972	
	6/03/2014	48.150	6.84	1889	
2	1/04/2014	51.865	6.71	1760	
	8/05/2014	52.907	6.79	1978	
	27/06/2014	55.732	6.97	1945	
3	14/07/2014	55.714	6.87	1951	
	19/08/2014	60.148	6.72	1994	
	18/09/2014	61.651	6.67	1968	
4	20/10/2014	57.203	6.76	1885	
	27/11/2014	51.430	6.73	3099	
	9/12/2014	50.662	6.79	1949	

BLPR7					
Quarter	**Date**	**SWL (mBTOC)**	**pH-Field**	**EC-Field**	**Interpretation**
1	17/01/2014	50.935	6.77	1790	SWL fluctuated throughout the reporting period. pH remained relatively constant throughout the reporting period. EC fluctuated slightly throughout the reporting period.
	4/02/2014	51.376	6.69	1835	
	6/03/2014	48.447	6.82	1747	
2	1/04/2014	52.028	6.69	1773	
	8/05/2014	54.881	6.78	1820	
	27/06/2014	56.640	6.98	1803	
3	14/07/2014	56.653	6.88	1810	
	19/08/2014	62.444	6.73	1811	
	19/09/2014	62.715	6.71	1847	
4	20/10/2014	56.551	6.74	1748	
	27/11/2014	51.903	6.62	2337	
	10/12/2014	51.157	6.82	2225	

SWL = Standing Water Level
mBTOC = meters Below Top of Casing
EC = Electrical Conductivity
For monitoring locations refer to Figure 11 of 'Surface Water, Groundwater, Meteorological and Biological Monitoring Programme'.

Table 4: Tailings Storage Facility Groundwater Bores - Water Quality

P412A-R	Units	LOR	Collect Date				Interpretation
			14/01/2014	30/04/2014	23/07/2014	9/10/2014	
Alkalinity - Total $CaCO_3$	mg/L	1	492	476	428	450	There were slight variations but overall all parameters remained relatively stable.
Antimony - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	
Arsenic - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	
Cadmium - Dissolved	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.001	
Calcium - Dissolved	mg/L	1	682	622	651	695	
Chloride	mg/L	1	14500	12300	11900	13300	
Copper - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	0.011	
Cyanide - WAD	mg/L	0.004	<0.004	<0.004	<0.004	<0.004	
Lead - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	
Magnesium - Dissolved	mg/L	1	1510	1380	1490	1410	
Potassium - Dissolved	mg/L	1	62	54	93	50	
Selenium - Dissolved	mg/L	0.01	<0.01	<0.01	<0.01	0.14	
Sodium - Dissolved	mg/L	1	8690	8720	8400	8070	
Sulphates	mg/L	1	4040	3960	3580	3960	
Total hardness - $CaCO_3$	mg/L	1	7920	7240	7760	7540	
Total Suspended Solids	mg/L	1	<5*	<5*	3	4	
Zinc - Dissolved	mg/L	0.005	<0.005	<0.005	0.07	0.005	

* Indicates LOR has been raised for Total Suspended Solids 5 mg/L

Table 4: Tailings Storage Facility Groundwater Bores - Water Quality

P414A	Units	LOR	Collect Date				Interpretation
			15/01/2014	8/04/2014	22/07/2014	7/10/2014	
Alkalinity - Total $CaCO_3$	mg/L	1	577	560	582	638	There were slight variations but overall all parameters remained relatively stable.
Antimony - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.01*	
Arsenic - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.01*	
Cadmium - Dissolved	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.001*	
Calcium - Dissolved	mg/L	1	464	437	447	444	
Chloride	mg/L	1	13100	13000	11400	14200	
Copper - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.01*	
Cyanide - WAD	mg/L	0.004	<0.004	<0.004	<0.004	<0.004	
Lead - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.01*	
Magnesium - Dissolved	mg/L	1	1430	1480	1410	1390	
Potassium - Dissolved	mg/L	1	52	49	57	47	
Selenium - Dissolved	mg/L	0.01	<0.01	<0.01	<0.01	<0.1	
Sodium - Dissolved	mg/L	1	8150	8280	8320	8520	
Sulphates	mg/L	1	3220	2910	3410	3330	
Total hardness - $CaCO_3$	mg/L	1	7050	7180	6920	6830*	
Total Suspended Solids	mg/L	1	5*	5*	1	1	
Zinc - Dissolved	mg/L	0.005	<0.005	<0.005	<0.005	<0.05*	

* Indicates LOR has been raised for the following:
Antimony 0.01 mg/L
Arsenic 0.01 mg/L
Cadmium 0.001 mg/L
Copper 0.01 mg/L
Lead 0.01 mg/L
Selenium 0.1 mg/L
Total hardness 10 mg/L
Total Suspended Solids 5 mg/L
Zinc 0.05 mg/L

Table 4: Tailings Storage Facility Groundwater Bores - Water Quality

P414B	Units	LOR	Collect Date				Interpretation
			22/01/2014	16/04/2014	17/07/2014	3/10/2014	
Alkalinity - Total $CaCO_3$	mg/L	1	514	508	578	601	There were slight variations but overall all parameters remained relatively stable.
Antimony - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.01*	
Arsenic - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.01*	
Cadmium - Dissolved	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.001*	
Calcium - Dissolved	mg/L	1	424	429	411	400	
Chloride	mg/L	1	12600	12400	13600	14200	
Copper - Dissolved	mg/L	0.001	0.001	0.001	0.001	<0.01*	
Cyanide - WAD	mg/L	0.004	<0.004	<0.004	<0.004	<0.004	
Lead - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.01*	
Magnesium - Dissolved	mg/L	1	1430	1470	1380	1370	
Potassium - Dissolved	mg/L	1	40	43	34	40	
Selenium - Dissolved	mg/L	0.01	<0.01	<0.01	<0.01	<0.1*	
Sodium - Dissolved	mg/L	1	9130	9380	9170	8360	
Sulphates	mg/L	1	3170	2920	3440	3260	
Total hardness - $CaCO_3$	mg/L	1	6950	7120	6710	6640*	
Total Suspended Solids	mg/L	1	97*	5*	13	12	
Zinc - Dissolved	mg/L	0.005	<0.005	<0.005	0.063	<0.05*	

* Indicates LOR has been raised for the following:
Antimony 0.01 mg/L
Arsenic 0.01 mg/L
Cadmium 0.001 mg/L
Copper 0.01 mg/L
Lead 0.01 mg/L
Selenium 0.1 mg/L
Total hardness 10 mg/L
Total Suspended Solids 5 mg/L
Zinc 0.05 mg/L

Table 4: Tailings Storage Facility Groundwater Bores - Water Quality

P417A	Units	LOR	Collect Date				Interpretation
			7/01/2014	14/04/2014	22/07/2014	7/10/2014	
Alkalinity - Total $CaCO_3$	mg/L	1	453	457	480	514	There were slight variations but overall all parameters remained relatively stable.
Antimony - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.01*	
Arsenic - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.01*	
Cadmium - Dissolved	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.001*	
Calcium - Dissolved	mg/L	1	639	629	584	575	
Chloride	mg/L	1	13400	13300	12600	15800	
Copper - Dissolved	mg/L	0.001	0.01	<0.001	<0.001	<0.01*	
Cyanide - WAD	mg/L	0.004	<0.004	<0.004	<0.004	<0.004	
Lead - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.01*	
Magnesium - Dissolved	mg/L	1	1700	1670	1560	1560	
Potassium - Dissolved	mg/L	1	40	48	47	43	
Selenium - Dissolved	mg/L	0.01	<0.01	<0.01	<0.01	<0.1*	
Sodium - Dissolved	mg/L	1	10200	10000	9160	9250	
Sulphates	mg/L	1	3350	2900	3460	3390	
Total hardness - $CaCO_3$	mg/L	1	8600	8450	7880	7860*	
Total Suspended Solids	mg/L	1	<5*	<5*	<1	<1	
Zinc - Dissolved	mg/L	0.005	<0.005	<0.005	0.091	<0.05*	

* Indicates LOR has been raised for the following:
Antimony 0.01 mg/L
Arsenic 0.01 mg/L
Cadmium 0.001 mg/L
Copper 0.01 mg/L
Lead 0.01 mg/L
Selenium 0.1 mg/L
Total hardness 10 mg/L
Total Suspended Solids 5 mg/L
Zinc 0.05 mg/L

Table 4: Tailings Storage Facility Groundwater Bores - Water Quality

P417B	Units	LOR	Collect Date				Interpretation
			22/01/2014	16/04/2014	17/07/2014	3/10/2014	
Alkalinity - Total $CaCO_3$	mg/L	1	211	203	229	237	There were slight variations but overall all parameters remained relatively stable.
Antimony - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.01*	
Arsenic - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.01*	
Cadmium - Dissolved	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.001*	
Calcium - Dissolved	mg/L	1	514	517	499	487	
Chloride	mg/L	1	12700	12200	13500	14500	
Copper - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.01*	
Cyanide - WAD	mg/L	0.004	<0.004	<0.004	<0.004	<0.004	
Lead - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.01*	
Magnesium - Dissolved	mg/L	1	1440	1440	1390	1400	
Potassium - Dissolved	mg/L	1	29	31	24	30	
Selenium - Dissolved	mg/L	0.01	<0.01	<0.01	<0.01	<0.1*	
Sodium - Dissolved	mg/L	1	8650	8810	8720	8090	
Sulphates	mg/L	1	2640	2450	3100	2970	
Total hardness - $CaCO_3$	mg/L	1	7210	7220	6970	6980*	
Total Suspended Solids	mg/L	1	19*	<5*	171	3	
Zinc - Dissolved	mg/L	0.005	<0.005	<0.005	0.056	<0.05*	

* Indicates LOR has been raised for the following:
Antimony 0.01 mg/L
Arsenic 0.01 mg/L
Cadmium 0.001 mg/L
Copper 0.01 mg/L
Lead 0.01 mg/L
Selenium 0.1 mg/L
Total hardness 10 mg/L
Total Suspended Solids 5 mg/L
Zinc 0.05 mg/L

Table 4: Tailings Storage Facility Groundwater Bores - Water Quality

P418A	Units	LOR	Collect Date				Interpretation
			7/01/2014	9/04/2014	8/07/2014	7/10/2014	
Alkalinity - Total $CaCO_3$	mg/L	1	563	559	598	640	There were slight variations but overall all parameters remained relatively stable.
Antimony - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.01*	
Arsenic - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.01*	
Cadmium - Dissolved	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.001*	
Calcium - Dissolved	mg/L	1	424	387	440	416	
Chloride	mg/L	1	13800	13900	16900	15000	
Copper - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.01	
Cyanide - WAD	mg/L	0.004	<0.004	<0.004	<0.004	<0.004	
Lead - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.01*	
Magnesium - Dissolved	mg/L	1	1410	1330	1410	1370	
Potassium - Dissolved	mg/L	1	17	18	29	27	
Selenium - Dissolved	mg/L	0.01	<0.01	<0.01	<0.01	<0.1*	
Sodium - Dissolved	mg/L	1	10900	9760	9820	10300	
Sulphates	mg/L	1	4500	4200	4420	4220	
Total hardness - $CaCO_3$	mg/L	1	6860	6440	6900	6680*	
Total Suspended Solids	mg/L	1	<5*	<5*	59	21	
Zinc - Dissolved	mg/L	0.005	<0.005	<0.005	<0.055	<0.05*	

* Indicates LOR has been raised for the following:
Antimony 0.01 mg/L
Arsenic 0.01 mg/L
Cadmium 0.001 mg/L
Copper 0.01 mg/L
Lead 0.01 mg/L
Selenium 0.1 mg/L
Total hardness 10 mg/L
Total Suspended Solids 5 mg/L
Zinc 0.05 mg/L

Table 4: Tailings Storage Facility Groundwater Bores - Water Quality

P418B	Units	LOR	Collect Date				Interpretation
			7/01/2014	9/04/2014	8/07/2014	7/10/2014	
Alkalinity - Total $CaCO_3$	mg/L	1	510	528	544	613	There were slight variations but overall all parameters remained relatively stable.
Antimony - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.01*	
Arsenic - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.01*	
Cadmium - Dissolved	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.001*	
Calcium - Dissolved	mg/L	1	281	288	296	278	
Chloride	mg/L	1	12100	12600	15100	14200	
Copper - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.01*	
Cyanide - WAD	mg/L	0.004	<0.004	<0.004	<0.004	<0.004	
Lead - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.01*	
Magnesium - Dissolved	mg/L	1	1240	1180	1250	1160	
Potassium - Dissolved	mg/L	1	1	1	15	12	
Selenium - Dissolved	mg/L	0.01	<0.01	<0.01	<0.01	<0.1*	
Sodium - Dissolved	mg/L	1	10500	9270	9580	9820	
Sulphates	mg/L	1	4260	3640	4030	3980	
Total hardness - $CaCO_3$	mg/L	1	5810	5580	5890	5470*	
Total Suspended Solids	mg/L	1	<5*	<5*	9	1	
Zinc - Dissolved	mg/L	0.005	0.058	<0.005	<0.005	<0.05*	

* Indicates LOR has been raised for the following:
Antimony 0.01 mg/L
Arsenic 0.01 mg/L
Cadmium 0.001 mg/L
Copper 0.01 mg/L
Lead 0.01 mg/L
Selenium 0.1 mg/L
Total hardness 10 mg/L
Total Suspended Solids 5 mg/L
Zinc 0.05 mg/L

P555A-R	Units	LOR	Collect Date				Interpretation
			7/01/2014	14/04/2014	8/07/2014	7/10/2014	
Alkalinity - Total $CaCO_3$	mg/L	1	732	730	774	841	There were slight variations but overall all parameters remained relatively stable.
Antimony - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	
Arsenic - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	
Cadmium - Dissolved	mg/L	0.0001	<0.0001	<0.0001	<0.0001	0.0004	
Calcium - Dissolved	mg/L	1	301	298	307	280	
Chloride	mg/L	1	8900	9000	10700	10400	
Copper - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	
Cyanide - WAD	mg/L	0.004	<0.004	<0.004	<0.004	<0.004	
Lead - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	
Magnesium - Dissolved	mg/L	1	877	884	884	726	
Potassium - Dissolved	mg/L	1	29	35	32	34	
Selenium - Dissolved	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	
Sodium - Dissolved	mg/L	1	7050	7160	6560	4470	
Sulphates	mg/L	1	2440	2300	2500	2340	
Total hardness - $CaCO_3$	mg/L	1	4360	4380	4410	3690	
Total Suspended Solids	mg/L	1	84*	46*	6	1	
Zinc - Dissolved	mg/L	0.005	<0.005	<0.005	0.055	0.007	

* Indicates LOR has been raised for Total Suspended Solids 5 mg/L

Table 4: Tailings Storage Facility Groundwater Bores - Water Quality

P558A-R	Units	LOR	Collect Date				Interpretation
			7/01/2014	14/04/2014	8/07/2014	7/10/2014	
Alkalinity - Total $CaCO_3$	mg/L	1	693	689	715	805	There were slight variations but overall all parameters remained relatively stable.
Antimony - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	
Arsenic - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	
Cadmium - Dissolved	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Calcium - Dissolved	mg/L	1	249	265	280	253	
Chloride	mg/L	1	9240	9480	11800	11200	
Copper - Dissolved	mg/L	0.001	<0.001	0.018	<0.001	0.008	
Cyanide - WAD	mg/L	0.004	<0.004	<0.004	<0.004	<0.004	
Lead - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	
Magnesium - Dissolved	mg/L	1	800	806	845	696	
Potassium - Dissolved	mg/L	1	25	41	36	39	
Selenium - Dissolved	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	
Sodium - Dissolved	mg/L	1	7760	8130	7460	4970	
Sulphates	mg/L	1	3120	2720	2990	2860	
Total hardness - $CaCO_3$	mg/L	1	3920	3980	4180	3500	
Total Suspended Solids	mg/L	1	<5*	8*	11	20	
Zinc - Dissolved	mg/L	0.005	<0.005	<0.005	<0.005	0.006	

* Indicates LOR has been raised for Total Suspended Solids 5 mg/L

TSFNA	Units	LOR	Collect Date				Interpretation
			13/01/2014	9/04/2014	24/07/2014	16/10/2014	
Alkalinity - Total $CaCO_3$	mg/L	1	511	498	512	460	There were slight variations but overall all parameters remained relatively stable.
Antimony - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	
Arsenic - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	
Cadmium - Dissolved	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Calcium - Dissolved	mg/L	1	593	566	614	604	
Chloride	mg/L	1	14500	15500	13200	16400	
Copper - Dissolved	mg/L	0.001	<0.001	0.106	<0.001	<0.001	
Cyanide - WAD	mg/L	0.004	<0.004	<0.004	<0.004	<0.004	
Lead - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	
Magnesium - Dissolved	mg/L	1	1580	1650	1600	1550	
Potassium - Dissolved	mg/L	1	30	23	34	28	
Selenium - Dissolved	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	
Sodium - Dissolved	mg/L	1	10300	10400	10800	10900	
Sulphates	mg/L	1	4440	3950	4820	4150	
Total hardness - $CaCO_3$	mg/L	1	7990	8210	8120	7890	
Total Suspended Solids	mg/L	1	<5*	<5*	<1	<1	
Zinc - Dissolved	mg/L	0.005	<0.005	<0.005	<0.005	<0.005	

* Indicates LOR has been raised for Total Suspended Solids 5 mg/L

Table 4: Tailings Storage Facility Groundwater Bores - Water Quality

TSFNB	Units	LOR	Collect Date				Interpretation
			13/01/2014	9/04/2014	24/07/2014	16/10/2014	
Alkalinity - Total $CaCO_3$	mg/L	1	249	118	234	209	There were slight variations but overall all parameters remained relatively stable.
Antimony - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	
Arsenic - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	
Cadmium - Dissolved	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Calcium - Dissolved	mg/L	1	428	500	442	452	
Chloride	mg/L	1	13800	15700	12600	15400	
Copper - Dissolved	mg/L	0.001	<0.001	<0.001	0.077	0.061	
Cyanide - WAD	mg/L	0.004	<0.004	<0.004	<0.004	<0.004	
Lead - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	
Magnesium - Dissolved	mg/L	1	1450	1690	1490	1490	
Potassium - Dissolved	mg/L	1	63	72	65	57	
Selenium - Dissolved	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	
Sodium - Dissolved	mg/L	1	9430	10000	9900	10500	
Sulphates	mg/L	1	4300	4440	4700	4010	
Total hardness - $CaCO_3$	mg/L	1	7040	8210	7240	7260	
Total Suspended Solids	mg/L	1	73*	<5*	83	89	
Zinc - Dissolved	mg/L	0.005	<0.005	0.078	0.094	<0.005	

* Indicates LOR has been raised for Total Suspended Solids 5 mg/L

TSFNC	Units	LOR	Collect Date				Interpretation
			13/01/2014	9/04/2014	24/07/2014	16/10/2014	
Alkalinity - Total $CaCO_3$	mg/L	1	114	231	124	108	There were slight variations but overall all parameters remained relatively stable.
Antimony - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	
Arsenic - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	
Cadmium - Dissolved	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Calcium - Dissolved	mg/L	1	493	407	541	524	
Chloride	mg/L	1	14000	14500	13000	15800	
Copper - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	
Cyanide - WAD	mg/L	0.004	<0.004	<0.004	<0.004	<0.004	
Lead - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	
Magnesium - Dissolved	mg/L	1	1520	1510	1670	1540	
Potassium - Dissolved	mg/L	1	67	62	74	60	
Selenium - Dissolved	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	
Sodium - Dissolved	mg/L	1	9610	9310	10700	10700	
Sulphates	mg/L	1	4450	3760	4620	3920	
Total hardness - $CaCO_3$	mg/L	1	7490	7230	8230	7650	
Total Suspended Solids	mg/L	1	<5*	99*	3	6	
Zinc - Dissolved	mg/L	0.005	0.066	<0.005	0.097	0.092	

* Indicates LOR has been raised for Total Suspended Solids 5 mg/L

Table 4: Tailings Storage Facility Groundwater Bores - Water Quality

MON01A	Units	LOR	Collect Date				Interpretation
			7/01/2014	14/04/2014	22/07/2014	7/10/2014	
Alkalinity - Total $CaCO_3$	mg/L	1	301	298	314	342	There were slight variations but overall all parameters remained relatively stable.
Antimony - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.01*	
Arsenic - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.01*	
Cadmium - Dissolved	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.001*	
Calcium - Dissolved	mg/L	1	498	477	464	458	
Chloride	mg/L	1	13500	13500	12600	15900	
Copper - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.01*	
Cyanide - WAD	mg/L	0.004	<0.004	<0.004	<0.004	<0.004	
Lead - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.01*	
Magnesium - Dissolved	mg/L	1	1520	1470	1440	1430	
Potassium - Dissolved	mg/L	1	25	32	34	30	
Selenium - Dissolved	mg/L	0.01	<0.01	<0.01	<0.01	<0.1*	
Sodium - Dissolved	mg/L	1	11100	10700	10100	10200	
Sulphates	mg/L	1	4510	4270	5080	4380	
Total hardness - $CaCO_3$	mg/L	1	7500	7240	7090	7030*	
Total Suspended Solids	mg/L	1	<5*	<5*	<1	<1	
Zinc - Dissolved	mg/L	0.005	<0.005	<0.005	<0.005	<0.05*	

* Indicates LOR has been raised for the following:
Antimony 0.01 mg/L
Arsenic 0.01 mg/L
Cadmium 0.001 mg/L
Copper 0.01 mg/L
Lead 0.01 mg/L
Selenium 0.1 mg/L
Total hardness 10 mg/L
Total Suspended Solids 5 mg/L
Zinc 0.05 mg/L

MON01B	Units	LOR	Collect Date				Interpretation
			22/01/2014	16/04/2014	17/07/2014	3/10/2014	
Alkalinity - Total $CaCO_3$	mg/L	1	25	13	13	21	There were slight variations but overall all parameters remained relatively stable.
Antimony - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.01*	
Arsenic - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.01*	
Cadmium - Dissolved	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.001*	
Calcium - Dissolved	mg/L	1	424	463	467	441	
Chloride	mg/L	1	12400	13000	15300	16100	
Copper - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.01*	
Cyanide - WAD	mg/L	0.004	<0.004	<0.004	<0.004	<0.004	
Lead - Dissolved	mg/L	0.001	<0.001	<0.001	0.013	0.013*	
Magnesium - Dissolved	mg/L	1	1340	1500	1510	1460	
Potassium - Dissolved	mg/L	1	55	60	48	54	
Selenium - Dissolved	mg/L	0.01	<0.01	<0.01	<0.01	<0.1*	
Sodium - Dissolved	mg/L	1	9390	10400	10700	10100	
Sulphates	mg/L	1	4340	4050	4870	4200	
Total hardness - $CaCO_3$	mg/L	1	6580	7330	7380	7110*	
Total Suspended Solids	mg/L	1	51*	<5*	<1	<1	
Zinc - Dissolved	mg/L	0.005	<0.005	<0.005	0.12	0.077*	

* Indicates LOR has been raised for the following:
Antimony 0.01 mg/L
Arsenic 0.01 mg/L
Cadmium 0.001 mg/L
Copper 0.01 mg/L
Lead 0.01 mg/L
Selenium 0.1 mg/L
Total hardness 10 mg/L
Total Suspended Solids 5 mg/L
Zinc 0.05 mg/L

Table 4: Tailings Storage Facility Groundwater Bores - Water Quality

MON02A	Units	LOR	Collect Date				Interpretation
			14/01/2014	15/04/2014	23/07/2014	28/10/2014	
Alkalinity - Total $CaCO_3$	mg/L	1	658	634	676	609	There were slight variations but overall all parameters remained relatively stable.
Antimony - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	
Arsenic - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	
Cadmium - Dissolved	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Calcium - Dissolved	mg/L	1	441	478	426	437	
Chloride	mg/L	1	12700	11800	11100	11500	
Copper - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	
Cyanide - WAD	mg/L	0.004	<0.004	<0.004	<0.004	<0.004	
Lead - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	
Magnesium - Dissolved	mg/L	1	1240	1340	1220	1180	
Potassium - Dissolved	mg/L	1	59	66	67	54	
Selenium - Dissolved	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	
Sodium - Dissolved	mg/L	1	8060	9480	8200	7720	
Sulphates	mg/L	1	3380	3070	3600	3570	
Total hardness - $CaCO_3$	mg/L	1	6210	6710	6090	5950	
Total Suspended Solids	mg/L	1	<5*	<5*	<1	<1	
Zinc - Dissolved	mg/L	0.005	<0.005	<0.005	<0.005	<0.005	

* Indicates LOR has been raised for Total Suspended Solids 5 mg/L

Table 4: Tailings Storage Facility Groundwater Bores - Water Quality

MON02B	Units	LOR	Collect Date				Interpretation
			14/01/2014	15/04/2014	23/07/2014	9/10/2014	
Alkalinity - Total $CaCO_3$	mg/L	1	604	494	424	582	There were slight variations but overall all parameters remained relatively stable.
Antimony - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	
Arsenic - Dissolved	mg/L	0.001	<0.001	<0.001	<0.002	<0.001	
Cadmium - Dissolved	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Calcium - Dissolved	mg/L	1	297	256	179	296	
Chloride	mg/L	1	9460	7480	5680	9190	
Copper - Dissolved	mg/L	0.001	<0.001	0.016	0.015	0.011	
Cyanide - WAD	mg/L	0.004	<0.004	<0.004	<0.004	<0.004	
Lead - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	
Magnesium - Dissolved	mg/L	1	1040	865	611	953	
Potassium - Dissolved	mg/L	1	65	62	56	55	
Selenium - Dissolved	mg/L	0.01	<0.01	<0.01	0.03	<0.01	
Sodium - Dissolved	mg/L	1	5950	5550	3690	5500	
Sulphates	mg/L	1	2090	1810	1630	2740	
Total hardness - $CaCO_3$	mg/L	1	5020	4200	2960	4660	
Total Suspended Solids	mg/L	1	86*	71*	103	58	
Zinc - Dissolved	mg/L	0.005	<0.005	0.073	0.045	<0.005	

* Indicates LOR has been raised for Total Suspended Solids 5 mg/L

Table 5: Pit Groundwater Bores - Water Quality

PDB1A	Units	LOR	Collect Date				Interpretation
			13/01/2014	8/04/2014	8/07/2014	7/10/2014	
Antimony - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.01*	There were slight variations but overall all parameters remained relatively stable.
Arsenic - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.01*	
Cadmium - Dissolved	mg/L	0.0001	<0.0001	<0.0001	0.0011	<0.001*	
Calcium - Dissolved	mg/L	1	903	864	944	901	
Chloride	mg/L	1	17000	18700	19000	19400	
Copper - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.01*	
Lead - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.01*	
Magnesium - Dissolved	mg/L	1	1850	1940	1940	1870	
Potassium - Dissolved	mg/L	1	37	30	37	36	
Selenium - Dissolved	mg/L	0.01	<0.01	<0.01	<0.01	<0.1*	
Sodium - Dissolved	mg/L	1	10500	10300	10700	11000	
Sulphates	mg/L	1	4360	4200	3600	4190	
Total hardness - $CaCO_3$	mg/L	1	9870	10100	10300	9950*	
Total Suspended Solids	mg/L	1	<5*	<5*	<1	<1	
Zinc - Dissolved	mg/L	0.005	<0.005	<0.005	0.05	<0.05*	

* Indicates LOR has been raised for the following:
Antimony 0.01 mg/L
Arsenic 0.01 mg/L
Cadmium 0.001 mg/L
Copper 0.01 mg/L
Lead 0.01 mg/L
Selenium 0.1 mg/L
Total hardness 10 mg/L
Total Suspended Solids 5 mg/L
Zinc 0.05 mg/L

Table 5: Pit Groundwater Bores - Water Quality

PDB1B	Units	LOR	Collect Date				Interpretation
			13/01/2014	8/04/2014	8/07/2014	7/10/2014	
Antimony - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.01*	There were slight variations but overall all parameters remained relatively stable.
Arsenic - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.01*	
Cadmium - Dissolved	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.001*	
Calcium - Dissolved	mg/L	1	753	744	804	771	
Chloride	mg/L	1	15500	16600	17100	17900	
Copper - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.01*	
Lead - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.01*	
Magnesium - Dissolved	mg/L	1	1760	1900	1920	1860	
Potassium - Dissolved	mg/L	1	26	20	30	27	
Selenium - Dissolved	mg/L	0.01	<0.01	<0.01	<0.01	<0.1*	
Sodium - Dissolved	mg/L	1	9330	9620	9570	10200	
Sulphates	mg/L	1	4220	3760	3540	3970	
Total hardness - $CaCO_3$	mg/L	1	9130	9680	9910	9580*	
Total Suspended Solids	mg/L	1	<5*	<5*	<1	2	
Zinc - Dissolved	mg/L	0.005	0.005	0.005	0.064	<0.05*	

* Indicates LOR has been raised for the following:
Antimony 0.01 mg/L
Arsenic 0.01 mg/L
Cadmium 0.001 mg/L
Copper 0.01 mg/L
Lead 0.01 mg/L
Selenium 0.1 mg/L
Total hardness 10 mg/L
Total Suspended Solids 5 mg/L
Zinc 0.05 mg/L

Table 5: Pit Groundwater Bores - Water Quality

PDB3A	Units	LOR	Collect Date				Interpretation
			8/01/2014	15/04/2014	24/07/2014	9/10/2014	
Antimony - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	There were slight variations but overall all parameters remained relatively stable.
Arsenic - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	
Cadmium - Dissolved	mg/L	0.0001	0.0052	0.0078	0.0077	0.0075	
Calcium - Dissolved	mg/L	1	1170	1180	1120	1080	
Chloride	mg/L	1	17700	17200	15100	16700	
Copper - Dissolved	mg/L	0.001	0.019	<0.001	<0.001	<0.001	
Lead - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	
Magnesium - Dissolved	mg/L	1	2110	2100	2020	1810	
Potassium - Dissolved	mg/L	1	43	48	48	36	
Selenium - Dissolved	mg/L	0.01	<0.01	<0.01	<0.01	0.14	
Sodium - Dissolved	mg/L	1	11200	11100	10400	8760	
Sulphates	mg/L	1	3870	3200	3980	3840	
Total hardness - $CaCO_3$	mg/L	1	11600	11600	11100	10200	
Total Suspended Solids	mg/L	1	7*	<5*	<1	<1	
Zinc - Dissolved	mg/L	0.005	0.363	0.077	0.091	<0.005	

* Indicates LOR has been raised for Total Suspended Solids 5 mg/L

PDB3B	Units	LOR	Collect Date				Interpretation
			7/01/2014	15/04/2014	24/07/2014	9/10/2014	
Antimony - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	There were slight variations but overall all parameters remained relatively stable.
Arsenic - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	
Cadmium - Dissolved	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Calcium - Dissolved	mg/L	1	1180	1180	1080	1100	
Chloride	mg/L	1	15000	15600	14200	15500	
Copper - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	
Lead - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	
Magnesium - Dissolved	mg/L	1	2390	2390	2220	2120	
Potassium - Dissolved	mg/L	1	60	68	67	52	
Selenium - Dissolved	mg/L	0.01	<0.01	<0.01	<0.01	0.16	
Sodium - Dissolved	mg/L	1	10900	10800	9810	8650	
Sulphates	mg/L	1	4970	4520	4800	5040	
Total hardness - $CaCO_3$	mg/L	1	12800	12800	11800	11500	
Total Suspended Solids	mg/L	1	8*	<5*	10	5	
Zinc - Dissolved	mg/L	0.005	<0.005	<0.005	0.063	<0.005	

* Indicates LOR has been raised for Total Suspended Solids 5 mg/L

Table 5: Pit Groundwater Bores - Water Quality

PDB5A	Units	LOR	Collect Date				Interpretation
			14/01/2014	15/04/2014	22/07/2014	21/10/2014	
Antimony - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	There were slight variations but overall all parameters remained relatively stable.
Arsenic - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	
Cadmium - Dissolved	mg/L	0.0001	0.0041	0.0035	0.0034	0.0031	
Calcium - Dissolved	mg/L	1	787	860	791	727	
Chloride	mg/L	1	17900	16100	14400	19200	
Copper - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	
Lead - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	
Magnesium - Dissolved	mg/L	1	1980	2120	1960	1910	
Potassium - Dissolved	mg/L	1	57	62	58	47	
Selenium - Dissolved	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	
Sodium - Dissolved	mg/L	1	9680	11300	10300	9980	
Sulphates	mg/L	1	3420	3130	3950	3130	
Total hardness - $CaCO_3$	mg/L	1	10100	10900	10000	9680	
Total Suspended Solids	mg/L	1	<5*	<5*	3	<1	
Zinc - Dissolved	mg/L	0.005	<0.005	0.072	0.147	<0.005	

* Indicates LOR has been raised for Total Suspended Solids 5 mg/L

PDB5B	Units	LOR	Collect Date				Interpretation
			14/01/2014	15/04/2014	22/07/2014	21/10/2014	
Antimony - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	There were slight variations but overall all parameters remained relatively stable.
Arsenic - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	
Cadmium - Dissolved	mg/L	0.0001	0.0012	0.0018	0.0016	0.0011	
Calcium - Dissolved	mg/L	1	868	861	810	776	
Chloride	mg/L	1	17200	15600	14200	18800	
Copper - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	
Lead - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	
Magnesium - Dissolved	mg/L	1	2080	2050	1930	1930	
Potassium - Dissolved	mg/L	1	64	64	62	52	
Selenium - Dissolved	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	
Sodium - Dissolved	mg/L	1	9920	10600	9870	9870	
Sulphates	mg/L	1	3510	3150	3840	3240	
Total hardness - $CaCO_3$	mg/L	1	10700	10600	9970	9880	
Total Suspended Solids	mg/L	1	50*	<5*	44	3	
Zinc - Dissolved	mg/L	0.005	<0.005	<0.005	0.094	<0.005	

* Indicates LOR has been raised for Total Suspended Solids 5 mg/L

Table 6: Processing Plant Bores - Water Quality

PP01	Units	LOR	Collect Date				Interpretation
			23/01/2014	30/04/2014	17/07/2014	28/10/2014	
Alkalinity - Total $CaCO_3$	mg/L	1	249	247	278	234	There were slight variations but overall all parameters remained relatively stable.
Antimony - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	
Arsenic - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	
Cadmium - Dissolved	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Calcium - Dissolved	mg/L	1	706	613	664	645	
Chloride	mg/L	1	15400	13400	16600	14100	
Copper - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	
Cyanide - WAD	mg/L	0.004	<0.004	<0.004	<0.004	<0.004	
Lead - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	
Magnesium - Dissolved	mg/L	1	1880	1640	1760	1670	
Potassium - Dissolved	mg/L	1	58	48	51	48	
Selenium - Dissolved	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	
Sodium - Dissolved	mg/L	1	10100	9220	9420	8450	
Sulphates	mg/L	1	3450	3710	4210	3620	
Total hardness - $CaCO_3$	mg/L	1	9500	8280	8900	8490	
Total Suspended Solids	mg/L	1	181*	64*	164	59	
Zinc - Dissolved	mg/L	0.005	<0.005	0.155	<0.005	<0.005	

* Indicates LOR has been raised for Total Suspended Solids 5 mg/L

Table 6: Processing Plant Bores - Water Quality

PP02	Units	LOR	Collect Date				Interpretation
			23/01/2014	15/04/2014	17/07/2014	28/10/2014	
Alkalinity - Total $CaCO_3$	mg/L	1	263	274	298	242	There were slight variations but overall all parameters remained relatively stable.
Antimony - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	
Arsenic - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	
Cadmium - Dissolved	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Calcium - Dissolved	mg/L	1	664	731	661	619	
Chloride	mg/L	1	14200	13900	15500	13500	
Copper - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	
Cyanide - WAD	mg/L	0.004	<0.004	<0.004	<0.004	<0.004	
Lead - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	
Magnesium - Dissolved	mg/L	1	1700	1810	1650	1550	
Potassium - Dissolved	mg/L	1	55	60	44	47	
Selenium - Dissolved	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	
Sodium - Dissolved	mg/L	1	9640	10500	9740	8330	
Sulphates	mg/L	1	3360	3110	3570	3400	
Total hardness - $CaCO_3$	mg/L	1	8660	9280	8440	7930	
Total Suspended Solids	mg/L	1	1210*	4230*	545	416	
Zinc - Dissolved	mg/L	0.005	<0.005	0.089	<0.005	0.075	

* Indicates LOR has been raised for Total Suspended Solids 5 mg/L

Table 6: Processing Plant Bores - Water Quality

PP03	Units	LOR	Collect Date				Interpretation
			23/01/2014	15/04/2014	17/07/2014	28/10/2014	
Alkalinity - Total $CaCO_3$	mg/L	1	130	132	154	139	There were slight variations but overall all parameters remained relatively stable.
Antimony - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	
Arsenic - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	
Cadmium - Dissolved	mg/L	0.0001	<0.0001	<0.0002	<0.0001	<0.0001	
Calcium - Dissolved	mg/L	1	135	130	132	144	
Chloride	mg/L	1	1860	1690	2100	2600	
Copper - Dissolved	mg/L	0.001	<0.001	0.004	0.005	0.004	
Cyanide - WAD	mg/L	0.004	<0.004	<0.004	<0.004	<0.004	
Lead - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	
Magnesium - Dissolved	mg/L	1	140	142	147	207	
Potassium - Dissolved	mg/L	1	24	25	20	24	
Selenium - Dissolved	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	
Sodium - Dissolved	mg/L	1	1360	1450	1480	1550	
Sulphates	mg/L	1	897	749	1100	1200	
Total hardness - $CaCO_3$	mg/L	1	914	909	935	1210	
Total Suspended Solids	mg/L	1	27*	<5*	<1	<1	
Zinc - Dissolved	mg/L	0.005	<0.005	0.057	0.016	0.042	

* Indicates LOR has been raised for Total Suspended Solids 5 mg/L

Table 6: Processing Plant Bores - Water Quality

PP04	Units	LOR	Collect Date				Interpretation
			23/01/2014	30/04/2014	17/07/2014	28/10/2014	
Alkalinity - Total $CaCO_3$	mg/L	1	440	456	507	419	There were slight variations but overall all parameters remained relatively stable.
Antimony - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	
Arsenic - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	
Cadmium - Dissolved	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Calcium - Dissolved	mg/L	1	727	637	737	672	
Chloride	mg/L	1	15500	13600	16500	14200	
Copper - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	
Cyanide - WAD	mg/L	0.004	<0.004	<0.004	<0.004	<0.004	
Lead - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	
Magnesium - Dissolved	mg/L	1	1710	1520	1680	1530	
Potassium - Dissolved	mg/L	1	61	52	50	52	
Selenium - Dissolved	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	
Sodium - Dissolved	mg/L	1	10300	9380	10400	8590	
Sulphates	mg/L	1	3520	3670	4080	3590	
Total hardness - $CaCO_3$	mg/L	1	8860	7850	8760	7980	
Total Suspended Solids	mg/L	1	332*	812*	83	1820	
Zinc - Dissolved	mg/L	0.005	<0.005	<0.005	<0.005	0.112	

* Indicates LOR has been raised for Total Suspended Solids 5 mg/L

Table 6: Processing Plant Bores - Water Quality

PP05	Units	LOR	Collect Date				Interpretation
			23/01/2014	30/04/2014	24/07/2014	28/10/2014	
Alkalinity - Total $CaCO_3$	mg/L	1	376	417	449	400	There were slight variations but overall all parameters remained relatively stable.
Antimony - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	
Arsenic - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	
Cadmium - Dissolved	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Calcium - Dissolved	mg/L	1	810	693	754	724	
Chloride	mg/L	1	15700	13600	13300	14400	
Copper - Dissolved	mg/L	0.001	0.148	0.031	0.014	0.021	
Cyanide - WAD	mg/L	0.004	<0.004	<0.004	<0.004	<0.004	
Lead - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	
Magnesium - Dissolved	mg/L	1	1850	1580	1720	1620	
Potassium - Dissolved	mg/L	1	63	52	63	53	
Selenium - Dissolved	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	
Sodium - Dissolved	mg/L	1	10600	9430	9750	8580	
Sulphates	mg/L	1	3760	3800	4030	3600	
Total hardness - $CaCO_3$	mg/L	1	9640	8240	8960	8480	
Total Suspended Solids	mg/L	1	648*	222*	36	110	
Zinc - Dissolved	mg/L	0.005	<0.005	<0.005	0.096	<0.005	

* Indicates LOR has been raised for Total Suspended Solids 5 mg/L

Table 6: Processing Plant Bores - Water Quality

PP06	Units	LOR	Collect Date				Interpretation
			23/01/2014	30/04/2014	24/07/2014	28/10/2014	
Alkalinity - Total $CaCO_3$	mg/L	1	192	185	201	177	There were slight variations but overall all parameters remained relatively stable.
Antimony - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	
Arsenic - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	
Cadmium - Dissolved	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Calcium - Dissolved	mg/L	1	700	591	678	654	
Chloride	mg/L	1	15100	13300	13400	13800	
Copper - Dissolved	mg/L	0.001	<0.001	<0.001	0.012	0.019	
Cyanide - WAD	mg/L	0.004	<0.004	<0.004	<0.004	<0.004	
Lead - Dissolved	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	
Magnesium - Dissolved	mg/L	1	1840	1530	1760	1680	
Potassium - Dissolved	mg/L	1	58	45	62	51	
Selenium - Dissolved	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	
Sodium - Dissolved	mg/L	1	10000	8720	9420	8430	
Sulphates	mg/L	1	3900	3760	3940	3620	
Total hardness - $CaCO_3$	mg/L	1	9320	7780	8940	8550	
Total Suspended Solids	mg/L	1	218*	408*	141	92	
Zinc - Dissolved	mg/L	0.005	<0.005	0.054	0.083	<0.005	

* Indicates LOR has been raised for Total Suspended Solids 5 mg/L

Table 7: Bland Creek Palaeochannel Groundwater Bores - Water Quality

BLPR1	Units	LOR	Collect Date				Interpretation
			22/01/2014	1/04/2014	14/07/2014	17/10/2014	
Alkalinity - Total $CaCO_3$	mg/L	1	162	152	191	156	There were slight variations but overall all parameters remained relatively stable.
Calcium - Dissolved	mg/L	1	43	36	39	39	
Chloride	mg/L	1	468	451	446	497	
Iron - Dissolved	mg/L	0.05	0.23	0.16	0.24	0.25	
Magnesium - Dissolved	mg/L	1	36	33	34	34	
Manganese - Total	mg/L	0.001	0.073	0.066	0.068	0.069	
Potassium - Dissolved	mg/L	1	4	4	4	4	
Sodium - Dissolved	mg/L	1	309	282	331	335	
Sulphates	mg/L	1	72	65	71	61	
Total Dissolved Solids	mg/L	1	1090*	978*	993	1020	
Total hardness as $CaCO_3$	mg/L	1	256	226	237	237	

* Indicates LOR has been raised for Dissolved Solids 10 mg/L

BLPR2	Units	LOR	Collect Date				Interpretation
			22/01/2014	2/04/2014	14/07/2014	20/10/2014	
Alkalinity - Total $CaCO_3$	mg/L	1	153	145	187	191	There were slight variations but overall all parameters remained relatively stable.
Calcium - Dissolved	mg/L	1	72	59	48	41	
Chloride	mg/L	1	836	734	622	578	
Iron - Dissolved	mg/L	0.05	3.47	1.07	2.72	0.66	
Magnesium - Dissolved	mg/L	1	68	55	44	38	
Manganese - Total	mg/L	0.001	0.359	0.278	0.199	0.132	
Potassium - Dissolved	mg/L	1	6	6	4	4	
Sodium - Dissolved	mg/L	1	506	443	377	323	
Sulphates	mg/L	1	120	103	95	68	
Total Dissolved Solids	mg/L	1	1750*	1490*	1240	1000	
Total hardness as $CaCO_3$	mg/L	1	460	374	301	259	

* Indicates LOR has been raised for Dissolved Solids 10 mg/L

BLPR3	Units	LOR	Collect Date				Interpretation
			17/01/2014	2/04/2014	14/07/2014	17/10/2014	
Alkalinity - Total $CaCO_3$	mg/L	1	130	112	157	128	There were slight variations but overall all parameters remained relatively stable.
Calcium - Dissolved	mg/L	1	48	55	52	53	
Chloride	mg/L	1	1370	1270	1450	1440	
Iron -Dissolved	mg/L	0.05	0.11	0.13	0.13	0.14	
Magnesium - Dissolved	mg/L	1	56	61	56	58	
Manganese - Total	mg/L	0.001	0.161	0.155	0.158	0.16	
Potassium - Dissolved	mg/L	1	6	7	6	6	
Sodium - Dissolved	mg/L	1	920	812	915	965	
Sulphates	mg/L	1	125	124	139	118	
Total Dissolved Solids	mg/L	1	2920*	2720*	2760	2780	
Total hardness as $CaCO_3$	mg/L	1	350	388	360	371	

* Indicates LOR has been raised for Dissolved Solids 10 mg/L

Table 7: Bland Creek Palaeochannel Groundwater Bores - Water Quality

BLPR4	Units	LOR	Collect Date				Interpretation
			22/01/2014	1/04/2014	14/07/2014	17/10/2014	
Alkalinity - Total $CaCO_3$	mg/L	1	160	142	190	161	There were slight variations but overall all parameters remained relatively stable.
Calcium - Dissolved	mg/L	1	39	35	35	34	
Chloride	mg/L	1	466	453	461	501	
Iron - Dissolved	mg/L	0.05	0.61	<0.05	0.41	0.43	
Magnesium - Dissolved	mg/L	1	34	32	33	31	
Manganese - Total	mg/L	0.001	0.096	0.085	0.093	0.096	
Potassium - Dissolved	mg/L	1	4	5	4	4	
Sodium - Dissolved	mg/L	1	319	294	335	355	
Sulphates	mg/L	1	69	63	72	56	
Total Dissolved Solids	mg/L	1	1010*	967*	1010	1010	
Total hardness as $CaCO_3$	mg/L	1	237	219	223	212	

* Indicates LOR has been raised for Dissolved Solids 10 mg/L

BLPR5	Units	LOR	Collect Date				Interpretation
			17/01/2014	1/04/2014	14/07/2014	20/10/2014	
Alkalinity - Total $CaCO_3$	mg/L	1	212	178	240	231	There were slight variations but overall all parameters remained relatively stable.
Calcium - Dissolved	mg/L	1	23	25	28	26	
Chloride	mg/L	1	556	539	538	603	
Iron - Dissolved	mg/L	0.05	0.14	<0.05	0.19	0.16	
Magnesium - Dissolved	mg/L	1	19	21	22	21	
Manganese - Total	mg/L	0.001	0.123	0.13	0.124	0.129	
Potassium - Dissolved	mg/L	1	4	5	4	4	
Sodium - Dissolved	mg/L	1	444	420	474	432	
Sulphates	mg/L	1	96	96	108	89	
Total Dissolved Solids	mg/L	1	1300*	1190*	1190	1170	
Total hardness as $CaCO_3$	mg/L	1	136	149	160	151	

* Indicates LOR has been raised for Dissolved Solids 10 mg/L

BLPR6	Units	LOR	Collect Date				Interpretation
			17/01/2014	1/04/2014	14/07/2014	17/10/2014	
Alkalinity - Total $CaCO_3$	mg/L	1	162	147	195	157	There were slight variations but overall all parameters remained relatively stable.
Calcium - Dissolved	mg/L	1	27	28	31	32	
Chloride	mg/L	1	450	433	434	480	
Iron - Dissolved	mg/L	0.05	0.36	0.18	0.34	0.45	
Magnesium - Dissolved	mg/L	1	25	25	27	28	
Manganese - Total	mg/L	0.001	0.082	0.075	0.072	0.076	
Potassium - Dissolved	mg/L	1	4	4	4	4	
Sodium - Dissolved	mg/L	1	328	298	346	352	
Sulphates	mg/L	1	63	66	73	62	
Total Dissolved Solids	mg/L	1	970*	927*	890	938	
Total hardness as $CaCO_3$	mg/L	1	170	173	188	195	

* Indicates LOR has been raised for Dissolved Solids 10 mg/L

Table 7: Bland Creek Palaeochannel Groundwater Bores - Water Quality

BLPR7	Units	LOR	Collect Date				Interpretation
			17/01/2014	1/04/2014	14/07/2014	20/10/2014	
Alkalinity - Total $CaCO_3$	mg/L	1	162	142	191	188	There were slight variations but overall all parameters remained relatively stable.
Calcium - Dissolved	mg/L	1	31	34	35	36	
Chloride	mg/L	1	404	399	401	434	
Iron - Dissolved	mg/L	0.05	0.22	0.12	0.18	0.24	
Magnesium - Dissolved	mg/L	1	29	31	31	32	
Manganese - Total	mg/L	0.001	0.061	0.06	0.057	0.065	
Potassium - Dissolved	mg/L	1	4	4	4	4	
Sodium - Dissolved	mg/L	1	266	255	292	282	
Sulphates	mg/L	1	60	63	70	56	
Total Dissolved Solids	mg/L	1	927*	842*	886	900	
Total hardness as $CaCO_3$	mg/L	1	197	212	215	222	

* Indicates LOR has been raised for Dissolved Solids 10 mg/L

Table 8: Bland Creek Palaeochannel Groundwater Bores - Extraction Volume

Quarter	Month	Volume Extracted (ML)					
		PB1	PB2	PB3	PB4	Monthly Total	Quarterly Total
Q1	January 2006	40.70	113.17	79.20	37.72	270.78	
	February 2006	33.09	78.78	117.94	31.90	261.71	
	March 2006	103.78	0.25	116.66	44.08	264.76	**797.25**
Q2	April 2006	87.39	0.00	81.99	51.77	221.16	
	May 2006	87.35	0.43	109.57	40.60	237.95	
	June 2006	114.22	10.48	119.69	33.58	277.97	**737.08**
Q3	July 2006	116.98	17.99	109.97	38.29	283.23	
	August 2006	123.18	91.40	33.20	39.35	287.13	
	September 2006	122.88	1.02	131.93	36.19	292.03	**862.39**
Q4	October 2006	120.70	0.18	126.32	38.53	285.73	
	November 2006	117.78	0.15	129.06	35.64	282.62	
	December 2006	66.03	97.52	125.34	10.12	299.01	**867.36**
Q1	January 2007	76.70	32.50	96.30	12.90	218.40	
	February 2007	5.70	9.90	38.30	0.90	54.80	
	March 2007	1.50	3.60	1.70	0.90	7.70	**280.90**
Q2	April 2007	0.00	0.00	0.00	0.00	0.00	
	May 2007	0.00	0.00	0.00	0.00	0.00	
	June 2007	62.95	62.94	62.40	0.00	188.29	**188.29**
Q3	July 2007	106.22	106.16	0.00	0.79	213.17	
	August 2007	91.56	94.00	0.00	2.32	187.88	
	September 2007	91.29	90.87	62.40	0.29	244.85	**645.90**
Q4	October 2007	103.70	103.68	0.00	1.45	208.83	
	November 2007	77.17	78.68	0.00	2.75	158.60	
	December 2007	0.00	0.00	0.00	0.00	0.00	**367.42**
Q1	January 2008	0.00	0.00	0.00	0.00	0.00	
	February 2008	0.00	0.00	0.00	0.00	0.00	
	March 2008	0.00	0.00	0.00	0.00	0.00	**0.00**
Q2	April 2008	13.02	0.00	12.90	9.22	35.14	
	May 2008	34.84	35.20	30.54	4.97	105.55	
	June 2008	83.86	86.75	74.51	8.25	253.37	**394.06**
Q3	July 2008	74.16	75.54	79.37	0.37	229.44	
	August 2008	81.50	81.50	85.11	0.39	248.50	
	September 2008	77.35	79.50	71.49	3.48	231.82	**709.76**
Q4	October 2008	82.29	82.26	82.32	0.43	247.30	
	November 2008	82.43	86.24	86.77	0.45	255.89	
	December 2008	15.91	17.15	17.93	0.49	51.48	**554.67**
Q1	January 2009	0.55	0.28	0.49	0.54	1.86	
	February 2009	23.76	25.81	8.27	9.84	67.68	
	March 2009	94.24	115.04	40.10	31.82	281.20	**350.74**
Q2	April 2009	36.76	41.50	41.62	0.00	119.88	
	May 2009	11.07	12.00	13.20	0.00	36.27	
	June 2009	91.93	90.94	91.71	0.00	274.58	**430.73**
Q3	July 2009	93.68	93.50	93.59	0.00	280.77	
	August 2009	81.32	81.13	81.13	0.00	243.58	
	September 2009	84.17	66.02	84.54	9.39	244.12	**768.47**
Q4	October 2009	26.84	7.31	24.81	8.04	67.00	
	November 2009	49.93	52.15	52.65	1.75	156.48	
	December 2009	96.50	78.17	95.96	8.78	279.41	**502.89**

Table 8: Bland Creek Palaeochannel Groundwater Bores - Extraction Volume

Quarter	Month	Volume Extracted (ML)					
		PB1	PB2	PB3	PB4	Monthly Total	Quarterly Total
Q1	January 2010	50.97	68.35	97.84	51.82	268.98	**650.39**
	February 2010	50.66	72.15	78.11	15.33	216.25	
	March 2010	55.57	53.98	55.61	0.00	165.16	
Q2	April 2010	50.35	48.04	49.29	0.00	147.68	**509.62**
	May 2010	61.15	59.05	59.60	0.00	179.80	
	June 2010	61.95	60.10	60.09	0.00	182.14	
Q3	July 2010	61.13	55.68	52.94	0.03	169.78	**398.60**
	August 2010	48.03	46.04	38.63	0.00	132.70	
	September 2010	42.99	46.44	6.69	0.00	96.12	
Q4	October 2010	55.89	45.14	17.55	0.00	118.58	**249.65**
	November 2010	48.39	42.98	0.00	0.00	91.37	
	December 2010	32.58	1.84	0.24	5.04	39.70	
Q1	January 2011	22.10	34.11	5.98	17.93	80.12	**182.97**
	February 2011	43.04	6.28	0.38	4.55	54.25	
	March 2011	43.39	2.07	2.64	0.50	48.60	
Q2	April 2011	34.06	0.00	8.06	2.51	44.62	**114.68**
	May 2011	36.32	0.00	0.13	0.08	36.52	
	June 2011	33.48	0.00	0.06	0.00	33.54	
Q3	July 2011	49.07	16.89	39.81	16.92	122.69	**275.86**
	August 2011	56.92	19.92	65.73	0.074	142.64	
	September 2011	5.866	0.056	4.61	0.00	10.53	
Q4	October 2011	0.00	0.45	0.00	0.00	0.45	**121.91**
	November 2011	0.29	38.98	0.02	24.36	63.66	
	December 2011	0.00	2.81	0.00	54.99	57.80	
Q1	January 2012	0.00	5.28	0.00	58.25	65.53	**167.08**
	February 2012	0.00	26.83	0.00	41.22	68.05	
	March 2012	0.00	26.42	0.00	7.08	33.50	
Q2	April 2012	30.18	11.49	4.68	0.00	43.35	**152.97**
	May 2012	31.79	1.10	0.42	0.00	33.31	
	June 2012	23.50	45.40	7.41	0.00	76.31	
Q3	July 2012	75.17	75.13	0.00	0.00	150.30	**461.19**
	August 2012	78.82	78.68	0.84	0.00	158.34	
	September 2012	76.29	76.26	0.00	0.00	152.55	
Q4	October 2012	78.72	78.73	0.00	0.00	157.45	**280.95**
	November 2012	49.84	49.86	23.57	0.00	123.27	
	December 2012	0.00	0.23	0.00	0.00	0.23	
Q1	January 2013	0.00	0.30	0.00	0.00	0.30	**0.90**
	February 2013	0.00	0.30	0.00	0.00	0.30	
	March 2013	0.00	0.30	0.00	0.00	0.30	
Q2	April 2013	59.6	0.00	88.00	20.9	168.50	**551.90**
	May 2013	104.0	0.00	72.00	79.7	255.70	
	June 2013	70.0	0.00	0.00	57.7	127.70	
Q3	July 2013	58.60	0.00	0.00	45.1	103.80	**274.40**
	August 2013	48.80	1.40	7.60	15.8	73.60	
	September 2013	55.70	0.10	41.30	0.00	97.00	
Q4	October 2013	68.30	0.40	14.00	53.4	136.00	**551.50**
	November 2013	76.10	0.5	76.10	72.7	225.5	
	December 2013	63.90	56.6	63.30	6.10	190	

For monitoring locations refer to Figure 1 of 'Surface Water, Groundwater, Meteorological and Biological Monitoring Programme'.

Table 9: Pit Dewatering Bores - Standing Water Level

Site	Month	Date	SWL (mBTOC)
PDB1A	Jan-14	13/01/2014	13.468
		31/01/2014	15.861
	Feb-14	6/02/2014	13.518
		7/02/2014	15.867
		14/02/2014	15.877
		21/02/2014	15.848
		28/02/2014	15.814
	Mar-14	7/03/2014	15.806
		14/03/2014	13.484
		21/03/2014	15.850
		24/03/2014	13.516
		31/03/2014	13.542
	Apr-14	7/04/2014	13.541
		8/04/2014	13.545
		14/04/2014	13.506
		21/04/2014	13.506
		28/04/2014	13.577
	May-14	5/05/2014	13.494
		12/05/2014	13.518
		19/05/2014	13.503
		26/05/2014	13.505
	Jun-14	2/06/2014	13.491
		9/06/2014	13.532
		10/06/2014	13.578
		16/06/2014	13.572
		23/06/2014	13.534
		26/06/2014	13.561
	Jul-14	3/07/2014	13.528
		8/07/2014	13.577
		10/07/2014	13.561
		17/07/2014	13.605
		24/07/2014	13.645
		31/07/2014	13.672
	Aug-14	7/08/2014	13.751
		13/08/2014	13.810
		14/08/2014	13.769
		21/08/2014	13.799
		28/08/2014	13.793
	Sep-14	4/09/2014	13.815
		11/09/2014	13.819
		17/09/2014	13.889
		18/09/2014	13.856
		25/09/2014	13.884
	Oct-14	2/10/2014	13.927
		7/10/2014	13.971
		9/10/2014	13.942
		16/10/2014	13.953
		23/10/2014	13.981
		30/10/2014	14.012
		31/10/2014	13.982
	Nov-14	7/11/2014	13.979
		14/11/2014	13.966
		17/11/2014	14.108
		21/11/2014	13.986
		28/11/2014	14.017

Table 9: Pit Dewatering Bores - Standing Water Level

PDB1A	Dec-14	4/12/2014	14.162
		5/12/2014	14.029
		12/12/2014	14.053
		19/12/2014	14.047
		26/12/2014	14.039

Note: SWL is recorded in this bore on a monthly basis.

Table 9: Pit Dewatering Bores - Standing Water Level

Site	Month	Date	SWL (mBTOC)
PDB5A	Jan-14	14/01/2014	27.285
	Feb-14	11/02/2014	27.478
	Mar-14	11/03/2014	27.708
	Apr-14	15/04/2014	27.993
		17/04/2014	27.997
		24/04/2014	24.472
	May-14	1/05/2014	24.537
		8/05/2014	24.608
		14/05/2014	28.331
		15/05/2014	24.651
		22/05/2014	24.691
		29/05/2014	24.735
	Jun-14	5/06/2014	24.791
		11/06/2014	28.514
		12/06/2014	24.826
		19/06/2014	24.871
		26/06/2014	28.577
	Jul-14	3/07/2014	28.610
		10/07/2014	28.606
		17/07/2014	28.632
		22/07/2014	28.681
		24/07/2014	28.67
		31/07/2014	28.683
	Aug-14	7/08/2014	28.743
		13/08/2014	28.782
		14/08/2014	28.788
		21/08/2014	28.800
		28/08/2014	28.830
	Sep-14	4/09/2014	28.845
		10/09/2014	28.865
		11/09/2014	28.856
		18/09/2014	28.905
		25/09/2014	28.915
	Oct-10	2/10/2014	28.982
		9/10/2014	29.016
		16/10/2014	29.039
		21/10/2014	29.110
		23/10/2014	29.071
		30/10/2014	29.112
	Nov-14	17/11/2014	29.263
	Dec-14	3/12/2014	29.494

Table 9: Pit Dewatering Bores - Standing Water Level

PDB3A	Jan-14	8/01/2014	78.268
	Feb-14	13/02/2014	78.745
	Mar-14	5/03/2014	79.010
	Apr-14	15/04/2014	79.390
	May-14	7/05/2014	79.548
	Jun-14	18/06/2014	80.766
	Jul-14	24/07/2014	79.837
	Aug-14	20/08/2014	80.070
	Sep-14	30/09/2014	80.231
	Oct-14	9/10/2014	80.336
	Nov-14	28/11/2014	80.620
	Dec-14	9/12/2014	80.650

SWL = Standing Water Level
BTOC = Below Top of Casing
For monitoring locations refer to Figure 12 of 'Surface Water, Groundwater, Meteorological and Biological Monitoring Programme'.

Table 10: Jemalong Weir - Surface Water Flow

Month	Date	Flow (ML/day)
Dec-13	23/12/2013	2219.585
	24/12/2013	2286.412
	25/12/2013	2465.856
	26/12/2013	2647.092
	27/12/2013	2719.165
	28/12/2013	2730.514
	29/12/2013	2782.826
	30/12/2013	2774.091
	31/12/2013	2721.779
Jan-14	1/01/2014	2676.890
	2/01/2014	2634.207
	3/01/2014	2635.917
	4/01/2014	2641.843
	5/01/2014	2652.130
	6/01/2014	2663.179
	7/01/2014	2569.002
	8/01/2014	2420.934
	9/01/2014	2412.725
	10/01/2014	2543.818
	11/01/2014	2618.876
	12/01/2014	2661.560
	13/01/2014	2653.089
	14/01/2014	2560.269
	15/01/2014	2389.907
	16/01/2014	2178.682
	17/01/2014	2065.591
	18/01/2014	2040.499
	19/01/2014	1703.388
	20/01/2014	1242.775
	21/01/2014	1147.947
	22/01/2014	1235.385
	23/01/2014	1296.892
	24/01/2014	1564.163
	25/01/2014	2001.617
	26/01/2014	2162.439
	27/01/2014	1986.514
	28/01/2014	1647.800
	29/01/2014	1352.269
	30/01/2014	1207.125
	31/01/2014	1153.081
Feb-14	1/02/2014	1107.183
	2/02/2014	1145.732
	3/02/2014	1247.394
	4/02/2014	1291.149
	5/02/2014	1298.044
	6/02/2014	1306.671
	7/02/2014	1436.328
	8/02/2014	1619.747
	9/02/2014	1668.591
	10/02/2014	1655.329
	11/02/2014	1682.108
	12/02/2014	1758.021
	13/02/2014	1769.557
	14/02/2014	1720.295
	15/02/2014	1747.803
	16/02/2014	1755.898
	17/02/2014	1688.087
	18/02/2014	1585.784
	19/02/2014	1470.276

Table 10: Jemalong Weir - Surface Water Flow

Feb-14	20/02/2014	1385.135
	21/02/2014	1406.614
	22/02/2014	1463.733
	23/02/2014	1433.166
	24/02/2014	1349.962
	25/02/2014	1214.006
	26/02/2014	1052.918
	27/02/2014	997.684
	28/02/2014	1046.088
Mar-14	1/03/2014	1049.502
	2/03/2014	1034.69
	3/03/2014	1012.025
	4/03/2014	910.945
	5/03/2014	860.264
	6/03/2014	830.452
	7/03/2014	722.417
	8/03/2014	602.247
	9/03/2014	506.879
	10/03/2014	468.388
	11/03/2014	460.903
	12/03/2014	403.942
	13/03/2014	305.884
	14/03/2014	268.636
	15/03/2014	299.494
	16/03/2014	333.529
	17/03/2014	322.167
	18/03/2014	305.147
	19/03/2014	306.217
	20/03/2014	302.716
	21/03/2014	319.399
	22/03/2014	343.133
	23/03/2014	343.133
	24/03/2014	345.404
	25/03/2014	348.654
	26/03/2014	346.383
	27/03/2014	346.383
	28/03/2014	467.804
	29/03/2014	569.344
	30/03/2014	522.844
	31/03/2014	486.348
Apr-14	1/04/2014	462.058
	2/04/2014	449.131
	3/04/2014	447.385
	4/04/2014	433.466
	5/04/2014	378.191
	6/04/2014	302.800
	7/04/2014	288.957
	8/04/2014	301.612
	9/04/2014	298.111
	10/04/2014	298.111
	11/04/2014	300.556
	12/04/2014	300.556
	13/04/2014	301.435
	14/04/2014	303.197
	15/04/2014	303.373
	16/04/2014	306.217
	17/04/2014	303.413
	18/04/2014	299.863
	19/04/2014	285.651
	20/04/2014	266.026

Table 10: Jemalong Weir - Surface Water Flow

Apr-14	21/04/2014	266.683
	22/04/2014	269.951
	23/04/2014	266.683
	24/04/2014	262.768
	25/04/2014	259.548
	26/04/2014	243.973
	27/04/2014	230.968
	28/04/2014	238.609
	29/04/2014	257.442
	30/04/2014	268.636
May-14	1/05/2014	268.636
	2/05/2014	285.651
	3/05/2014	384.678
	4/05/2014	414.771
	5/05/2014	351.382
	6/05/2014	321.289
	7/05/2014	299.166
	8/05/2014	299.166
	9/05/2014	302.667
	10/05/2014	287.961
	11/05/2014	271.602
	12/05/2014	286.662
	13/05/2014	320.039
	14/05/2014	343.170
	15/05/2014	339.993
	16/05/2014	333.529
	17/05/2014	302.671
	18/05/2014	199.190
	19/05/2014	199.190
	20/05/2014	268.636
	21/05/2014	268.636
	22/05/2014	268.636
	23/05/2014	270.945
	24/05/2014	272.592
	25/05/2014	271.930
	26/05/2014	270.283
	27/05/2014	270.945
	28/05/2014	273.254
	29/05/2014	272.592
	30/05/2014	262.228
	31/05/2014	250.951
Jun-14	1/06/2014	250.951
	2/06/2014	252.526
	3/06/2014	253.159
	4/06/2014	434.917
	5/06/2014	607.038
	6/06/2014	590.246
	7/06/2014	562.470
	8/06/2014	558.969
	9/06/2014	554.745
	10/06/2014	505.239
	11/06/2014	518.339
	12/06/2014	679.936
	13/06/2014	653.041
	14/06/2014	502.052
	15/06/2014	497.663
	16/06/2014	502.052
	17/06/2014	506.442
	18/06/2014	399.322
	19/06/2014	274.589

Table 10: Jemalong Weir - Surface Water Flow

Jun-14	20/06/2014	253.805
	21/06/2014	250.633
	22/06/2014	262.275
	23/06/2014	306.914
	24/06/2014	348.720
	25/06/2014	350.978
	26/06/2014	331.423
	27/06/2014	311.249
	28/06/2014	300.569
	29/06/2014	291.884
	30/06/2014	282.650
Jul-14	1/07/2014	275.260
	2/07/2014	274.256
	3/07/2014	289.624
	4/07/2014	315.721
	5/07/2014	340.843
	6/07/2014	358.551
	7/07/2014	425.256
	8/07/2014	504.953
	9/07/2014	511.632
	10/07/2014	486.430
	11/07/2014	462.571
	12/07/2014	443.440
	13/07/2014	423.911
	14/07/2014	407.532
	15/07/2014	397.920
	16/07/2014	397.920
	17/07/2014	416.679
	18/07/2014	442.534
	19/07/2014	457.06
	20/07/2014	462.502
	21/07/2014	528.902
	22/07/2014	853.383
	23/07/2014	1483.800
	24/07/2014	1948.692
	25/07/2014	1893.081
	26/07/2014	1581.770
	27/07/2014	1300.249
	28/07/2014	1088.528
	29/07/2014	937.538
	30/07/2014	830.191
	31/07/2014	754.018
Aug-14	1/08/2014	708.297
	2/08/2014	665.800
	3/08/2014	608.575
	4/08/2014	463.569
	5/08/2014	340.320
	6/08/2014	318.279
	7/08/2014	312.311
	8/08/2014	317.692
	9/08/2014	316.966
	10/08/2014	316.966
	11/08/2014	357.083
	12/08/2014	401.461
	13/08/2014	398.650
	14/08/2014	394.389
	15/08/2014	396.143
	16/08/2014	563.004
	17/08/2014	818.599
	18/08/2014	919.033

Table 10: Jemalong Weir - Surface Water Flow

Aug-14	19/08/2014	820.575
	20/08/2014	663.792
	21/08/2014	557.943
	22/08/2014	488.693
	23/08/2014	656.860
	24/08/2014	1315.877
	25/08/2014	1671.450
	26/08/2014	1320.526
	27/08/2014	1004.716
	28/08/2014	843.948
	29/08/2014	713.695
	30/08/2014	621.970
	31/08/2014	565.996
Sep-14	1/09/2014	503.879
	2/09/2014	411.447
	3/09/2014	302.791
	4/09/2014	319.778
	5/09/2014	393.691
	6/09/2014	389.070
	7/09/2014	373.012
	8/09/2014	357.359
	9/09/2014	441.833
	10/09/2014	537.552
	11/09/2014	551.338
	12/09/2014	540.867
	13/09/2014	655.971
	14/09/2014	690.787
	15/09/2014	704.620
	16/09/2014	866.745
	17/09/2014	944.112
	18/09/2014	925.432
	19/09/2014	885.288
	20/09/2014	831.420
	21/09/2014	789.281
	22/09/2014	780.228
	23/09/2014	870.716
	24/09/2014	960.865
	25/09/2014	1094.789
	26/09/2014	1354.783
	27/09/2014	1648.053
	28/09/2014	1765.316
	29/09/2014	1748.127
	30/09/2014	1740.628
Oct-14	1/10/2014	1726.344
	2/10/2014	1627.916
	3/10/2014	1479.788
	4/10/2014	1550.605
	5/10/2014	1689.288
	6/10/2014	1756.881
	7/10/2014	1921.552
	8/10/2014	2119.007
	9/10/2014	2254.452
	10/10/2014	2358.169
	11/10/2014	2510.007
	12/10/2014	2452.242
	13/10/2014	2066.882
	14/10/2014	1942.581
	15/10/2014	1872.128
	16/10/2014	1870.170
	17/10/2014	1922.113

Table 10: Jemalong Weir - Surface Water Flow

Oct-14	18/10/2014	1874.110
	19/10/2014	1616.781
	20/10/2014	1404.319
	21/10/2014	1359.393
	22/10/2014	1307.959
	23/10/2014	1225.331
	24/10/2014	1251.832
	25/10/2014	1207.611
	26/10/2014	1145.548
	27/10/2014	1096.793
	28/10/2014	1201.843
	29/10/2014	1184.916
	30/10/2014	1156.790
	31/10/2014	1107.782
Nov-14	1/11/2014	1116.012
	2/11/2014	1161.215
	3/11/2014	1143.527
	4/11/2014	1177.317
	5/11/2014	1163.769
	6/11/2014	1067.710
	7/11/2014	1167.030
	8/11/2014	1273.643
	9/11/2014	1365.683
	10/11/2014	1533.523
	11/11/2014	1611.741
	12/11/2014	1514.067
	13/11/2014	1369.143
	14/11/2014	1194.938
	15/11/2014	1123.595
	16/11/2014	1144.717
	17/11/2014	1193.001
	18/11/2014	1339.236
	19/11/2014	1418.935
	20/11/2014	1501.373
	21/11/2014	1532.218
	22/11/2014	1422.140
	23/11/2014	1416.845
	24/11/2014	1320.723
	25/11/2014	1175.678
	26/11/2014	1100.094
	27/11/2014	969.770
	28/11/2014	995.343
	29/11/2014	1027.079
	30/11/2014	922.443
Dec-14	1/12/2014	943.383
	2/12/2014	1046.894
	3/12/2014	1051.375
	4/12/2014	913.168
	5/12/2014	787.022
	6/12/2014	616.964
	7/12/2014	614.114
	8/12/2014	619.737
	9/12/2014	927.766
	10/12/2014	924.056
	11/12/2014	788.427
	12/12/2014	588.361
	13/12/2014	511.565
	14/12/2014	611.344
	15/12/2014	657.642
	16/12/2014	681.417

Table 10: Jemalong Weir - Surface Water Flow

Dec-14	17/12/2014	733.975
	18/12/2014	742.895
	19/12/2014	755.101
	20/12/2014	739.668
	21/12/2014	862.130
	22/12/2014	1128.446

For monitoring locations refer to Figure 2 of 'Surface Water, Groundwater, Meteorological and Biological Monitoring Programme'.

Table 11: Pond UCD North - Water Quality (Weekly and following rainfall events of 20 mm or greater in a 24 hour period)

Quarter	Collect Date	EC-Field (µS/cm)	pH-Field	TSS (mg/L)	Interpretation
1	6/01/2014	1023	8.30	59	
	14/01/2014	1108	8.94	219	
	20/01/2014	1067	9.08	109	
	29/01/2014	1509	8.57	170	
	3/02/2014	1276	8.08	201	
	11/02/2014	1294	8.23	608	
	17/02/2014	1239	9.12	172	
	26/02/2014	1153	8.67	319	
	3/03/2014	1126	8.97	129	
	10/03/2014	1166	8.98	158	
	19/03/2014	1215	9.07	141	
	24/03/2014	1110	9.17	322	
2	1/04/2014	1391	8.78	236	
	7/04/2014	1216	8.58	236	
	14/04/2014	580	8.55	259	
	22/04/2014	1376	9.12	301	
	29/04/2014	1392	8.84	162	
	9/05/2014	1497	7.94	282	
	12/05/2014	1312	9.00	165	
	19/05/2014	1299	7.84	205	
	28/05/2014	1338	8.06	421	
	2/06/2014	1108	8.00	147	
	10/06/2014	1064	7.16	632	There were slight variations but overall all parameters remained relatively stable.
	16/06/2014	1176	7.77	663	
	23/06/2014	1327	7.87	648	
3	1/07/2014	1612	8.92	592	
	8/07/2014	1226	8.40	271	
	16/07/2014	868	8.11	375	
	23/07/2014	1068	8.65	234	
	30/07/2014	1122	8.12	398	
	4/08/2014	1183	8.22	187	
	11/08/2014	1038	7.01	503	
	18/08/2014	1104	7.73	608	
	26/08/2014	1237	8.02	426	
	3/09/2014	1312	8.02	416	
	12/09/2014	1376	8.11	524	
	17/09/2014	1202	8.22	389	
	22/09/2014	1327	8.06	57	
	29/09/2014	1353	8.16	112	
4	7/10/2014	1353	9.29	100	
	13/10/2014	1517	9.55	105	
	20/10/2014	1571	9.33	266	
	29/10/2014	2097	8.98	512	
	3/11/2014	2830	8.98	680	
	16/12/2014	1435	9.01	463	
	23/12/2014	1633	9.25	344	
	Count	46	46	46	
	Minimum	580	7.01	57	
	Maximum	2830	9.55	680	
	Mean	1301	8.50	316	

Table 12: Pond UCD South - Water Quality (Weekly and following rainfall events of 20 mm or greater in a 24 hour period)

Quarter	Collect Date	EC-Field (µS/cm)	pH-Field	TSS (mg/L)	Interpretation
1	6/01/2014	298	7.27	88	
	13/01/2014	454	8.60	104	
	20/01/2014	502	8.44	120	
	29/01/2014	547	8.67	82	
	3/02/2014	670	8.70	87	
	11/02/2014	644	8.71	88	
	17/02/2014	811	8.81	56	
	26/02/2014	935	8.81	197	
	3/03/2014	848	8.76	115	
	10/03/2014	823	8.70	146	
	19/03/2014	974	8.83	272	
	24/03/2014	1053	8.94	63	
2	1/04/2014	1010	8.45	136	
	7/04/2014	913	8.81	138	
	14/04/2014	1086	9.00	163	
	22/04/2014	1055	8.97	114	
	29/04/2014	1053	9.00	214	
	9/05/2014	1057	8.96	89	
	12/05/2014	1205	8.94	72	
	19/05/2014	1193	8.85	124	
	28/05/2014	1304	8.83	91	
	2/06/2014	961	8.88	153	
	10/06/2014	910	8.54	158	EC increased in quarter 1 and remained stable for the remained of the reporting period. Otherwise, there were slight variations but overall all other parameters remained relatively stable.
	16/06/2014	1184	8.58	177	
	23/06/2014	1307	8.65	169	
3	1/07/2014	1044	8.07	136	
	8/07/2014	1317	8.68	116	
	16/07/2014	1133	8.70	198	
	23/07/2014	1085	8.81	68	
	30/07/2014	1062	8.87	148	
	4/08/2014	1452	8.88	80	
	11/08/2014	1210	8.90	116	
	18/08/2014	1204	8.72	149	
	26/08/2014	1394	8.80	139	
	3/09/2014	1266	8.86	133	
	12/09/2014	1425	8.64	118	
	17/09/2014	1069	9.11	139	
	22/09/2014	1223	9.06	83	
	29/09/2014	1263	8.82	69	
4	7/10/2014	1424	9.05	158	
	13/10/2014	1691	9.00	164	
	20/10/2014	1879	8.64	343	
	29/10/2014	2296	8.94	146	
	3/11/2014	2810	9.09	83	
	10/11/2014	3920	9.05	190	
	17/11/2014	5220	9.18	158	
	24/11/2014	8720	9.23	242	
	4/12/2014	8480	9.35	45	
	9/12/2014	5640	9.35	26	
	30/12/2014	3360	8.34	71	
	Count	50	50	50	
	Minimum	298	7.27	26	
	Maximum	8720	9.35	343	
	Mean	1708	8.80	131	

Table 13: Pond D1 - Water Quality (Weekly and following rainfall events of 20 mm or greater per 24 hrs)

Quarter	Collect Date	EC-Field (µS/cm)	pH-Field	TSS (mg/L)	Interpretation
1	6/01/2014	7780	8.84	32	There were slight variations but overall all parameters remained relatively stable.
	13/01/2014	7670	9.07	19	
	20/01/2014	8830	9.04	7	
	29/01/2014	9390	8.69	16	
	3/02/2014	8610	8.09	60	
	11/02/2014	9620	8.33	38	
	17/02/2014	8110	8.61	10	
	26/02/2014	8050	8.56	12	
	3/03/2014	8220	8.5	<5	
	10/03/2014	8660	8.84	<5	
	19/03/2014	8910	9.01	44	
	24/03/2014	9490	9.02	11	
2	1/04/2014	11780	8.35	<5	
	7/04/2014	11760	8.34	<5	
	14/04/2014	11810	8.48	<5	
	22/04/2014	12120	8.64	<5	
	29/04/2014	12020	8.75	<5	
	9/05/2014	12220	8.53	<5	
	12/05/2014	12400	8.75	<5	
	19/05/2014	11880	8.68	64	
	28/05/2014	11660	8.38	14	
	2/06/2014	9570	8.32	<5	
	10/06/2014	9160	8.38	<1	
	16/06/2014	10490	8.55	<1	
	23/06/2014	11620	8.69	6	
3	1/07/2014	11670	8.66	12	
	8/07/2014	10270	8.66	39	
	16/07/2014	10010	8.67	70	
	23/07/2014	9960	8.91	26	
	30/07/2014	10040	8.81	14	
	4/08/2014	9910	8.92	1	
	11/08/2014	9980	8.31	8	
	18/08/2014	10260	8.61	<5	
	26/08/2014	9730	8.71	2	
	3/09/2014	9570	8.99	<1	
	12/09/2014	10120	8.33	7	
	17/09/2014	7240	9.36	4	
	22/09/2014	7320	9.46	8	
	29/09/2014	7450	9.58	3	
4	7/10/2014	7410	9.42	18	
	13/10/2014	7480	9.22	74	
	20/10/2014	7480	9.44	12	
	29/10/2014	7830	9.27	54	
	3/11/2014	7760	9.5	54	
	10/11/2014	7760	9.33	36	
	17/11/2014	9980	8.23	24	
	24/11/2014	9820	9.53	22	
	4/12/2014	9250	8.85	23	
	9/12/2014	9800	8.4	16	
	16/12/2014	11290	8.35	18	
	23/12/2014	10740	9.23	8	
	30/12/2014	7310	7.32	60	
	Count	52	52	52	
	Minimum	7240	7.32	1	
	Maximum	12400	9.58	74	
	Mean	9601	8.77	19	

Table 14: Pond D4 - Water Quality (Weekly and following rainfall events of 20 mm or greater per 24 hrs)

Quarter	Collect Date	EC-Field (µS/cm)	pH-Field	TSS (mg/L)	Interpretation
1	6/01/2014	13830	8.73	48	EC fluctuated considerably throughout the reporting period. Otherwise, there were slight variations but overall all other parameters remained relatively stable.
	13/01/2014	14900	8.58	20	
	20/01/2014	19720	8.72	103	
	29/01/2014	28600	8.34	100	
	3/02/2014	31800	8.03	36	
	11/02/2014	53200	8.12	31	
	17/02/2014	69030	8.19	34	
	3/03/2014	6530	7.61	<5	
	10/03/2014	11580	8.58	<5	
	27/03/2014	17340	7.34	26	
2	1/04/2014	5370	7.16	14	
	7/04/2014	6400	8.31	98	
	14/04/2014	8110	8.31	196	
	2/06/2014	2034	8.12	10	
	10/06/2014	2750	7.97	8	
	16/06/2014	4650	8.45	<5	
	23/06/2014	6140	8.46	9	
3	1/07/2014	6720	8.44	38	
	8/07/2014	5980	8.34	3	
	16/07/2014	5910	8.23	14	
	23/07/2014	6030	8.51	3	
	30/07/2014	6290	8.48	4	
	4/08/2014	6510	8.44	7	
	11/08/2014	6590	8.29	35	
	18/08/2014	6990	8.27	118	
	26/08/2014	7090	8.43	28	
	3/09/2014	7640	7.99	40	
	12/09/2014	8430	7.21	2	
	17/09/2014	6170	8.73	34	
	22/09/2014	6690	7.46	2	
	29/09/2014	6960	8.01	<5	
4	7/10/2014	7730	8.31	38	
	13/10/2014	8620	8.09	<5	
	20/10/2014	8640	8.3	8	
	29/10/2014	10120	8.12	11	
	3/11/2014	10770	8.17	8	
	10/11/2014	11850	8.26	20	
	17/11/2014	16820	8.02	24	
	24/11/2014	22500	8.48	583	
	4/12/2014	4310	8.44	61	
	9/12/2014	2020	7.86	51	
	30/12/2014	1767	7.86	44	
	Count	42	42	42	
	Minimum	1767	7.16	2	
	Maximum	69030	8.73	583	
	Mean	11932	8.19	46	

Table 15: Pond D2, D3, D8B and D9 - Water Quality

Quarter	Sample Point	Collect Date	Oil/Grease (mg/L)	pH-Field	EC-Field (µS/cm)
1	D2	3/01/2014	<5	8.77	53600
2	D2	1/04/2014	<5	8.09	3250
3	D2	2/07/2014	<5	7.73	4160
4	D2	7/10/2014	<5	8.20	7870
	Summary Statistics	Count	4	4	4
		Minimum	<5	7.73	3250
		Maximum	<5	8.77	53600
		Mean	<5	8.20	17220

Quarter	Sample Point	Collect Date	Oil/Grease (mg/L)	pH-Field	EC-Field (µS/cm)
1	D3	3/01/2014	<5	8.51	55300
2	D3	1/04/2014	<5	8.18	13760
3	D3	2/07/2014	<5	8.06	18210
4	D3	7/10/2014	<5	8.92	18343
	Summary Statistics	Count	4	4	4
		Minimum	<5	8.06	13760
		Maximum	<5	8.92	55300
		Mean	<5	8.42	26403

Quarter	Sample Point	Collect Date	Oil/Grease (mg/L)	pH-Field	EC-Field (µS/cm)
1	D8B	3/01/2014	<5	8.56	12960
2	D8B	1/04/2014	<5	6.67	15680
3	D8B	2/07/2014	<5	8.64	3820
4	D8B	7/10/2014	<5	8.41	6430
	Summary Statistics	Count	4	4	4
		Minimum	<5	6.67	3820
		Maximum	<5	8.64	15680
		Mean	<5	8.07	9723

Quarter	Sample Point	Collect Date	Oil/Grease (mg/L)	pH-Field	EC-Field (µS/cm)
1	D9	3/01/2014	<5	7.91	17980
2	D9	1/04/2014	<5	7.77	13120
3	D9	2/07/2014	<5	7.98	12190
4	D9	7/10/2014	<5	8.44	7980
	Summary Statistics	Count	4	4	4
		Minimum	<5	7.77	7980
		Maximum	<5	8.44	17980
		Mean	<5	8.03	12818

For all surface water monitoring locations refer to Figure 7 of 'Surface Water, Groundwater, Meteorological and Biological Monitoring Programme'.

Table 16: Pond D5 - Water Quality

Quarter	Sample Point	Collect Date	DO-Field (mg/L)	pH - Lab	EC-Lab (µS/cm)	Temperature (Deg C)	Turbidity (NTU)	Interpretation
1	D5	6/01/2014	5.89	8.45	60700	22.3	79.00	EC and Turbidity fluctuated considerably Otherwise, there were slight variations but overall all other parameters remained relatively stable.
	D5	3/02/2014	5.59	8.78	40600	25.8	4.30	
	D5	3/03/2014	-	7.74	7650	31.8	33.30	
2	D5	2/04/2014	6.62	7.62	7690	21.9	5.20	
	D5	12/05/2014	8.50	8.28	11700	16.4	8.30	
	D5	2/06/2014	6.98	7.63	3680	14	3.00	
3	D5	2/07/2014	9.69	8.09	15000	10.4	19.40	
	D5	6/08/2014	9.35	7.96	13700	7.2	6.50	
	D5	4/09/2014	8.56	8.07	13900	11.6	7.10	
4	D5	8/10/2014	8.27	8.14	15600	14.5	11.50	
	D5	3/11/2014	-	8.68	20300	20.3	30.10	
	D5	9/12/2014	7.44	7.97	4300	23.2	3.50	
	Summary Statistics	Count	10	12	12	12	12	
		Minimum	5.59	7.62	3680	7.2	3.00	
		Maximum	9.69	8.78	60700	31.8	79.00	
		Mean	7.70	8.10	17902	18.3	17.60	

For all surface water monitoring locations refer to Figure 7 of 'Surface Water, Groundwater, Meteorological and Biological Monitoring Programme'.

Table 17: Pond D6 - Water Quality

Quarter	Sample Point	Collect Date	DO	pH-Lab	EC-Lab (µS/cm)	Temperature (Deg C)	Turbidity (NTU)	Interpretation
1	D6	6/01/2014	4.79	8.02	22900	25.1	101	EC and Turbidity fluctuated considerably Otherwise, there were slight variations but overall all other parameters remained relatively stable.
	D6	3/02/2014	3.5	8.04	14800	28.4	309	
	D6	3/03/2014	-	7.66	13900	29	21.70	
2	D6	2/04/2014	4.88	8.15	13400	24.5	125	
	D6	12/05/2014	4.87	8.33	14100	24.1	99.40	
	D6	2/06/2014	5.01	8.29	6640	20.3	28.60	
3	D6	3/07/2014	5.58	8.6	12800	18	77.80	
	D6	6/08/2014	7.03	8.22	11700	13.2	54.80	
	D6	4/09/2014	8.71	7.8	8650	12.8	38.20	
4	D6	8/10/2014	7.67	8.16	14100	17.2	1930	
	D6	3/11/2014	-	7.92	4860	25.3	84.10	
	D6	9/12/2014	5.72	7.96	4900	28.1	46.30	
	Summary Statistics	Count	10	12	12	12	12	
		Minimum	3.5	7.66	4860	12.8	21.7	
		Maximum	8.71	8.6	22900	29	309	
		Mean	5.78	8.10	11896	22.2	98.2	

For all surface water monitoring locations refer to Figure 7 of 'Surface Water, Groundwater, Meteorological and Biological Monitoring Programme'.

Table 18: Pond D6 - Water Quality

Parameter	Unit	LOR	Collect Date				Summary Statistics			
			Quarter 1	Quarter 2	Quarter 3	Quarter 4	Count	Minimum	Maximum	Mean
			6/01/2014	2/04/2014	3/07/2014	8/10/2014				
Antimony - Total	mg/L	0.001	0.009	0.005	0.017	0.01	4	0.005	0.017	0.01025
Arsenic - Total	mg/L	0.001	0.008	0.015	0.01	0.011	4	0.008	0.015	0.011
Biochemical Oxygen Demand	mg/L	2	<2	<2	<2	<2	4	<2	<2	<2
Cadmium - Total	mg/L	0.0001	0.0048	0.0073	0.0004	0.0008	4	0.0004	0.0073	0.003325
Calcium - Dissolved	mg/L	1	596	288	225	273	4	225	596	345.5
Chloride	mg/L	1	6740	3530	3130	3460	4	3130	6740	4215
Coliforms	CFU/100mL	1	0	<1	<1	<1	4	0	<1	0.75
Copper - Total	mg/L	0.001	1.11	1.07	3.66	1.24	4	1.07	3.66	1.77
Enterococci	CFU/100mL	1	<1	<1	<1	<1	4	<1	<1	<1
Escherichia coli	CFU/100mL	1	<1	<1	<2	<2	4	<1	2	1.5
Faecal Coliform -Total	CFU/100mL	1	<1	<1	<2	<2	4	<1	2	1.5
Iron - Total	mg/L	0.05	1.87	5.81	2.34	4.46	4	1.87	5.81	3.62
Lead - Total	mg/L	0.001	0.006	0.008	0.005	0.017	4	0.005	0.017	0.009
Magnesium - Dissolved	mg/L	1	541	300	143	210	4	143	541	298.5
Manganese - Total	mg/L	0.001	0.645	0.396	0.268	0.477	4	0.268	0.645	0.4465
Mercury - Total	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	4	<0.0001	<0.0001	<0.0001
Potassium - Dissolved	mg/L	1	266	126	238	234	4	126	266	216
Selenium - Total	mg/L	0.01	<0.01	<0.01	0.02	<0.01	4	<0.01	0.02	0.0125
Sodium - Dissolved	mg/L	1	4160	2150	2170	2210	4	2150	4160	2672.5
Sulphates	mg/L	1	2070	1200	2100	2900	4	1200	2900	2067.5
Total Dissolved Solids	mg/L	1	16100*	7360*	8560	9900	2	8560	9900	9230
Total hardness as CaCO3	mg/L	1	3720	1950	1150	1550	4	1150	3720	2092.5
Total Suspended Solids	mg/L	1	86*	146*	85	290	2	85	290	187.5
Zinc - Total	mg/L	0.005	0.057	0.609	0.039	0.101	4	0.039	0.609	0.2015

* Indicates LOR has been raised for Total Suspended Solids (5 mg/L), and, Total Dissolved Solids (10 mg/L).
NOTE: Calculation of mean not possible where >50% of dataset is below LOR.

Table 19: Pit Sumps - Water Quality

Quarter	Sample Point	Collect Date	pH-Field	EC-Field (µS/cm)	Total Suspended Solids (mg/L)
1	Pit Sump 1	2/01/2014	7.96	65500	6
	Pit Sump 1	4/02/2014	7.77	52700	<5
	Pit Sump 1	5/03/2014	6.72	48160	<5
2	Pit Sump 1	7/04/2014	7.76	51300	<5
	Pit Sump 1	13/05/2014	6.95	52400	3300
	Pit Sump 1	5/06/2014	7.82	51600	4
3	Pit Sump 1	8/07/2014	7.85	30500	2
	Pit Sump 1	12/08/2014	8.17	45200	3
	Pit Sump 1	23/09/2014	8.05	51800	<1
4	Pit Sump 1	16/10/2014	7.63	51100	2
	Pit Sump 1	24/11/2014	7.97	51900	49
	Pit Sump 1	4/12/2014	7.56	38700	7
1	Pit Sump 2	2/01/2014	8.06	55400	<5
	Pit Sump 2	4/02/2014	7.62	65000	878
	Pit Sump 2	5/03/2014	8.06	50230	<5
2	Pit Sump 2	7/04/2014	8.12	54200	<5
	Pit Sump 2	13/05/2014	7.81	51500	8
	Pit Sump 2	5/06/2014	7.74	50400	7
3	Pit Sump 2	8/07/2014	7.8	51600	167
	Pit Sump 2	12/08/2014	8.43	58300	<1
	Pit Sump 2	23/09/2014	7.83	54100	654
4	Pit Sump 2	16/10/2014	8.2	50800	11
	Pit Sump 2	24/11/2014	8.04	47900	71
	Pit Sump 2	4/12/2014	7.82	48800	40
1	Pit Sump 3	2/01/2014	7.68	52700	27
	Pit Sump 3	4/02/2014	7.87	57600	6
2	Pit Sump 3	13/05/2014	7.92	52200	12
	Pit Sump 3	5/06/2014	7.95	55100	<1
3	Pit Sump 3	8/07/2014	7.63	52400	399
	Pit Sump 3	23/09/2014	8.07	54400	2
4	Pit Sump 3	16/10/2014	8.18	52300	29
	Pit Sump 3	24/11/2014	7.99	49800	75
Summary Statistics		Count	32	32	32
		Minimum	6.72	30500	<1
		Maximum	8.43	65500	3300
		Mean	7.84	51737	181

NOTE: Vertical advancement of pit floor causes sumps to be continuously destroyed and recreated. Sumps are sampled monthly when they exist.

FIGURES

FIGURES

Figure 1: Groundwater Bores – Standing Water Level

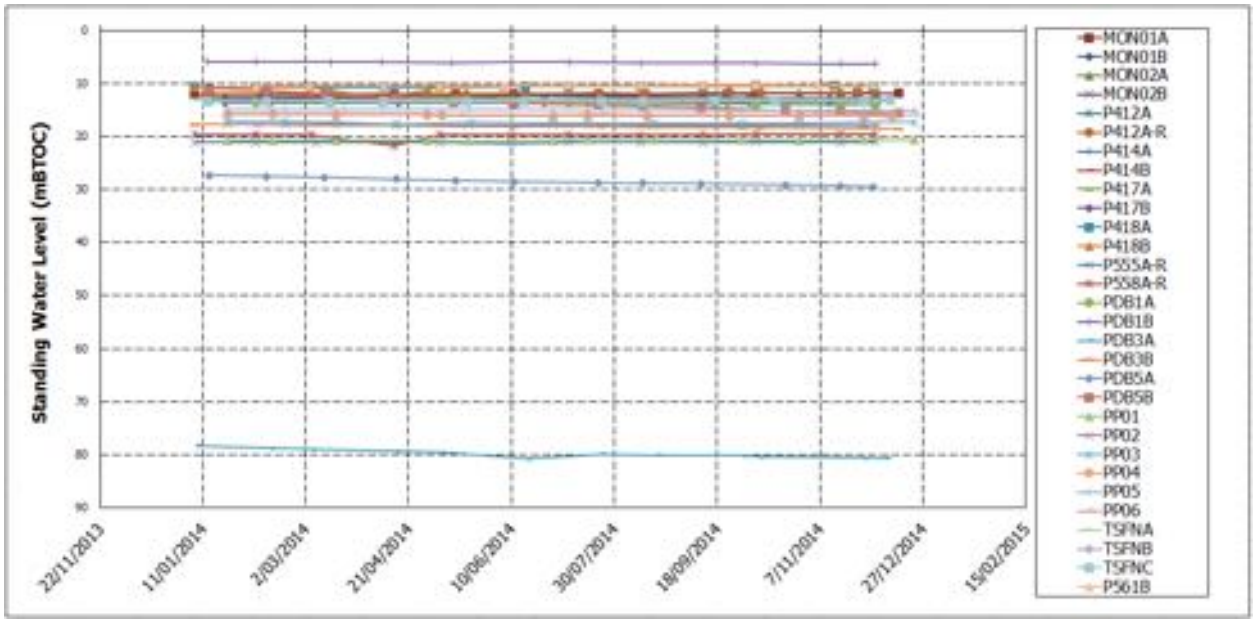


Figure 2: DWE Groundwater Bores – Standing Water Level

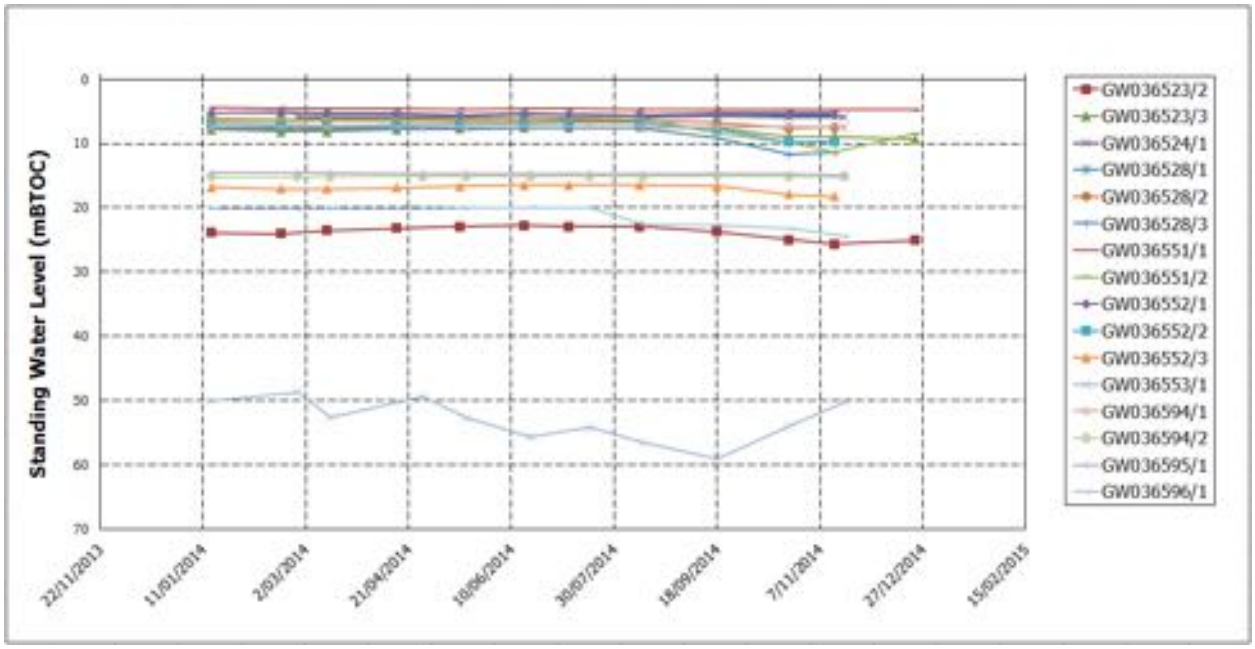


Figure 3: DWE – Groundwater Bores – Standing Water Level

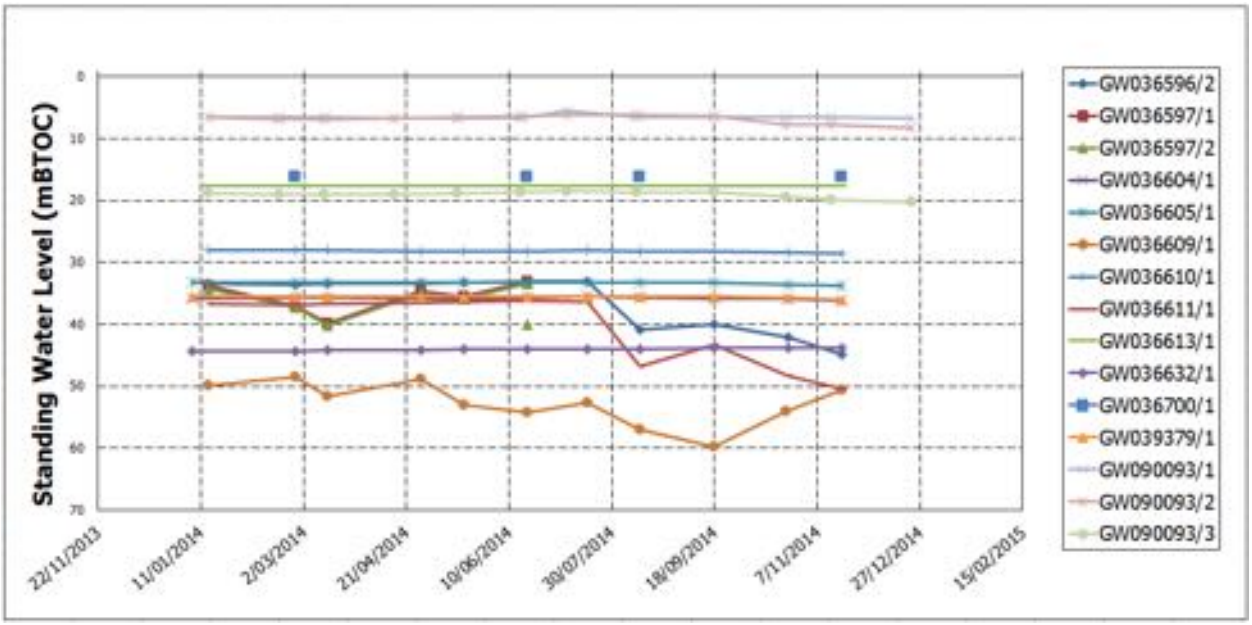


Figure 4: P412A – pH, Standing Water Level and Electrical Conductivity

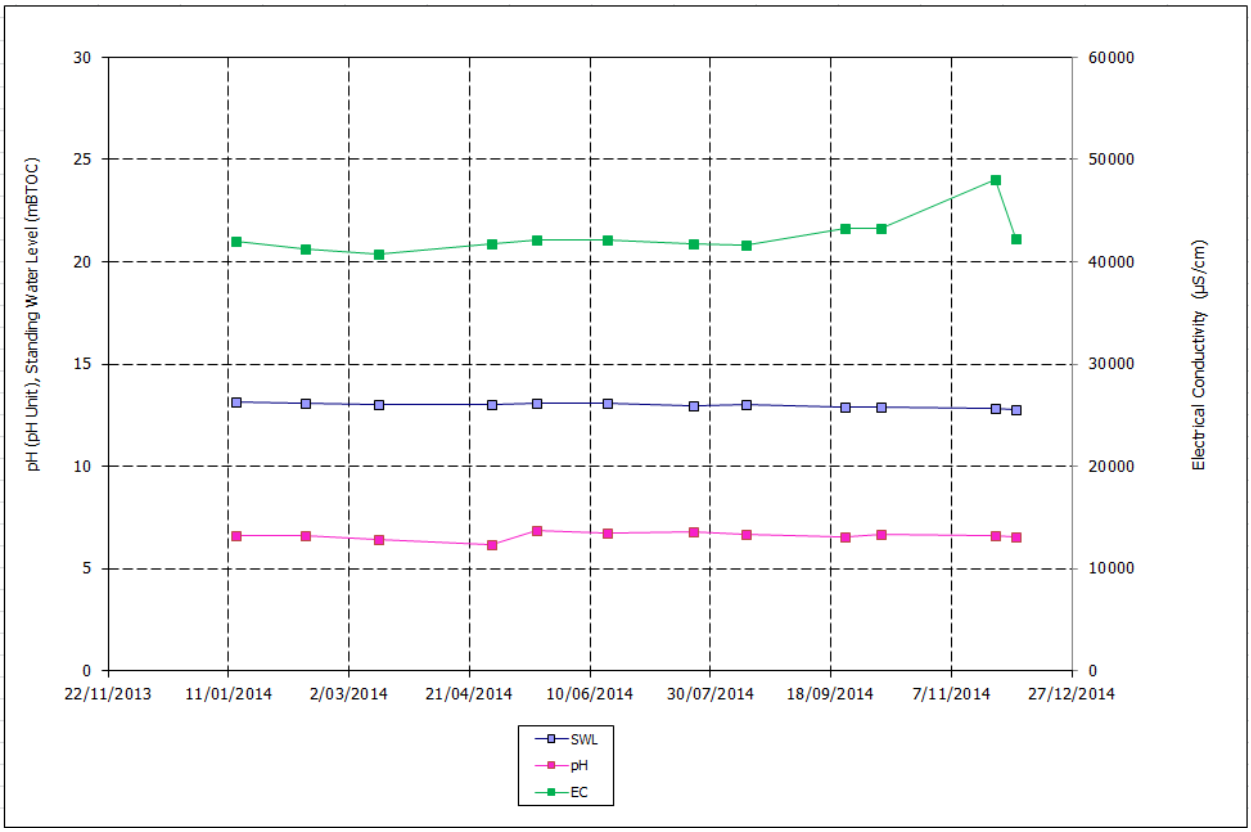


Figure 5: P412A-R – pH, Standing Water Level and Electrical Conductivity

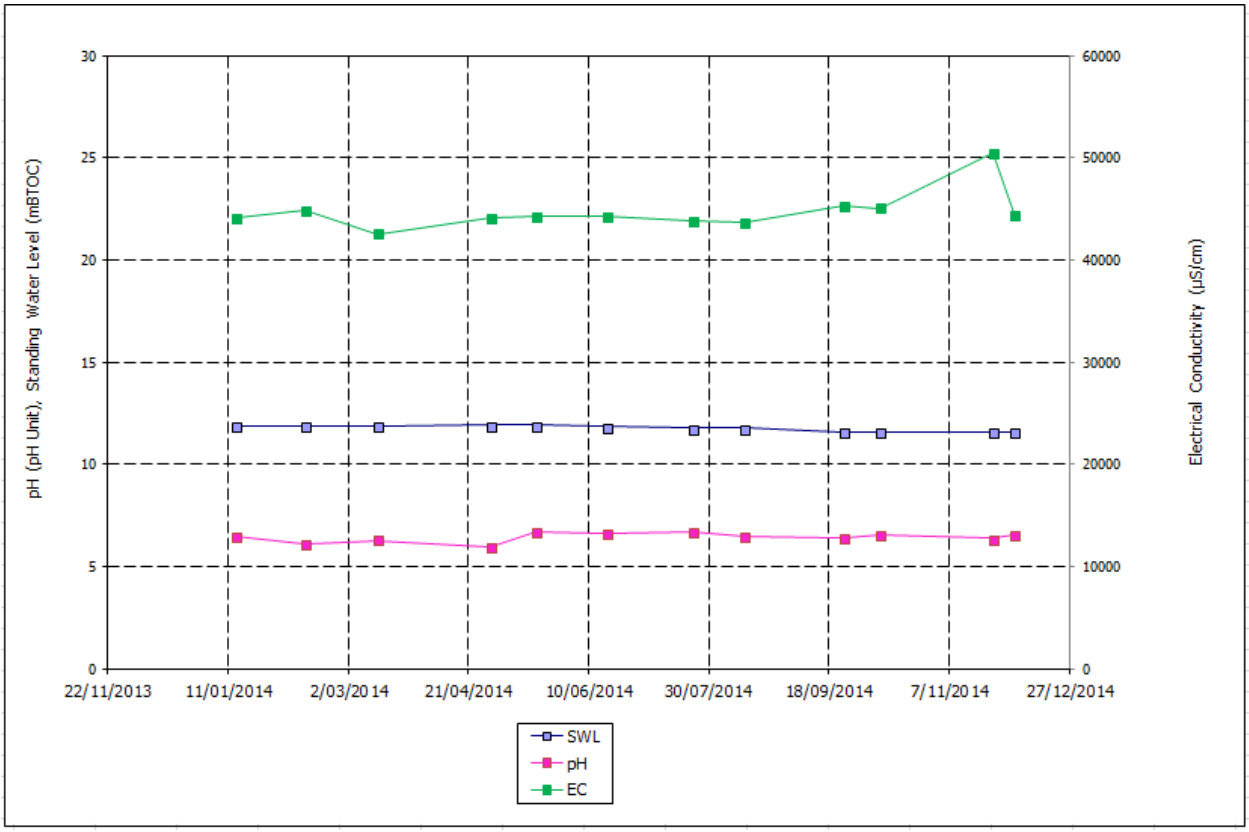


Figure 6: P414A –pH, Standing Water Level and Electrical Conductivity

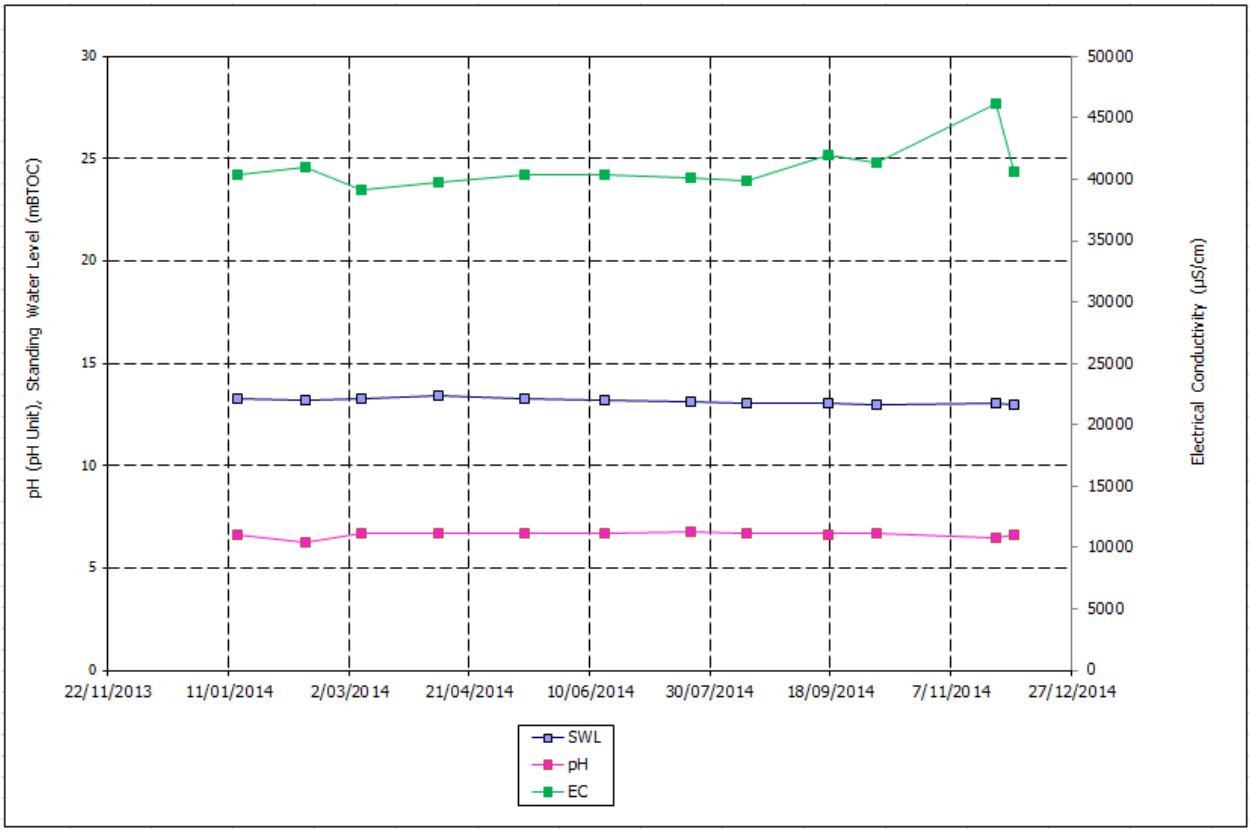


Figure 7: P414B – pH, Standing Water Level and Electrical Conductivity

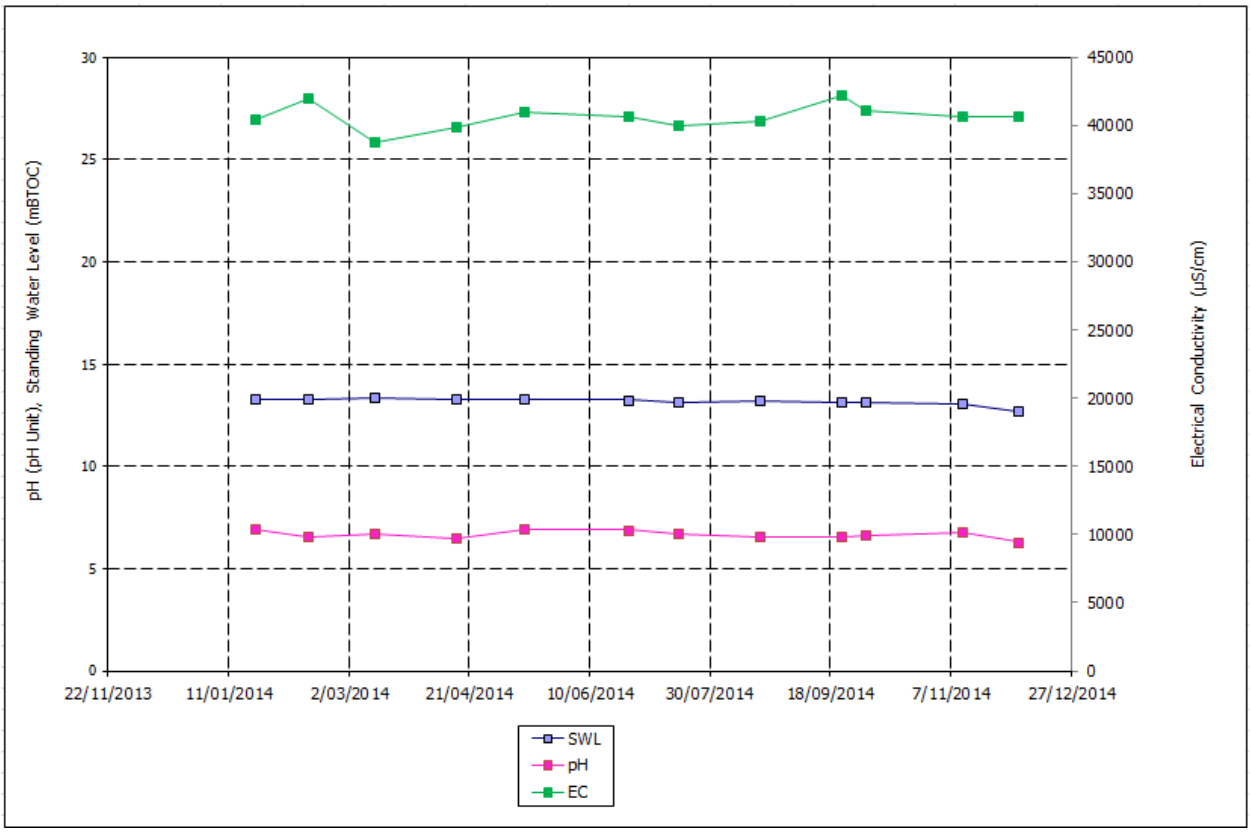


Figure 8: P417A – pH, Standing Water Level and Electrical Conductivity

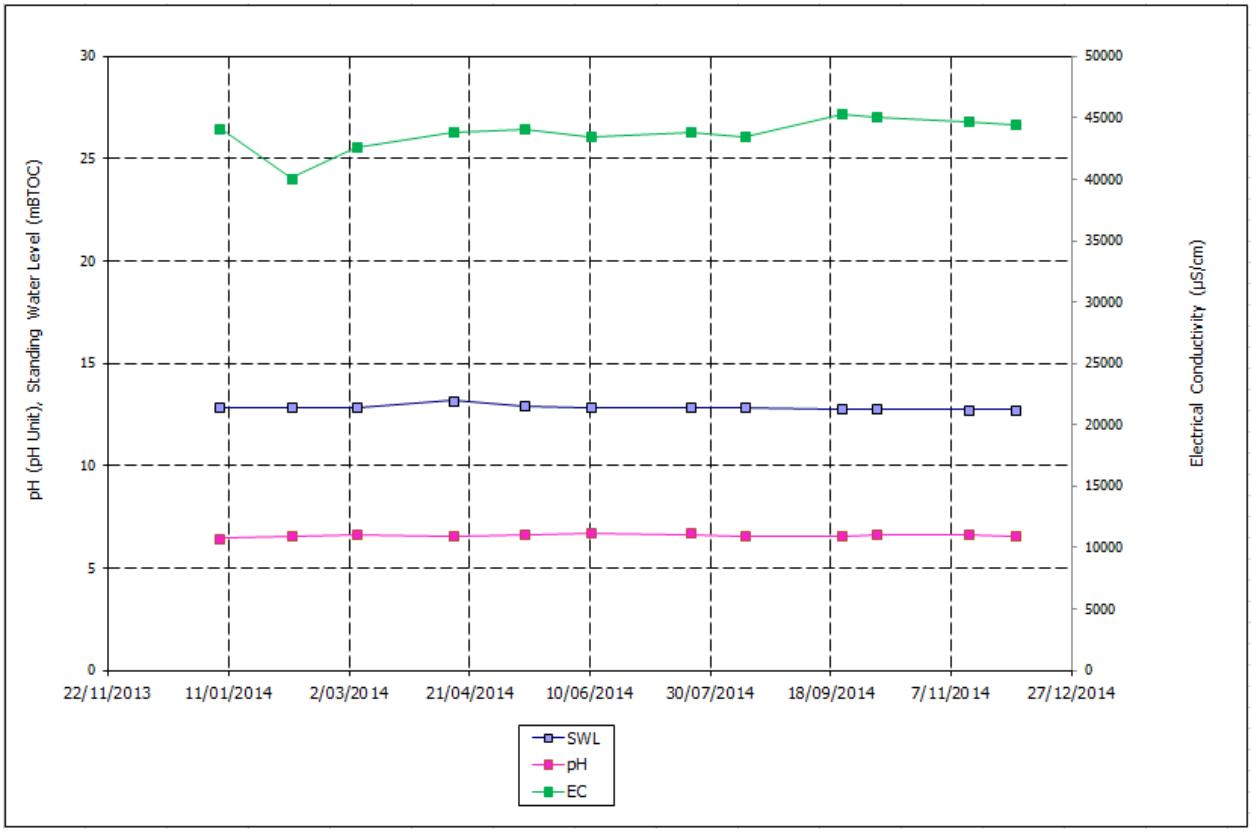


Figure 9: P417B – pH, Standing Water Level and Electrical Conductivity

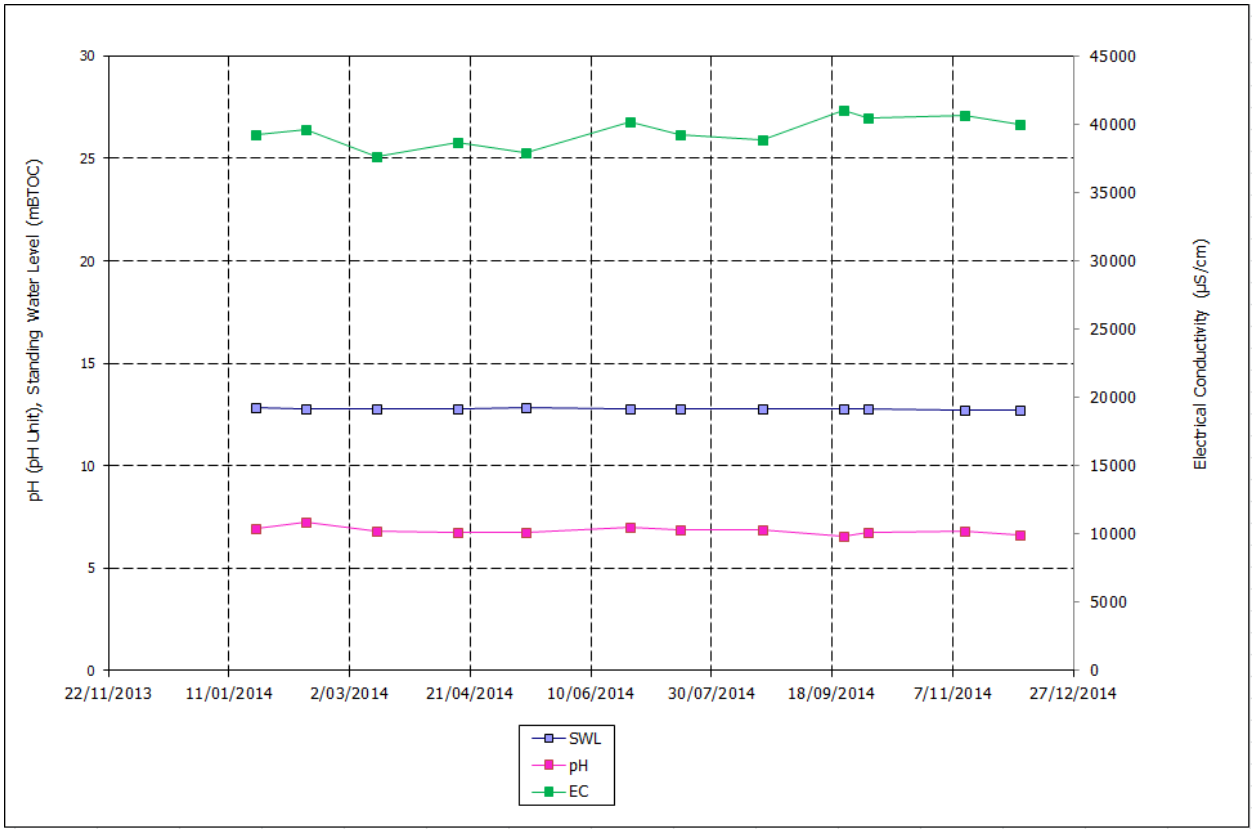


Figure 10: P418A – pH, Standing Water Level and Electrical Conductivity

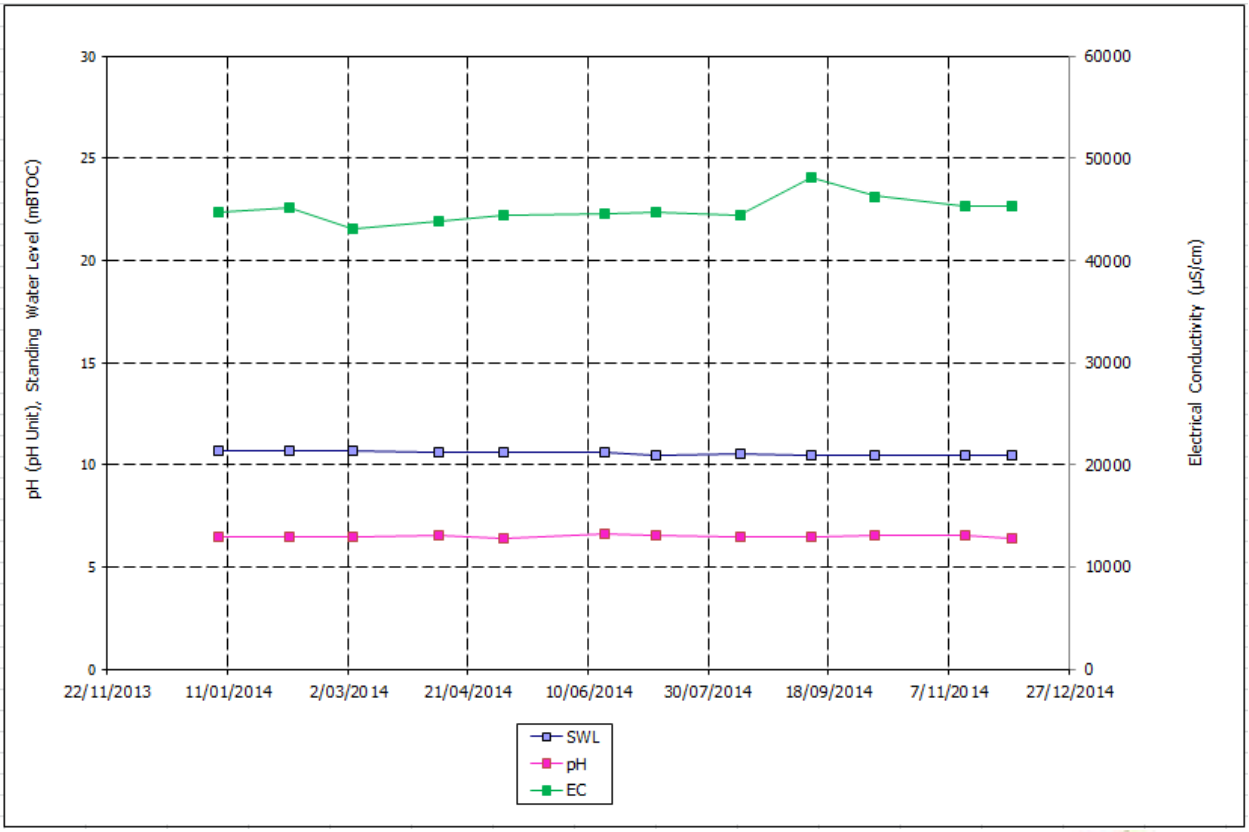


Figure 11: P418B – pH, Standing Water Level and Electrical Conductivity

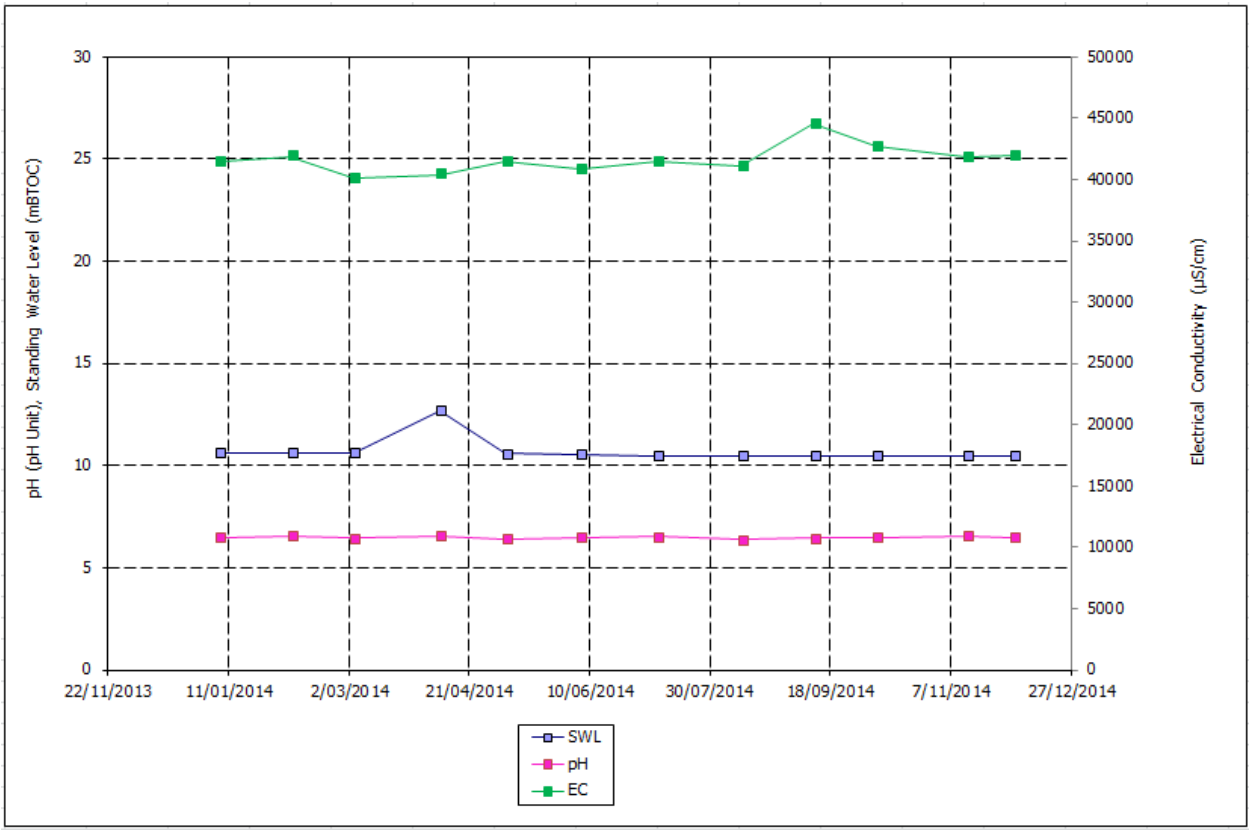


Figure 12: P555A-R – pH, Standing Water Level and Electrical Conductivity

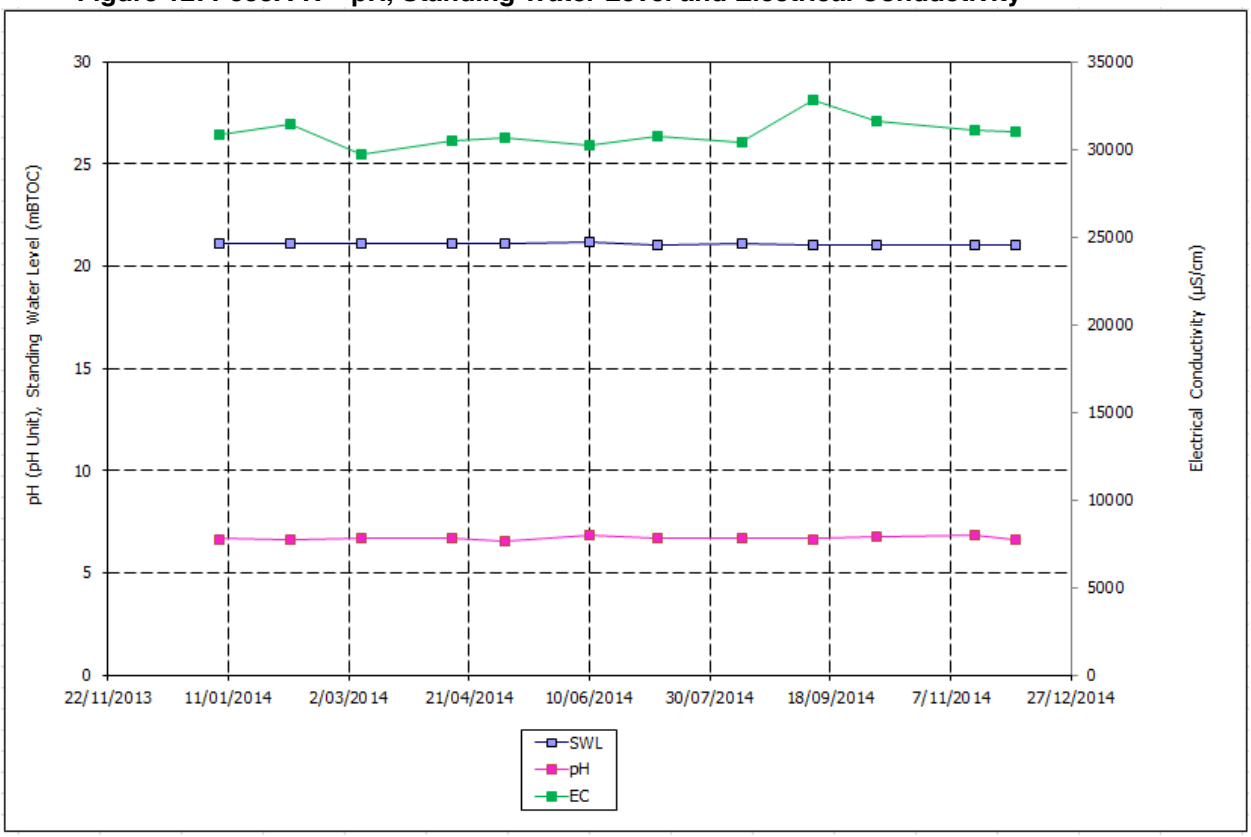


Figure 13: P558A-R – pH, Standing Water Level and Electrical Conductivity

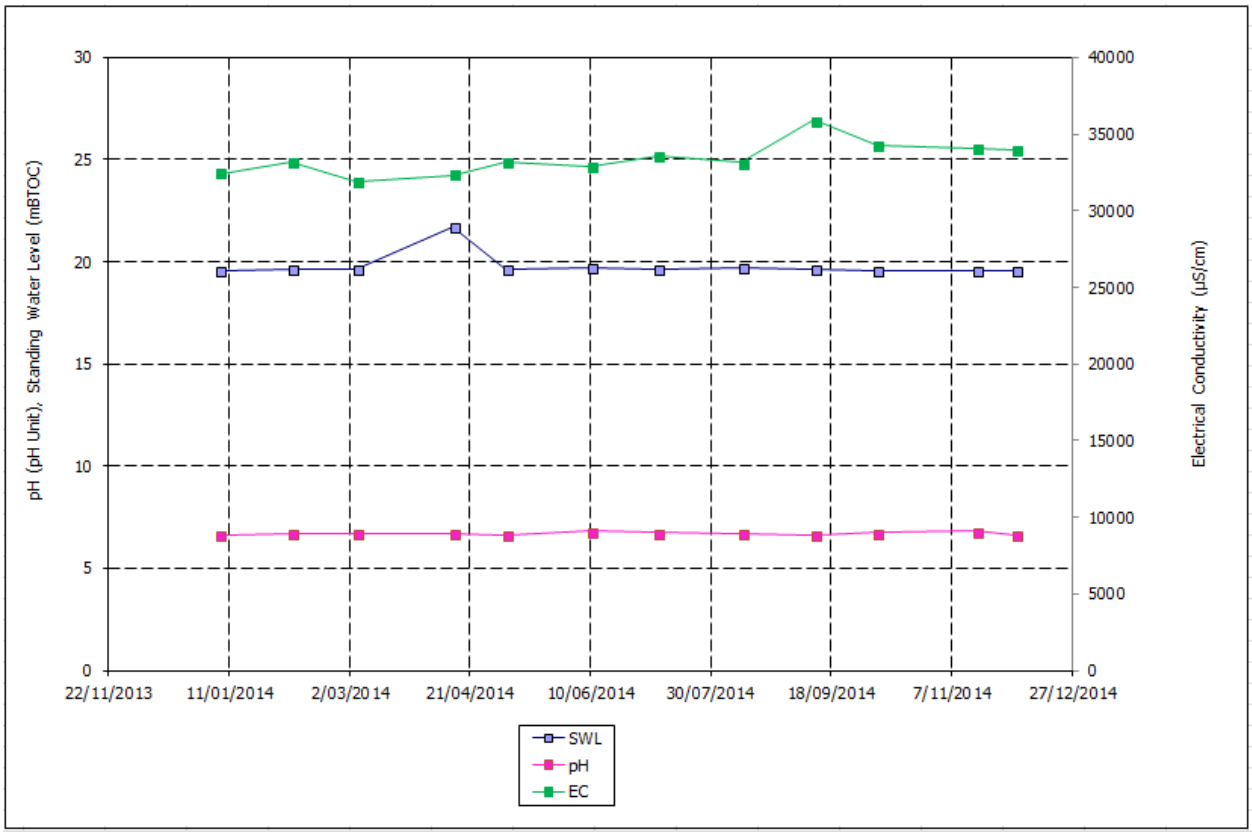


Figure 14: TSFNA – pH, Standing Water Level and Electrical Conductivity

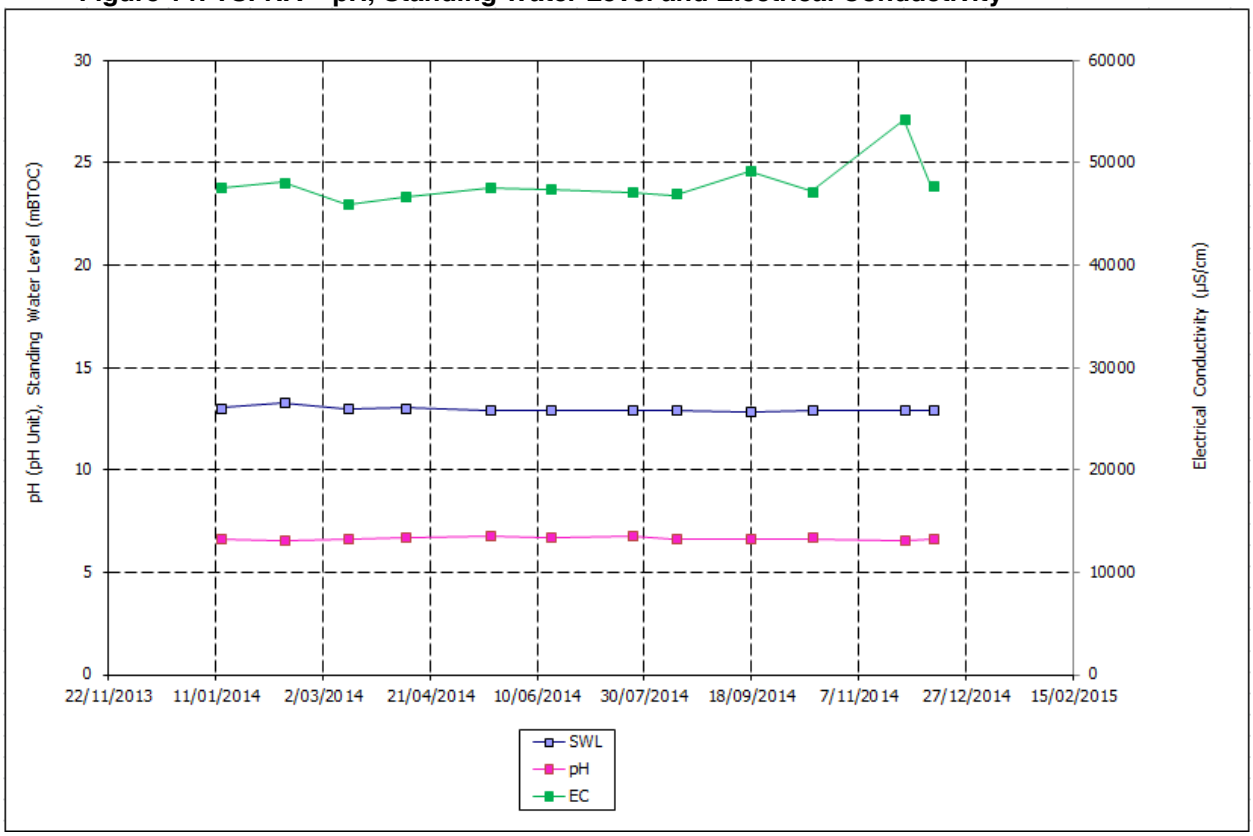


Figure 15: TSFNB – pH, Standing Water Level and Electrical Conductivity

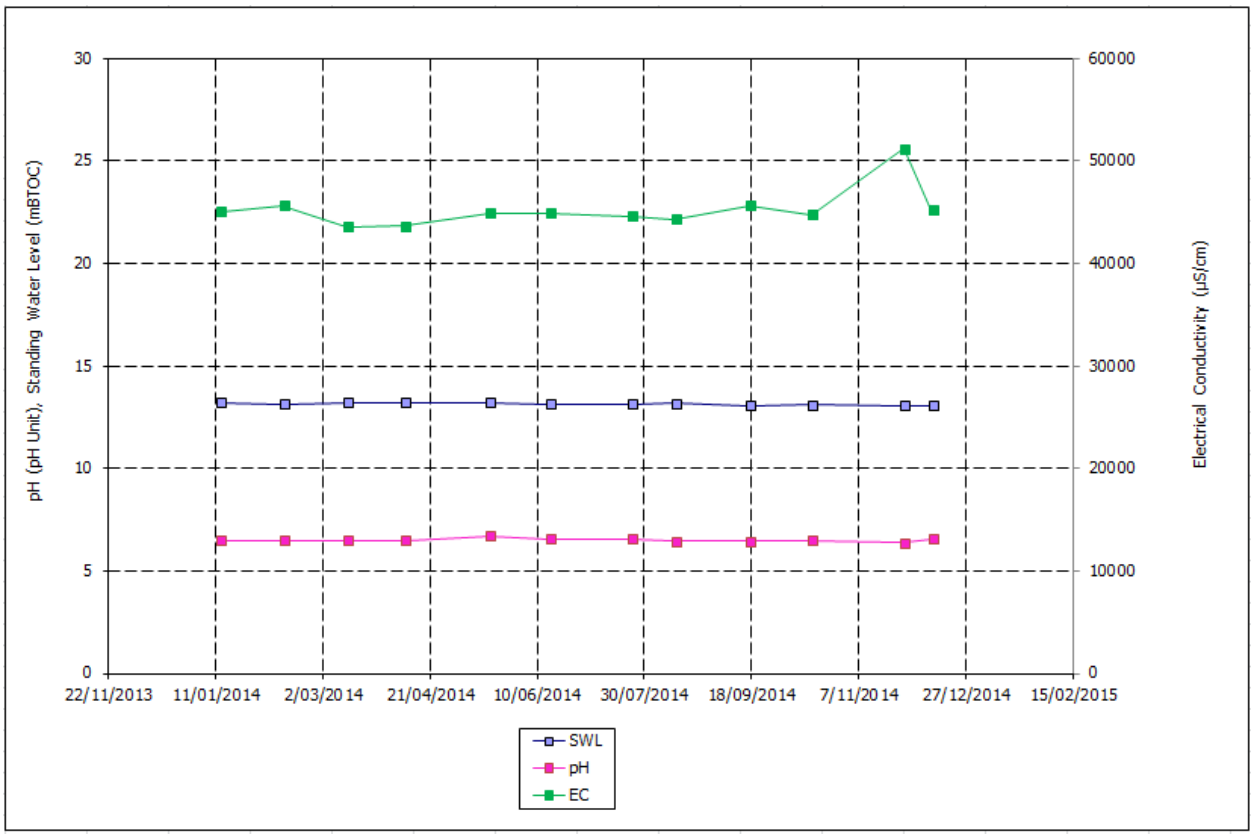


Figure 16: TSFNC – pH, Standing Water Level and Electrical Conductivity

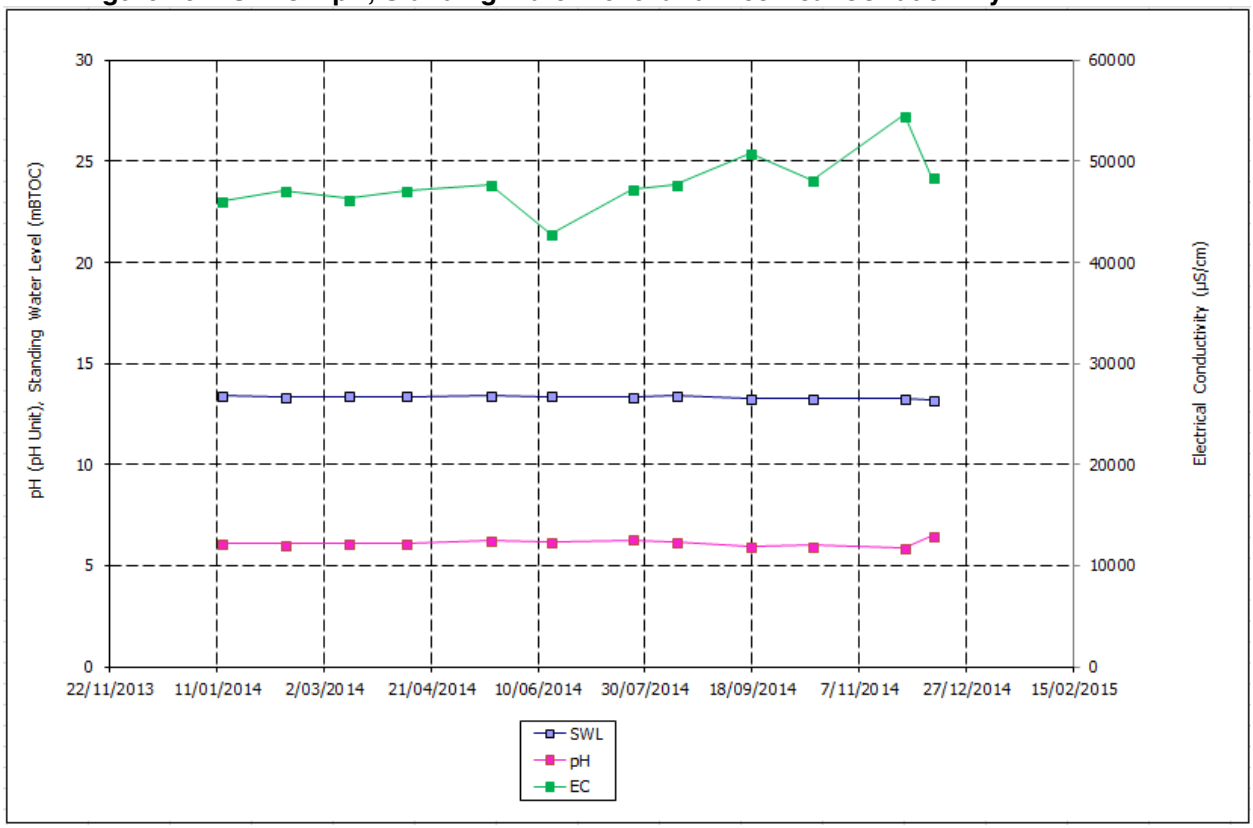


Figure 17: MON01A – pH, Standing Water Level and Electrical Conductivity

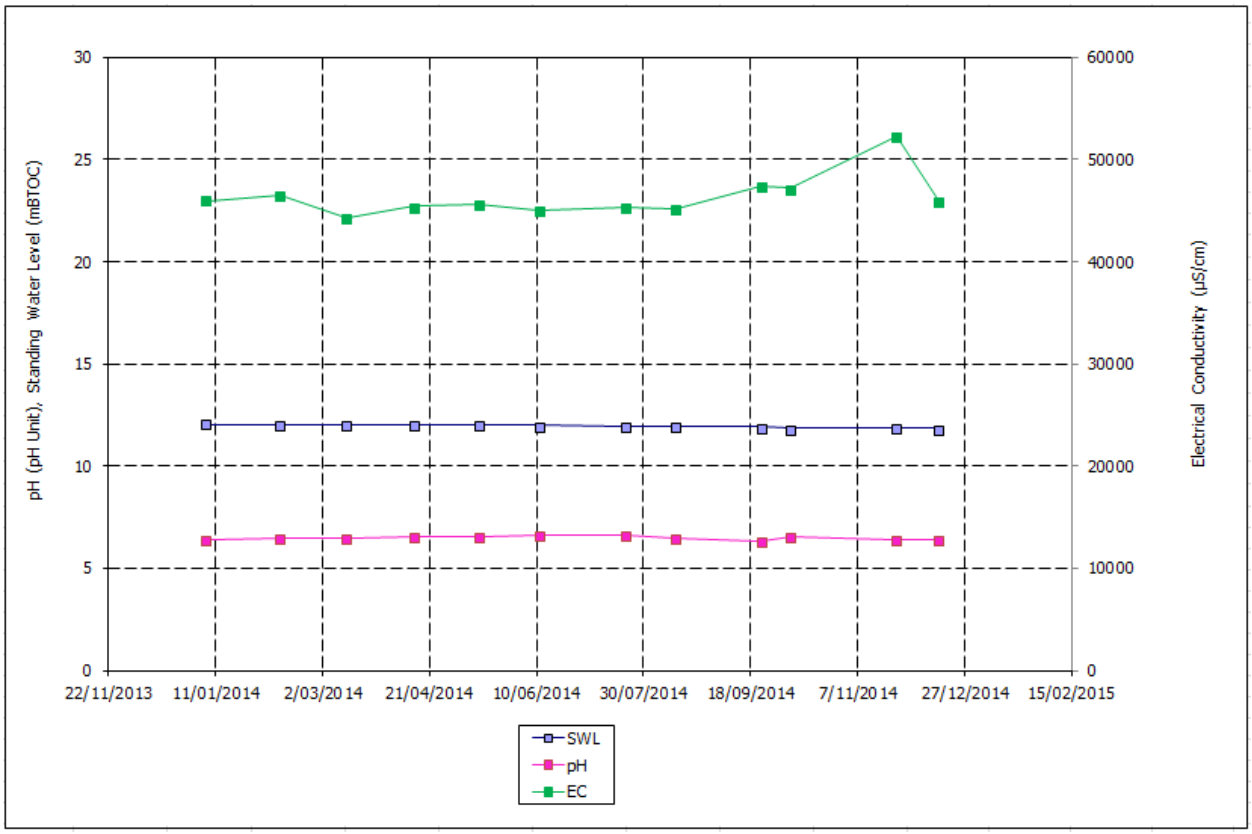


Figure 18: MON01B – pH, Standing Water Level and Electrical Conductivity

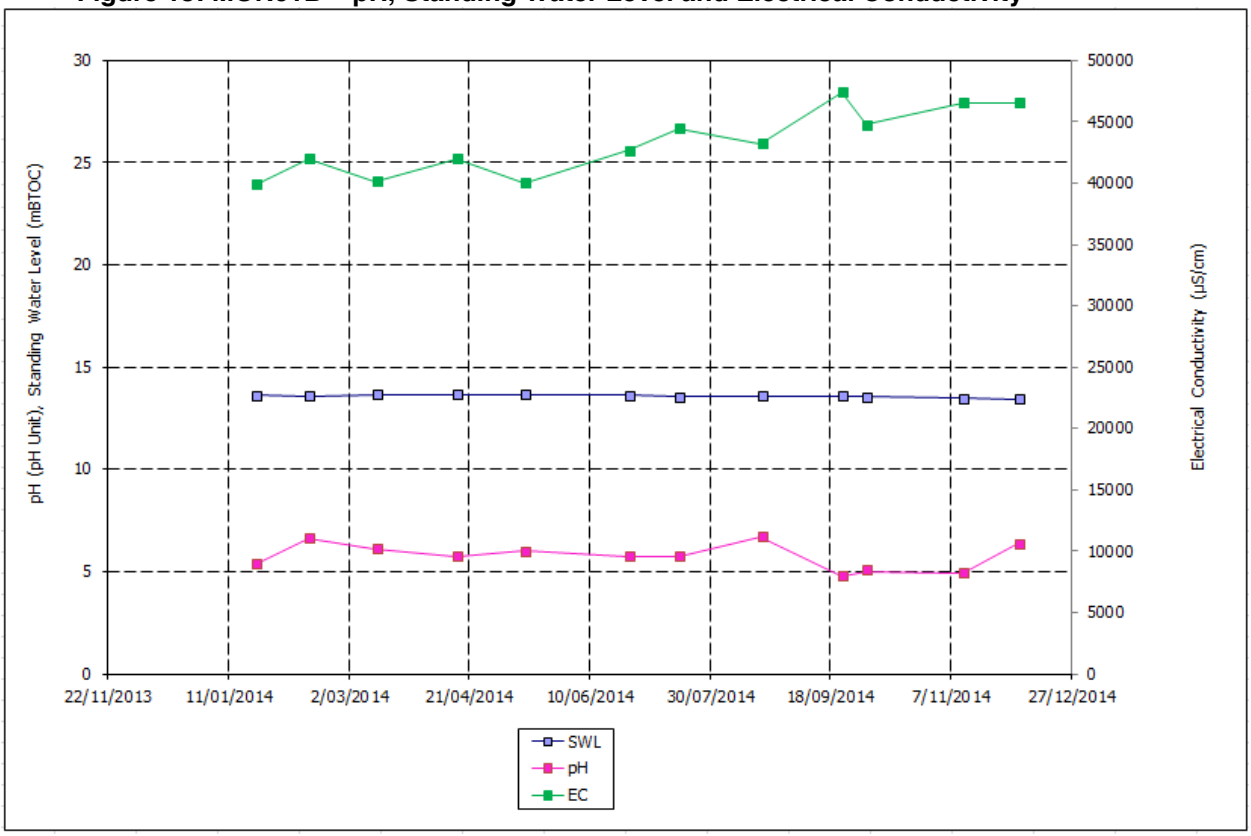


Figure 19: MON02A – pH, Standing Water Level and Electrical Conductivity

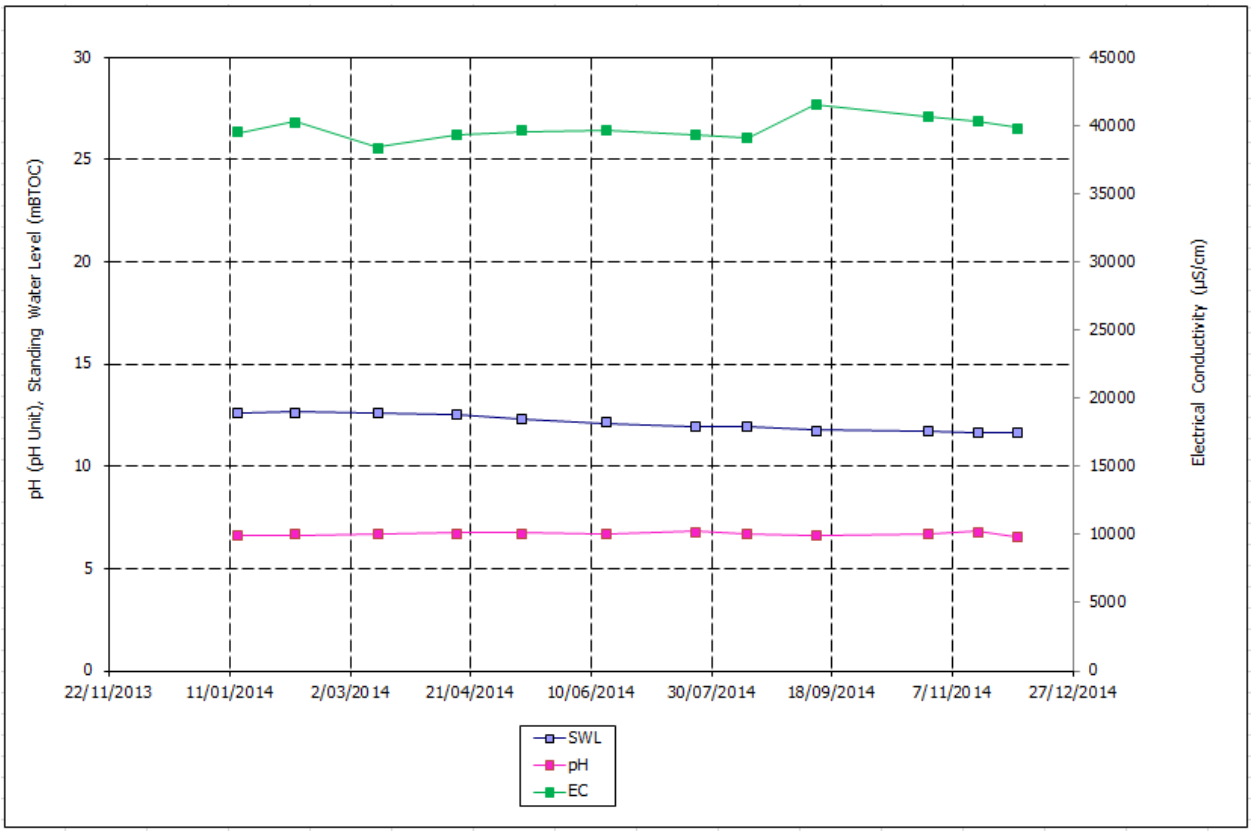


Figure 20: MON02B – pH, Standing Water Level and Electrical Conductivity

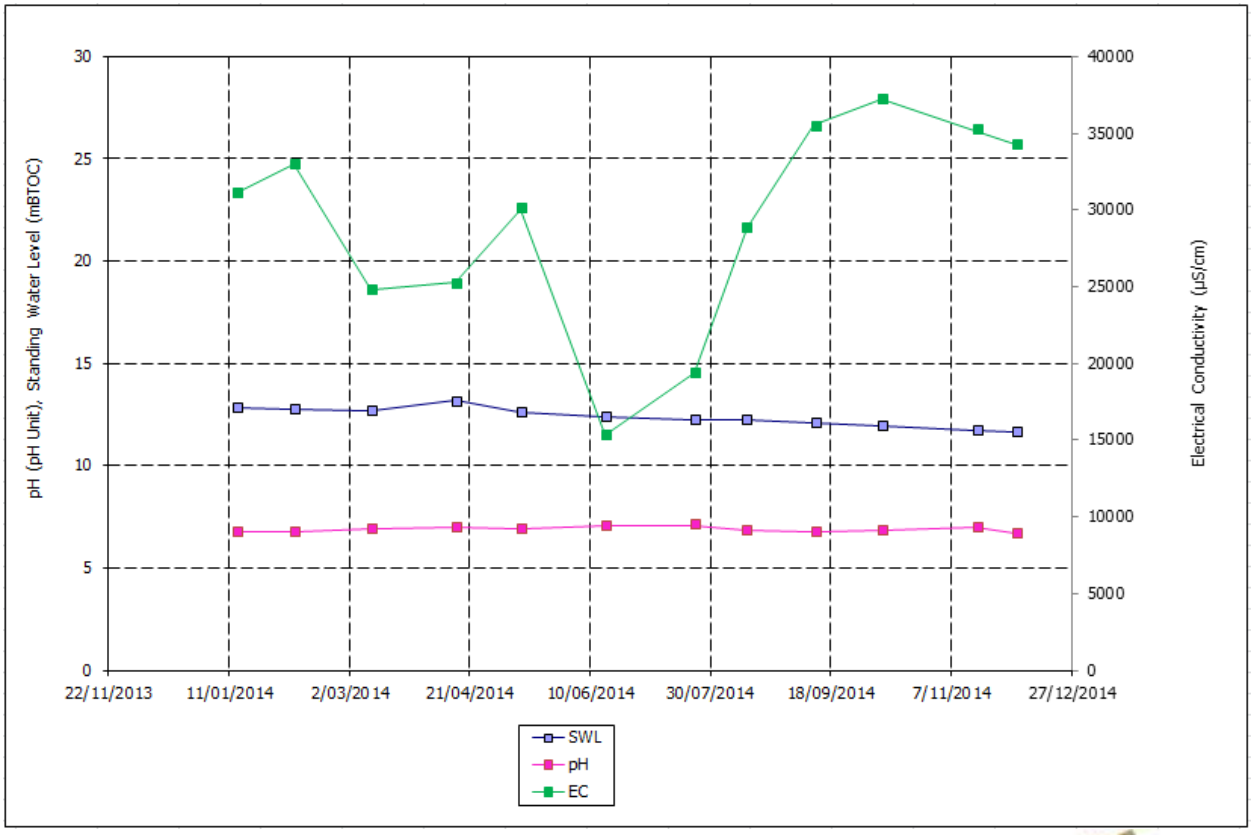


Figure 21: PDB1A – pH, Standing Water Level and Electrical Conductivity

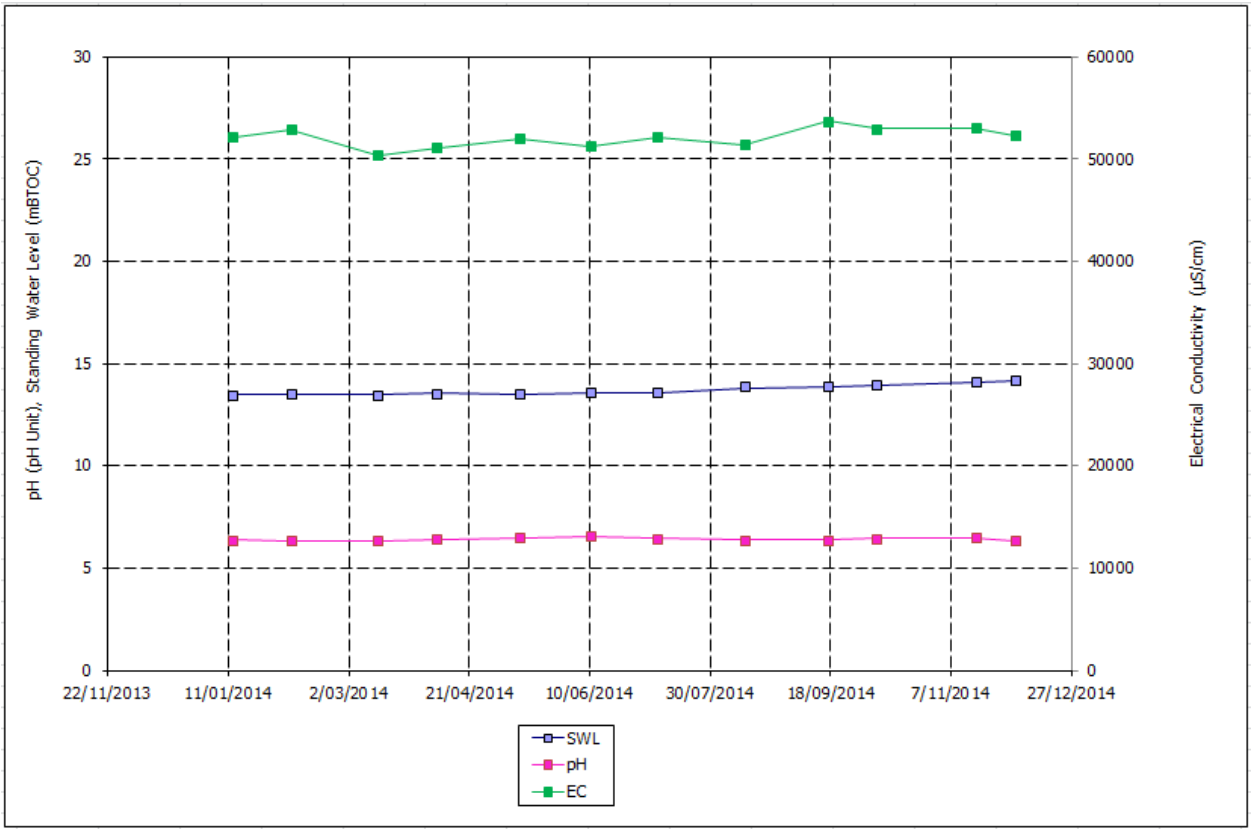


Figure 22: PDB1B – pH, Standing Water Level and Electrical Conductivity

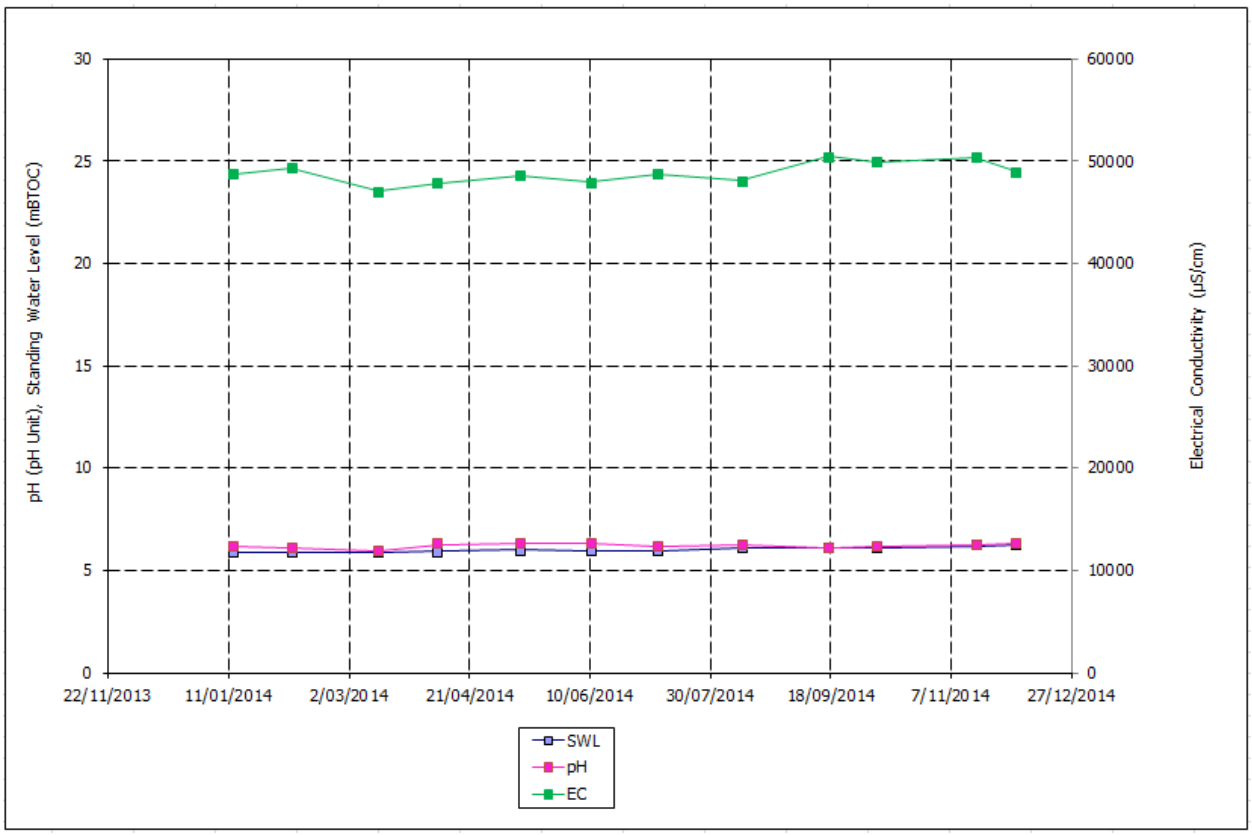


Figure 23: PDB3A – pH, Standing Water Level and Electrical Conductivity

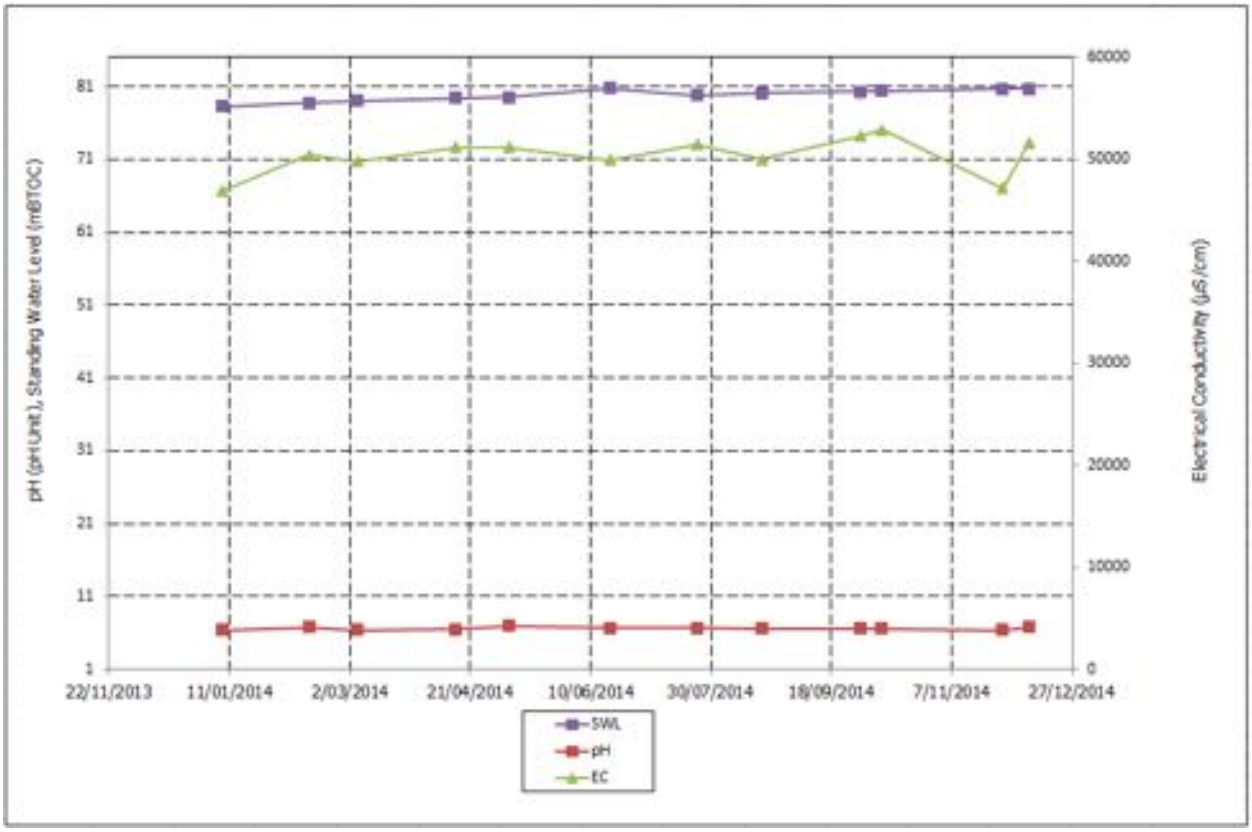


Figure 24: PDB3B – pH, Standing Water Level and Electrical Conductivity

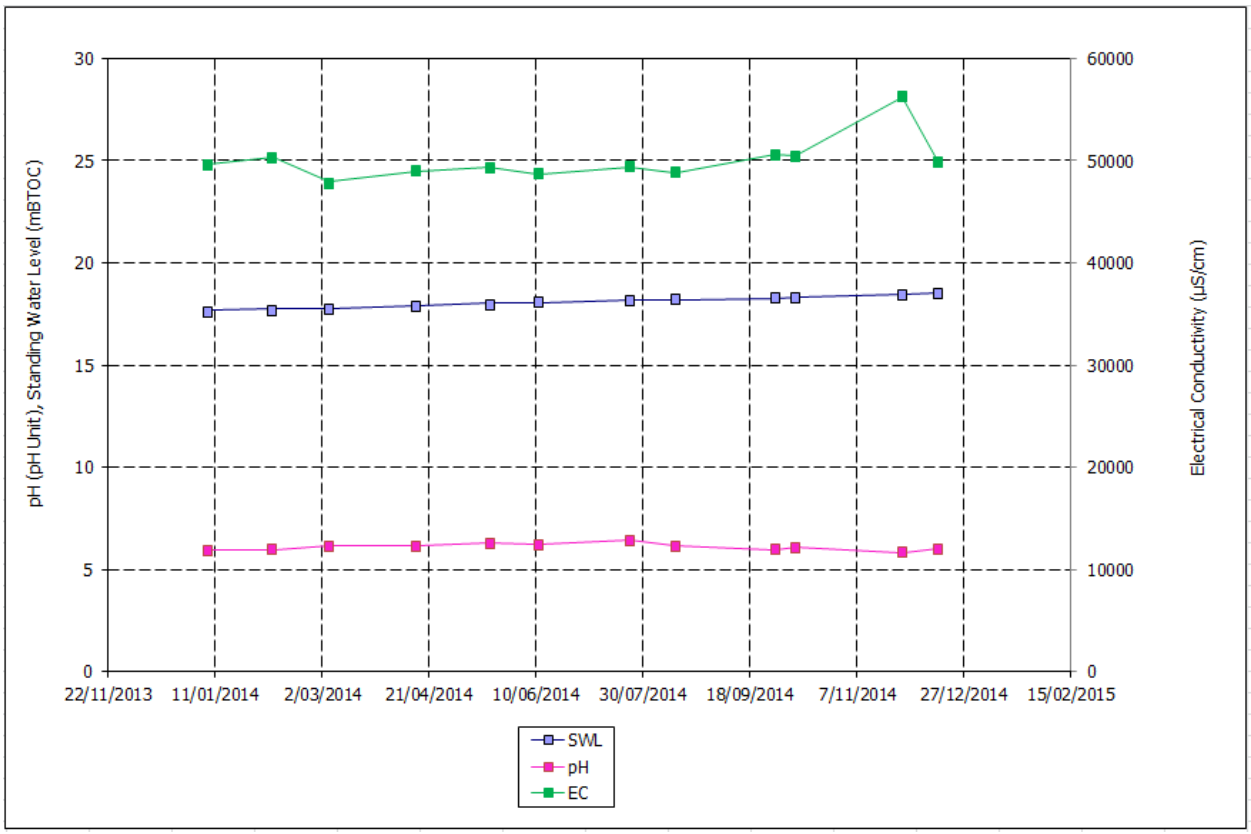


Figure 25: PDB5A – pH, Standing Water Level and Electrical Conductivity

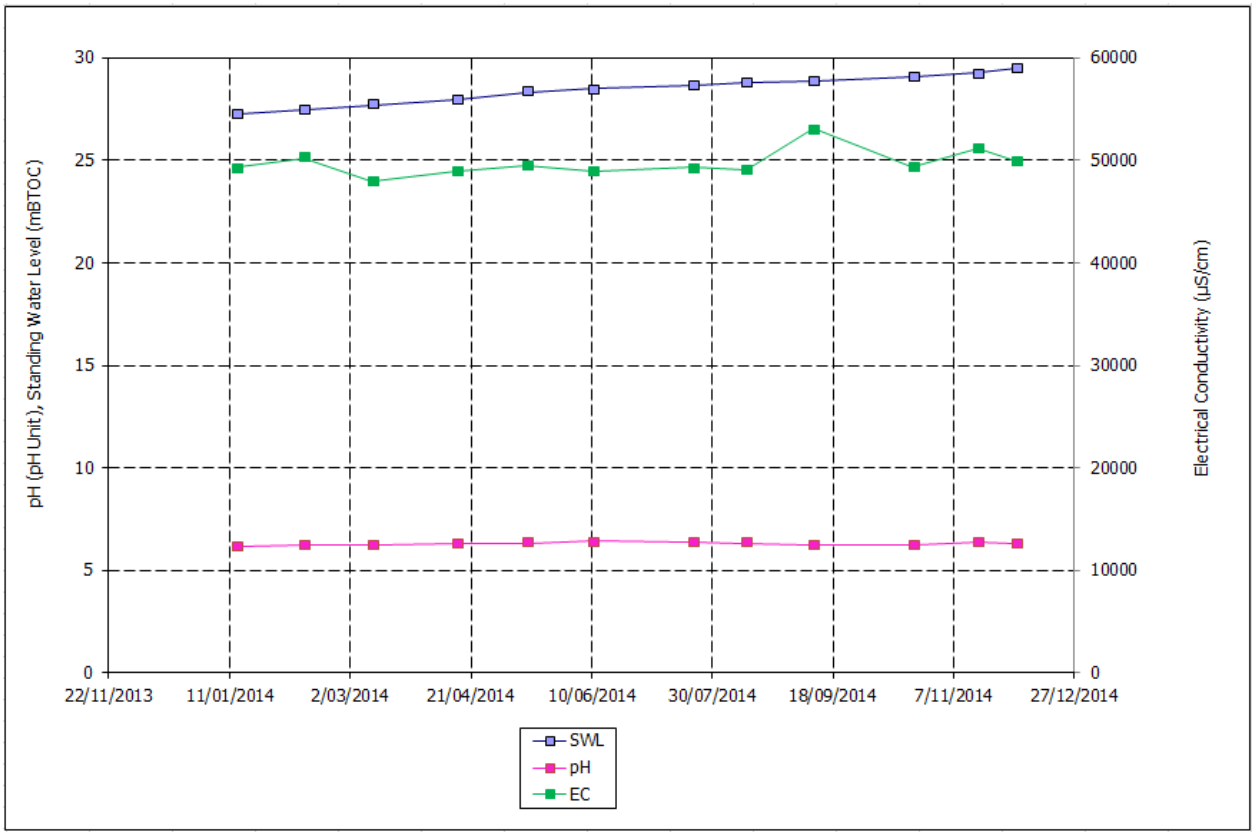


Figure 26: PDB5B – pH, Standing Water Level and Electrical Conductivity

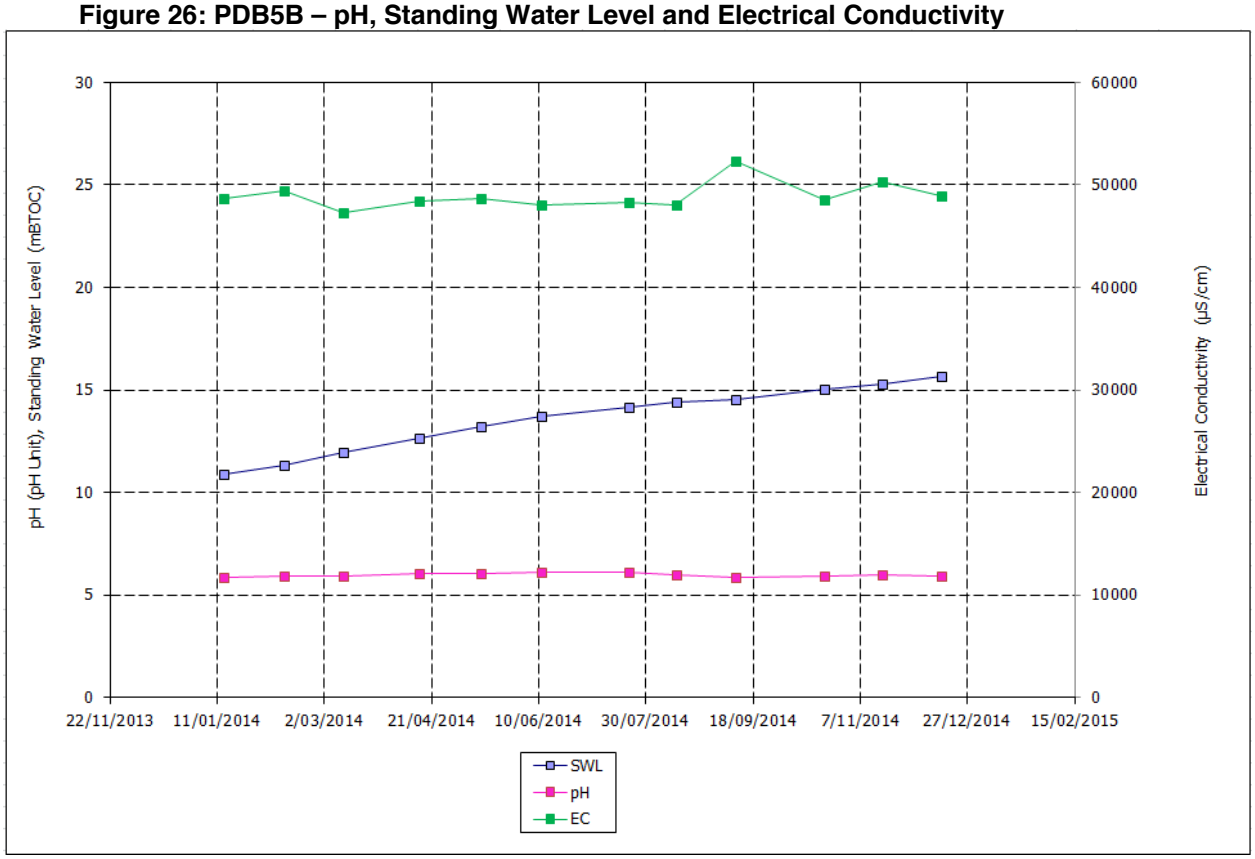


Figure 27: PP01 – pH, Standing Water Level and Electrical Conductivity

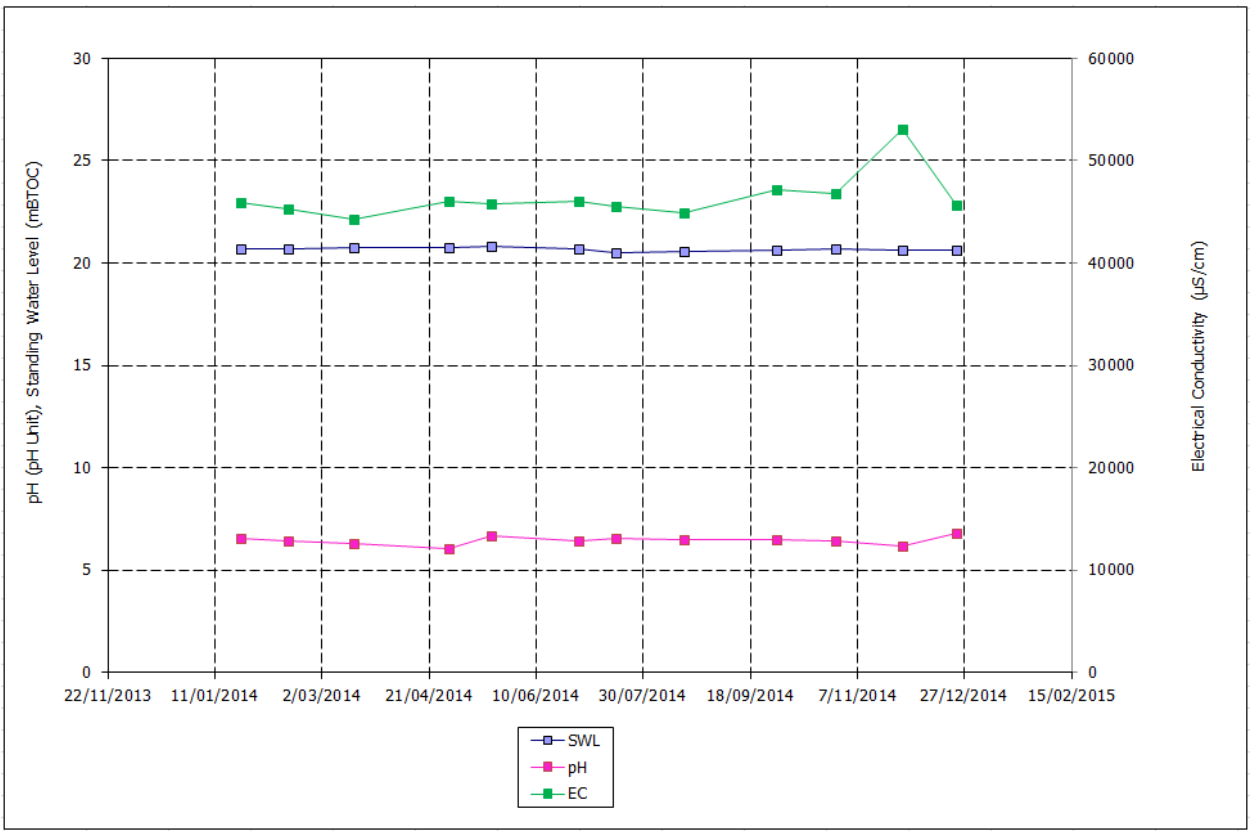


Figure 28: PP02 – pH, Standing Water Level and Electrical Conductivity

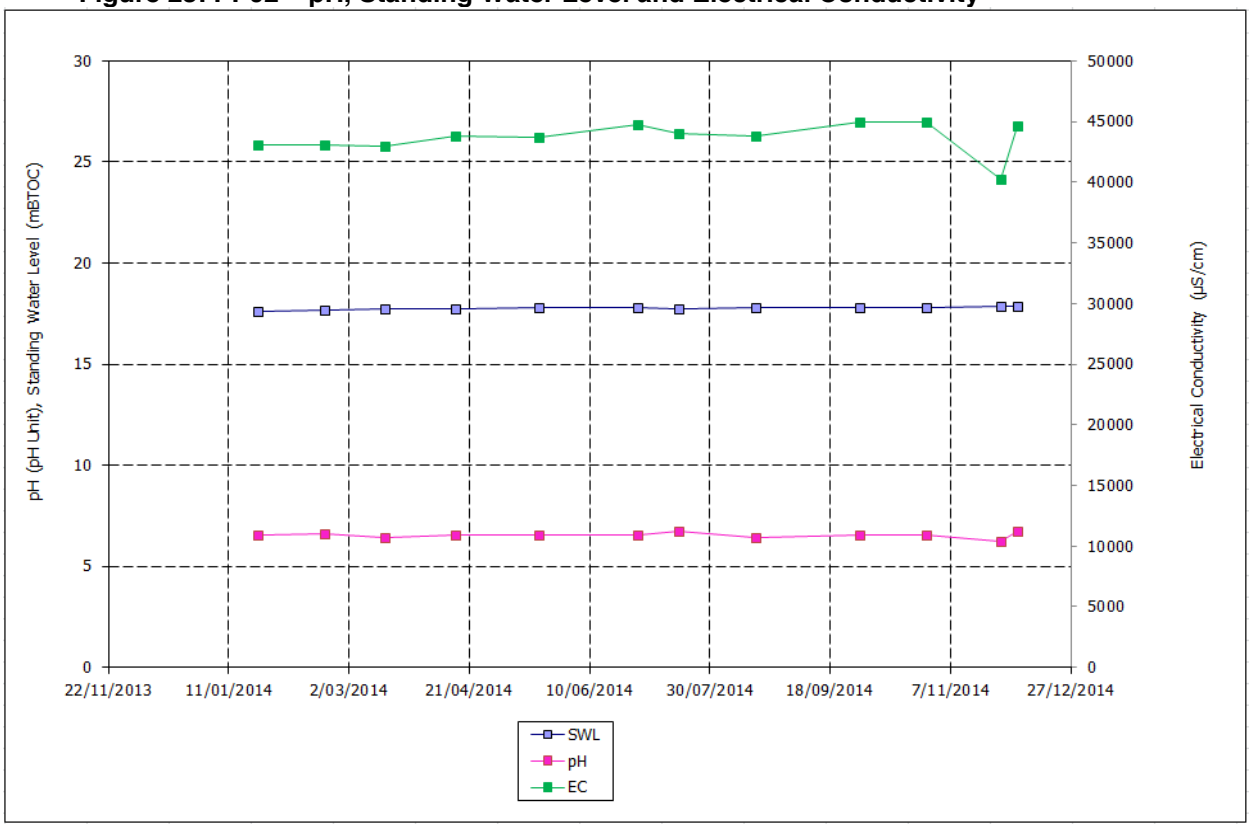


Figure 29: PP03 – pH, Standing Water Level and Electrical Conductivity

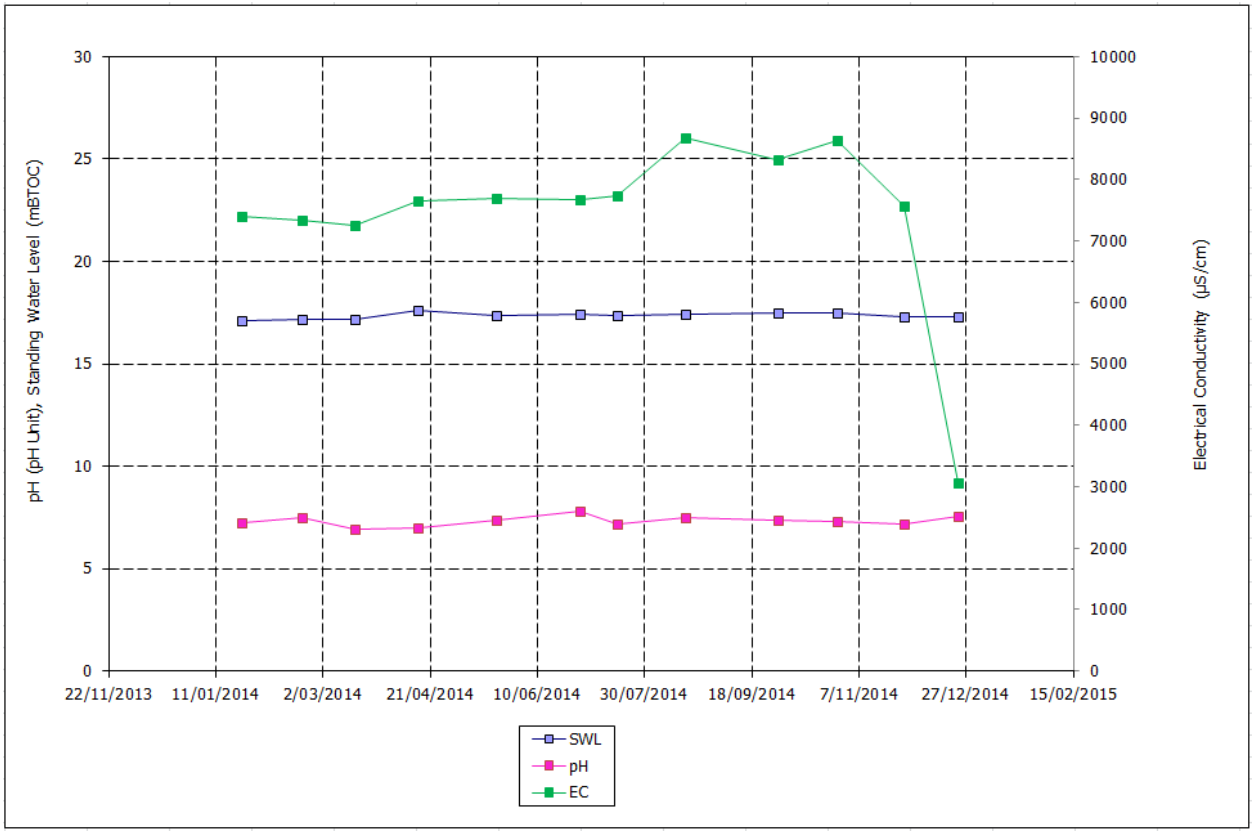


Figure 30: PP04 – pH, Standing Water Level and Electrical Conductivity

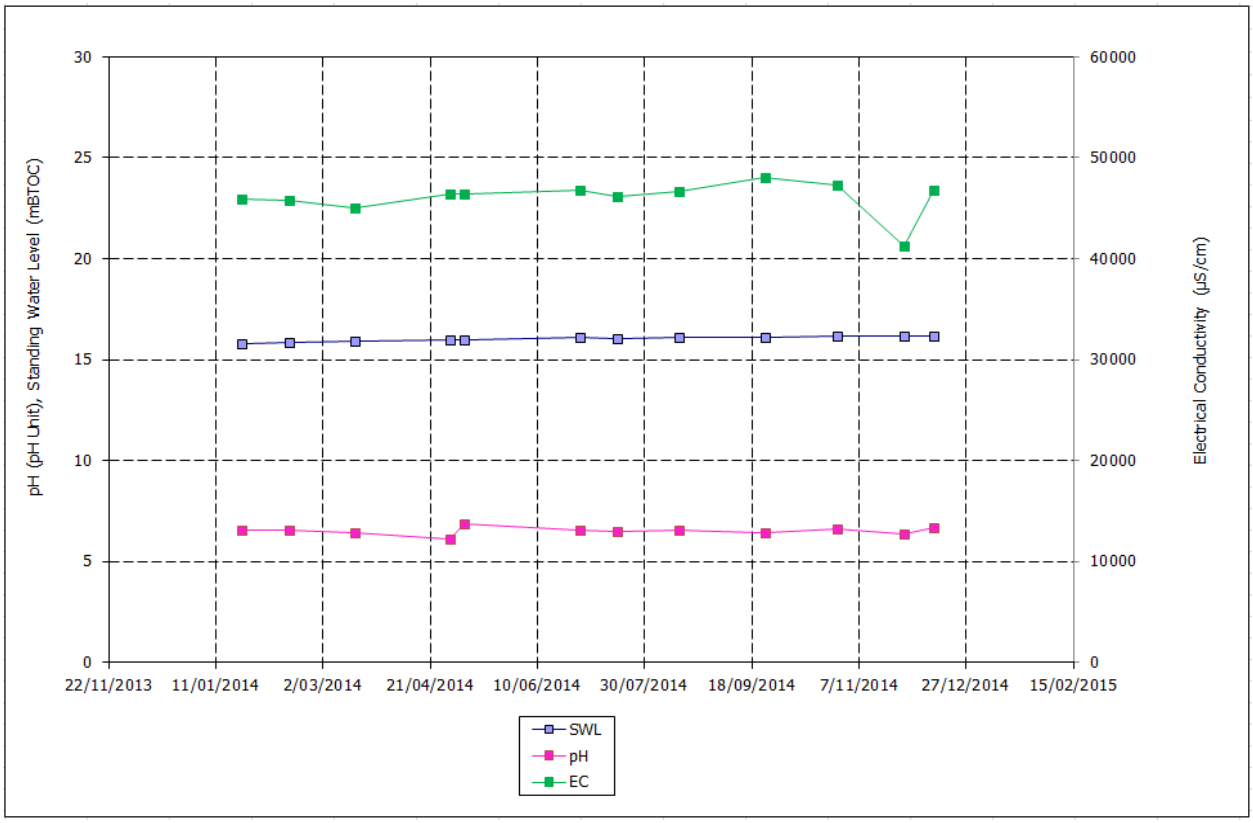


Figure 31: PP05 – pH, Standing Water Level and Electrical Conductivity

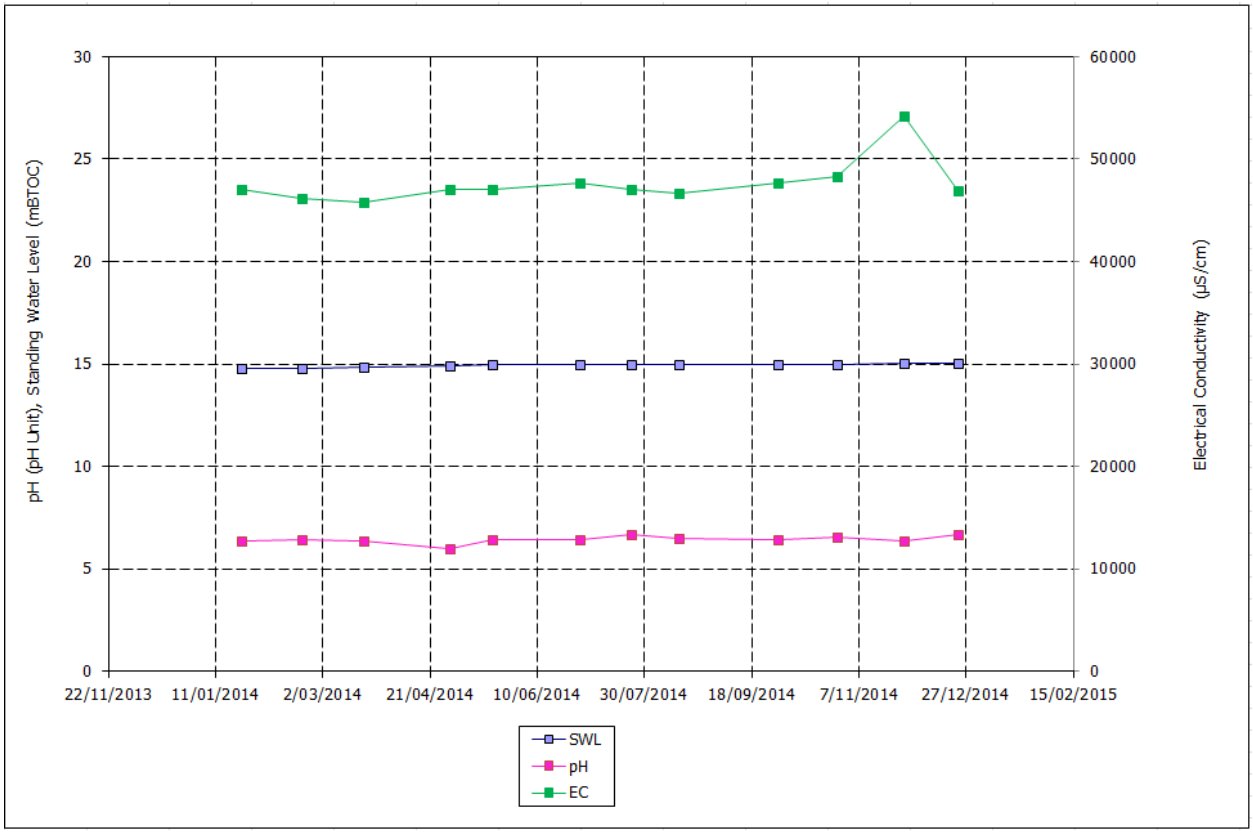


Figure 32: PP06 – pH, Standing Water Level and Electrical Conductivity

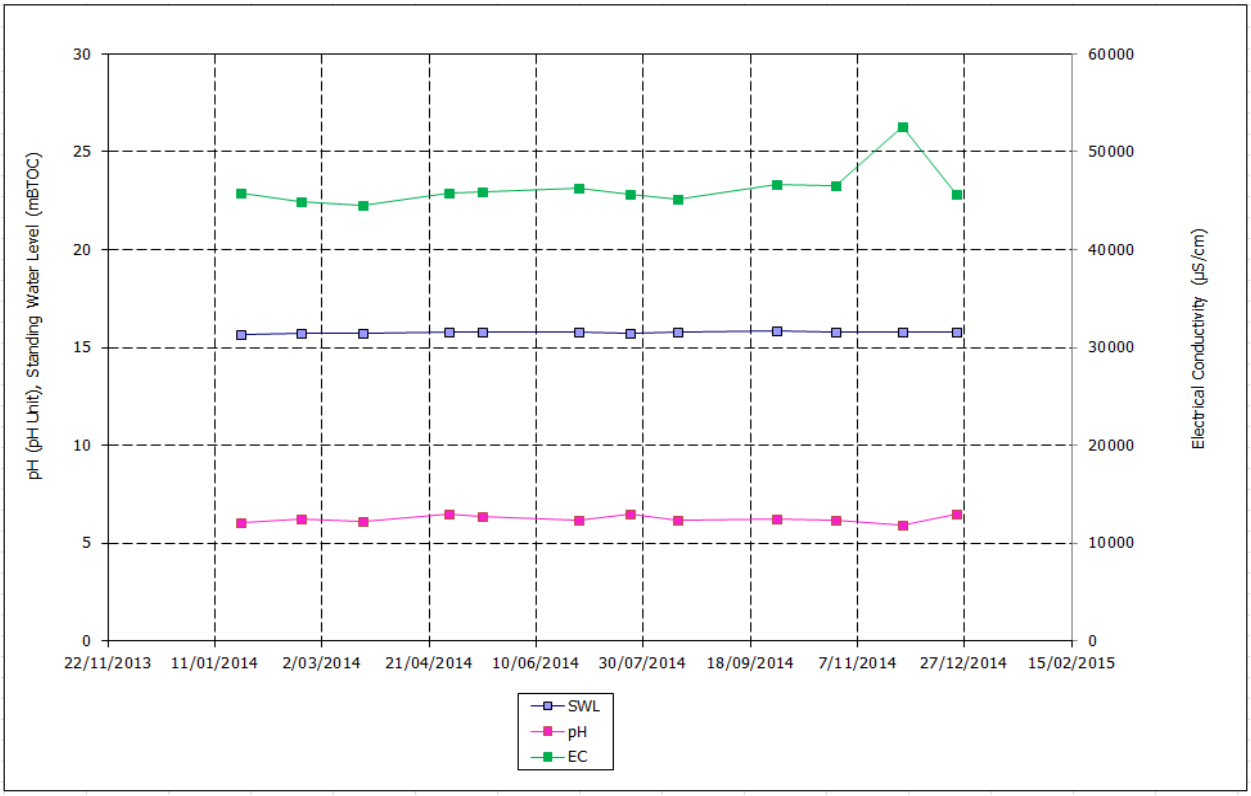


Figure 33: BLPR1 – pH, Standing Water Level and Electrical Conductivity

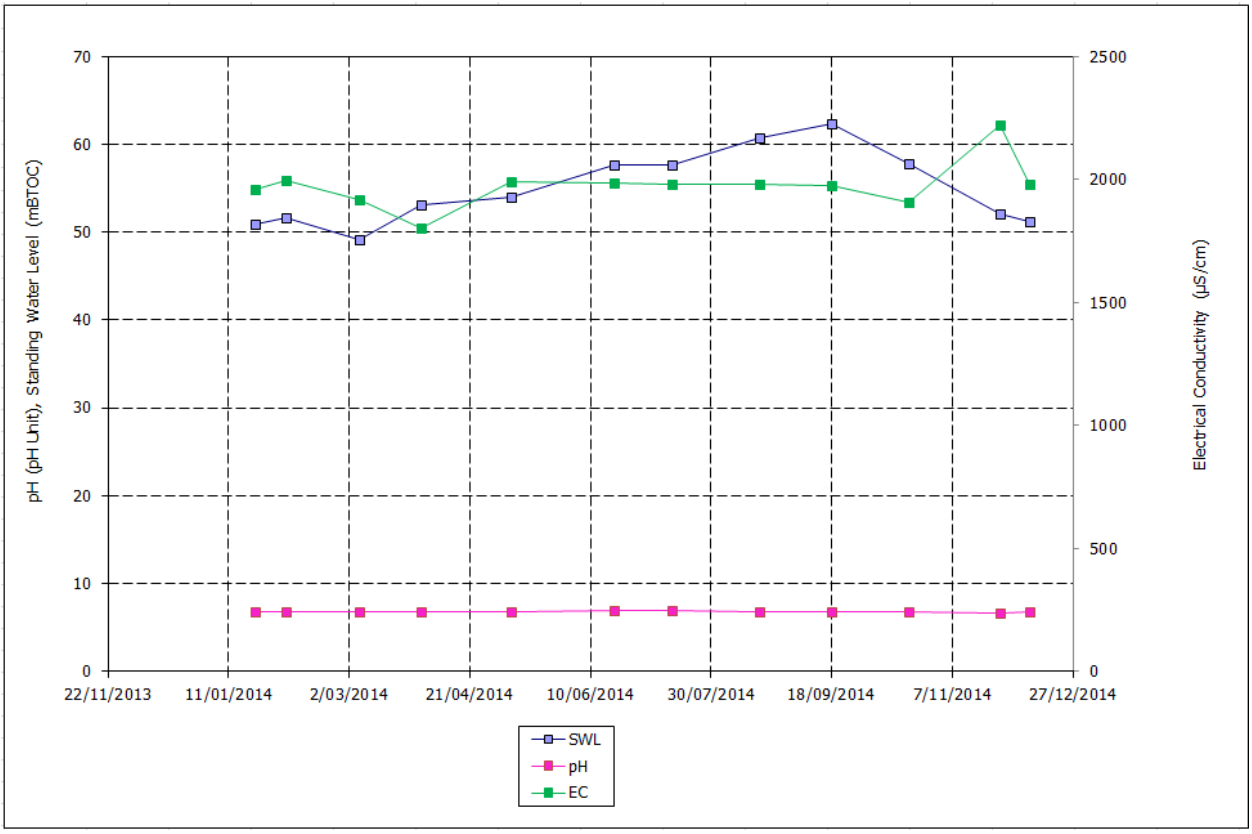


Figure 34: BLPR2 – pH, Standing Water Level and Electrical Conductivity

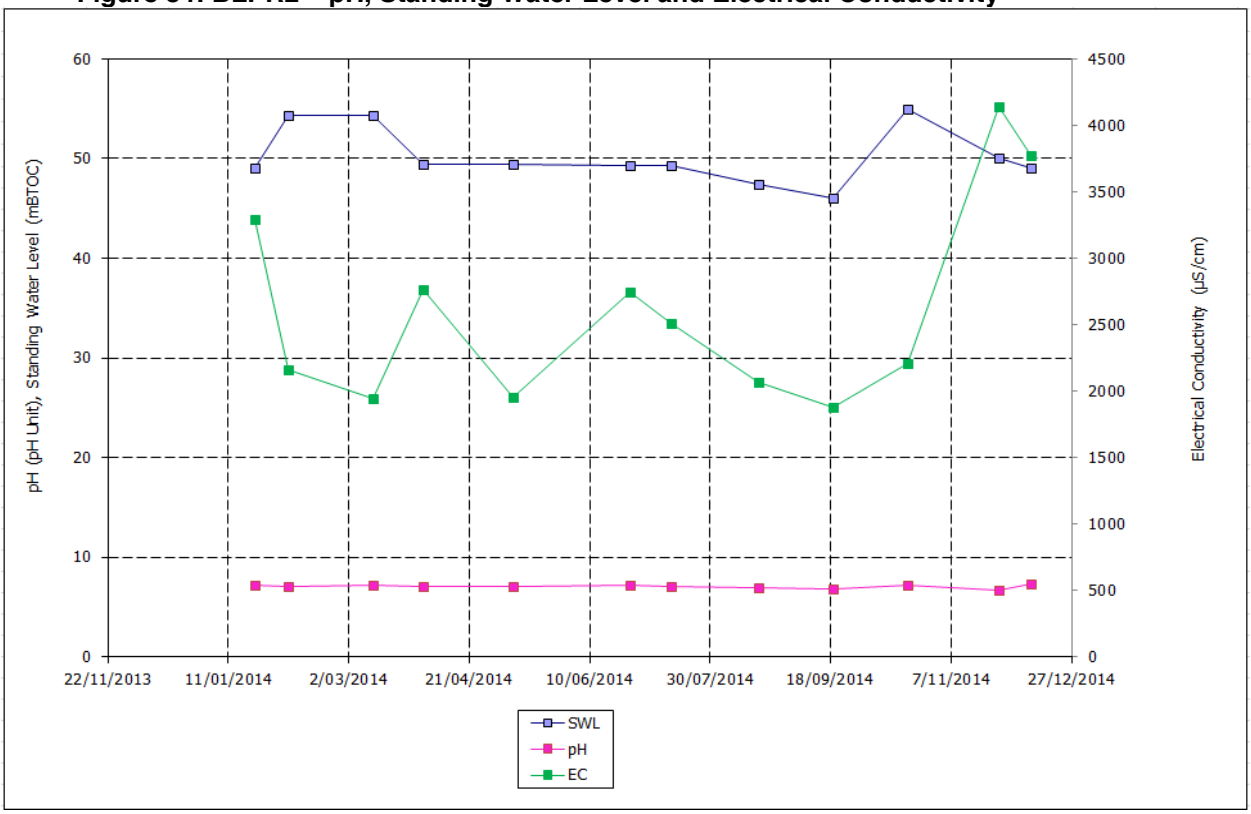


Figure 35: BLPR3 – pH, Standing Water Level and Electrical Conductivity

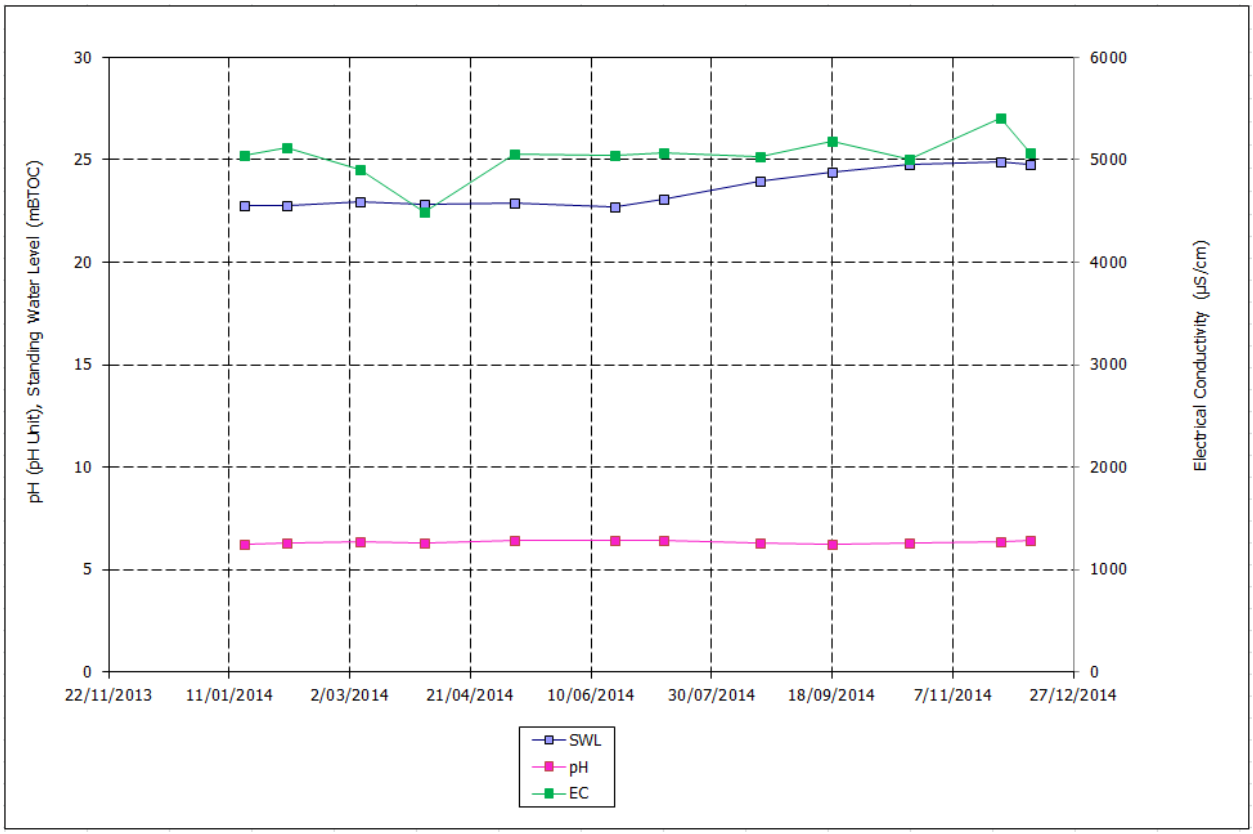


Figure 36: BLPR4 – pH, Standing Water Level and Electrical Conductivity

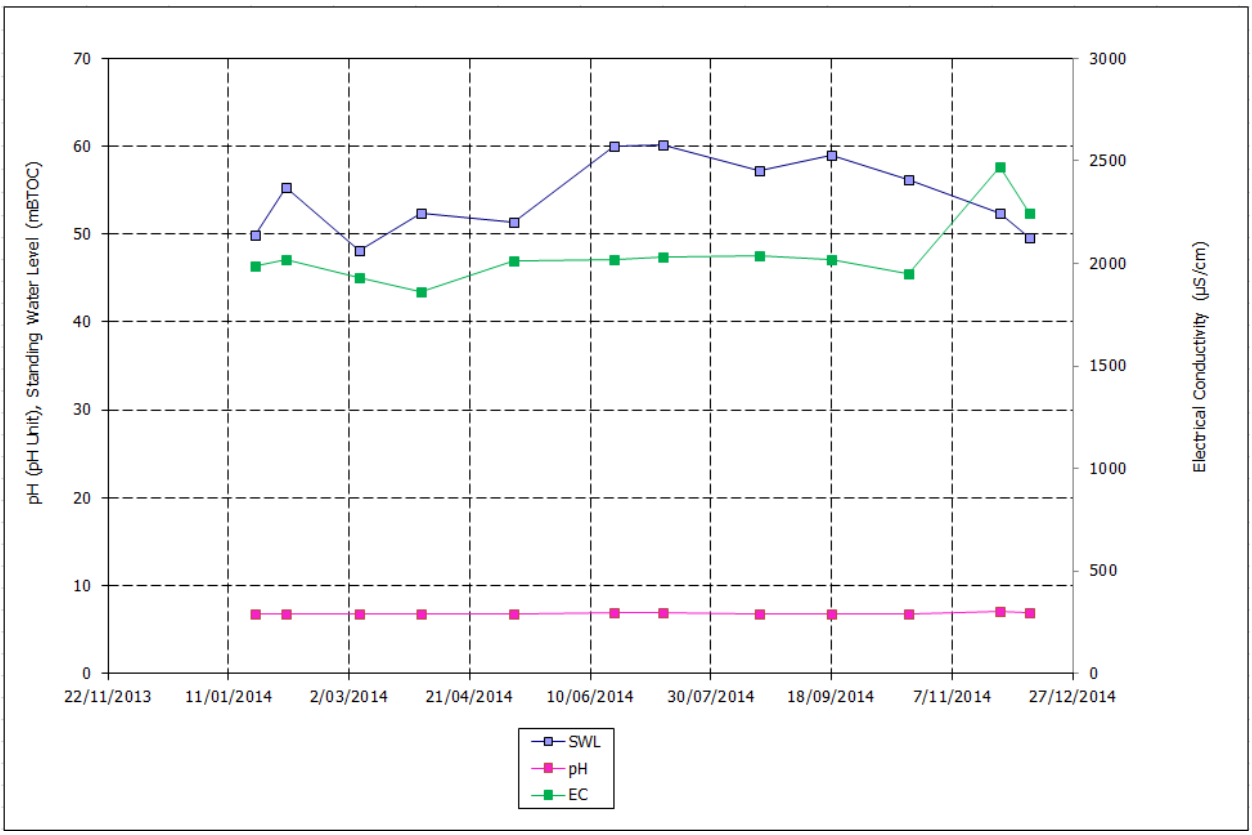


Figure 37: BLPR5 – pH, Standing Water Level and Electrical Conductivity

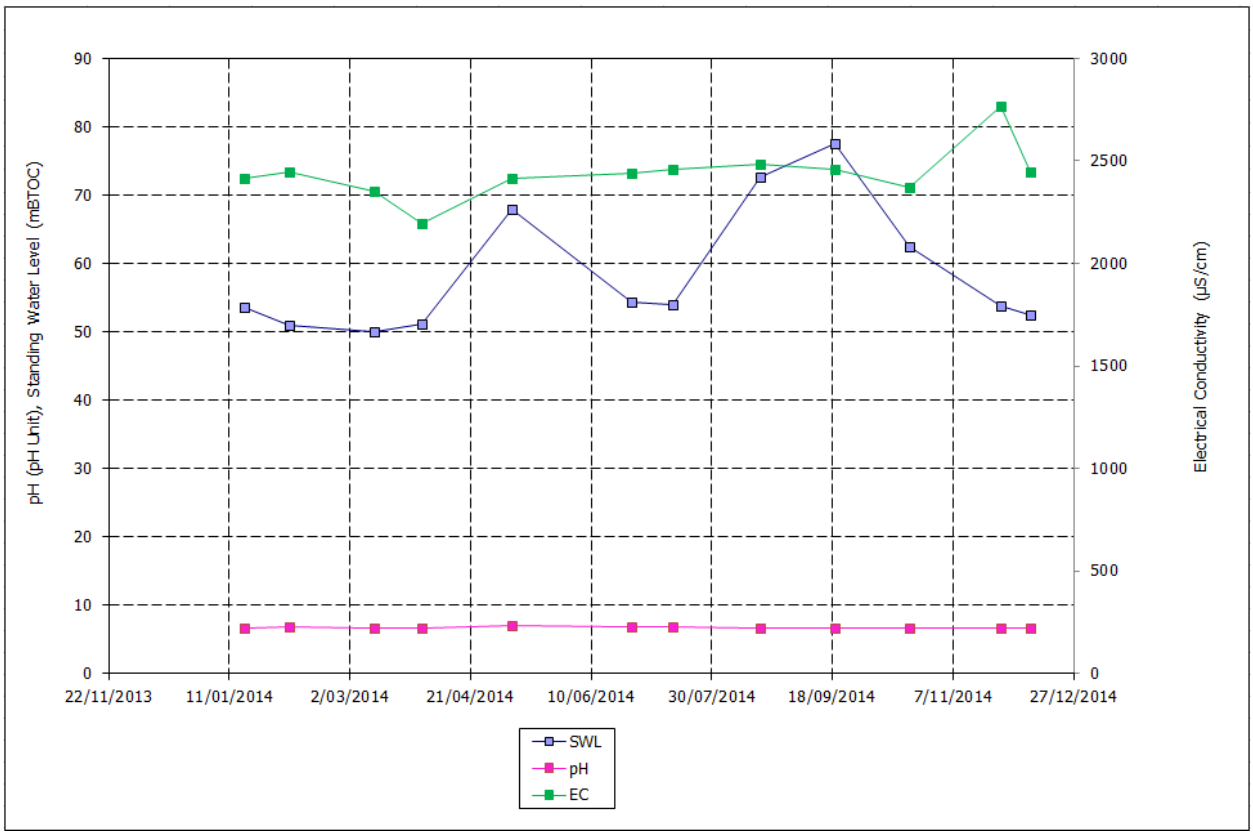


Figure 38: BLPR6 – pH, Standing Water Level and Electrical Conductivity

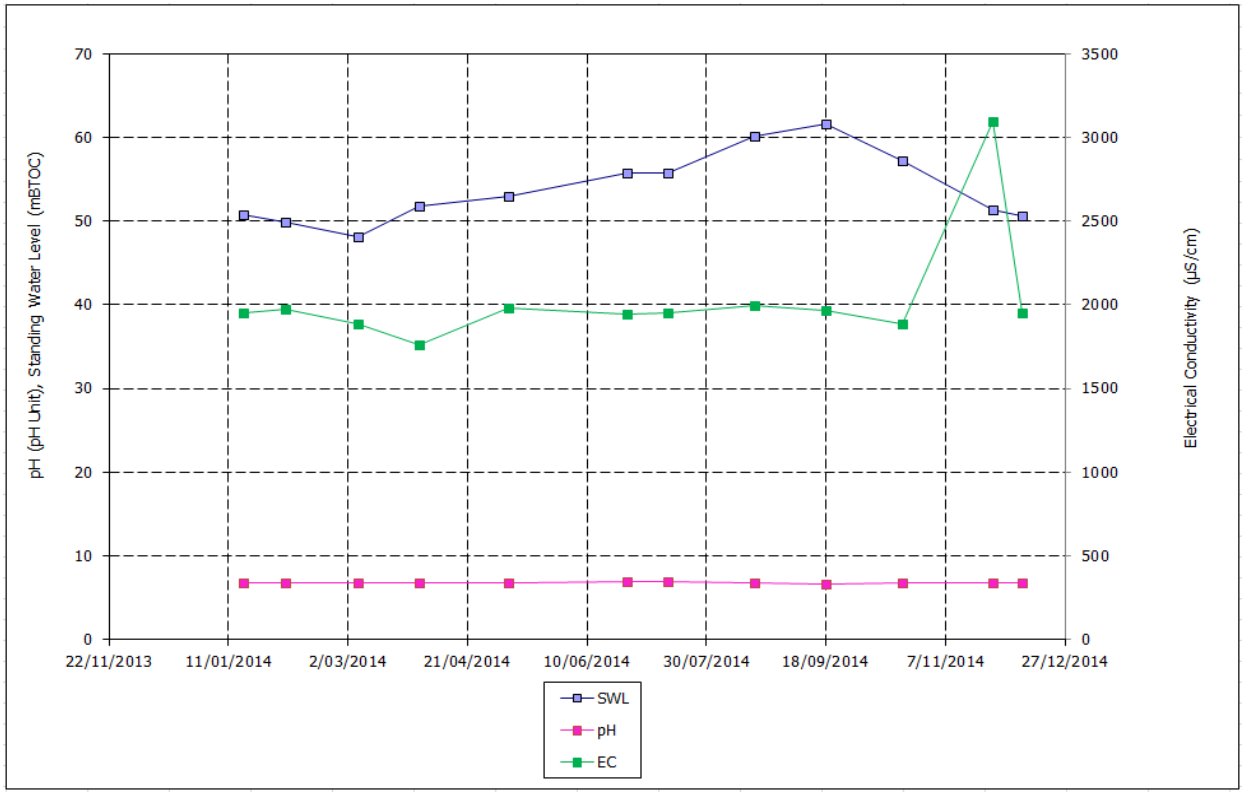


Figure 39: BLPR7 – pH, Standing Water Level and Electrical Conductivity

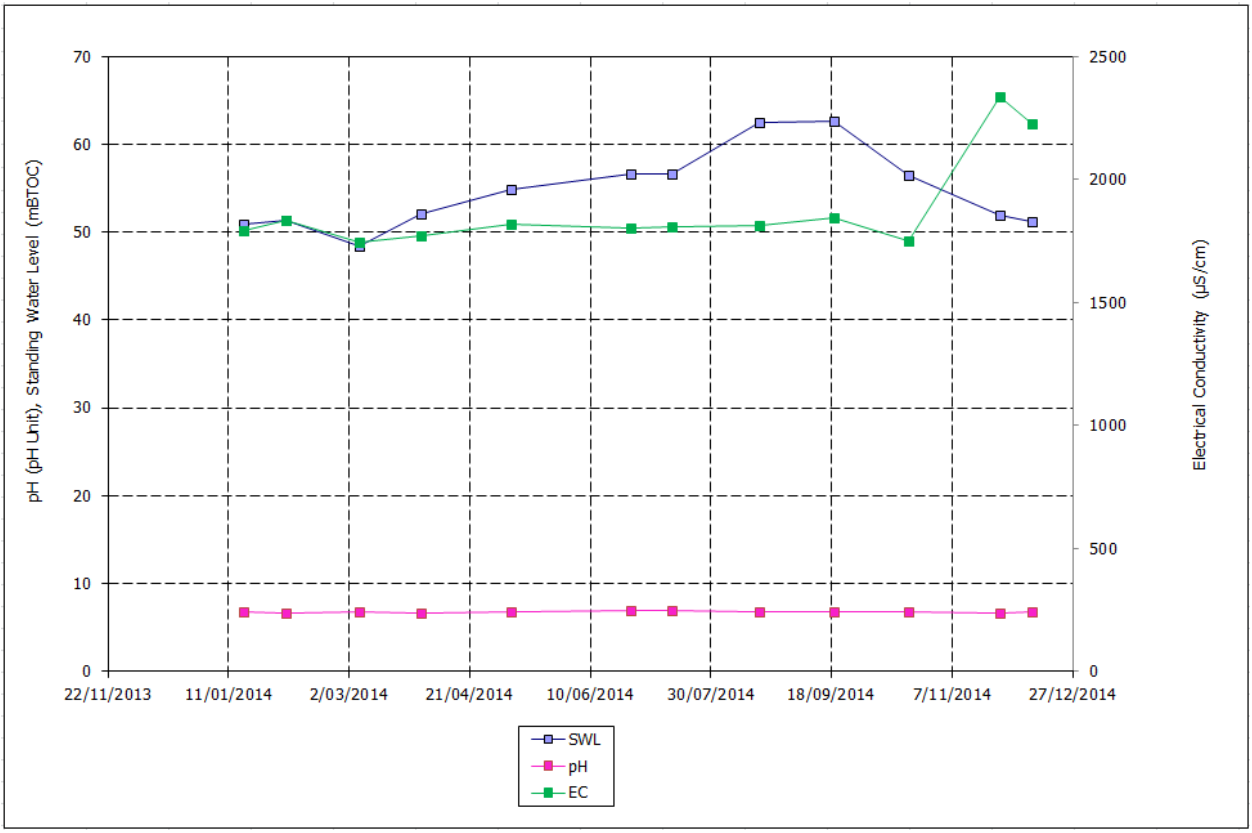


Figure 40: Pit Dewatering Bores – Standing Water Levels

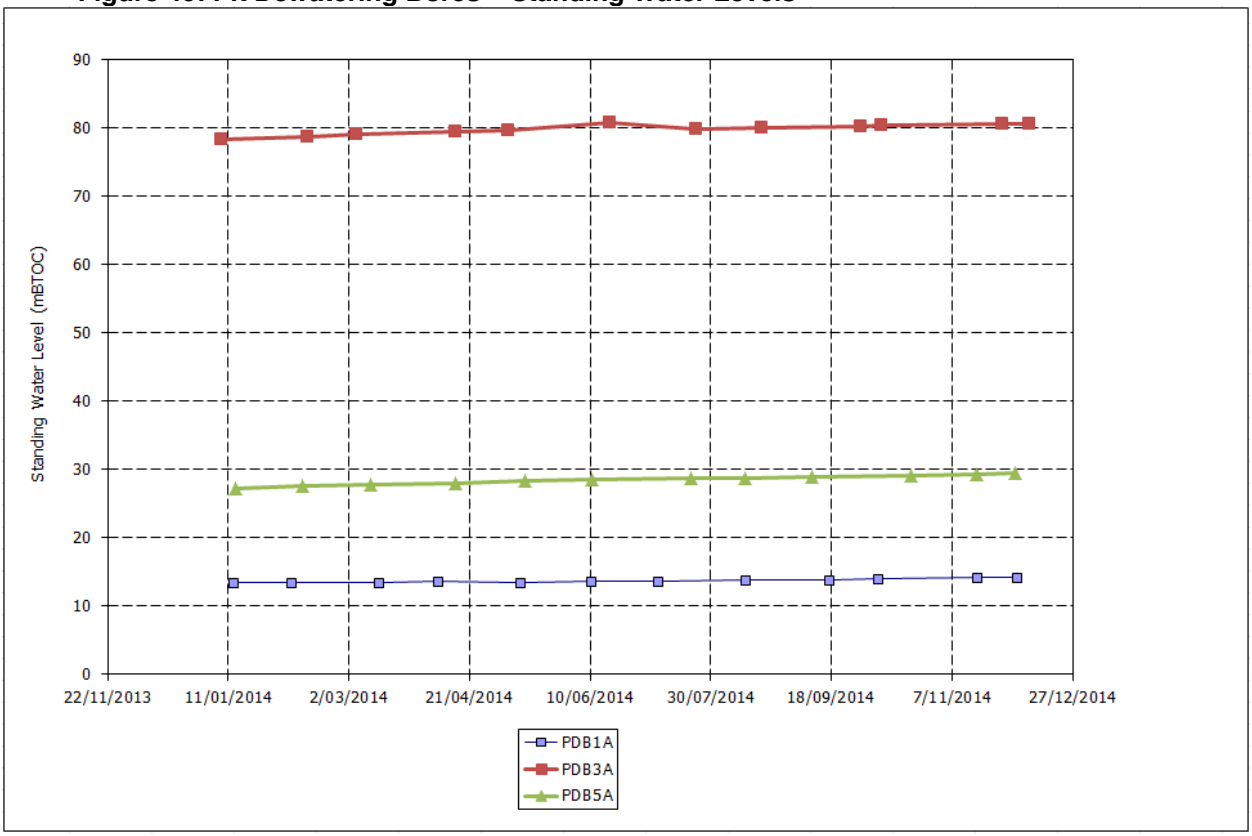


Figure 41: Bland Creek Paleochannel Production Bores – Extraction Volume

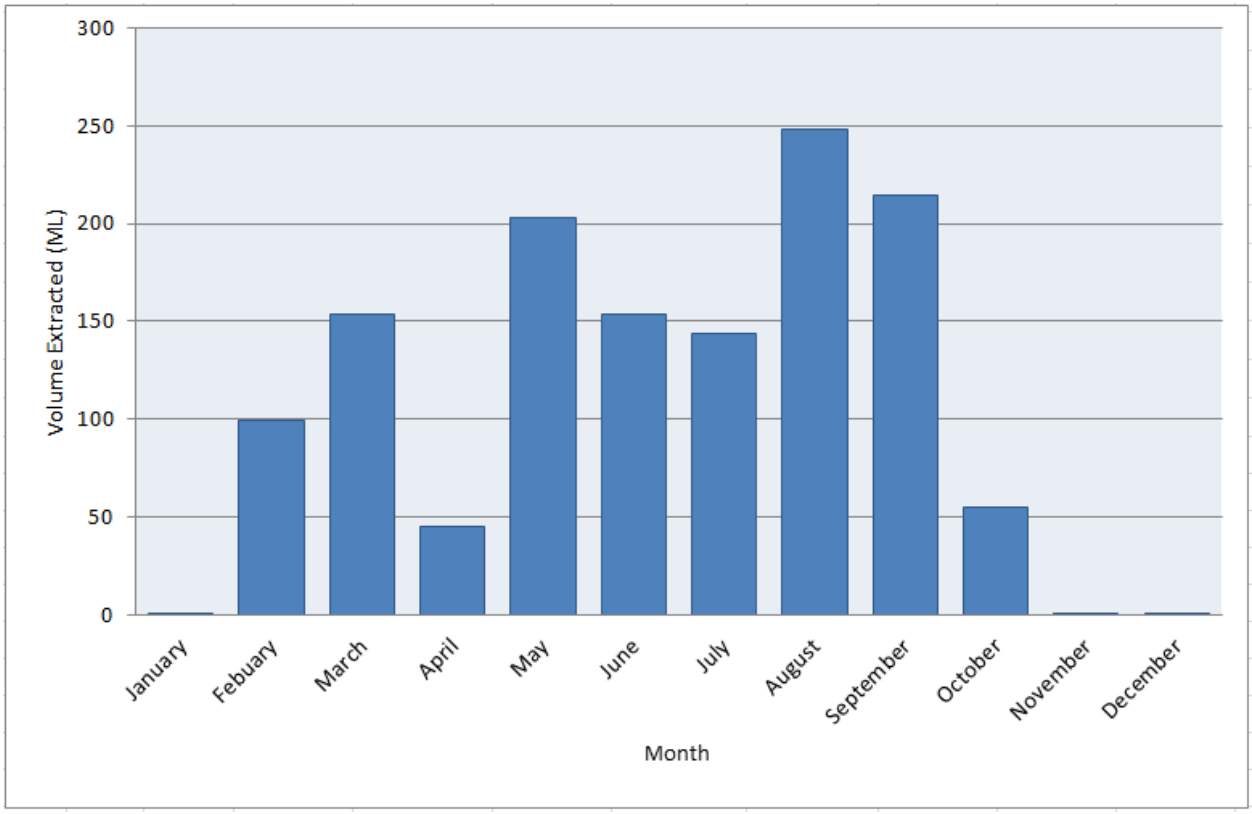


Figure 42: Jemalong Weir – Surface Water Flow

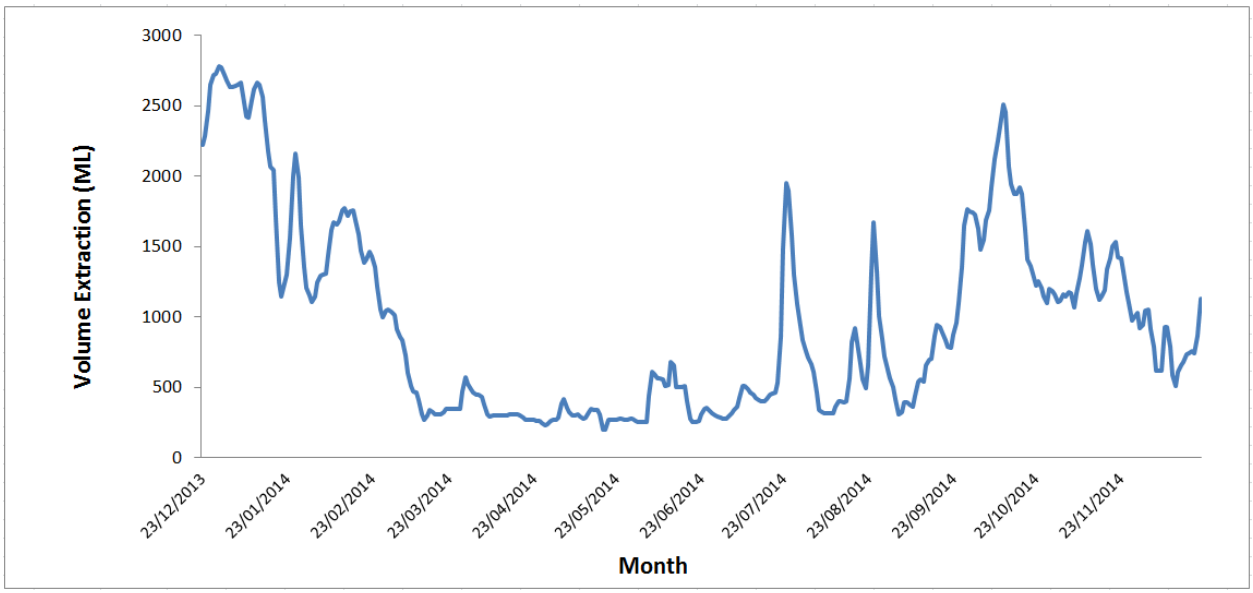


Figure 43: UCD North – pH, Electrical Conductivity and Total Suspended Solids

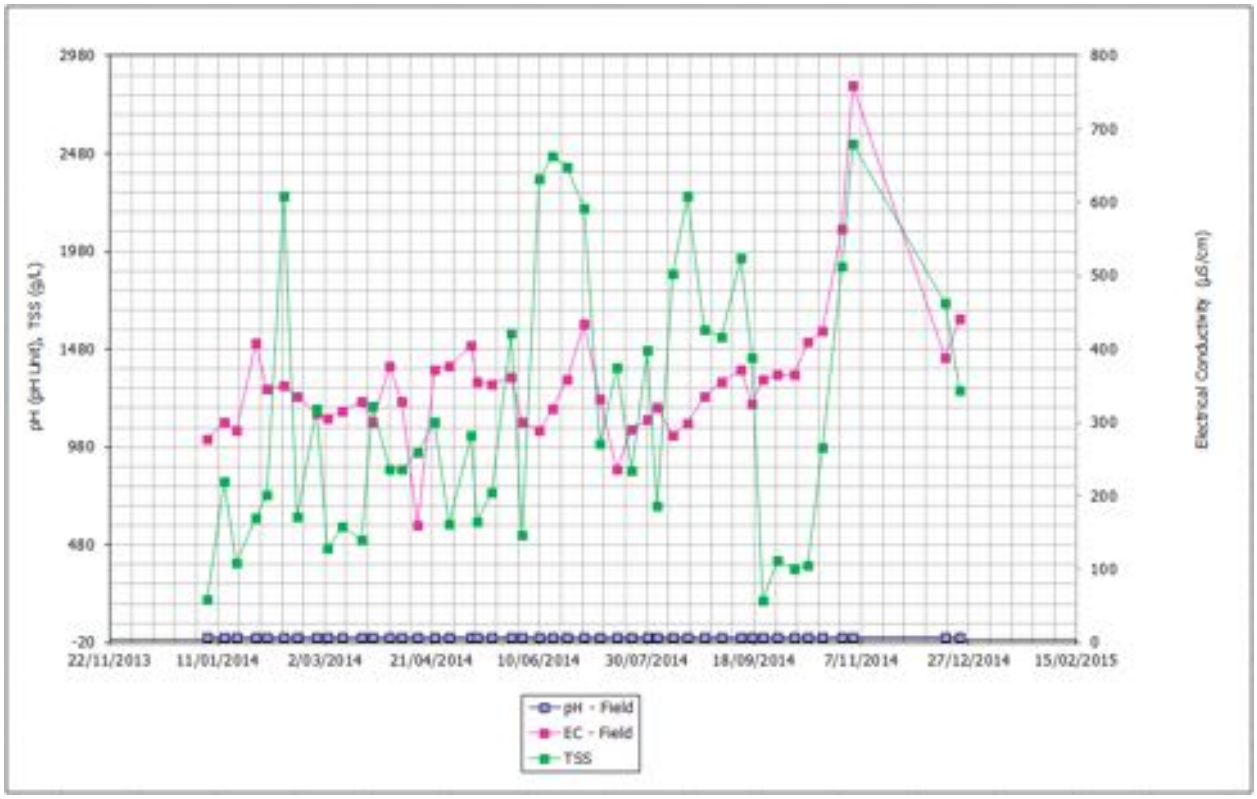


Figure 44: UCD South – pH, Electrical Conductivity and Total Suspended Solids

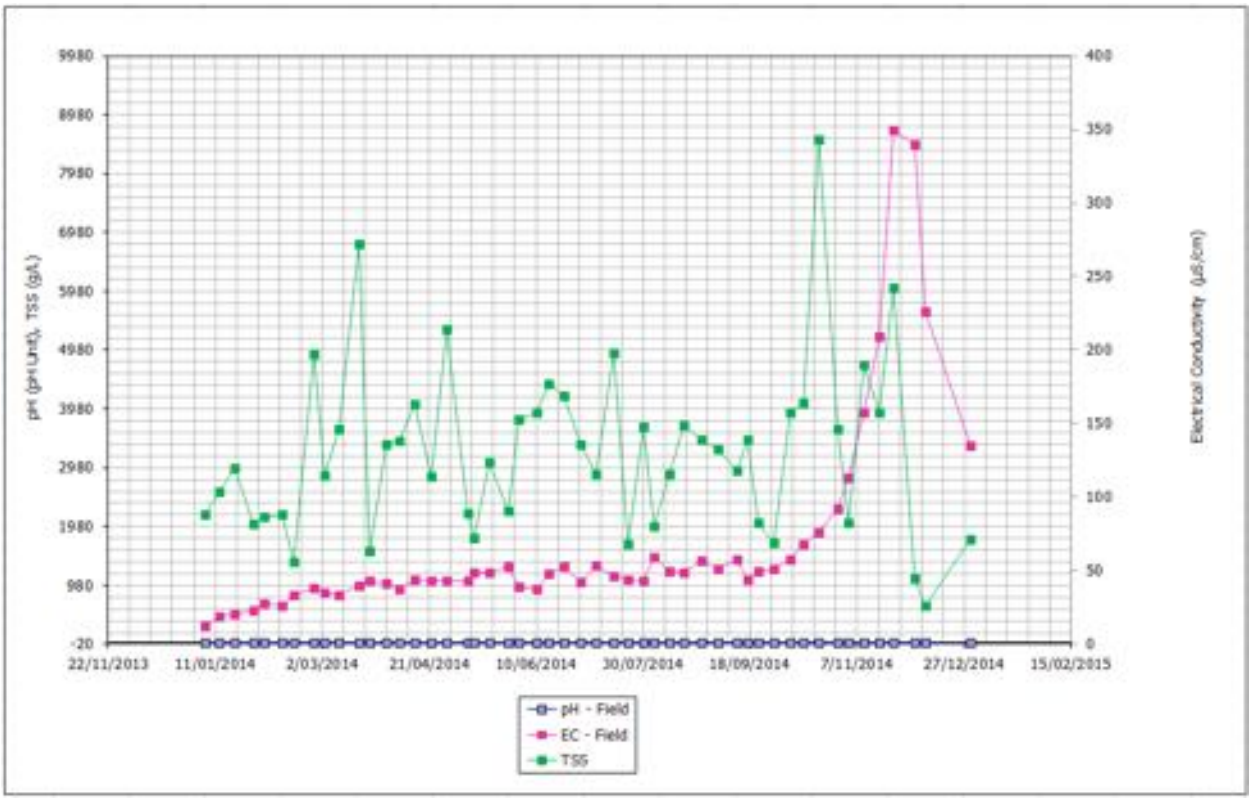


Figure 45: D1 – pH, Electrical Conductivity and Total Suspended Solids

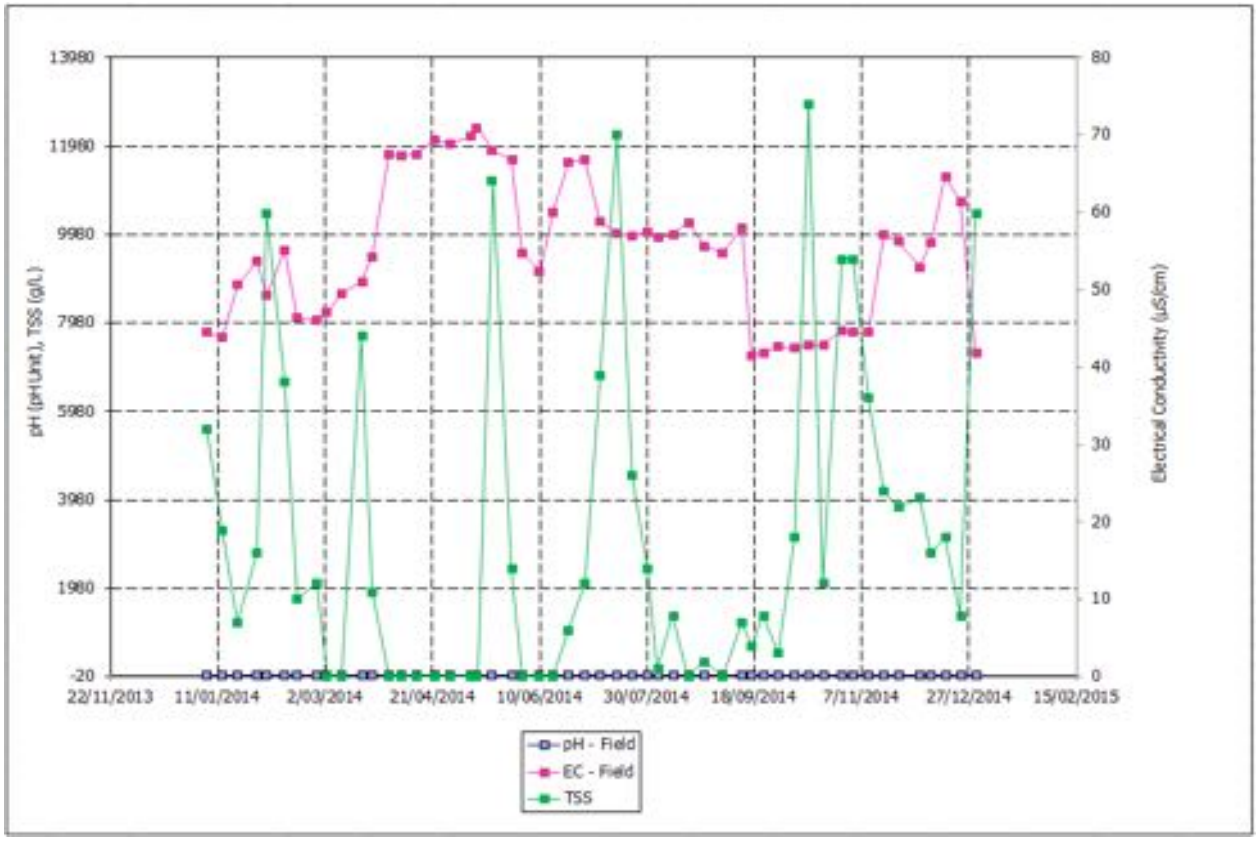


Figure 46: D4 – pH, Electrical Conductivity and Total Suspended Solids

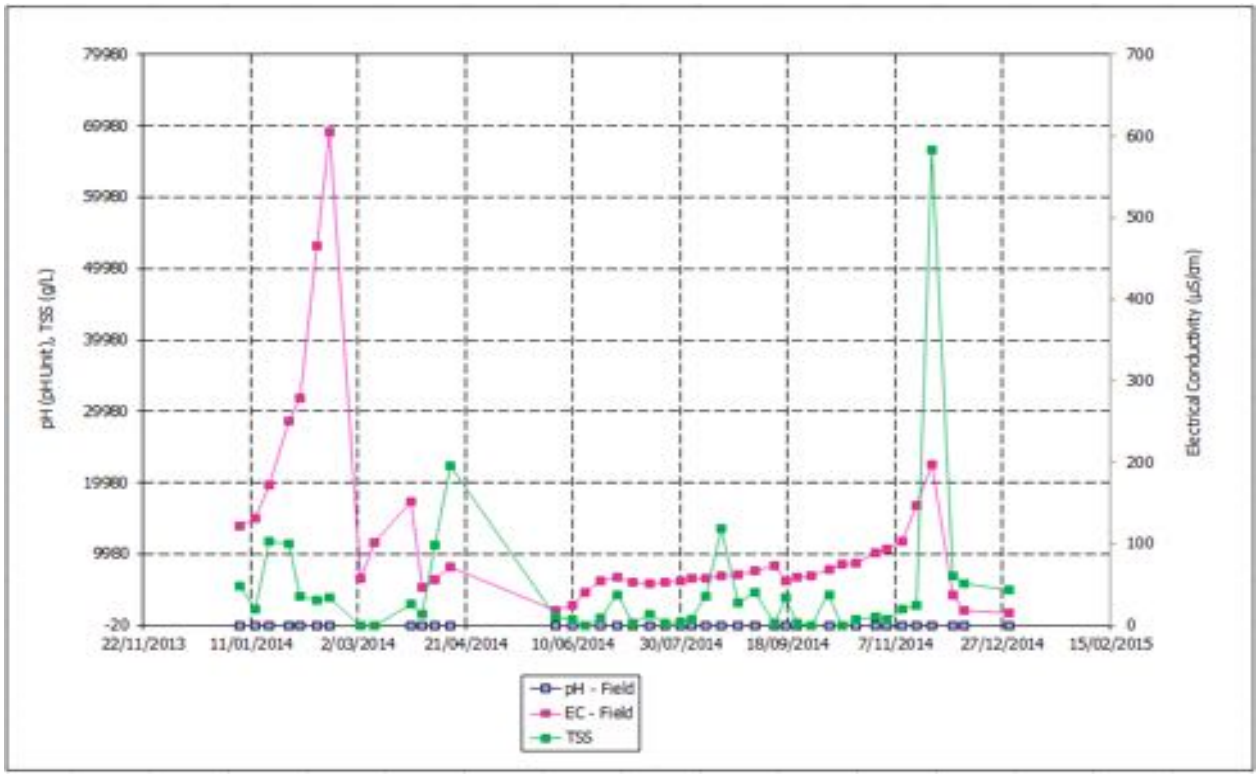


Figure 47: Pond D2 – pH, Oil & Grease and Electrical Conductivity

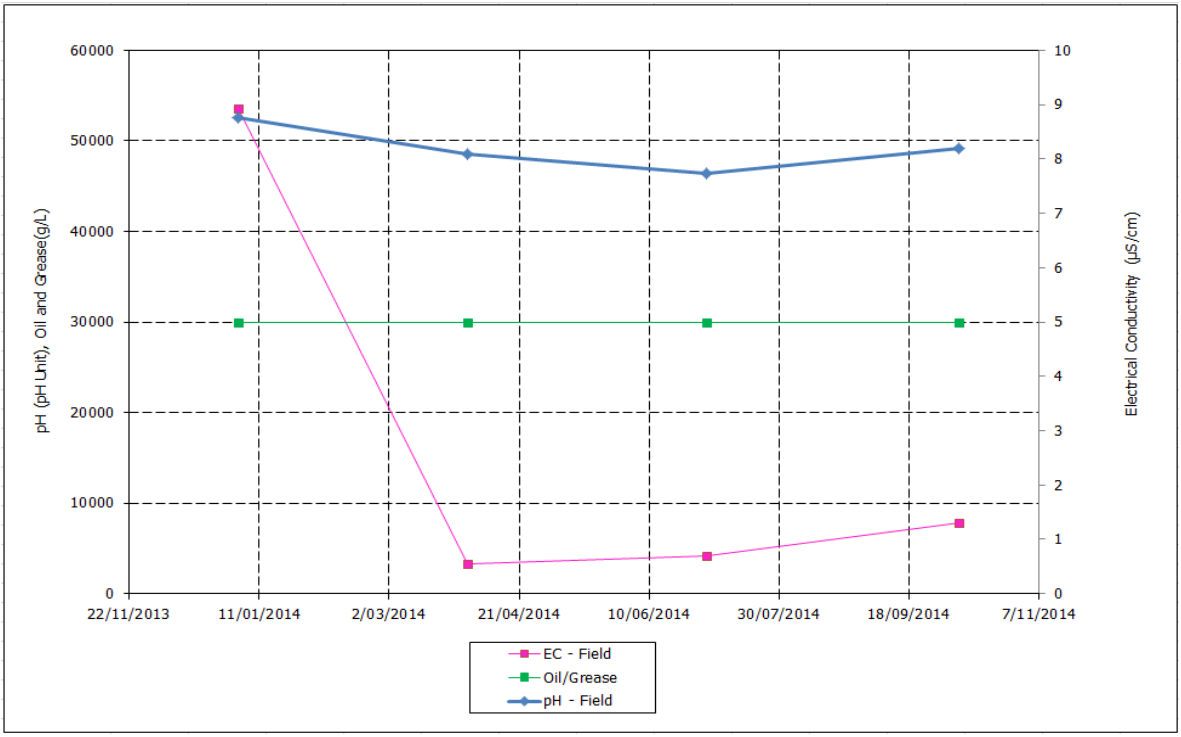


Figure 48: Pond D3 – pH, Oil & Grease and Electrical Conductivity

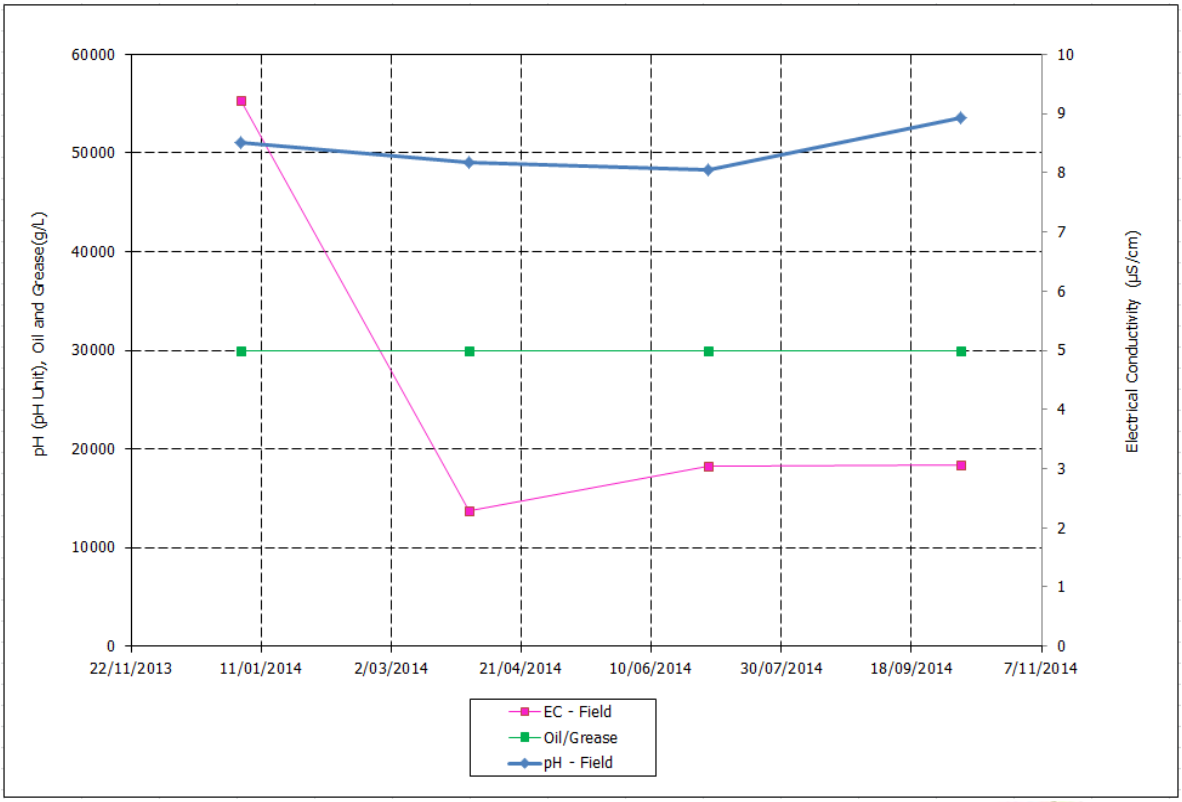


Figure 49: Pond D8B – pH, Oil & Grease and Electrical Conductivity

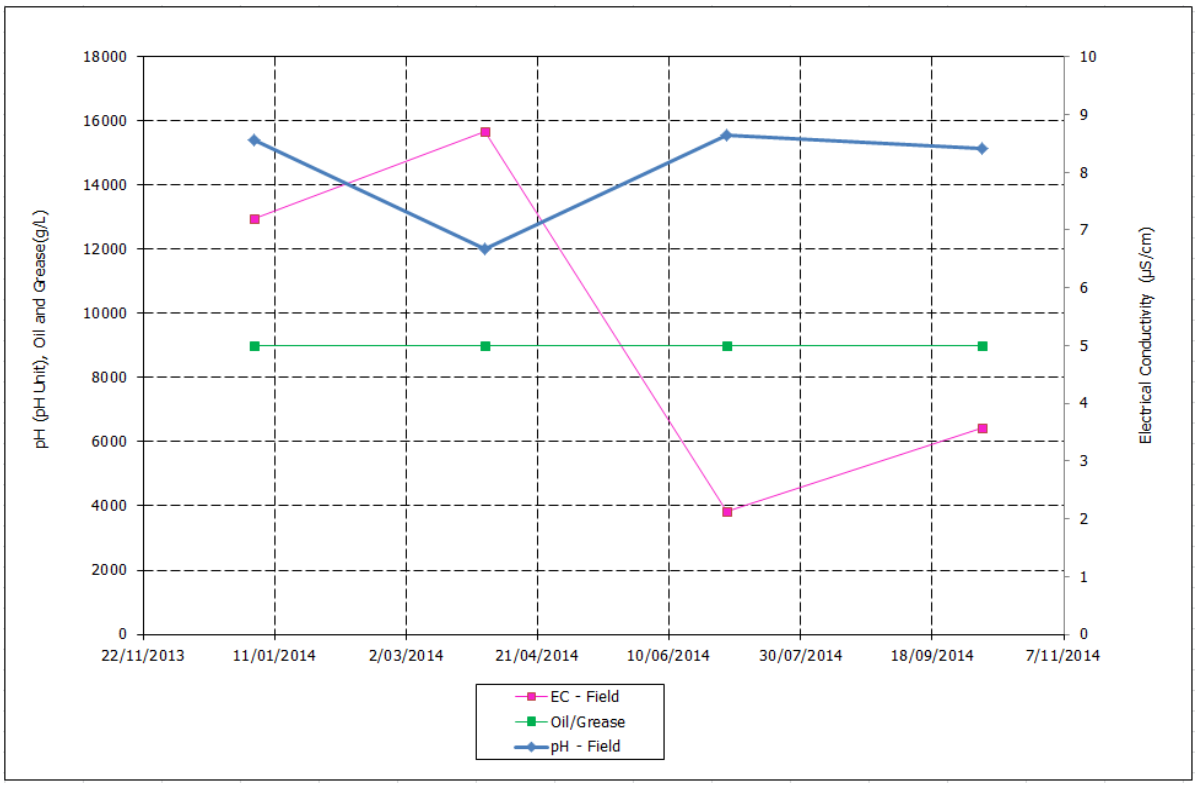


Figure 50: Pond D9 – pH, Oil & Grease and Electrical Conductivity

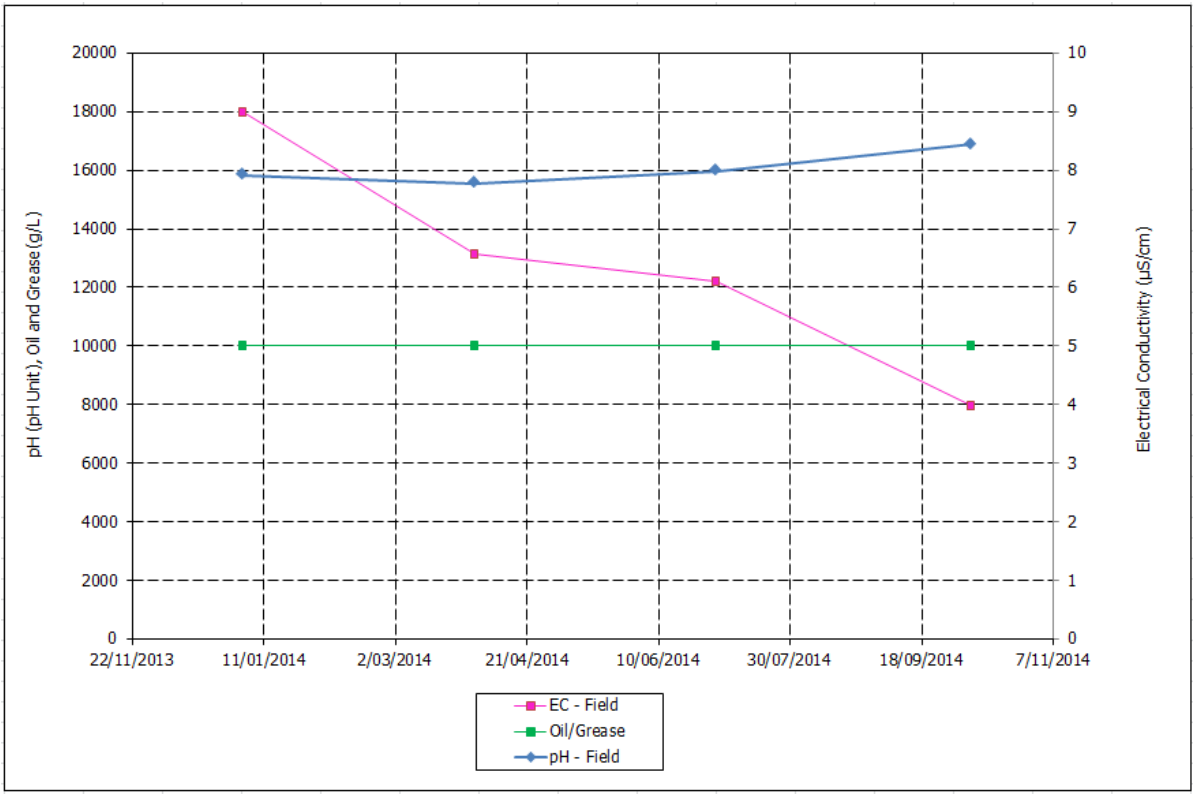


Figure 51: D5 – pH, Dissolved Oxygen, Electrical Conductivity, Temperature and Turbidity

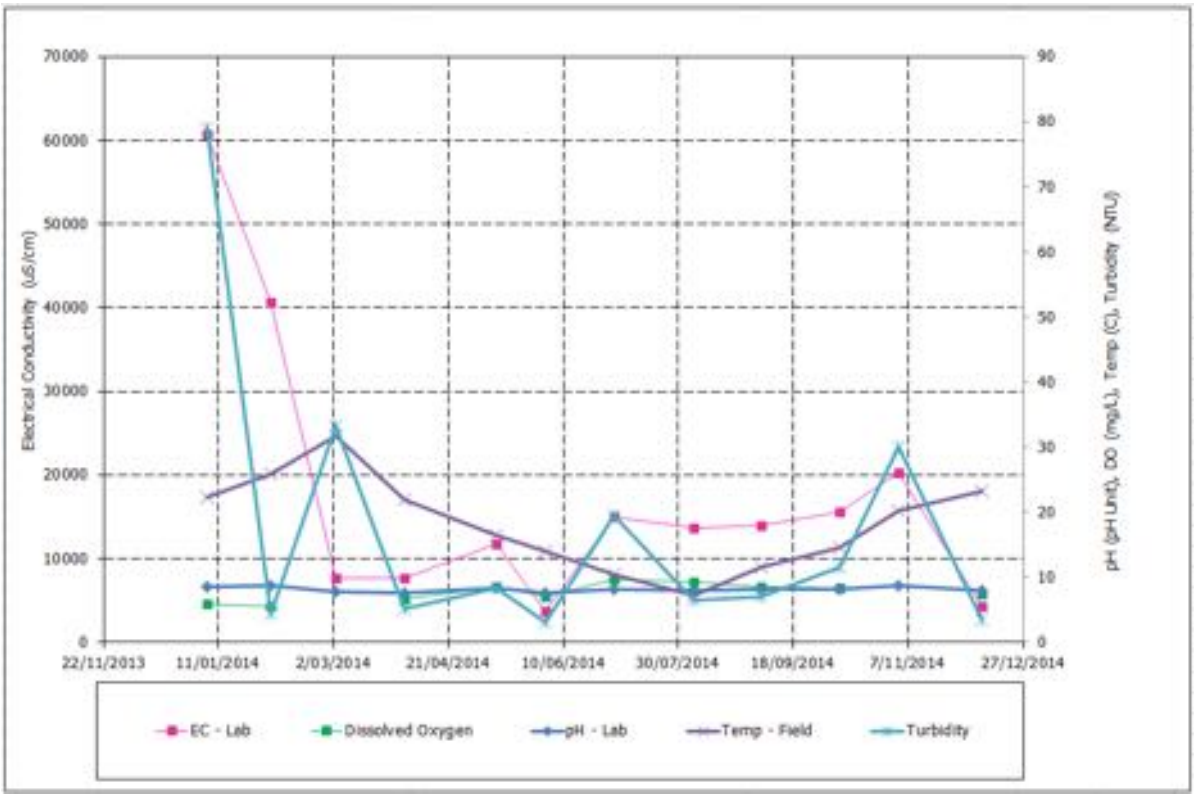
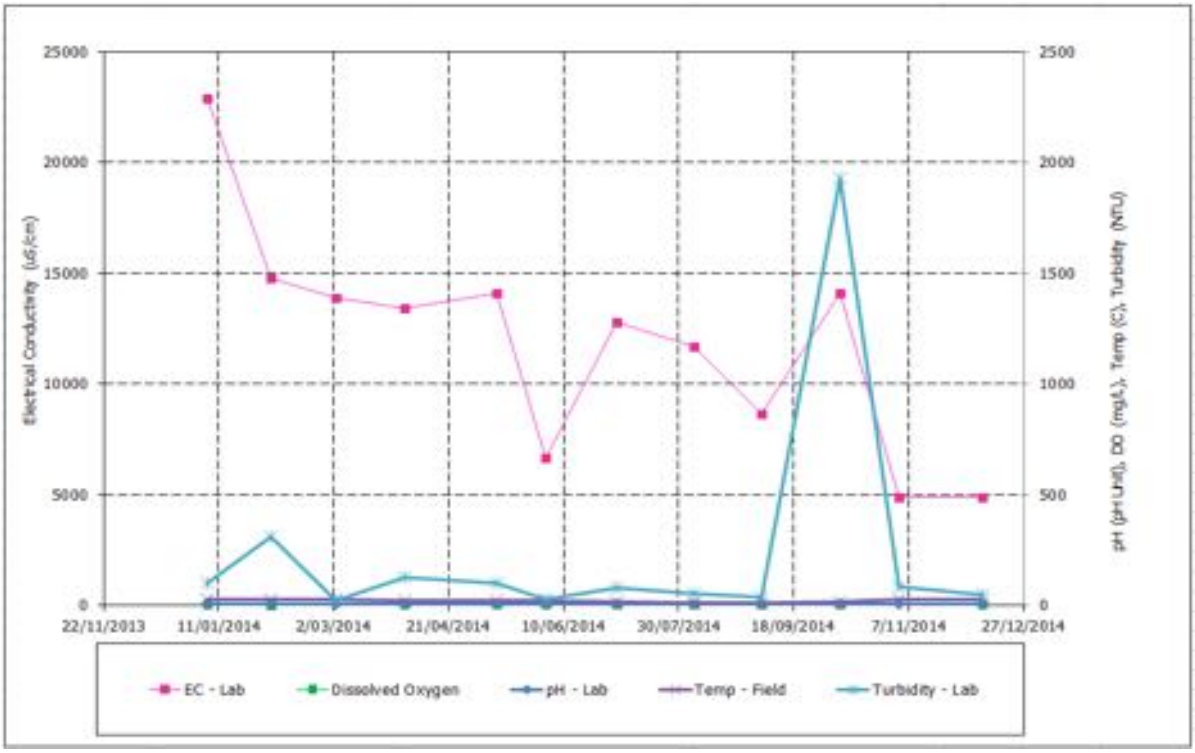


Figure 52: D6 – pH, Dissolved Oxygen, Electrical Conductivity, Temperature and Turbidity



APPENDIX D

LAKE WATER AND SEDIMENT SAMPLING DATA AND GRAPHS

COWAL GOLD MINE

LAKE WATER AND SEDIMENT MONITORING REPORT

23 December 2013 – 22 December 2014

INTRODUCTION

This report contains results and interpretation of Lake Water and Lake Sediment monitoring at Cowal Gold Mine for the period 23 December 2013 – 22 December 2014. The data contained in this report is intended to compliment summary reports contained in the 2014 Annual Review (refer to section 3.3 of the main report). Please refer to figure 8 in the main report to view all lake water monitoring locations.

SAMPLE COLLECTION METHODOLOGY AND QA/QC PROCEDURES

Employees at Cowal Gold Mine collect environmental monitoring samples in accordance with procedures developed specifically for the tasks. These procedures adhere to AS 5667:1998 and APHA guidelines on the collection and preservation of samples and include specific direction pertaining to:

- Methods for collection of samples from lake water and lake sediment;
- Use of measurement and sampling equipment;
- Sample identification;
- Sample containers and preservation methods;
- Sample filtration, storage and holding times;
- Sample transport;
- Chain of Custody (COC) documentation and laboratory analytical scheduling; and
- Data management and QA/QC checks.

LABORATORY ANALYTICAL METHODS AND QA/QC PROCEDURES

Unless otherwise stated, all analytical work was conducted by ALS Environmental at their NATA-accredited Sydney laboratory. In accordance with Cowal Gold Mine environmental monitoring procedures, trip blank and duplicate samples are collected throughout the course of the monitoring program for analysis by ALS Environmental in Sydney. The results of these and other QA checks are not contained in this report.

CONTENTS

Lake Water

Sediment

B1 – EPA ID #17	**Units**	**Collect Date**				**Interpretation**
		14/01/2014	1/04/2014	3/07/2014		
Alkalinity - Total $CaCO_3$	mg/L	314	290	350	-	Alkalinity decreased in the 2nd quarter and increased in the 3rd quarter. Conductivity decreased in each quarter. Total suspended solids decreased in the 2nd quarter and increased in the 3rd quarter. Other metals concentrations remained fairly stable. Safe access prevented sampling in the 4th quarter.
Arsenic - Dissolved	mg/L	0.016	0.020	0.014	-	
Cadmium - Dissolved	mg/L	< 0.0001	< 0.0001	< 0.0001	-	
Copper - Dissolved	mg/L	0.004	0.003	0.005	-	
Lead - Dissolved	mg/L	< 0.001	< 0.001	< 0.001	-	
Mercury - Dissolved	mg/L	< 0.0001	< 0.0001	< 0.0001	-	
pH - Field		8.66	8.52	8.98	-	
Selenium - Dissolved	mg/L	< 0.01	< 0.01	< 0.01	-	
Conductivity-Field	µS/cm	1706	1230	838	-	
Total Suspended Solids	mg/L	325	117	261	-	
Zinc - Dissolved	mg/L	< 0.005	< 0.005	0.011	-	

B2	**Units**	**Collect Date**				**Interpretation**
		14/01/2014	1/04/2014	3/07/2014		
Alkalinity - Total $CaCO_3$	mg/L	319	286	348	-	Alkalinity decreased in the 2nd quarter and increased in the 3rd quarter. Conductivity increased in each quarter. Total suspended solids decreased in the 2nd quarter and increased in the 3rd quarter. Other metals concentrations remained fairly stable. Safe access prevented sampling in the 4th quarter.
Arsenic - Dissolved	mg/L	0.023	0.016	0.013	-	
Cadmium - Dissolved	mg/L	< 0.0001	< 0.0001	< 0.0001	-	
Copper - Dissolved	mg/L	0.004	0.003	0.005	-	
Lead - Dissolved	mg/L	< 0.001	< 0.001	< 0.001	-	
Mercury - Dissolved	mg/L	< 0.0001	< 0.0001	< 0.0001	-	
pH - Field		8.9	8.91	8.92	-	
Selenium - Dissolved	mg/L	< 0.01	< 0.01	< 0.01	-	
Conductivity-Field	µS/cm	1083	1190	1237	-	
Total Suspended Solids	mg/L	209	142	271	-	
Zinc - Dissolved	mg/L	< 0.005	< 0.005	0.019	-	

B3	**Units**	**Collect Date**				**Interpretation**
		14/01/2014	1/04/2014	3/07/2014		
Alkalinity - Total $CaCO_3$	mg/L	320	294	339	-	Alkalinity decreased in the 2nd quarter and increased in the 3rd quarter. Conductivity increased in the 2nd quarter and decreased in the 3rd quarter. Total suspended solids decreased in the 2nd quarter and increased in the 3rd quarter. Other metals concentrations remained fairly stable. Safe access prevented sampling in the 4th quarter.
Arsenic - Dissolved	mg/L	0.022	0.016	0.013	-	
Cadmium - Dissolved	mg/L	< 0.0001	< 0.0001	< 0.0001	-	
Copper - Dissolved	mg/L	0.004	0.003	0.005	-	
Lead - Dissolved	mg/L	< 0.001	< 0.001	< 0.001	-	
Mercury - Dissolved	mg/L	< 0.0001	< 0.0001	< 0.0001	-	
pH - Field		8.81	8.92	8.74	-	
Selenium - Dissolved	mg/L	< 0.01	< 0.01	< 0.01	-	
Conductivity-Field	µS/cm	1077	1180	809	-	
Total Suspended Solids	mg/L	213	66	405	-	
Zinc - Dissolved	mg/L	< 0.005	< 0.005	0.023	-	

B4	Units	Collect Date				Interpretation
		14/01/2014	1/04/2014	3/07/2014		
Alkalinity - Total $CaCO_3$	mg/L	313	285	346	-	Alkalinity decreased in the 2nd quarter and increased in the 3rd quarter. Conductivity increased in the 2nd quarter and decreased in the 3rd quarter. Total suspended solids decreased in the 2nd quarter and increased in the 3rd quarter. Other metals concentrations remained fairly stable. Safe access prevented sampling in the 4th quarter.
Arsenic - Dissolved	mg/L	0.02	0.017	0.012	-	
Cadmium - Dissolved	mg/L	< 0.0001	< 0.0001	< 0.0001	-	
Copper - Dissolved	mg/L	0.004	0.003	0.005	-	
Lead - Dissolved	mg/L	< 0.001	< 0.001	< 0.001	-	
Mercury - Dissolved	mg/L	< 0.0001	< 0.0001	< 0.0001	-	
pH - Field		8.8	8.74	8.7	-	
Selenium - Dissolved	mg/L	< 0.01	< 0.01	< 0.01	-	
Conductivity-Field	µS/cm	1044	1160	817	-	
Total Suspended Solids	mg/L	351	143	362	-	
Zinc - Dissolved	mg/L	0.007	< 0.005	0.022	-	

B5 – EPA ID #18	Units	Collect Date				Interpretation
		14/01/2014	1/04/2014	3/07/2014		
Alkalinity - Total $CaCO_3$	mg/L	313	291	341	-	Alkalinity decreased in the 2nd quarter and increased in the 3rd quarter. Conductivity increased in the 2nd quarter and decreased in the 3rd quarter. Total suspended solids decreased in the 2nd quarter and increased in the 3rd quarter. Other metals concentrations remained fairly stable. Safe access prevented sampling in the 4th quarter.
Arsenic - Dissolved	mg/L	0.022	0.017	0.012	-	
Cadmium - Dissolved	mg/L	< 0.0001	< 0.0001	< 0.0001	-	
Copper - Dissolved	mg/L	0.004	0.003	0.005	-	
Lead - Dissolved	mg/L	< 0.001	< 0.001	< 0.001	-	
Mercury - Dissolved	mg/L	< 0.0001	< 0.0001	< 0.0001	-	
pH - Field		8.82	8.82	8.72	-	
Selenium - Dissolved	mg/L	< 0.01	< 0.01	< 0.01	-	
Conductivity-Field	µS/cm	1053	1170	805	-	
Total Suspended Solids	mg/L	297	186	338	-	
Zinc - Dissolved	mg/L	0.027	< 0.005	0.023	-	

B6	Units	Collect Date				Interpretation
Alkalinity - Total $CaCO_3$	mg/L	-	-	-	-	Location was dry from 1st to 4th quarters.
Arsenic - Dissolved	mg/L	-	-	-	-	
Cadmium - Dissolved	mg/L	-	-	-	-	
Copper - Dissolved	mg/L	-	-	-	-	
Lead - Dissolved	mg/L	-	-	-	-	
Mercury - Dissolved	mg/L	-	-	-	-	
pH - Field		-	-	-	-	
Selenium - Dissolved	mg/L	-	-	-	-	
Conductivity-Field	µS/cm	-	-	-	-	
Total Suspended Solids	mg/L	-	-	-	-	
Zinc - Dissolved	mg/L	-	-	-	-	

BLAND CREEK	Units	Collect Date				Interpretation
Alkalinity - Total $CaCO_3$	mg/L	-	-	-	-	Safe access prevented sampling from 1st to 4th quarters.
Arsenic - Dissolved	mg/L	-	-	-	-	
Cadmium - Dissolved	mg/L	-	-	-	-	
Copper - Dissolved	mg/L	-	-	-	-	
Lead - Dissolved	mg/L	-	-	-	-	
Mercury - Dissolved	mg/L	-	-	-	-	
pH - Field		-	-	-	-	
Selenium - Dissolved	mg/L	-	-	-	-	
Conductivity-Field	µS/cm	-	-	-	-	
Total Suspended Solids	mg/L	-	-	-	-	
Zinc - Dissolved	mg/L	-	-	-	-	

C1	Units	Collect Date				Interpretation
		14/01/2014	1/04/2014	3/07/2014		
Alkalinity - Total $CaCO_3$	mg/L	310	298	344	-	Alkalinity decreased in the 2nd quarter and increased in the 3rd quarter. Conductivity increased in the 2nd quarter and decreased in the 3rd quarter. Total suspended solids decreased in the 2nd quarter and increased in the 3rd quarter. Other metals concentrations remained fairly stable. Safe access prevented sampling in the 4th quarter.
Arsenic - Dissolved	mg/L	0.021	0.019	0.012	-	
Cadmium - Dissolved	mg/L	< 0.0001	< 0.0001	< 0.0001	-	
Copper - Dissolved	mg/L	0.004	0.003	0.005	-	
Lead - Dissolved	mg/L	< 0.001	< 0.001	< 0.001	-	
Mercury - Dissolved	mg/L	< 0.0001	< 0.0001	< 0.0001	-	
pH - Field		8.79	8.94	8.76	-	
Selenium - Dissolved	mg/L	< 0.01	< 0.01	< 0.01	-	
Conductivity-Field	µS/cm	1054	1210	815	-	
Total Suspended Solids	mg/L	215	57	373	-	
Zinc - Dissolved	mg/L	0.008	< 0.005	0.015	-	

C2	Units	Collect Date				Interpretation
		14/01/2014	1/04/2014	3/07/2014		
Alkalinity - Total $CaCO_3$	mg/L	311	296	346	-	Alkalinity decreased in the 2nd quarter and increased in the 3rd quarter. Conductivity increased in the 2nd quarter and decreased in the 3rd quarter. Total suspended solids decreased in the 2nd quarter and increased in the 3rd quarter. Other metals concentrations remained fairly stable. Safe access prevented sampling in quarter 4.
Arsenic - Dissolved	mg/L	0.021	0.020	0.013	-	
Cadmium - Dissolved	mg/L	< 0.0001	< 0.0001	< 0.0001	-	
Copper - Dissolved	mg/L	0.004	0.003	0.005	-	
Lead - Dissolved	mg/L	< 0.001	< 0.001	< 0.001	-	
Mercury - Dissolved	mg/L	< 0.0001	< 0.0001	< 0.0001	-	
pH - Field		8.77	8.97	8.77	-	
Selenium - Dissolved	mg/L	< 0.01	< 0.01	< 0.01	-	
Conductivity-Field	µS/cm	1051	1210	816	-	
Total Suspended Solids	mg/L	184	87	381	-	
Zinc - Dissolved	mg/L	0.008	< 0.005	0.020	-	

C3	Units	Collect Date				Interpretation
		14/01/2014	1/04/2014	3/07/2014		
Alkalinity - Total $CaCO_3$	mg/L	310	296	346	-	Alkalinity decreased in the 2nd quarter and increased in the 3rd quarter. Conductivity increased in the 2nd quarter and decreased in the 3rd quarter. Total suspended solids decreased in the 2nd quarter and increased in the 3rd quarter. Other metals concentrations remained fairly stable. Safe access prevented sampling in the 4th quarter.
Arsenic - Dissolved	mg/L	0.022	0.016	0.012	-	
Cadmium - Dissolved	mg/L	< 0.0001	< 0.0001	< 0.0001	-	
Copper - Dissolved	mg/L	0.004	0.003	0.005	-	
Lead - Dissolved	mg/L	< 0.001	< 0.001	< 0.001	-	
Mercury - Dissolved	mg/L	< 0.0001	< 0.0001	< 0.0001	-	
pH - Field		8.76	8.96	8.76	-	
Selenium - Dissolved	mg/L	< 0.01	< 0.01	< 0.01	-	
Conductivity-Field	µS/cm	1054	1210	817	-	
Total Suspended Solids	mg/L	259	96	417	-	
Zinc - Dissolved	mg/L	0.009	< 0.005	0.018	-	

E1	Units	Collect Date				Interpretation
		14/01/2014	1/04/2014	3/07/2014		
Alkalinity - Total $CaCO_3$	mg/L	319	297	339	-	Alkalinity decreased in the 2nd quarter and increased in the 3rd quarter. Conductivity increased in the 2nd quarter and decreased in the 3rd quarter. Total suspended solids decreased in the 2nd quarter and increased in the 3rd quarter. Other metals concentrations remained fairly stable. Safe access prevented sampling in the 4th quarter.
Arsenic - Dissolved	mg/L	0.019	0.016	0.012	-	
Cadmium - Dissolved	mg/L	< 0.0001	< 0.0001	< 0.0001	-	
Copper - Dissolved	mg/L	0.004	0.003	0.004	-	
Lead - Dissolved	mg/L	< 0.001	< 0.001	< 0.001	-	
Mercury - Dissolved	mg/L	< 0.0001	< 0.0001	< 0.0001	-	
pH - Field		8.79	8.72	8.79	-	
Selenium - Dissolved	mg/L	< 0.01	< 0.01	< 0.01	-	
Conductivity-Field	µS/cm	1077	1200	825	-	
Total Suspended Solids	mg/L	146	99	301	-	
Zinc - Dissolved	mg/L	0.007	< 0.005	0.028	-	

E2	Units	Collect Date				Interpretation
		14/01/2014	1/04/2014	3/07/2014		
Alkalinity - Total $CaCO_3$	mg/L	315	291	346	-	Alkalinity decreased in the 2nd quarter and increased in the 3rd quarter. Conductivity increased in the 2nd quarter and decreased in the 3rd quarter. Total suspended solids decreased in the 2nd quarter and increased in the 3rd quarter. Other metals concentrations remained fairly stable. Safe access prevented sampling in the 4th quarter.
Arsenic - Dissolved	mg/L	0.024	0.019	0.012	-	
Cadmium - Dissolved	mg/L	< 0.0001	< 0.0001	< 0.0001	-	
Copper - Dissolved	mg/L	0.004	0.003	0.005	-	
Lead - Dissolved	mg/L	< 0.001	< 0.001	< 0.001	-	
Mercury - Dissolved	mg/L	< 0.0001	< 0.0001	< 0.0001	-	
pH - Field		8.75	8.66	8.72	-	
Selenium - Dissolved	mg/L	< 0.01	< 0.01	< 0.01	-	
Conductivity-Field	µS/cm	1061	1200	822	-	
Total Suspended Solids	mg/L	198	115	352	-	
Zinc - Dissolved	mg/L	0.014	< 0.005	0.023	-	

E3	Units	Collect Date				Interpretation
		14/01/2014	1/04/2014	3/07/2014		
Alkalinity - Total $CaCO_3$	mg/L	312	295	346	-	Alkalinity decreased in the 2nd quarter and increased in the 3rd quarter. Conductivity increased in the 2nd quarter and decreased in the 3rd quarter. Total suspended solids decreased in the 2nd quarter and increased in the 3rd quarter. Other metals concentrations remained fairly stable. Safe access prevented sampling in the 4th quarter.
Arsenic - Dissolved	mg/L	0.016	0.019	0.012	-	
Cadmium - Dissolved	mg/L	< 0.0001	< 0.0001	< 0.0001	-	
Copper - Dissolved	mg/L	0.004	0.004	0.005	-	
Lead - Dissolved	mg/L	< 0.001	< 0.001	< 0.001	-	
Mercury - Dissolved	mg/L	< 0.0001	< 0.0001	< 0.0001	-	
pH - Field		8.8	8.85	8.73	-	
Selenium - Dissolved	mg/L	< 0.01	< 0.01	< 0.01	-	
Conductivity-Field	µS/cm	1059	1210	819	-	
Total Suspended Solids	mg/L	213	109	348	-	
Zinc - Dissolved	mg/L	0.013	< 0.005	0.021	-	

E4	Units	Collect Date				Interpretation
		14/01/2014				
Alkalinity - Total $CaCO_3$	mg/L	310	-	-	-	Safe access prevented sampling in 2nd to 4th quarters.
Arsenic - Dissolved	mg/L	0.019	-	-	-	
Cadmium - Dissolved	mg/L	< 0.0001	-	-	-	
Copper - Dissolved	mg/L	0.004	-	-	-	
Lead - Dissolved	mg/L	< 0.001	-	-	-	
Mercury - Dissolved	mg/L	< 0.0001	-	-	-	
pH - Field		8.79	-	-	-	
Selenium - Dissolved	mg/L	< 0.01	-	-	-	
Conductivity-Field	µS/cm	1051	-	-	-	
Total Suspended Solids	mg/L	262	-	-	-	
Zinc - Dissolved	mg/L	0.008	-	-	-	

E5	Units	Collect Date				Interpretation
		14/01/2014				
Alkalinity - Total $CaCO_3$	mg/L	312	-	-	-	Safe access prevented sampling in 2nd to 4th quarters.
Arsenic - Dissolved	mg/L	0.023	-	-	-	
Cadmium - Dissolved	mg/L	< 0.0001	-	-	-	
Copper - Dissolved	mg/L	0.004	-	-	-	
Lead - Dissolved	mg/L	< 0.001	-	-	-	
Mercury - Dissolved	mg/L	< 0.0001	-	-	-	
pH - Field		8.96	-	-	-	
Selenium - Dissolved	mg/L	< 0.01	-	-	-	
Conductivity-Field	µS/cm	1049	-	-	-	
Total Suspended Solids	mg/L	252	-	-	-	
Zinc - Dissolved	mg/L	0.007	-	-	-	

I1	Units	Collect Date				Interpretation
		14/01/2014	1/04/2014			
Alkalinity - Total $CaCO_3$	mg/L	300	296	-	-	Alkalinity decreased in the 2nd quarter. Conductivity increased in the 2nd quarter. Total suspended solids decreased in the 2nd quarter. Other metals concentrations remained fairly stable. Safe access prevented sampling in the 3rd and 4th quarters.
Arsenic - Dissolved	mg/L	0.022	0.022	-	-	
Cadmium - Dissolved	mg/L	< 0.0001	< 0.0001	-	-	
Copper - Dissolved	mg/L	0.004	0.004	-	-	
Lead - Dissolved	mg/L	< 0.001	< 0.001	-	-	
Mercury - Dissolved	mg/L	< 0.0001	< 0.0001	-	-	
pH - Field		8.81	8.45	-	-	
Selenium - Dissolved	mg/L	< 0.01	< 0.01	-	-	
Conductivity-Field	µS/cm	1067	1253	-	-	
Total Suspended Solids	mg/L	201	199	-	-	
Zinc - Dissolved	mg/L	0.008	< 0.005	-	-	

I2	Units	Collect Date				Interpretation
		14/01/2014				
Alkalinity - Total $CaCO_3$	mg/L	282	-	-	-	Location was dry from 2nd to 4th quarters.
Arsenic - Dissolved	mg/L	0.021	-	-	-	
Cadmium - Dissolved	mg/L	< 0.0001	-	-	-	
Copper - Dissolved	mg/L	0.004	-	-	-	
Lead - Dissolved	mg/L	< 0.001	-	-	-	
Mercury - Dissolved	mg/L	< 0.0001	-	-	-	
pH - Field		8.66	-	-	-	
Selenium - Dissolved	mg/L	< 0.01	-	-	-	
Conductivity-Field	µS/cm	1032	-	-	-	
Total Suspended Solids	mg/L	556	-	-	-	
Zinc - Dissolved	mg/L	0.023	-	-	-	

I3	Units	Collect Date				Interpretation
Alkalinity - Total $CaCO_3$	mg/L	-	-	-	-	Location was dry from 1st to 4th quarters.
Arsenic - Dissolved	mg/L	-	-	-	-	
Cadmium - Dissolved	mg/L	-	-	-	-	
Copper - Dissolved	mg/L	-	-	-	-	
Lead - Dissolved	mg/L	-	-	-	-	
Mercury - Dissolved	mg/L	-	-	-	-	
pH - Field		-	-	-	-	
Selenium - Dissolved	mg/L	-	-	-	-	
Conductivity-Field	µS/cm	-	-	-	-	
Total Suspended Solids	mg/L	-	-	-	-	
Zinc - Dissolved	mg/L	-	-	-	-	

I4	Units	Collect Date				Interpretation
Alkalinity - Total $CaCO_3$	mg/L	-	-	-	-	Location was dry from 1st to 4th quarters.
Arsenic - Dissolved	mg/L	-	-	-	-	
Cadmium - Dissolved	mg/L	-	-	-	-	
Copper - Dissolved	mg/L	-	-	-	-	
Lead - Dissolved	mg/L	-	-	-	-	
Mercury - Dissolved	mg/L	-	-	-	-	
pH - Field		-	-	-	-	
Selenium - Dissolved	mg/L	-	-	-	-	
Conductivity-Field	µS/cm	-	-	-	-	
Total Suspended Solids	mg/L	-	-	-	-	
Zinc - Dissolved	mg/L	-	-	-	-	

L1	Units	Collect Date				Interpretation
		14/01/2014				
Alkalinity - Total $CaCO_3$	mg/L	216	-	-	-	Location was dry from 2nd to 4th quarters.
Arsenic - Dissolved	mg/L	0.02	-	-	-	
Cadmium - Dissolved	mg/L	< 0.0001	-	-	-	
Copper - Dissolved	mg/L	0.004	-	-	-	
Lead - Dissolved	mg/L	< 0.001	-	-	-	
Mercury - Dissolved	mg/L	< 0.0001	-	-	-	
pH - Field		8.84	-	-	-	
Selenium - Dissolved	mg/L	< 0.01	-	-	-	
Conductivity-Field	µS/cm	1099	-	-	-	
Total Suspended Solids	mg/L	541	-	-	-	
Zinc - Dissolved	mg/L	< 0.005	-	-	-	

L2	Units	Collect Date				Interpretation
		14/01/2014				
Alkalinity - Total $CaCO_3$	mg/L	290	-	-	-	Location was dry from 2nd to 4th quarters.
Arsenic - Dissolved	mg/L	0.023	-	-	-	
Cadmium - Dissolved	mg/L	< 0.0001	-	-	-	
Copper - Dissolved	mg/L	0.004	-	-	-	
Lead - Dissolved	mg/L	< 0.001	-	-	-	
Mercury - Dissolved	mg/L	< 0.0001	-	-	-	
pH - Field		8.91	-	-	-	
Selenium - Dissolved	mg/L	< 0.01	-	-	-	
Conductivity-Field	µS/cm	1103	-	-	-	
Total Suspended Solids	mg/L	240	-	-	-	
Zinc - Dissolved	mg/L	0.02	-	-	-	

L3	Units	Collect Date				Interpretation
		14/01/2014				
Alkalinity - Total $CaCO_3$	mg/L	262	-	-	-	Location was dry from 2nd to 4th quarters.
Arsenic - Dissolved	mg/L	0.023	-	-	-	
Cadmium - Dissolved	mg/L	< 0.0001	-	-	-	
Copper - Dissolved	mg/L	0.004	-	-	-	
Lead - Dissolved	mg/L	< 0.001	-	-	-	
Mercury - Dissolved	mg/L	< 0.0001	-	-	-	
pH - Field		8.73	-	-	-	
Selenium - Dissolved	mg/L	< 0.01	-	-	-	
Conductivity-Field	µS/cm	1011	-	-	-	
Total Suspended Solids	mg/L	298	-	-	-	
Zinc - Dissolved	mg/L	0.03	-	-	-	

L4	Units	Collect Date				Interpretation
Alkalinity - Total $CaCO_3$	mg/L	-	-	-	-	Location was dry from 1st to 4th quarters.
Arsenic - Dissolved	mg/L	-	-	-	-	
Cadmium - Dissolved	mg/L	-	-	-	-	
Copper - Dissolved	mg/L	-	-	-	-	
Lead - Dissolved	mg/L	-	-	-	-	
Mercury - Dissolved	mg/L	-	-	-	-	
pH - Field		-	-	-	-	
Selenium - Dissolved	mg/L	-	-	-	-	
Conductivity-Field	µS/cm	-	-	-	-	
Total Suspended Solids	mg/L	-	-	-	-	
Zinc - Dissolved	mg/L	-	-	-	-	

L5	Units	Collect Date				Interpretation
Alkalinity - Total $CaCO_3$	mg/L	-	-	-	-	Location was dry from 1st to 4th quarters.
Arsenic - Dissolved	mg/L	-	-	-	-	
Cadmium - Dissolved	mg/L	-	-	-	-	
Copper - Dissolved	mg/L	-	-	-	-	
Lead - Dissolved	mg/L	-	-	-	-	
Mercury - Dissolved	mg/L	-	-	-	-	
pH - Field		-	-	-	-	
Selenium - Dissolved	mg/L	-	-	-	-	
Conductivity-Field	µS/cm	-	-	-	-	
Total Suspended Solids	mg/L	-	-	-	-	
Zinc - Dissolved	mg/L	-	-	-	-	

L6	Units	Collect Date				Interpretation
Alkalinity - Total $CaCO_3$	mg/L	-	-	-	-	Location was dry from 1st to 4th quarters.
Arsenic - Dissolved	mg/L	-	-	-	-	
Cadmium - Dissolved	mg/L	-	-	-	-	
Copper - Dissolved	mg/L	-	-	-	-	
Lead - Dissolved	mg/L	-	-	-	-	
Mercury - Dissolved	mg/L	-	-	-	-	
pH - Field		-	-	-	-	
Selenium - Dissolved	mg/L	-	-	-	-	
Conductivity-Field	µS/cm	-	-	-	-	
Total Suspended Solids	mg/L	-	-	-	-	
Zinc - Dissolved	mg/L	-	-	-	-	

L7	Units	Collect Date				Interpretation
Alkalinity - Total $CaCO_3$	mg/L	-	-	-	-	Location was dry from 1st to 4th quarters.
Arsenic - Dissolved	mg/L	-	-	-	-	
Cadmium - Dissolved	mg/L	-	-	-	-	
Copper - Dissolved	mg/L	-	-	-	-	
Lead - Dissolved	mg/L	-	-	-	-	
Mercury - Dissolved	mg/L	-	-	-	-	
pH - Field		-	-	-	-	
Selenium - Dissolved	mg/L	-	-	-	-	
Conductivity-Field	µS/cm	-	-	-	-	
Total Suspended Solids	mg/L	-	-	-	-	
Zinc - Dissolved	mg/L	-	-	-	-	

L8	Units	Collect Date				Interpretation
Alkalinity - Total $CaCO_3$	mg/L	-	-	-	-	Location was dry from 1st to 4th quarters.
Arsenic - Dissolved	mg/L	-	-	-	-	
Cadmium - Dissolved	mg/L	-	-	-	-	
Copper - Dissolved	mg/L	-	-	-	-	
Lead - Dissolved	mg/L	-	-	-	-	
Mercury - Dissolved	mg/L	-	-	-	-	
pH - Field		-	-	-	-	
Selenium - Dissolved	mg/L	-	-	-	-	
Conductivity-Field	µS/cm	-	-	-	-	
Total Suspended Solids	mg/L	-	-	-	-	
Zinc - Dissolved	mg/L	-	-	-	-	

L9	Units	Collect Date				Interpretation
Alkalinity - Total $CaCO_3$	mg/L	-	-	-	-	Location was dry from 1st to 4th quarters.
Arsenic - Dissolved	mg/L	-	-	-	-	
Cadmium - Dissolved	mg/L	-	-	-	-	
Copper - Dissolved	mg/L	-	-	-	-	
Lead - Dissolved	mg/L	-	-	-	-	
Mercury - Dissolved	mg/L	-	-	-	-	
pH - Field		-	-	-	-	
Selenium - Dissolved	mg/L	-	-	-	-	
Conductivity-Field	µS/cm	-	-	-	-	
Total Suspended Solids	mg/L	-	-	-	-	
Zinc - Dissolved	mg/L	-	-	-	-	

L10	Units	Collect Date				Interpretation
Alkalinity - Total $CaCO_3$	mg/L	-	-	-	-	Location was dry from 1st to 4th quarters.
Arsenic - Dissolved	mg/L	-	-	-	-	
Cadmium - Dissolved	mg/L	-	-	-	-	
Copper - Dissolved	mg/L	-	-	-	-	
Lead - Dissolved	mg/L	-	-	-	-	
Mercury - Dissolved	mg/L	-	-	-	-	
pH - Field		-	-	-	-	
Selenium - Dissolved	mg/L	-	-	-	-	
Conductivity-Field	µS/cm	-	-	-	-	
Total Suspended Solids	mg/L	-	-	-	-	
Zinc - Dissolved	mg/L	-	-	-	-	

L11	Units	Collect Date				Interpretation
Alkalinity - Total $CaCO_3$	mg/L	-	-	-	-	Location was dry from 1st to 4th quarters.
Arsenic - Dissolved	mg/L	-	-	-	-	
Cadmium - Dissolved	mg/L	-	-	-	-	
Copper - Dissolved	mg/L	-	-	-	-	
Lead - Dissolved	mg/L	-	-	-	-	
Mercury - Dissolved	mg/L	-	-	-	-	
pH - Field		-	-	-	-	
Selenium - Dissolved	mg/L	-	-	-	-	
Conductivity-Field	µS/cm	-	-	-	-	
Total Suspended Solids	mg/L	-	-	-	-	
Zinc - Dissolved	mg/L	-	-	-	-	

L12	Units	Collect Date				Interpretation
Alkalinity - Total $CaCO_3$	mg/L	-	-	-	-	Location was dry from 1st to 4th quarters.
Arsenic - Dissolved	mg/L	-	-	-	-	
Cadmium - Dissolved	mg/L	-	-	-	-	
Copper - Dissolved	mg/L	-	-	-	-	
Lead - Dissolved	mg/L	-	-	-	-	
Mercury - Dissolved	mg/L	-	-	-	-	
pH - Field		-	-	-	-	
Selenium - Dissolved	mg/L	-	-	-	-	
Conductivity-Field	µS/cm	-	-	-	-	
Total Suspended Solids	mg/L	-	-	-	-	
Zinc - Dissolved	mg/L	-	-	-	-	

L13	Units	Collect Date				Interpretation
Alkalinity - Total $CaCO_3$	mg/L	-	-	-	-	Location was dry from 1st to 4th quarters.
Arsenic - Dissolved	mg/L	-	-	-	-	
Cadmium - Dissolved	mg/L	-	-	-	-	
Copper - Dissolved	mg/L	-	-	-	-	
Lead - Dissolved	mg/L	-	-	-	-	
Mercury - Dissolved	mg/L	-	-	-	-	
pH - Field		-	-	-	-	
Selenium - Dissolved	mg/L	-	-	-	-	
Conductivity-Field	µS/cm	-	-	-	-	
Total Suspended Solids	mg/L	-	-	-	-	
Zinc - Dissolved	mg/L	-	-	-	-	

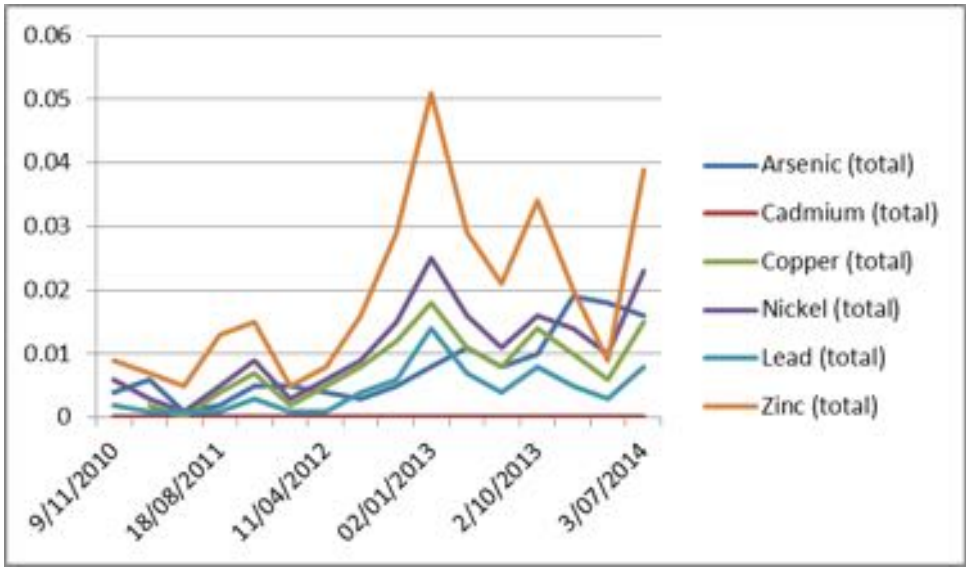
P1 – EPA ID #14	Units	Collect Date				Interpretation
		14/01/2014	1/04/2014	3/07/2014		
Alkalinity - Total $CaCO_3$	mg/L	319	292	350	-	Alkalinity decreased in the 2nd quarter and increased in the 3rd quarter. Conductivity increased in the 2nd quarter and decreased in the 3rd quarter. Total suspended solids decreased in the 2nd quarter and increased in the 3rd quarter. Other metals concentrations remained fairly stable. Safe access prevented sampling in the 4th quarter.
Arsenic - Dissolved	mg/L	0.02	0.019	0.013	-	
Cadmium - Dissolved	mg/L	< 0.0001	< 0.0001	< 0.0001	-	
Copper - Dissolved	mg/L	0.004	0.003	0.005	-	
Lead - Dissolved	mg/L	< 0.001	< 0.001	< 0.001	-	
Mercury - Dissolved	mg/L	< 0.0001	< 0.0001	< 0.0001	-	
pH - Field		8.74	8.82	9	-	
Selenium - Dissolved	mg/L	< 0.01	< 0.01	< 0.01	-	
Conductivity-Field	µS/cm	1081	1210	841	-	
Total Suspended Solids	mg/L	140	88	252	-	
Zinc - Dissolved	mg/L	< 0.005	< 0.005	< 0.005	-	

P2 – EPA ID #15	**Units**	**Collect Date**				**Interpretation**
		14/01/2014	1/04/2014	3/07/2014		
Alkalinity - Total $CaCO_3$	mg/L	318	296	356	-	Alkalinity decreased in the 2nd quarter and increased in the 3rd quarter. Conductivity increased in the 2nd quarter and decreased in the 3rd quarter. Total suspended solids decreased in the 2nd quarter and increased in the 3rd quarter. Other metals concentrations remained fairly stable. Safe access prevented sampling in the 4th quarter.
Arsenic - Dissolved	mg/L	0.022	0.018	0.013	-	
Cadmium - Dissolved	mg/L	0.0002	< 0.0001	< 0.0001	-	
Copper - Dissolved	mg/L	0.004	0.003	0.005	-	
Lead - Dissolved	mg/L	< 0.001	< 0.001	< 0.001	-	
Mercury - Dissolved	mg/L	< 0.0001	< 0.0001	< 0.0001	-	
pH - Field		8.77	8.91	8.99	-	
Selenium - Dissolved	mg/L	< 0.01	< 0.01	< 0.01	-	
Conductivity-Field	µS/cm	1801	1222	842	-	
Total Suspended Solids	mg/L	188	94	238	-	
Zinc - Dissolved	mg/L	< 0.005	< 0.005	0.014	-	

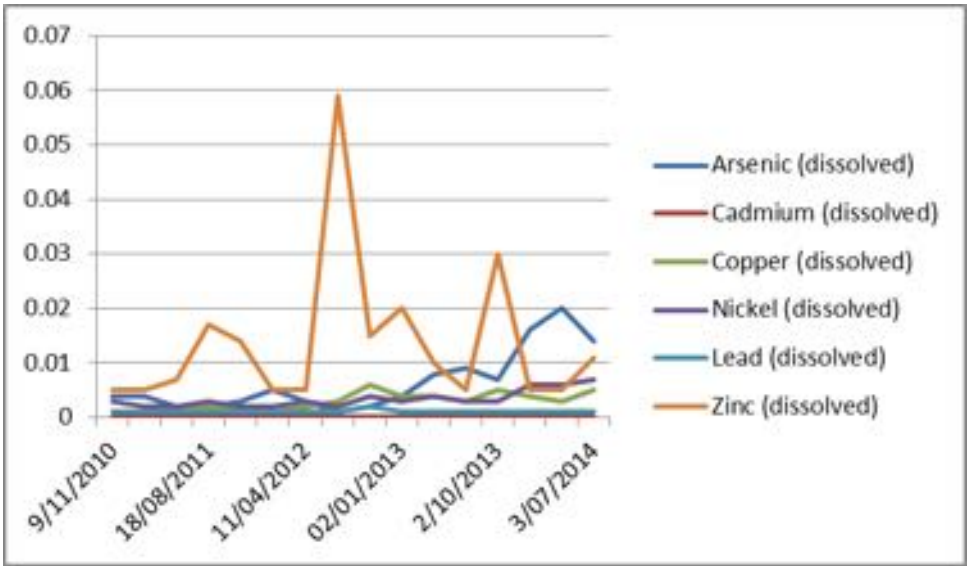
P3 – EPA ID #16	**Units**	**Collect Date**				**Interpretation**
		14/01/2014	1/04/2014	3/07/2014		
Alkalinity - Total $CaCO_3$	mg/L	318	296	348	-	Alkalinity decreased in the 2nd quarter and increased in the 3rd quarter. Conductivity increased in the 2nd quarter and decreased in the 3rd quarter. Total suspended solids decreased in the 2nd quarter and increased in the 3rd quarter. Other metals concentrations remained fairly stable. Safe access prevented sampling in the 4th quarter.
Arsenic - Dissolved	mg/L	0.022	0.018	0.013	-	
Cadmium - Dissolved	mg/L	< 0.0001	< 0.0001	< 0.0001	-	
Copper - Dissolved	mg/L	0.004	0.003	0.005	-	
Lead - Dissolved	mg/L	< 0.001	< 0.001	< 0.001	-	
Mercury - Dissolved	mg/L	< 0.0001	< 0.0001	< 0.0001	-	
pH - Field		8.77	8.6	8.97	-	
Selenium - Dissolved	mg/L	< 0.01	< 0.01	< 0.01	-	
Conductivity-Field	µS/cm	1078	1210	840	-	
Total Suspended Solids	mg/L	248	98	248	-	
Zinc - Dissolved	mg/L	0.005	< 0.005	0.011	-	

SANDY CREEK	**Units**	**Collect Date**				**Interpretation**
Alkalinity - Total $CaCO_3$	mg/L	-	-	-	-	Safe access prevented sampling from 1st to 4th quarters.
Arsenic - Dissolved	mg/L	-	-	-	-	
Cadmium - Dissolved	mg/L	-	-	-	-	
Copper - Dissolved	mg/L	-	-	-	-	
Lead - Dissolved	mg/L	-	-	-	-	
Mercury - Dissolved	mg/L	-	-	-	-	
pH - Field		-	-	-	-	
Selenium - Dissolved	mg/L	-	-	-	-	
Conductivity-Field	µS/cm	-	-	-	-	
Total Suspended Solids	mg/L	-	-	-	-	
Zinc - Dissolved	mg/L	-	-	-	-	

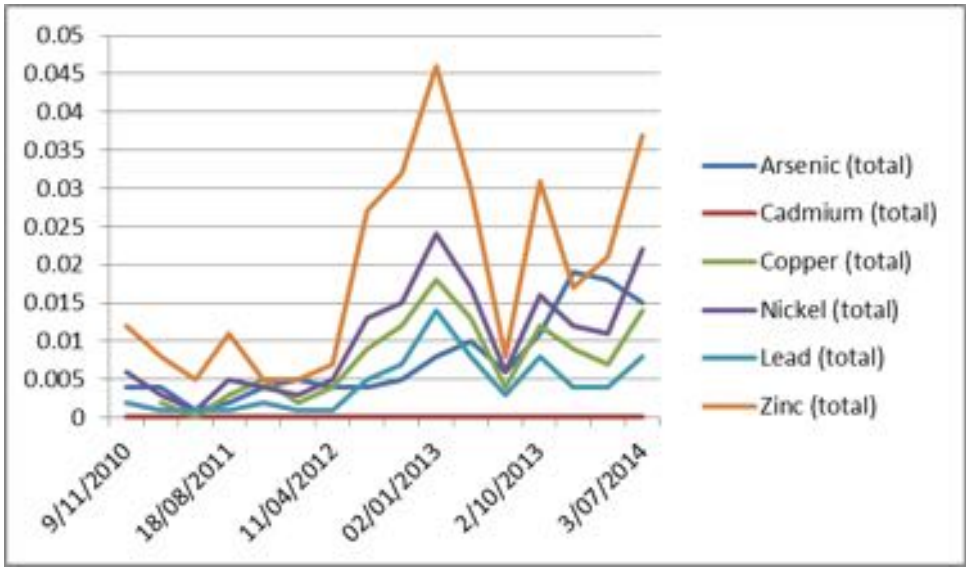
B1-Lake Water Metals - Total



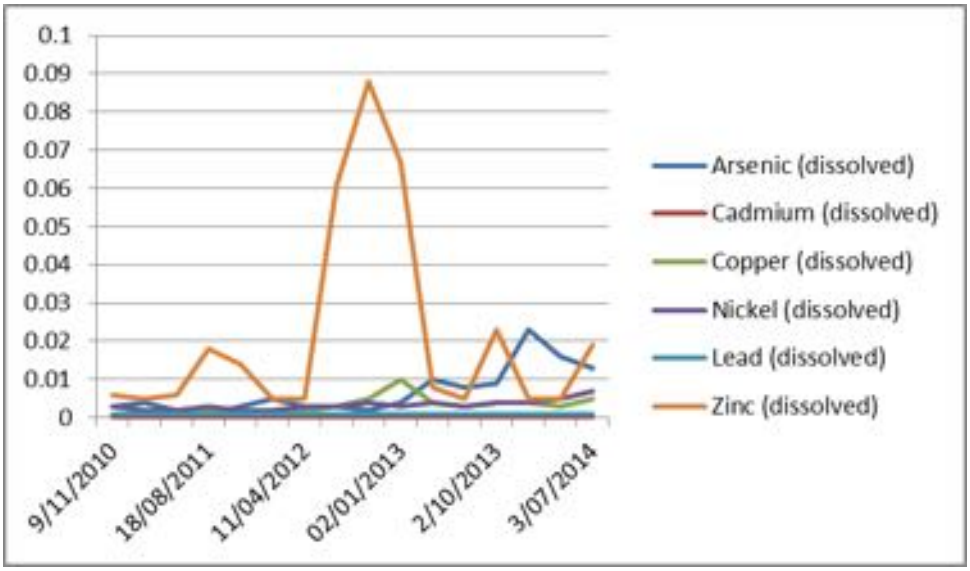
B1-Lake Water Metals - Dissolved



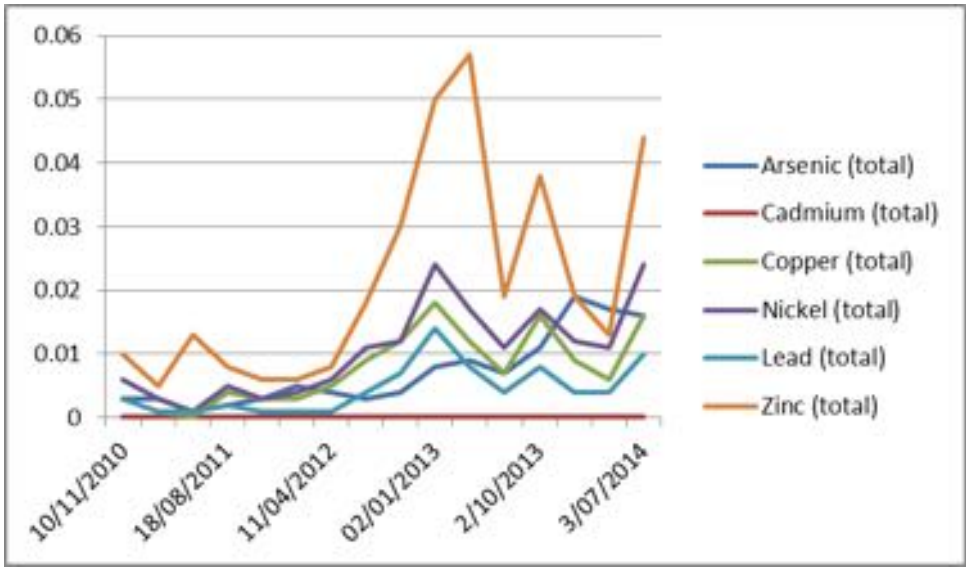
B2-Lake Water Metals - Total



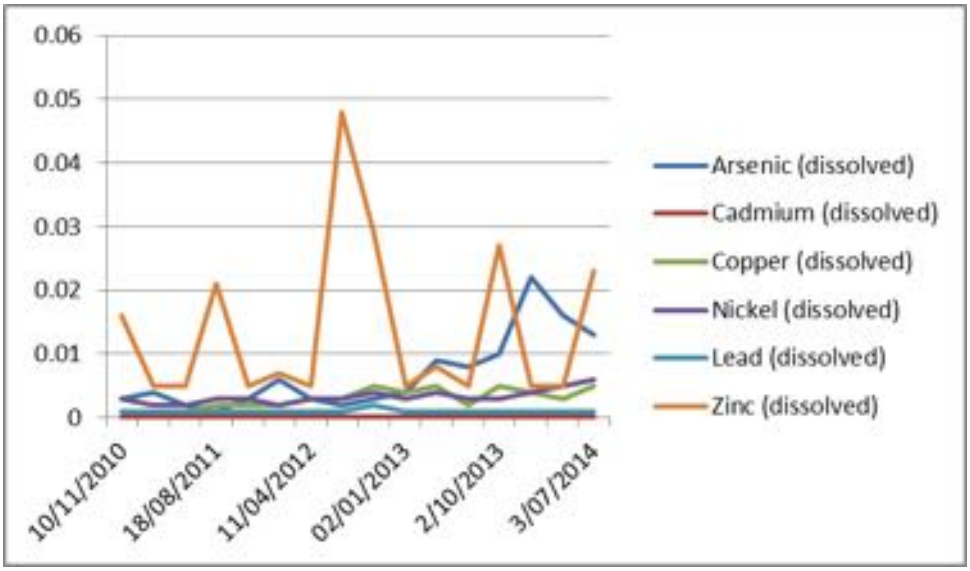
B2-Lake Water Metals - Dissolved



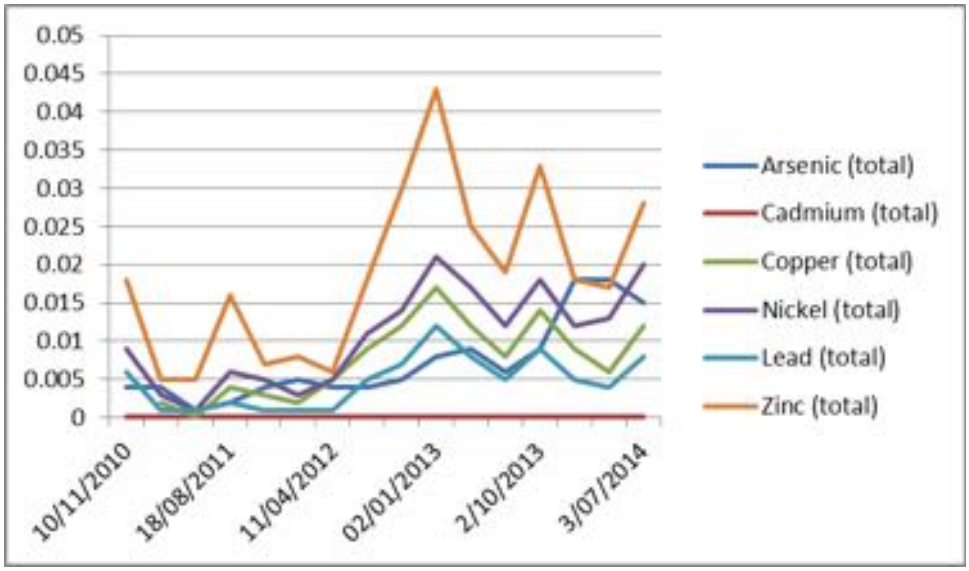
B3-Lake Water Metals - Total



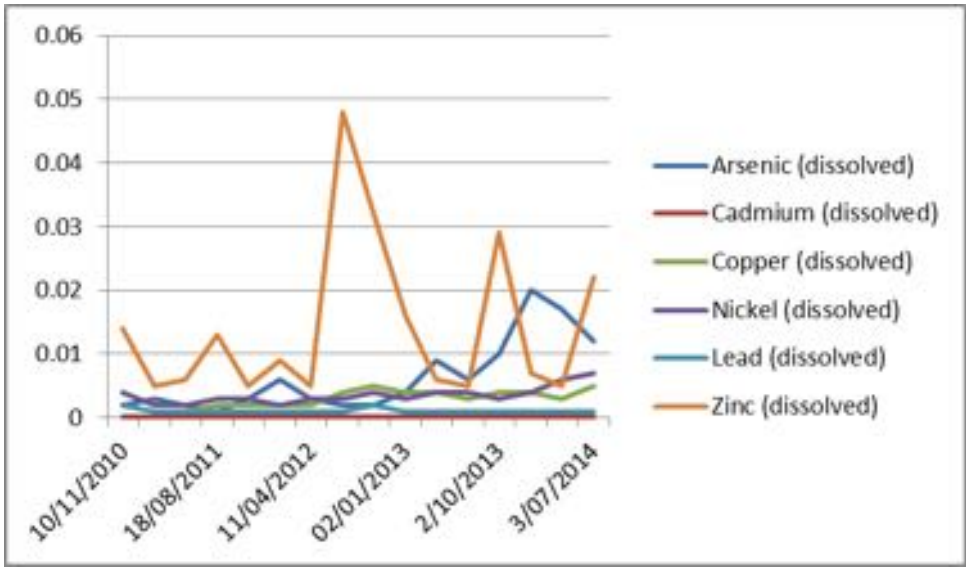
B3-Lake Water Metals - Dissolved



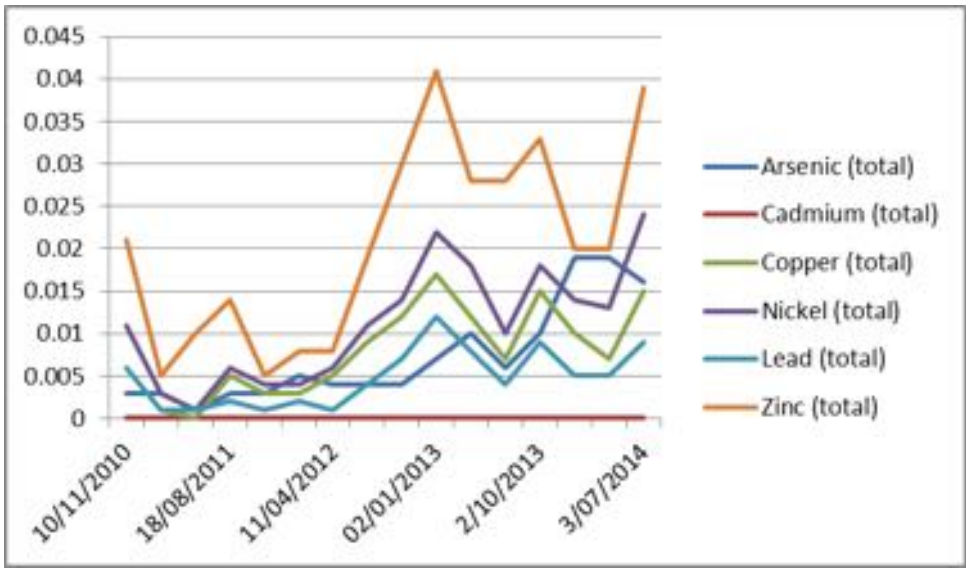
B4-Lake Water Metals - Total



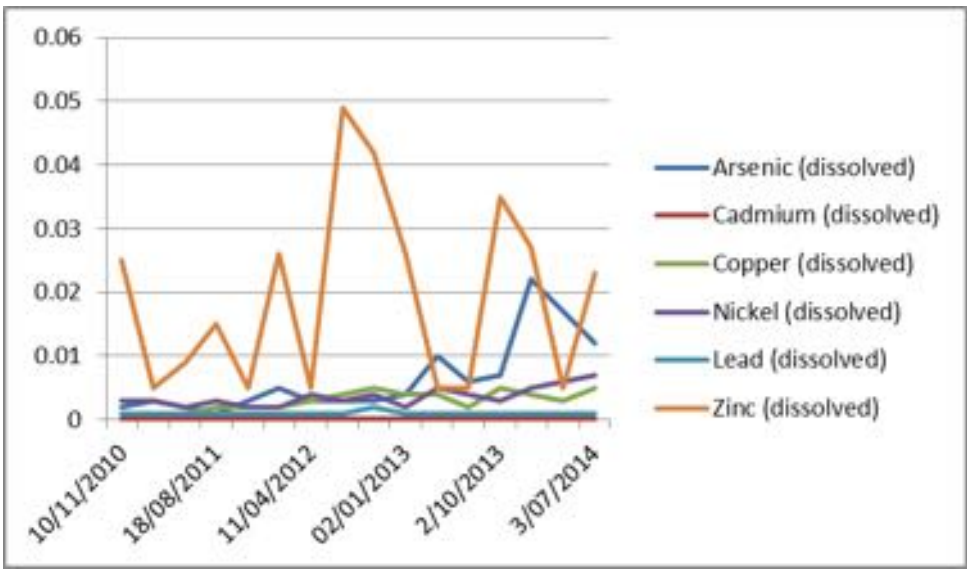
B4-Lake Water Metals - Dissolved



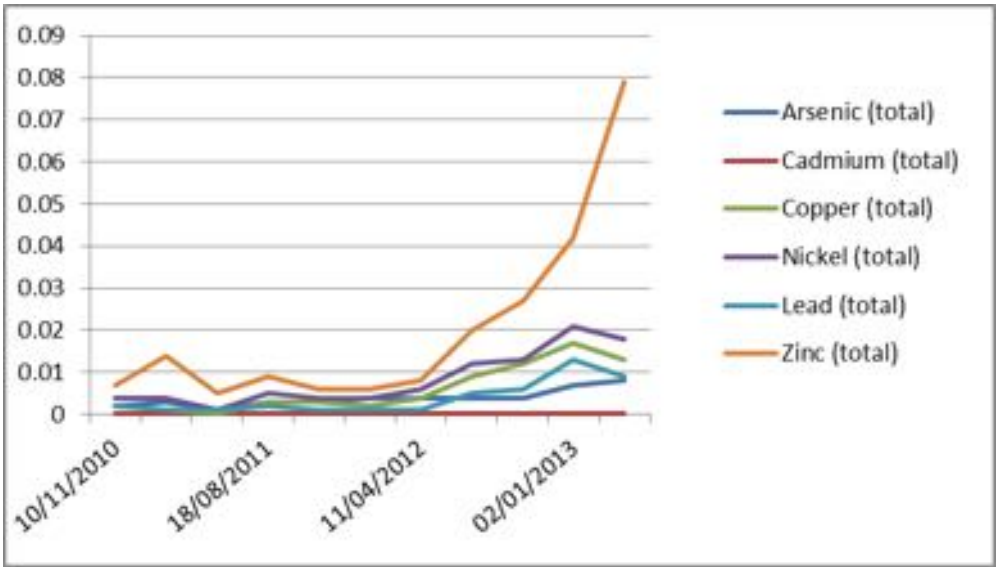
B5-Lake Water Metals - Total



B5-Lake Water Metals - Dissolved

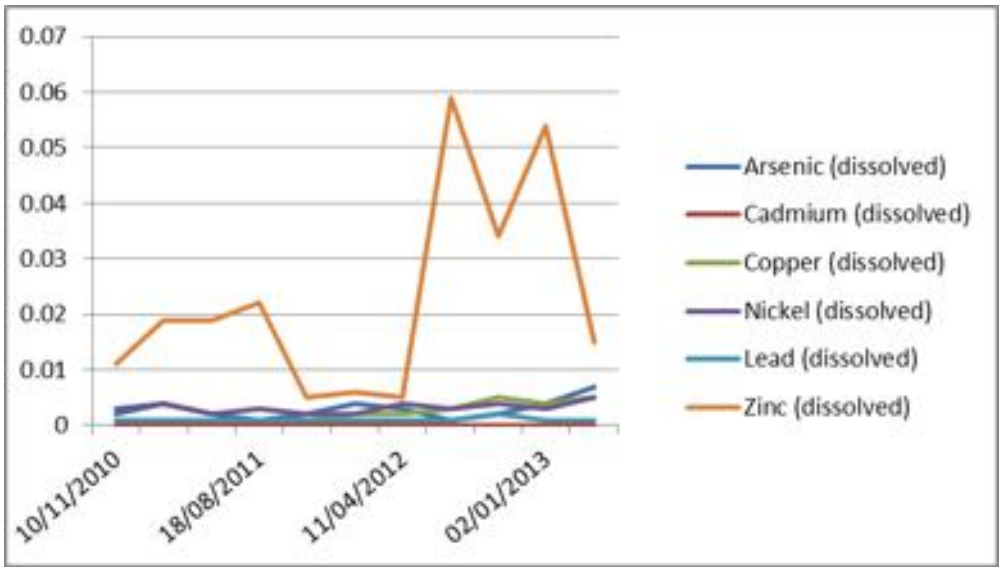


B6-Lake Water Metals - Total



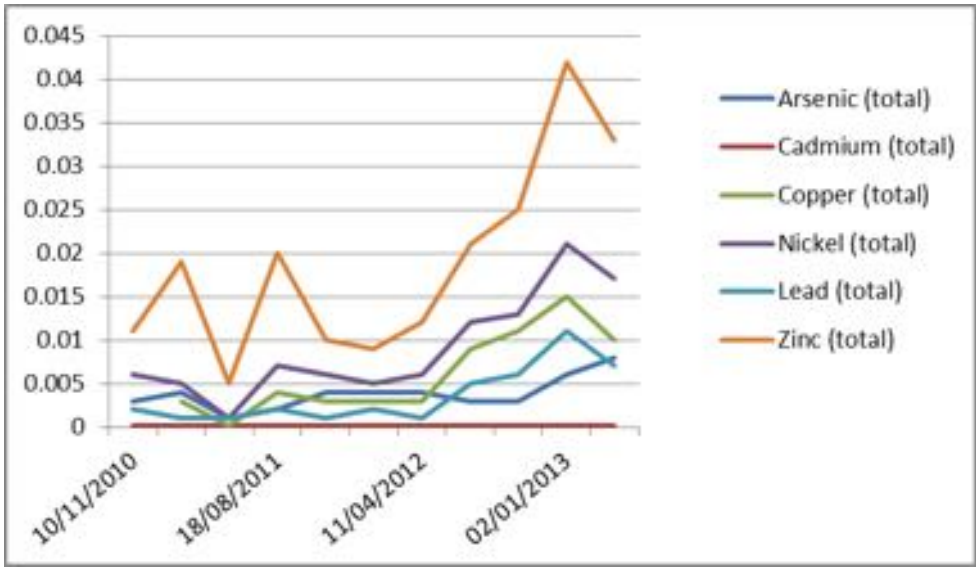
Total metals not analysed in some periods due to low lake water level

B6-Lake Water Metals - Dissolved



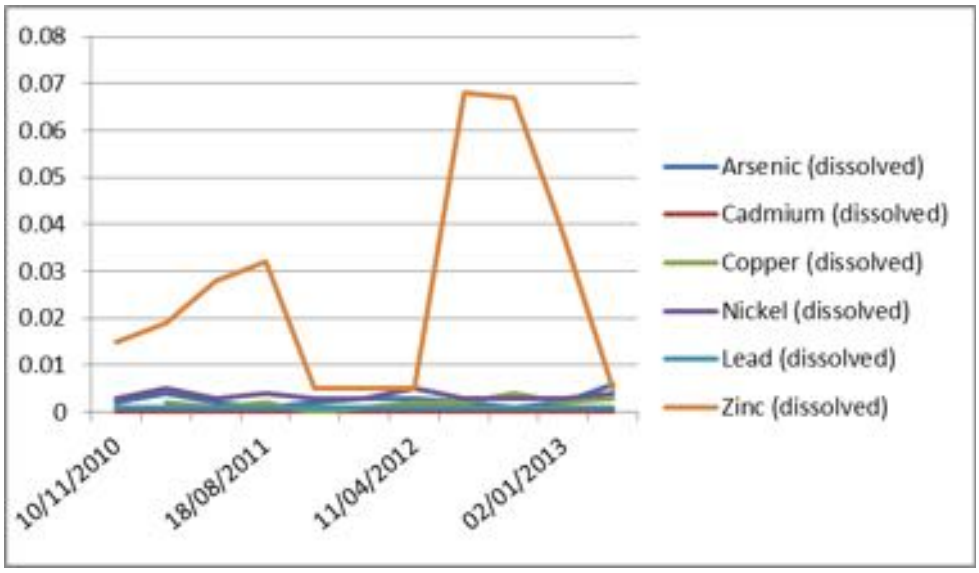
Dissolved metals not analysed in some periods due to low lake water level

Bland Creek-Lake Water Metals - Total



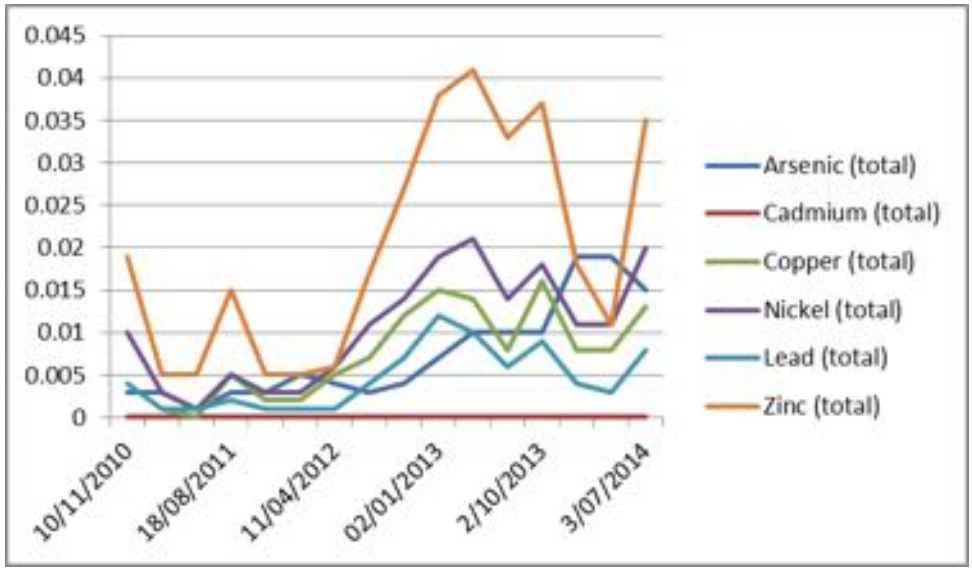
Total metals not analysed in some periods due to low lake water level

Bland Creek-Lake Water Metals - Dissolved

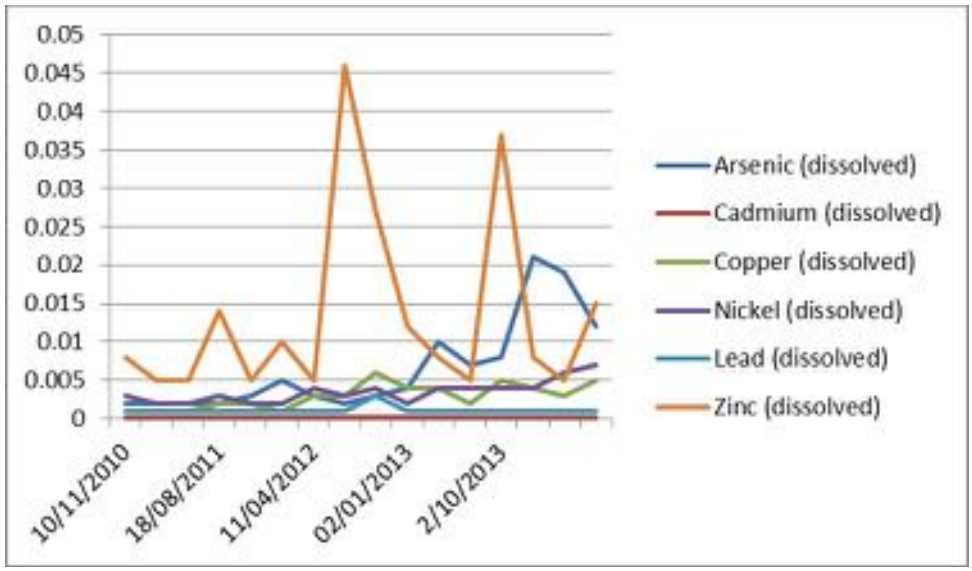


Dissolved metals not analysed in some periods due to low lake water level

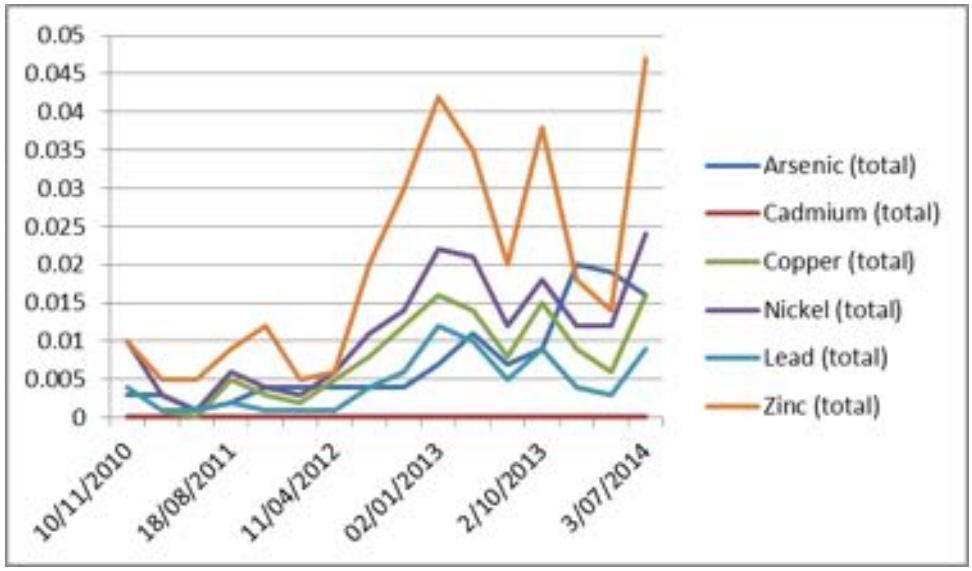
C1-Lake Water Metals - Total



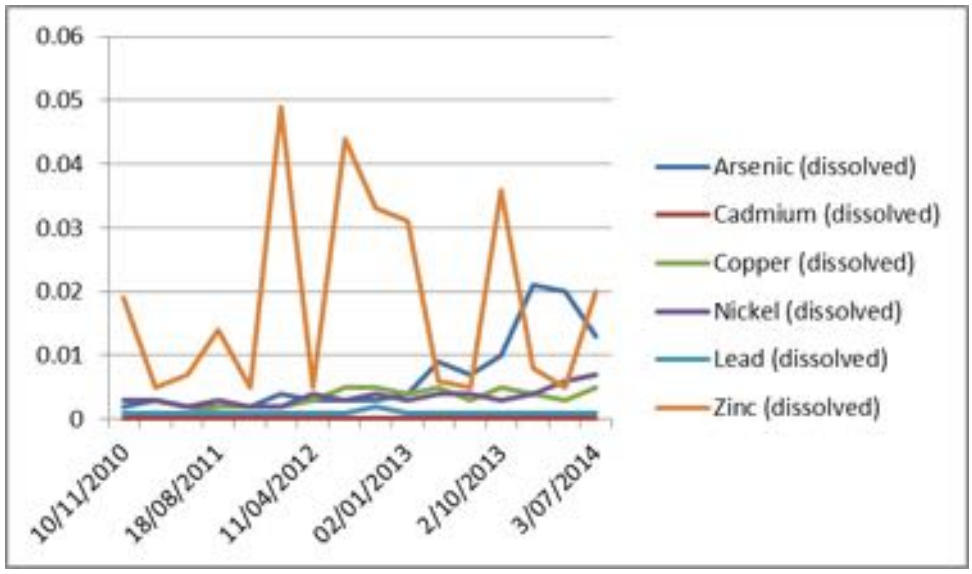
C1-Lake Water Metals - Dissolved



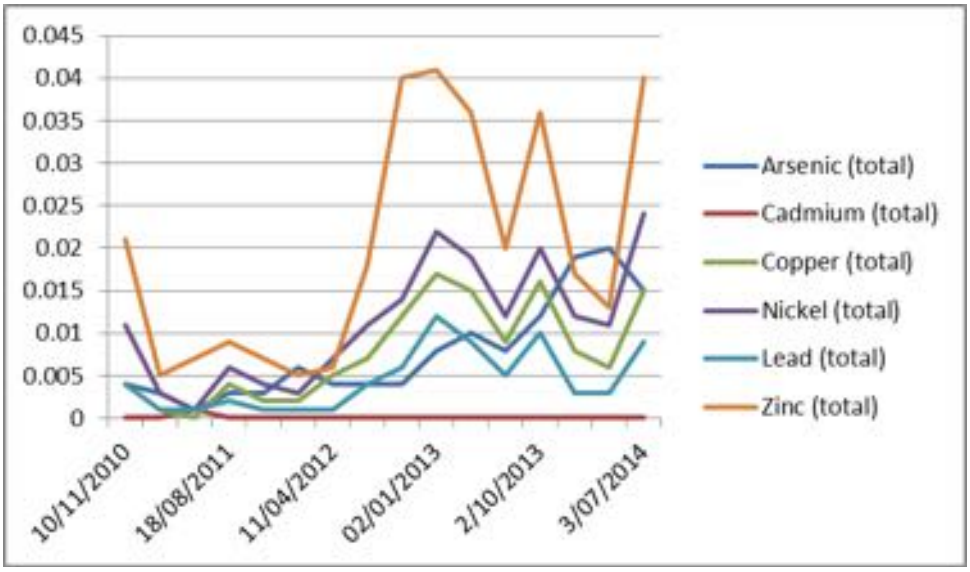
C2-Lake Water Metals - Total



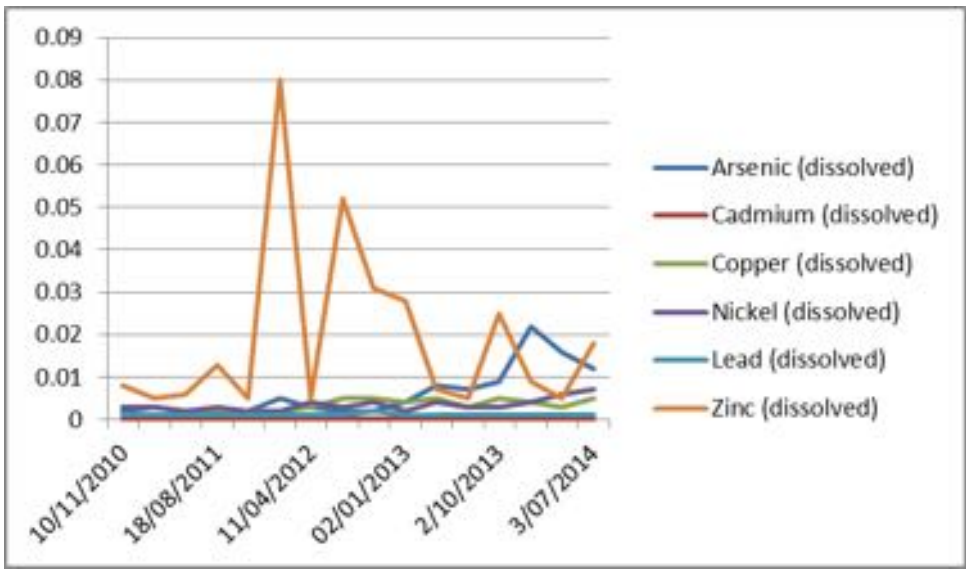
C2-Lake Water Metals - Dissolved



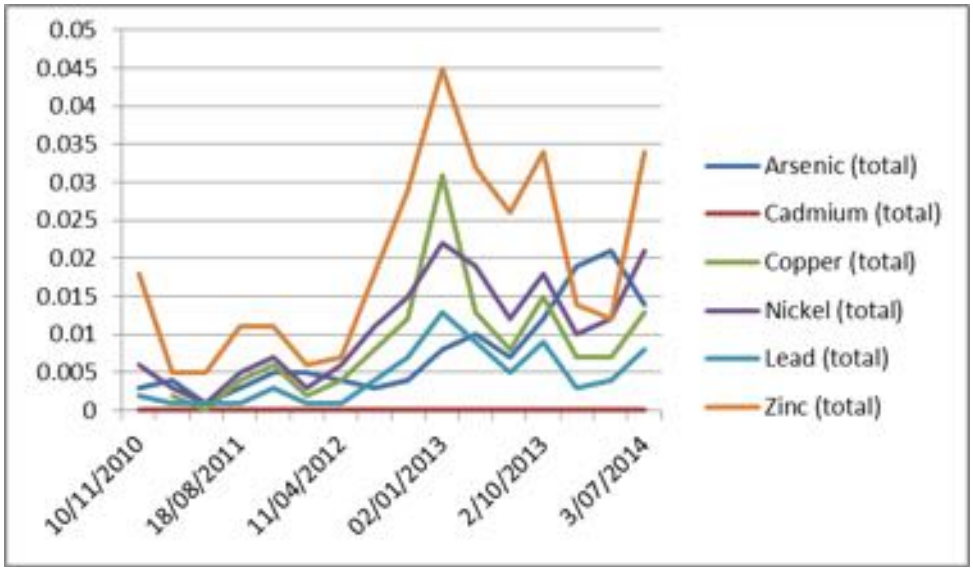
C3-Lake Water Metals - Total



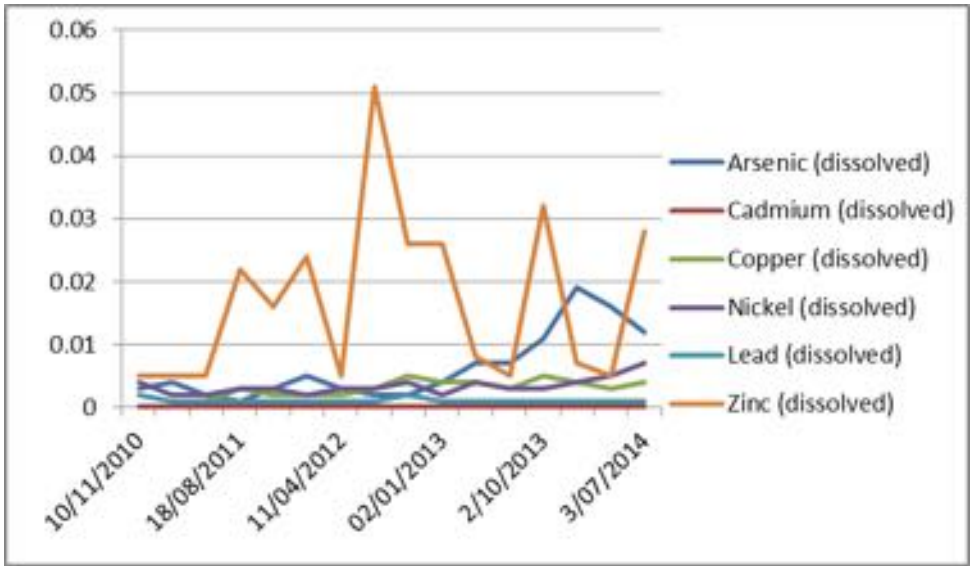
C3-Lake Water Metals - Dissolved



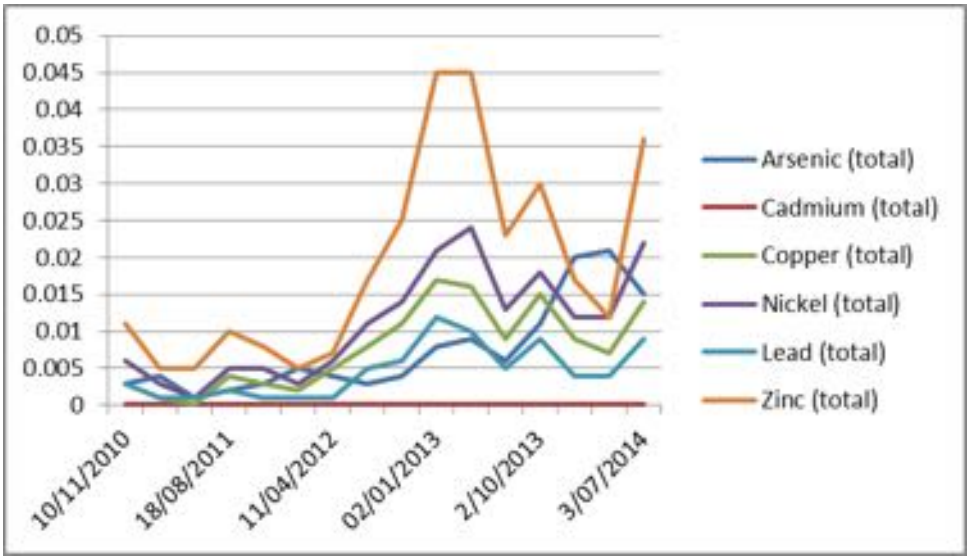
E1-Lake Water Metals - Total



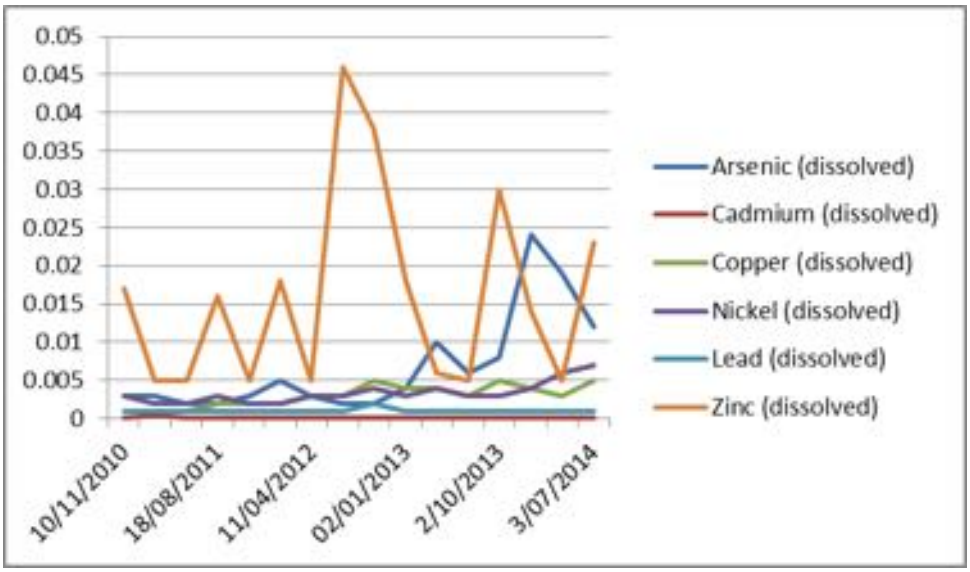
E1-Lake Water Metals - Dissolved



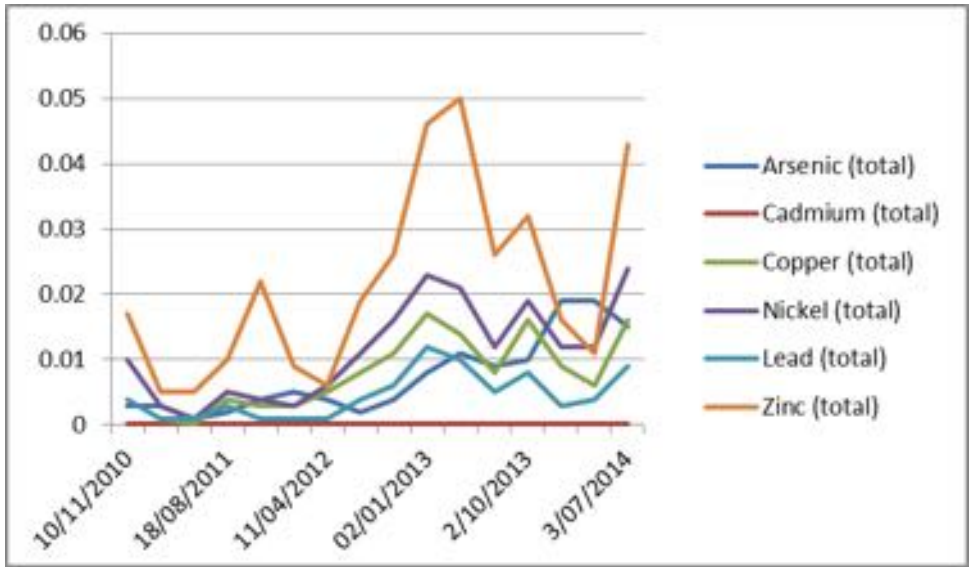
E2-Lake Water Metals - Total



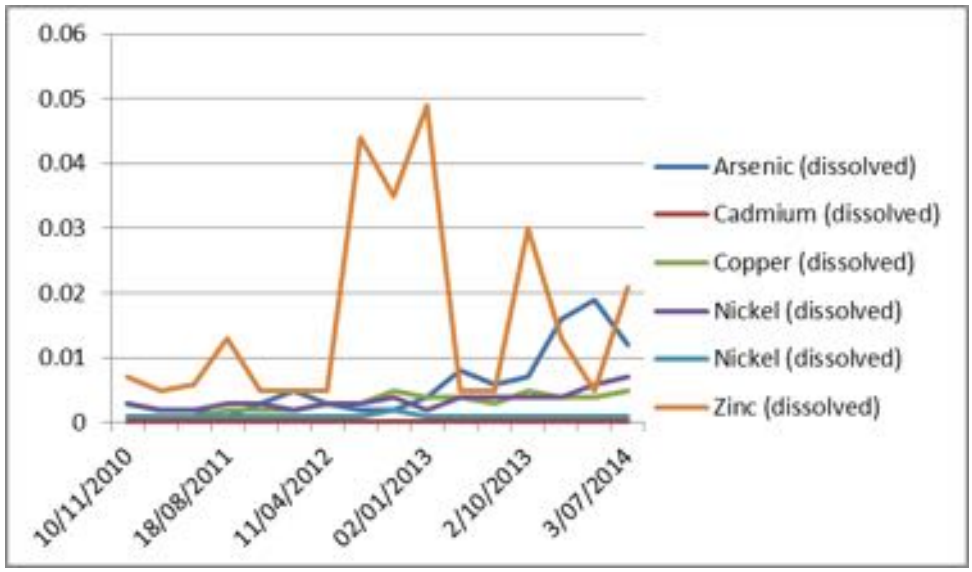
E2-Lake Water Metals - Dissolved



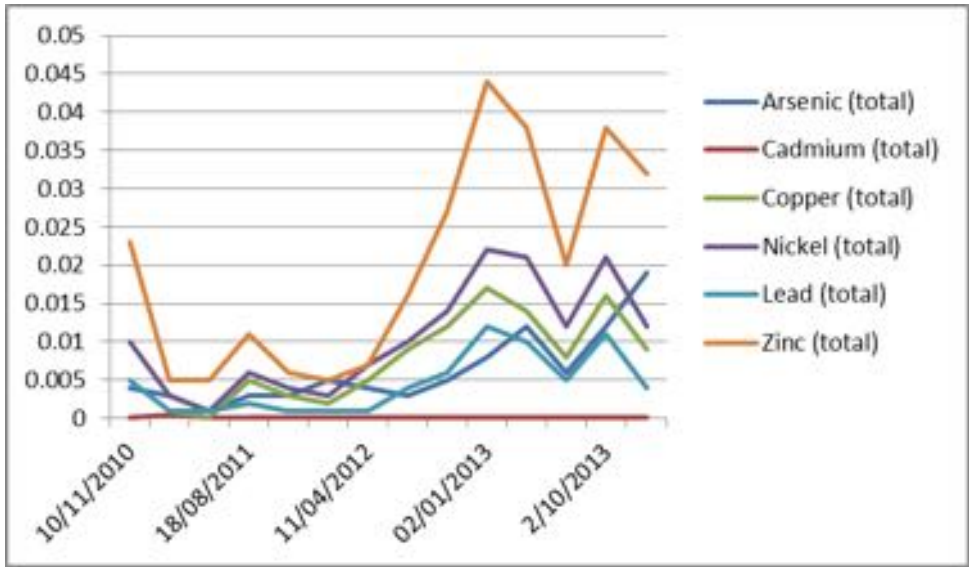
E3-Lake Water Metals - Total



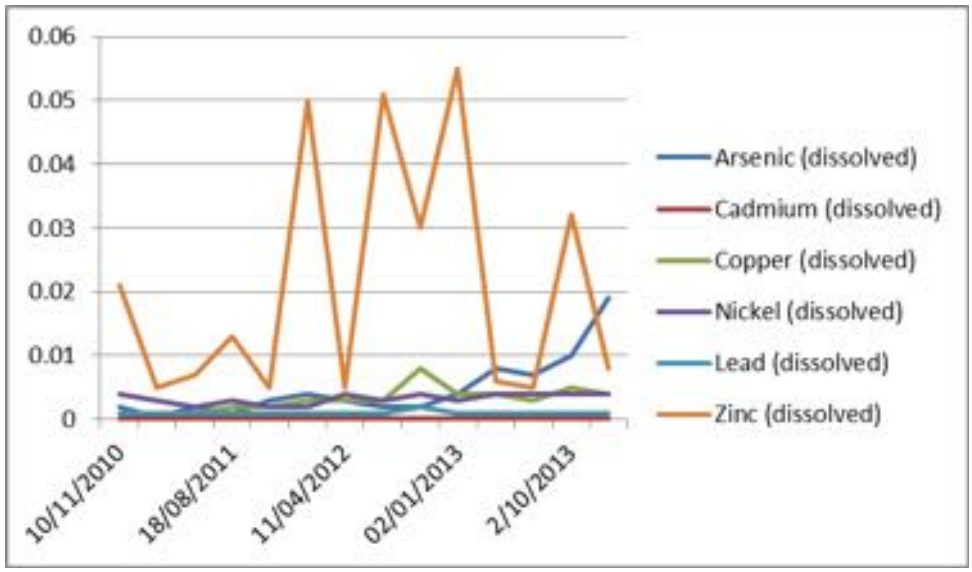
E3-Lake Water Metals - Dissolved



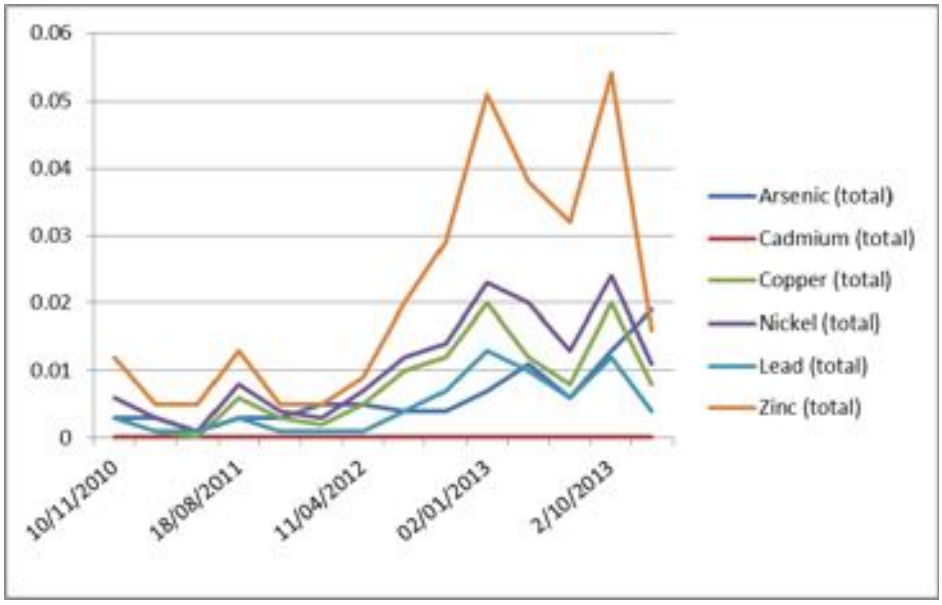
E4-Lake Water Metals - Total



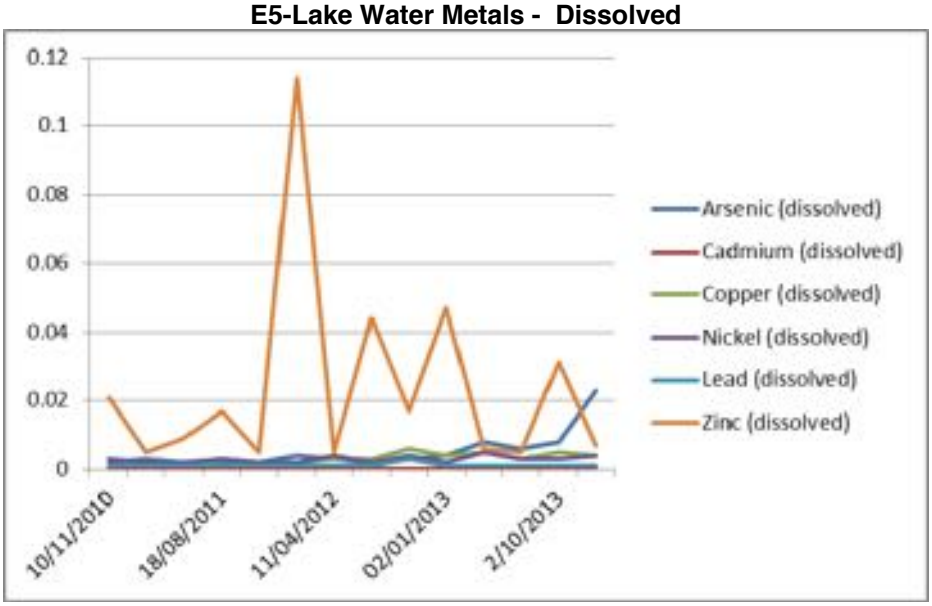
E4-Lake Water Metals - Dissolved



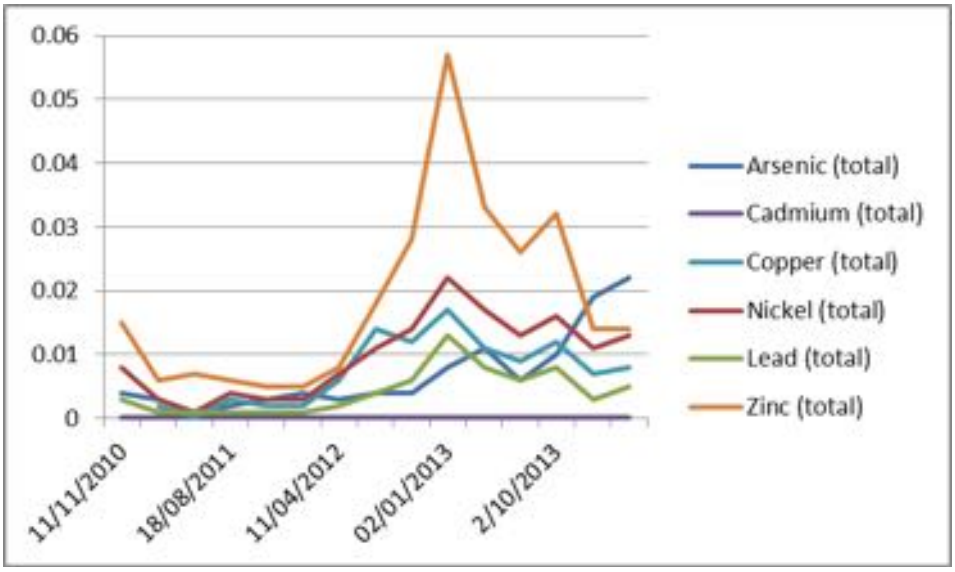
E5-Lake Water Metals - Total



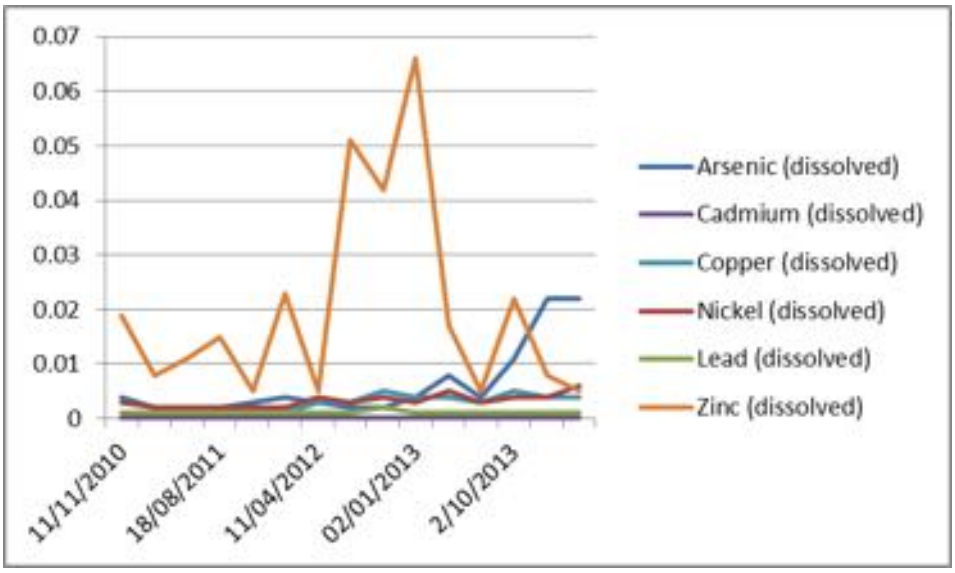
E5-Lake Water Metals - Dissolved



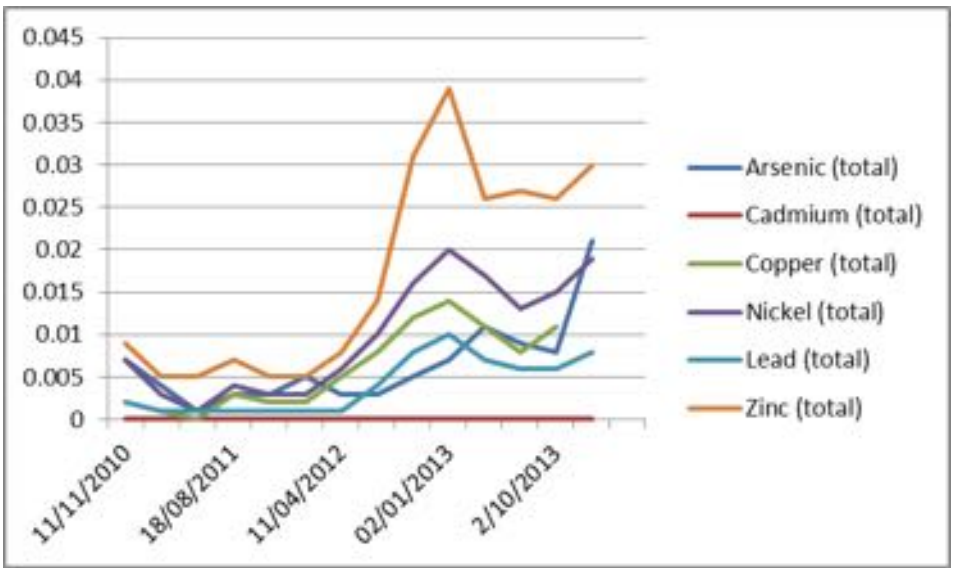
I1-Lake Water Metals - Total



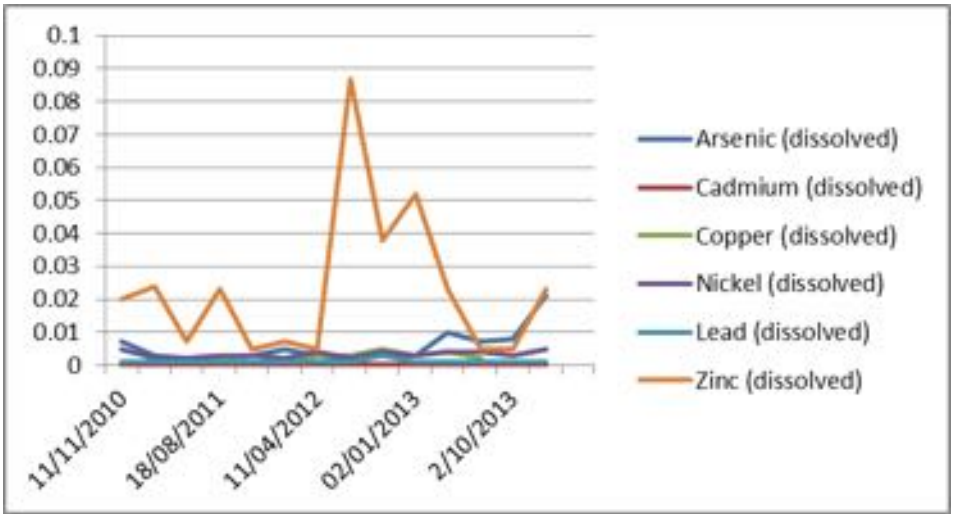
I1-Lake Water Metals - Dissolved



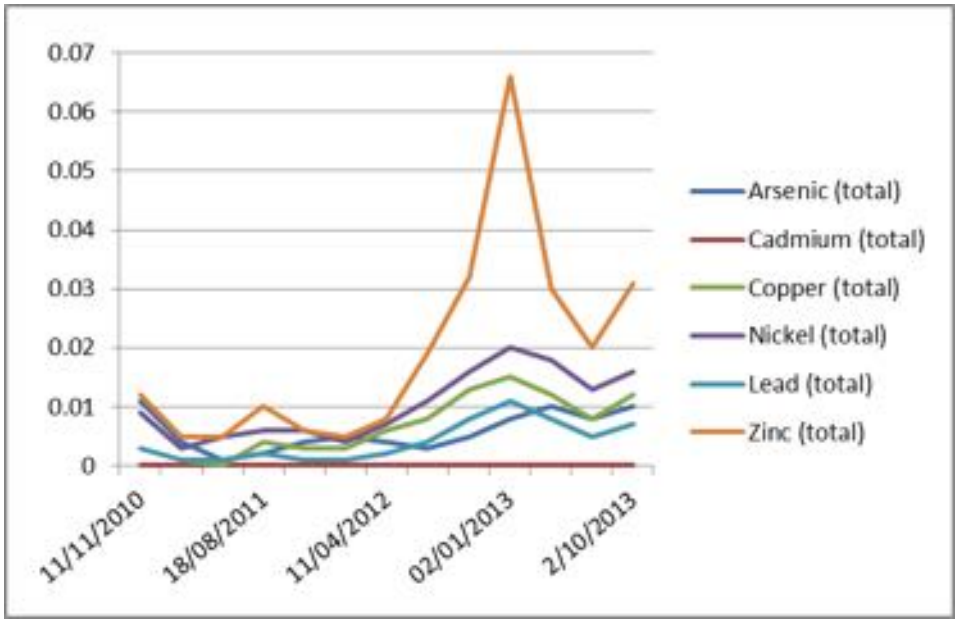
I2-Lake Water Metals - Total



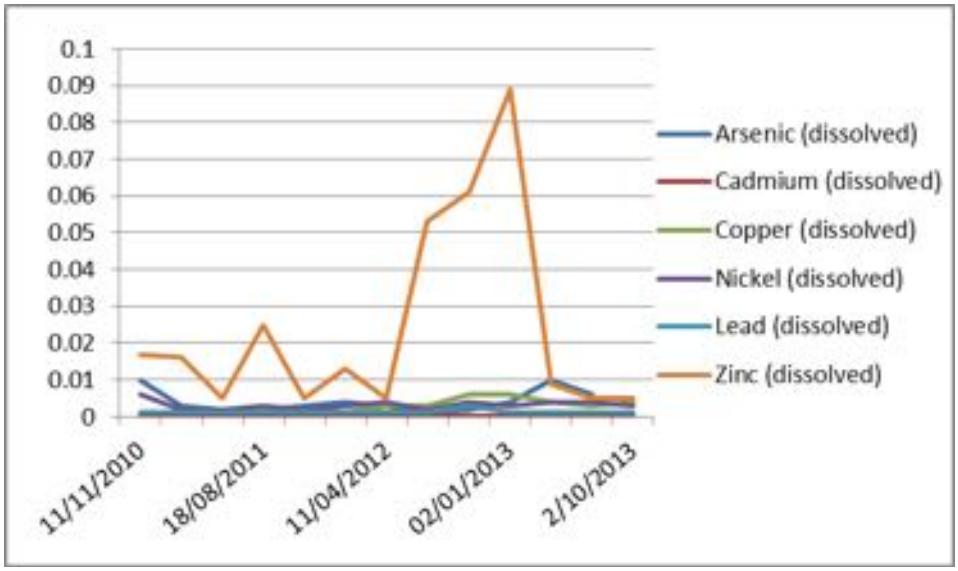
I2-Lake Water Metals - Dissolved



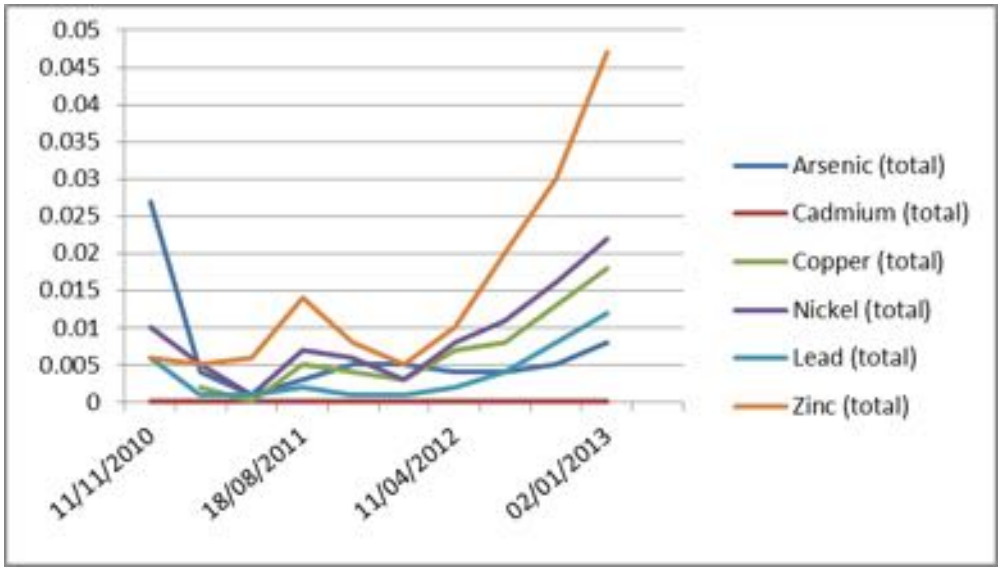
I3-Lake Water Metals - Total



I3-Lake Water Metals - Dissolved

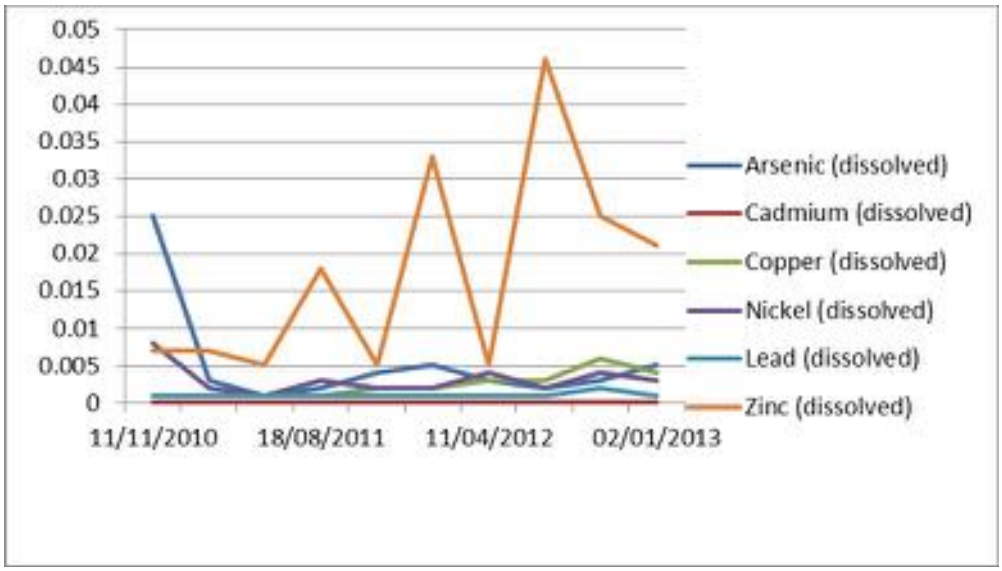


I4-Lake Water Metals - Total



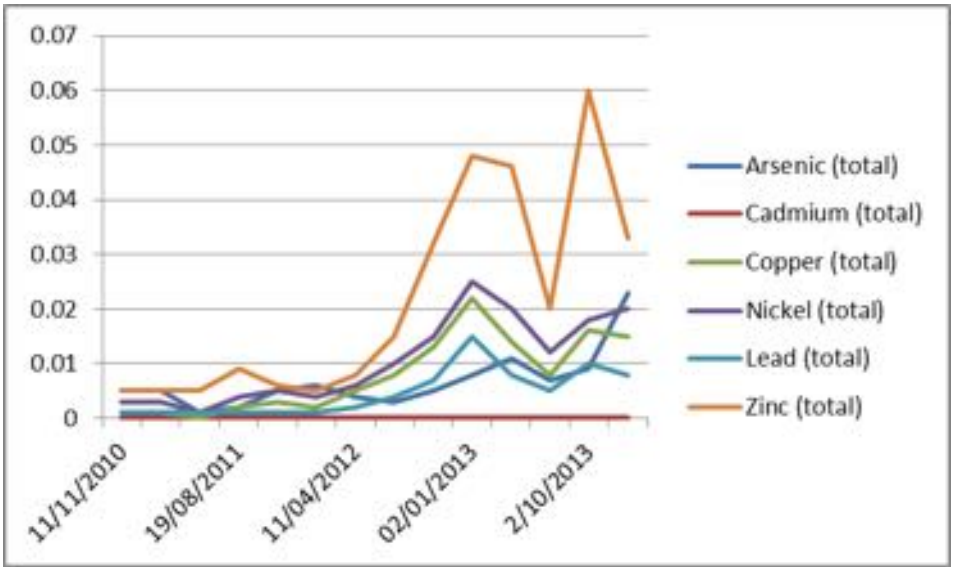
Total metals not analysed in some periods due to low lake water level

I4-Lake Water Metals - Dissolved

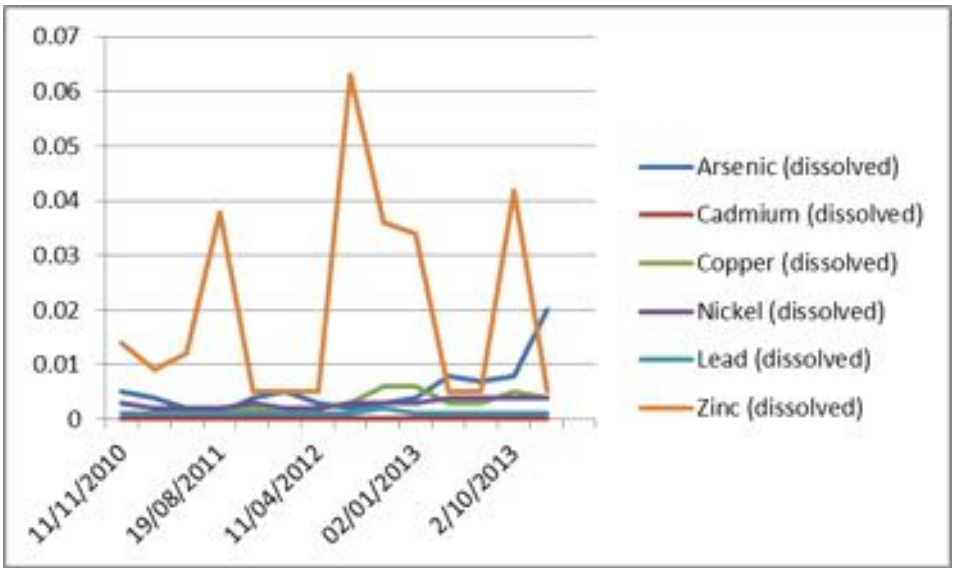


Dissolved metals not analysed in some periods due to low lake water level

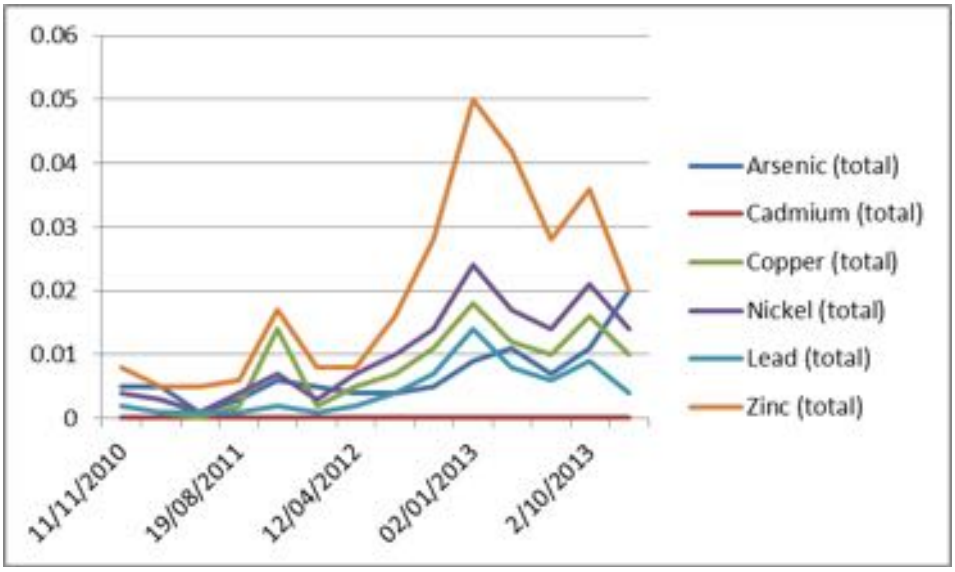
L1-Lake Water Metals - Total



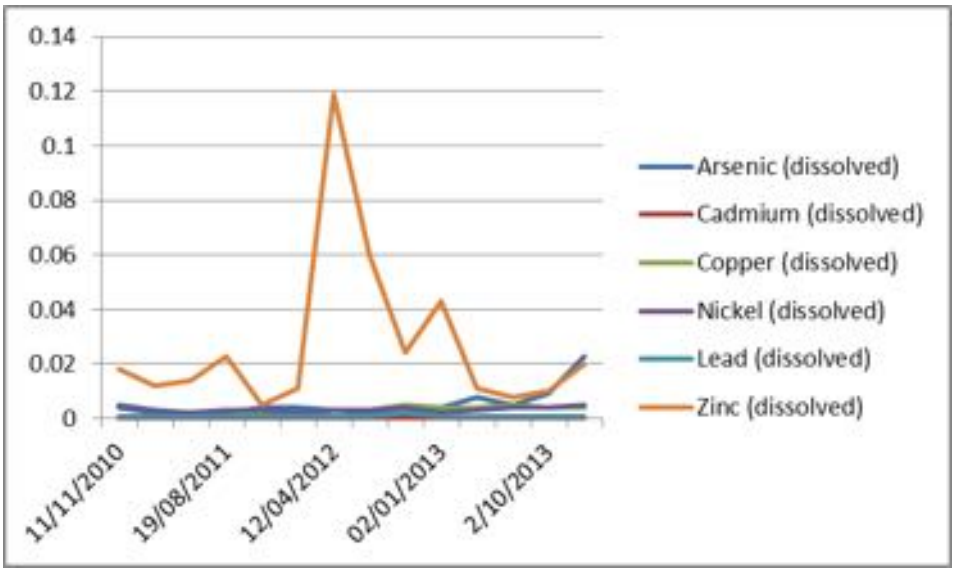
L1-Lake Water Metals - Dissolved



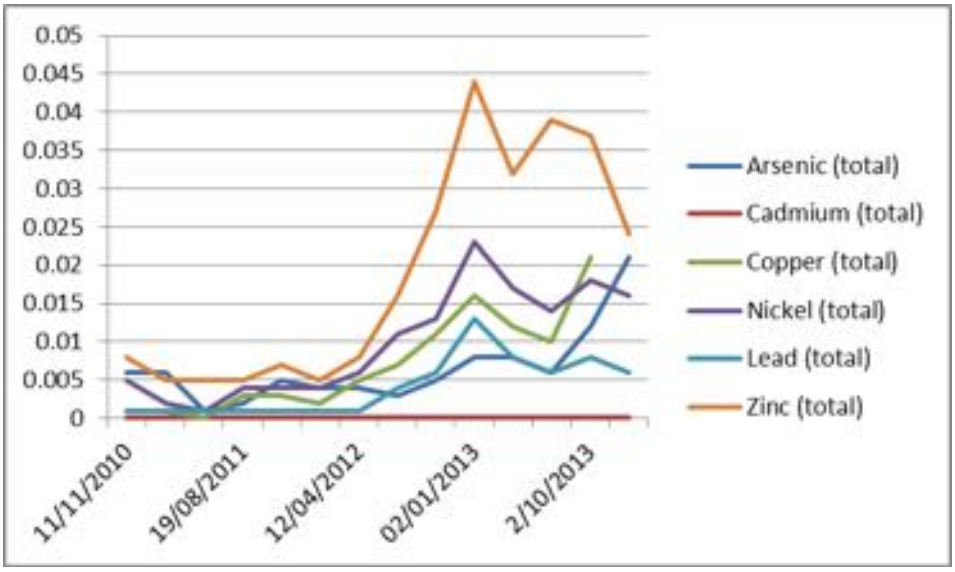
L2-Lake Water Metals - Total



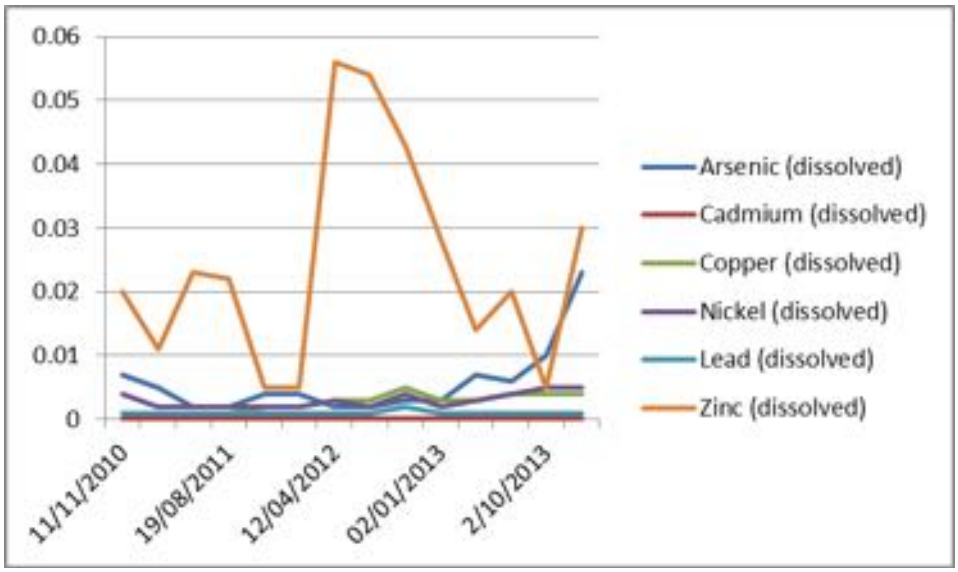
L2-Lake Water Metals - Dissolved



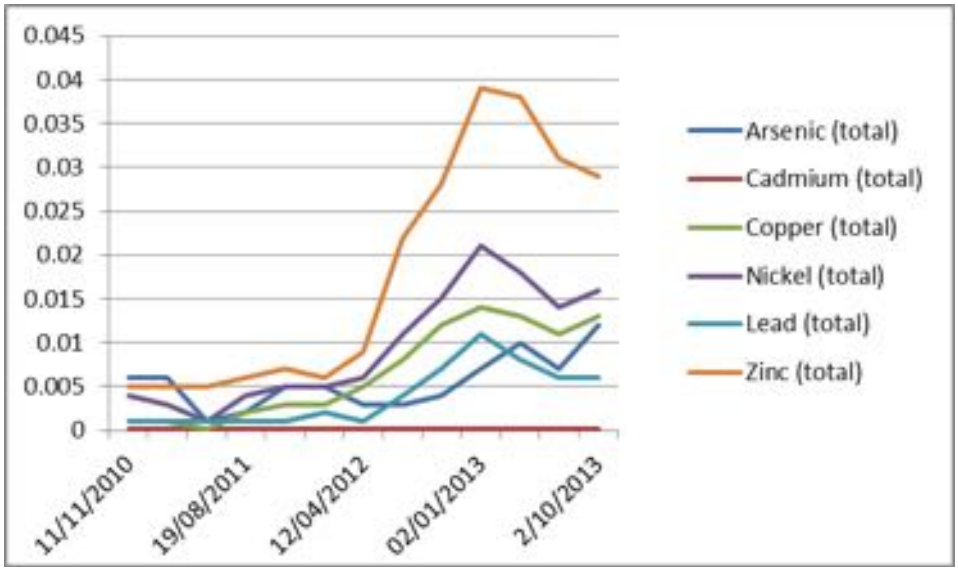
L3-Lake Water Metals - Total



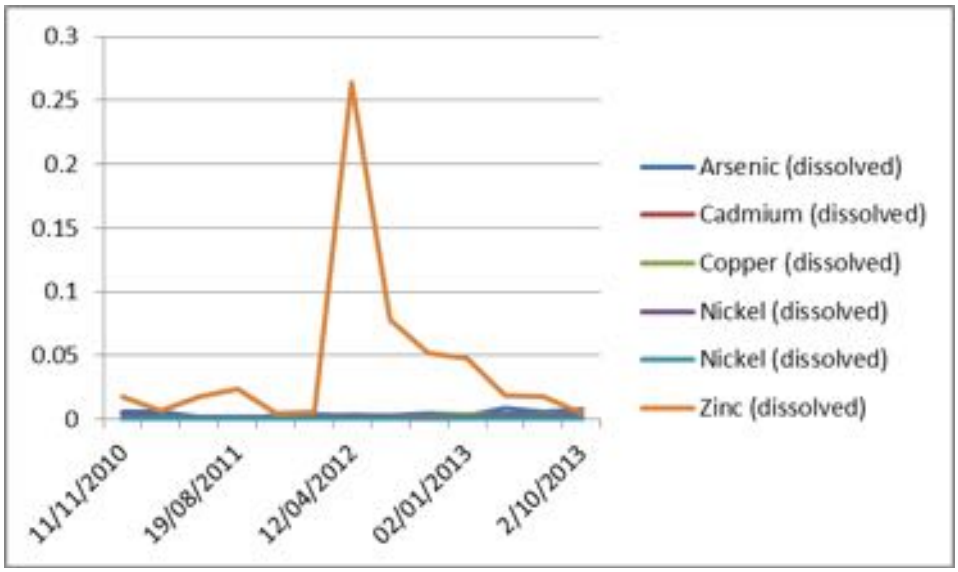
L3-Lake Water Metals - Dissolved



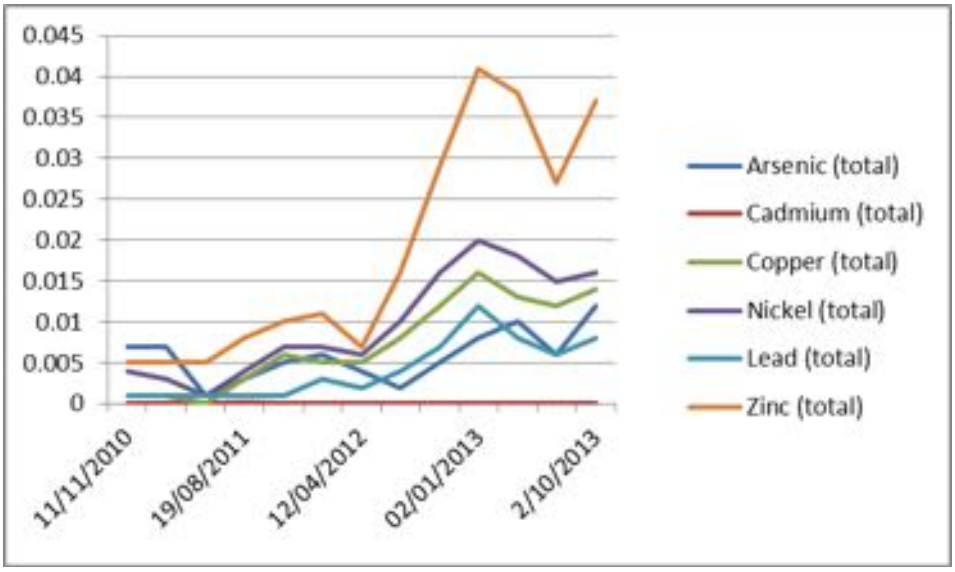
L4-Lake Water Metals - Total



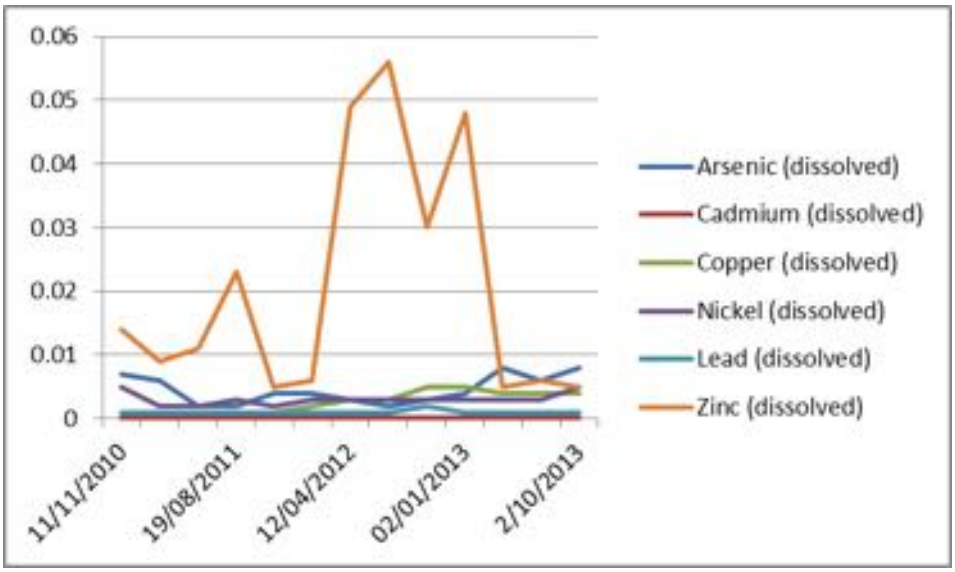
L4-Lake Water Metals - Dissolved



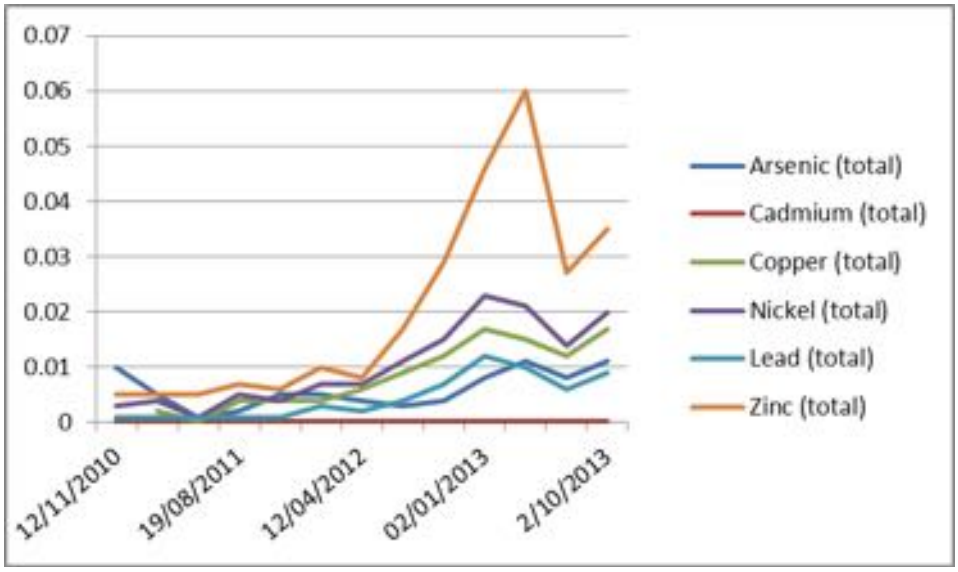
L5-Lake Water Metals - Total



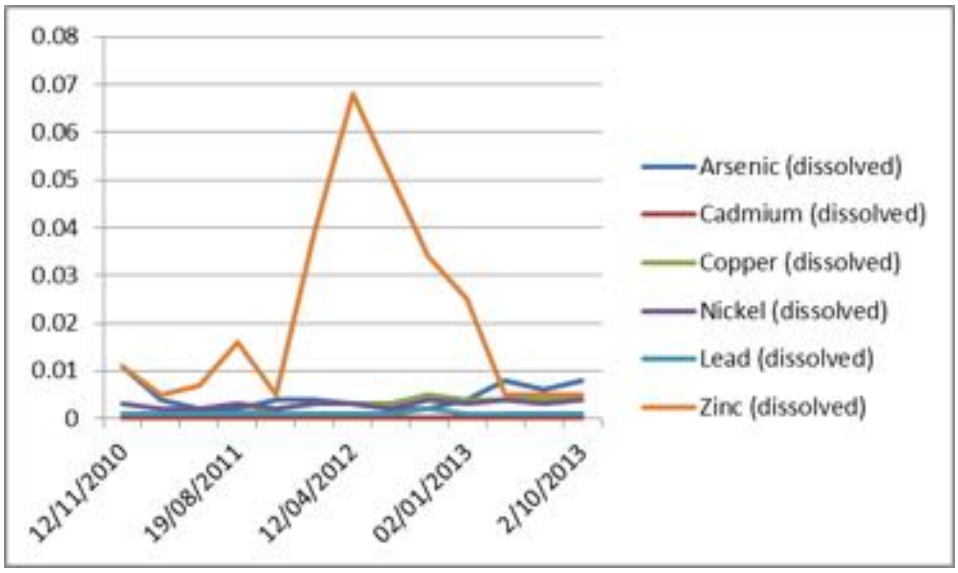
L5-Lake Water Metals - Dissolved



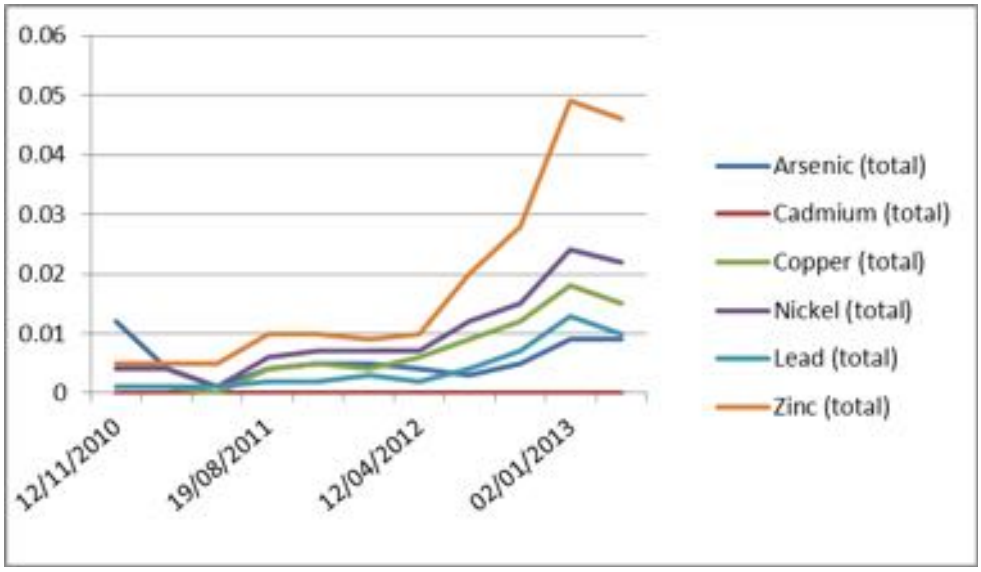
L6-Lake Water Metals - Total



L6-Lake Water Metals - Dissolved

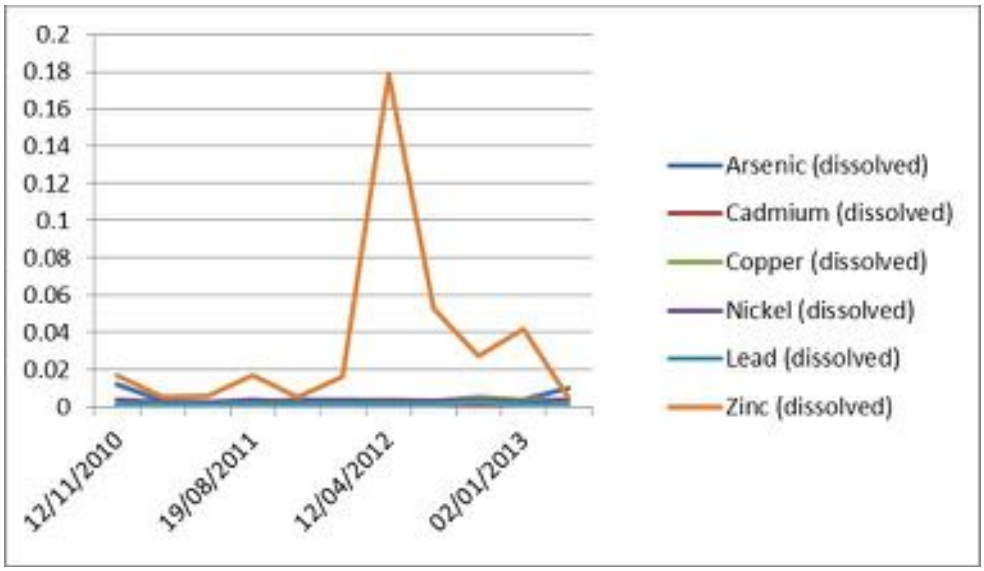


L7-Lake Water Metals - Total



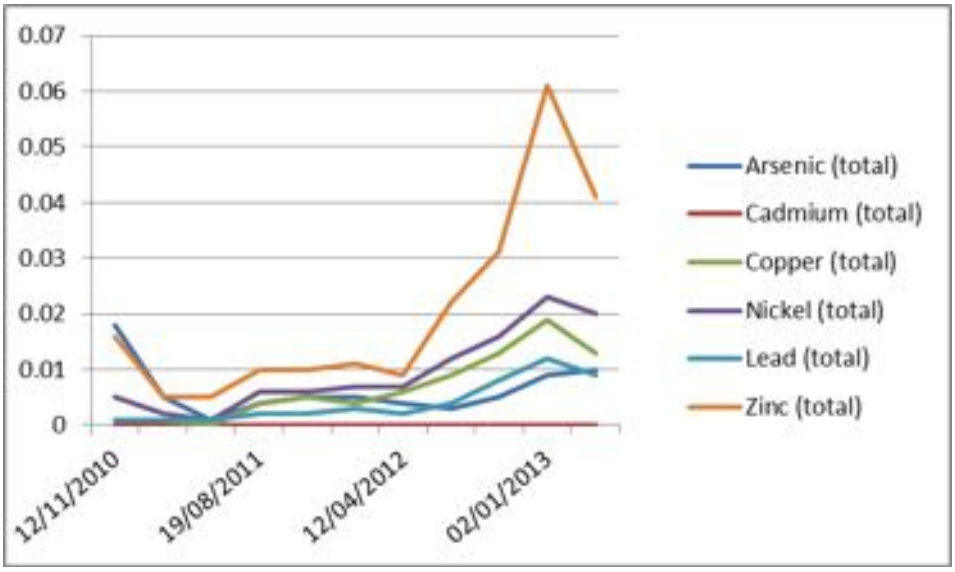
Total metals not analysed in some periods due to low lake water level

L7-Lake Water Metals - Dissolved



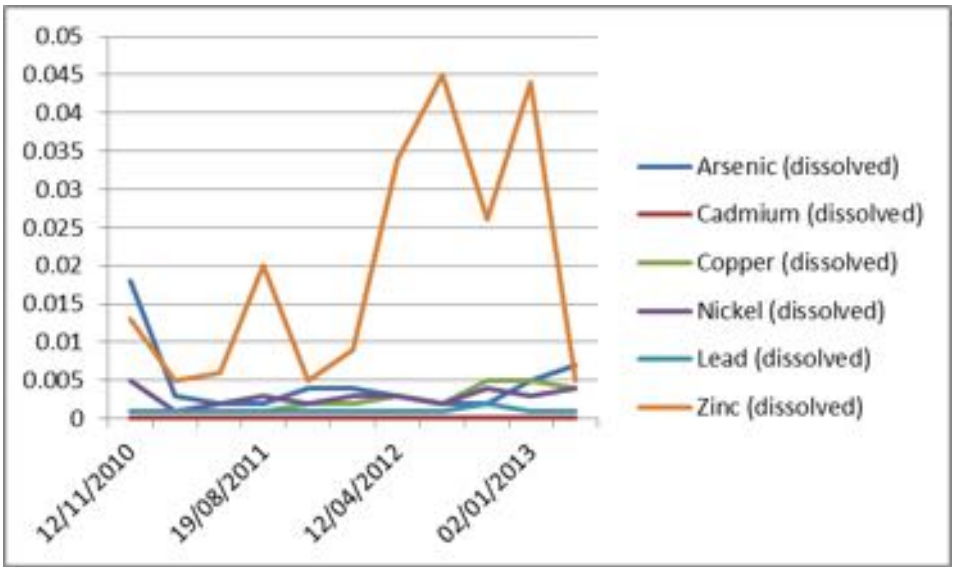
Dissolved metals not analysed in some periods due to low lake water level

L8-Lake Water Metals - Total



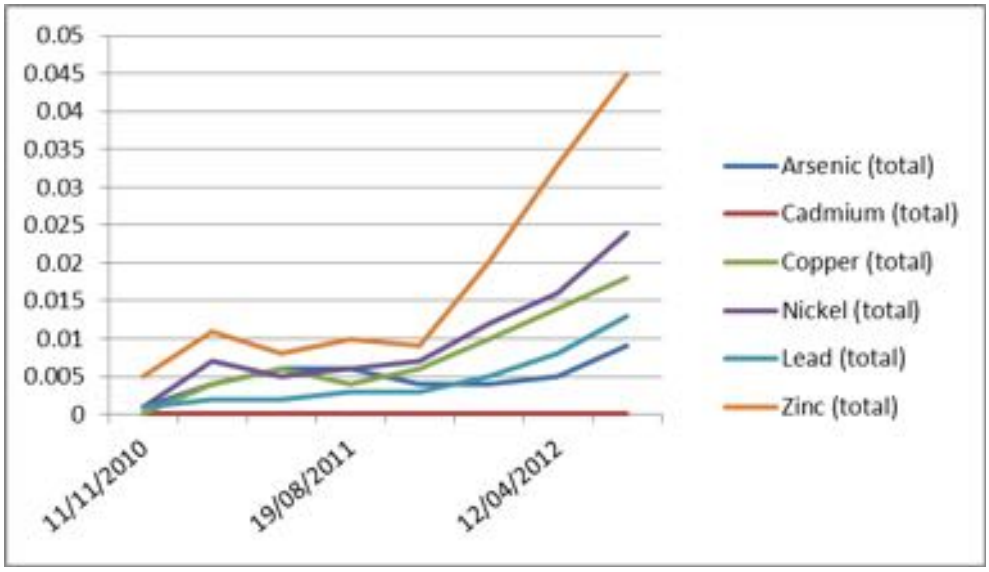
Total metals not analysed in some periods due to low lake water level

L8-Lake Water Metals - Dissolved



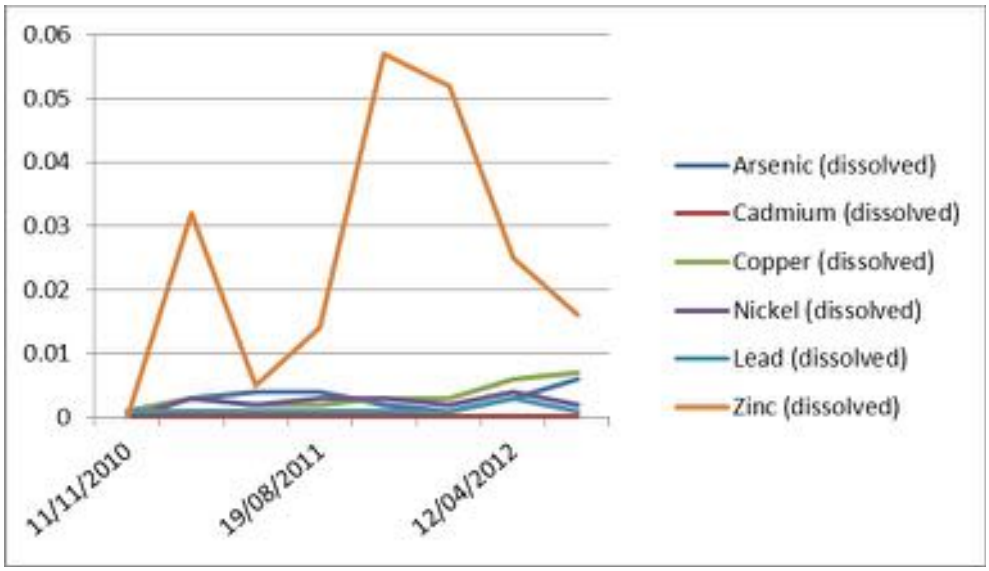
Dissolved metals not analysed in some periods due to low lake water level

L9-Lake Water Metals - Total



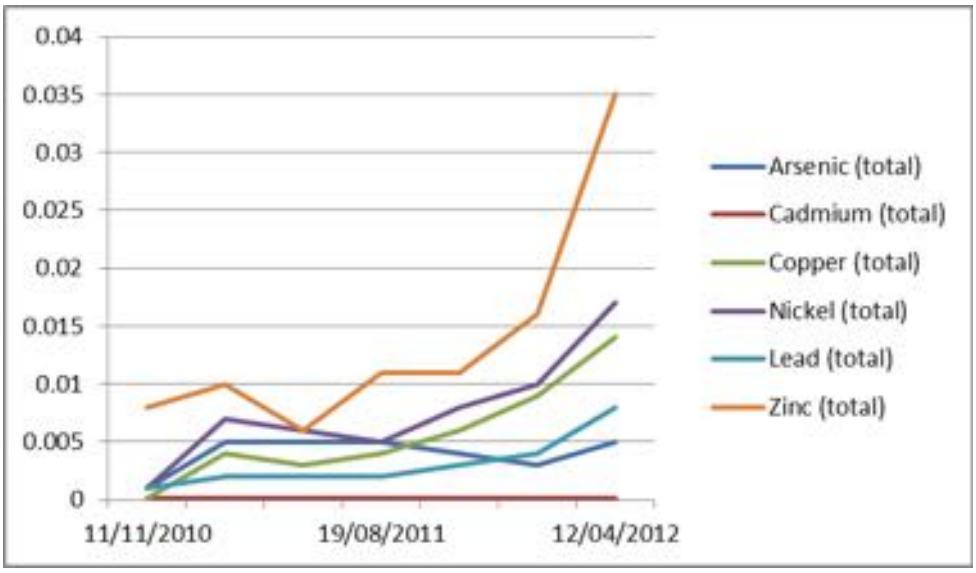
Total metals not analysed in some periods due to low lake water level

L9-Lake Water Metals - Dissolved



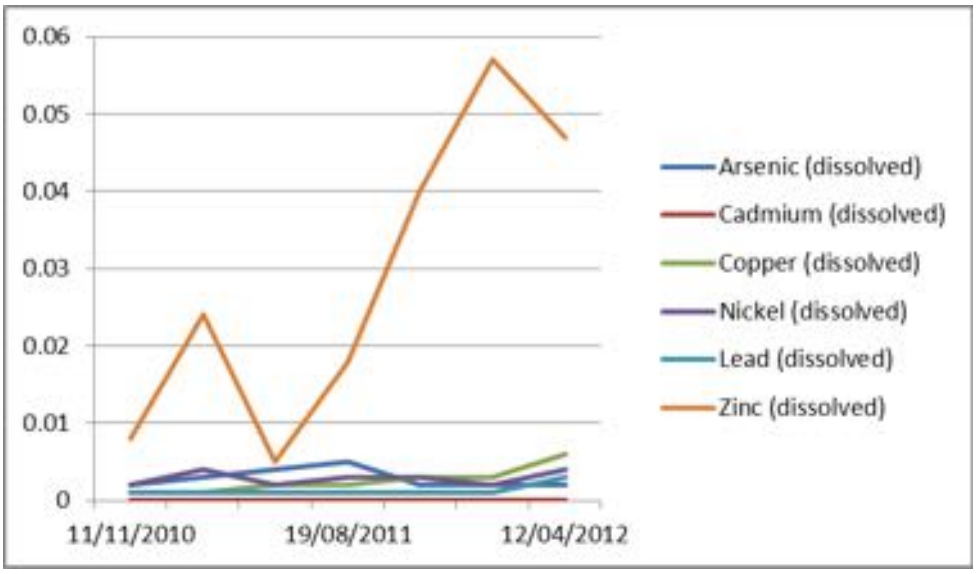
Dissolved metals not analysed in some periods due to low lake water level

L10-Lake Water Metals - Total



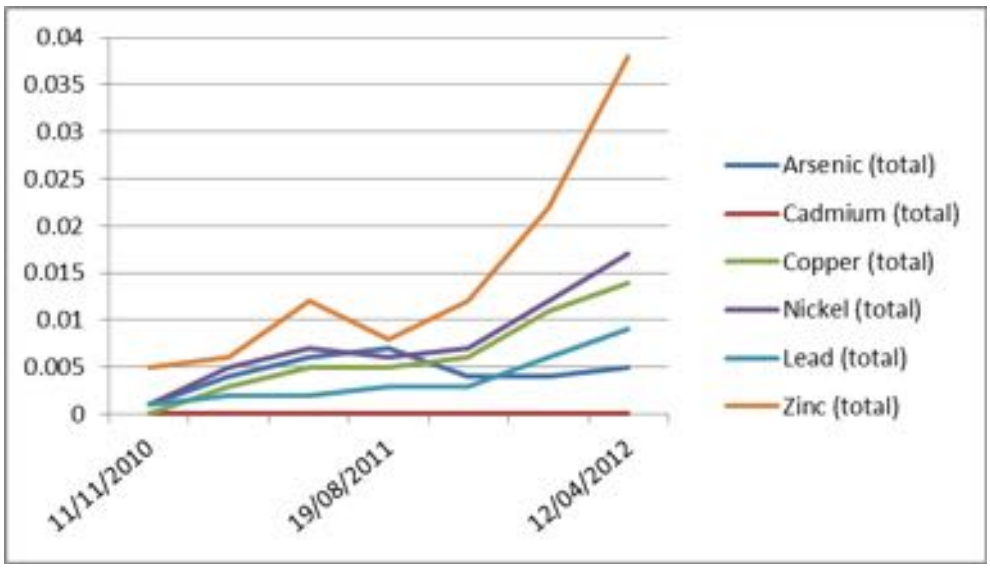
Total metals not analysed in some periods due to low lake water level

L10-Lake Water Metals - Dissolved



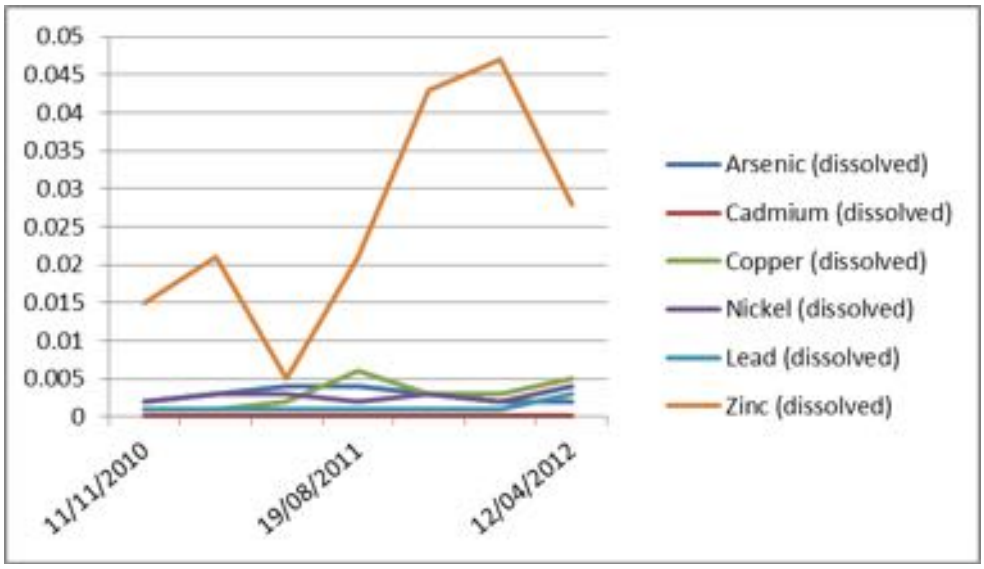
Dissolved metals not analysed in some periods due to low lake water level

L11-Lake Water Metals - Total



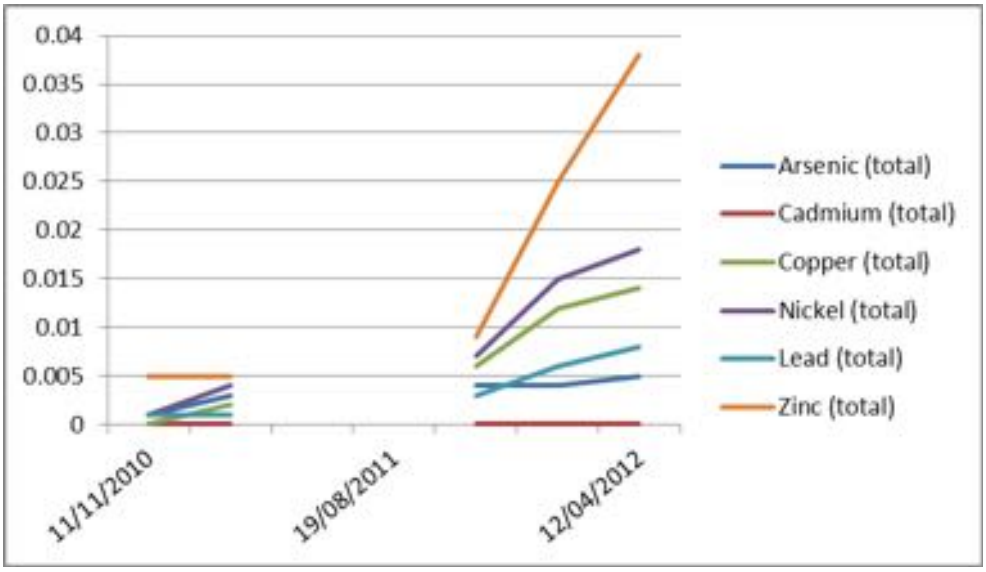
Total metals not analysed in some periods due to low lake water level

L11-Lake Water Metals - Dissolved



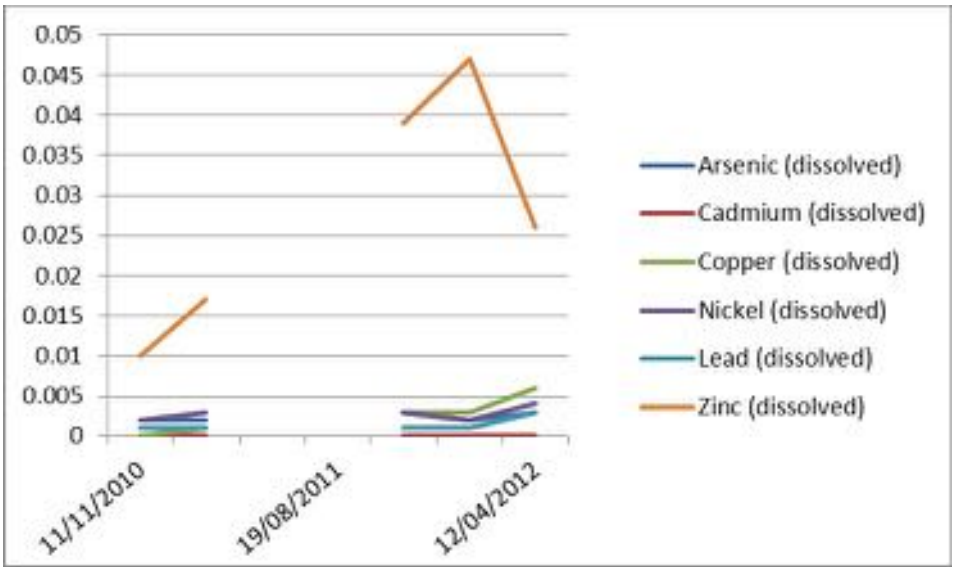
Dissolved metals not analysed in some periods due to low lake water level

L12-Lake Water Metals - Total



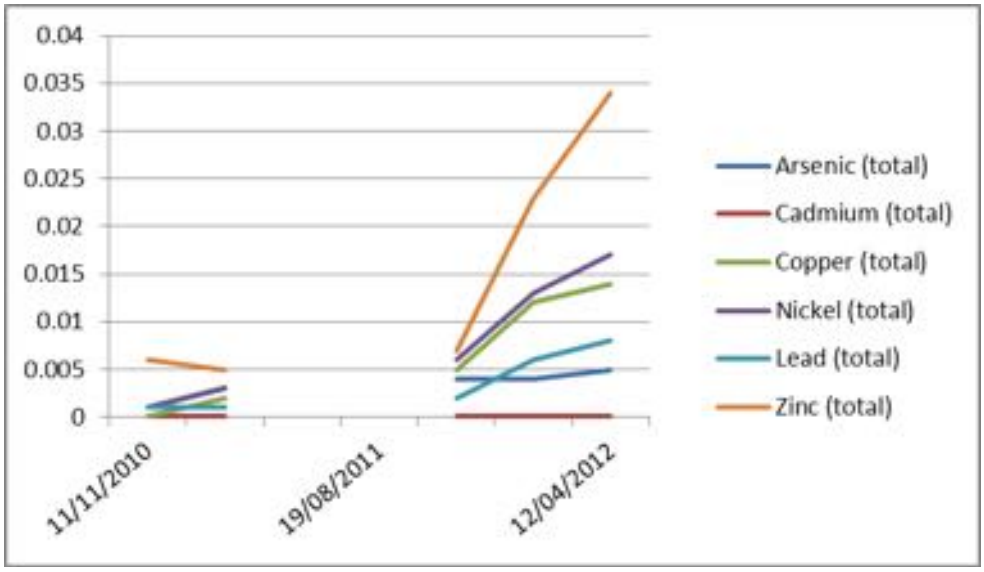
Total metals not analysed in some periods due to low lake water level

L12-Lake Water Metals - Dissolved



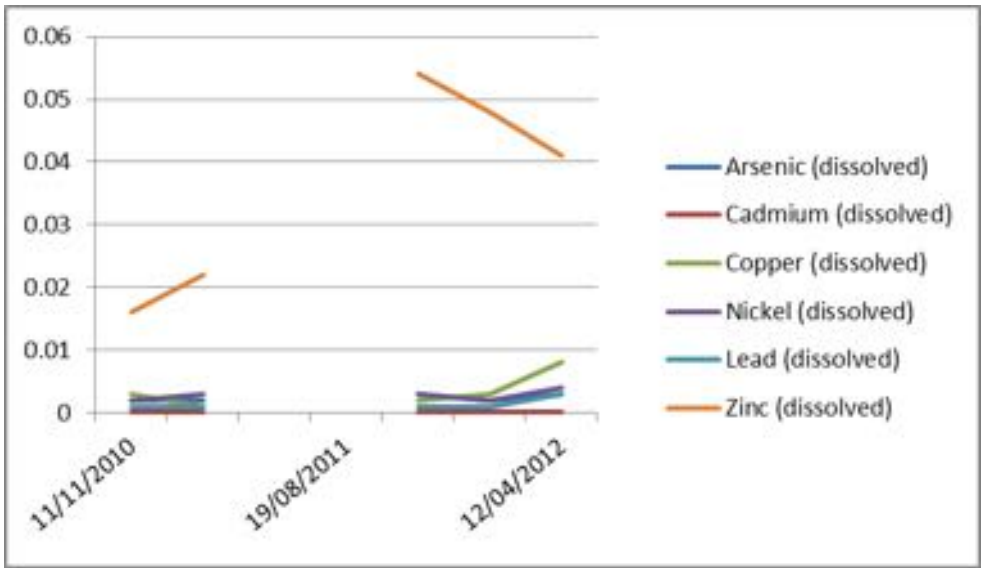
Dissolved metals not analysed in some periods due to low lake water level

L13-Lake Water Metals - Total



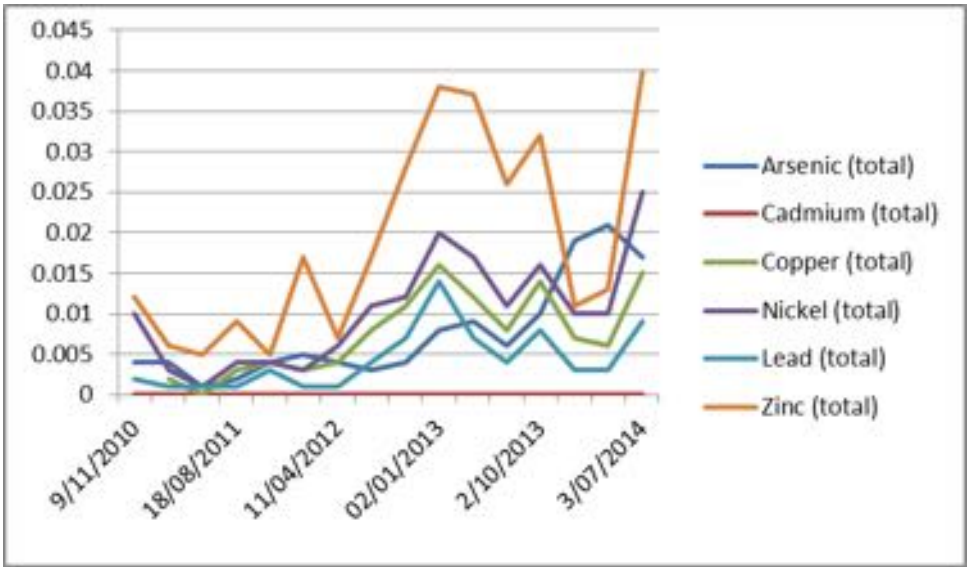
Total metals not analysed in some periods due to low lake water level

L13-Lake Water Metals - Dissolved

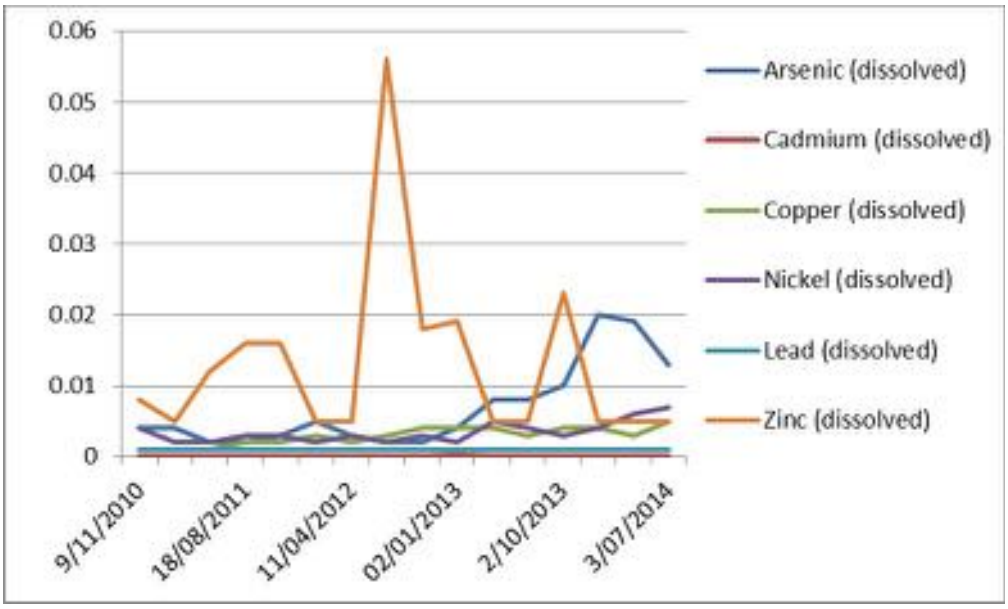


Dissolved metals not analysed in some periods due to low lake water level

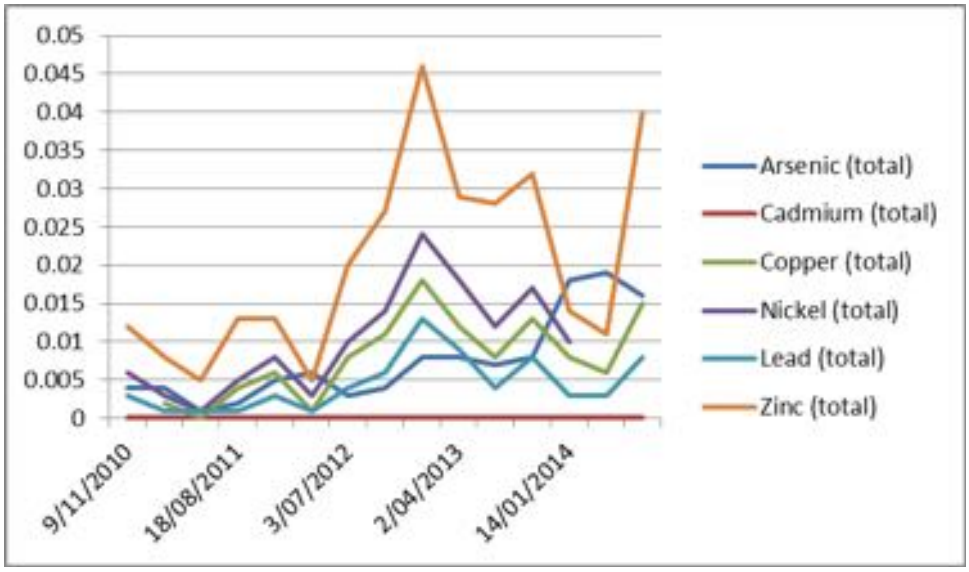
P1-Lake Water Metals - Total



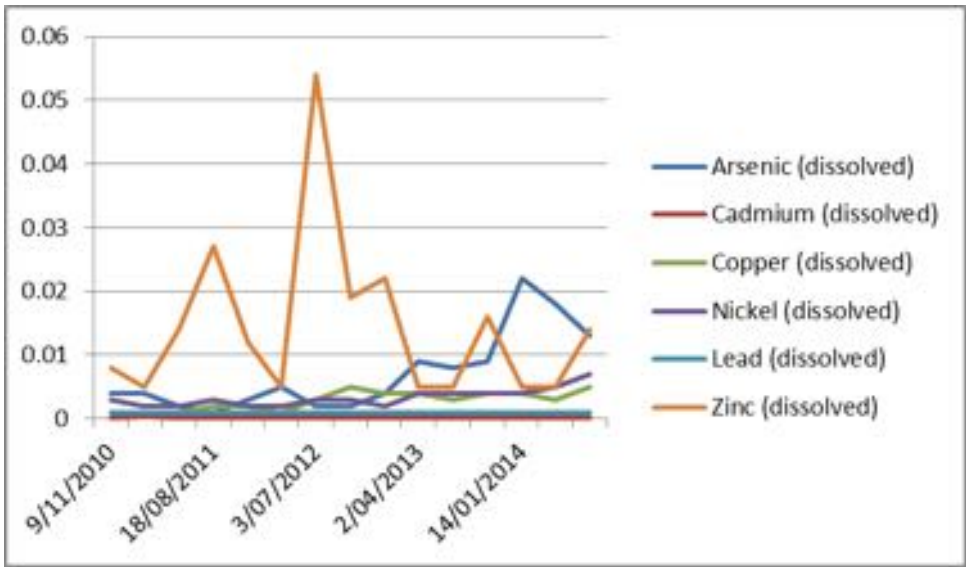
P1-Lake Water Metals - Dissolved



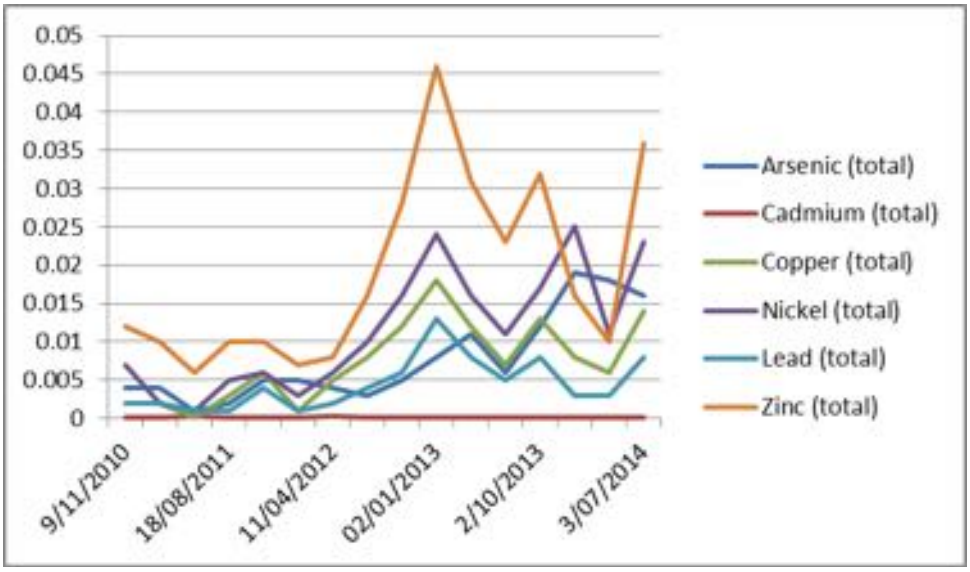
P2-Lake Water Metals - Total



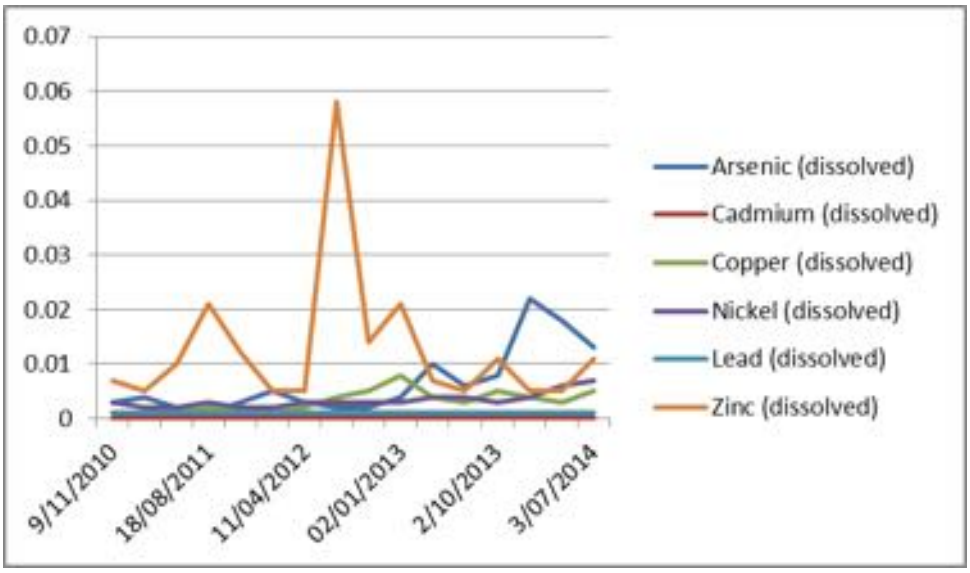
P2-Lake Water Metals - Dissolved



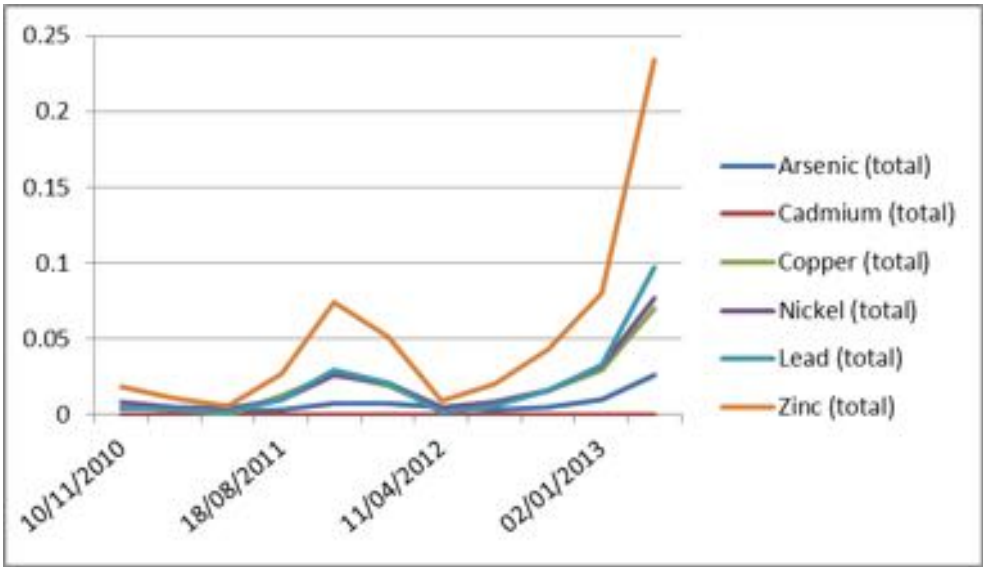
P3-Lake Water Metals - Total



P3-Lake Water Metals - Dissolved

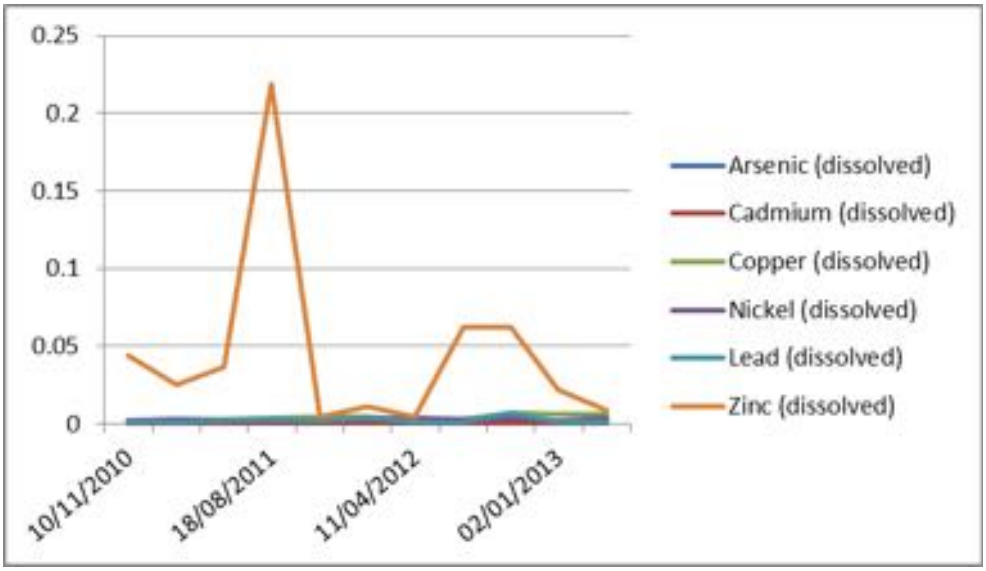


Sandy Creek-Lake Water Metals - Total



Total metals not analysed in some periods due to low lake water level

Sandy Creek-Lake Water Metals - Dissolved



Dissolved metals not analysed in some periods due to low lake water level

COWAL GOLD MINE

LAKE SEDIMENT MONITORING REPORT

23 December 2013 – 22 December 2014

B1– EPA ID #17	**Units**	**Collect Date**				**Interpretation**
		14/01/2014	1/04/2014	3/07/2014		
Antimony - Total	mg/kg	< 5	< 5	< 5	-	Conductivity increased slightly throughout the reporting period. Arsenic increased slightly. Zinc decreased 2nd quarter and increased in the 3rd quarter. All other parameters remained fairly stable throughout the reporting period. Safe access prevented sampling in the 4th quarter.
Arsenic - Total	mg/kg	2.3	2.9	3.5	-	
Cadmium - Total	mg/kg	< 1	< 1	< 1	-	
Conductivity - Lab	µS/cm	70	76	156	-	
Lead - Total	mg/kg	9	10	12	-	
Mercury - Total	mg/kg	0.01	0.01	< 0.01	-	
Zinc - Total	mg/kg	30	16	21	-	

B2	**Units**	**Collect Date**				**Interpretation**
		14/01/2014	1/04/2014	3/07/2014		
Antimony - Total	mg/kg	< 5	< 5	< 5	-	Conductivity increased slightly throughout the reporting period. Arsenic increased slightly. Zinc decreased 2nd quarter and increased in the 3rd quarter. All other parameters remained fairly stable throughout the reporting period. Safe access prevented sampling in the 4th quarter.
Arsenic - Total	mg/kg	3.3	3.2	4.0	-	
Cadmium - Total	mg/kg	< 1	< 1	< 1	-	
Conductivity - Lab	µS/cm	147	150	168	-	
Lead - Total	mg/kg	14	13	13	-	
Mercury - Total	mg/kg	0.02	0.02	0.01	-	
Zinc - Total	mg/kg	74	23	27	-	

B3	**Units**	**Collect Date**				**Interpretation**
		14/01/2014	1/04/2014	3/07/2014		
Antimony - Total	mg/kg	< 5	< 5	< 5	-	Conductivity increased slightly throughout the reporting period. Arsenic increased slightly. Zinc decreased 2nd quarter and increased in the 3rd quarter. All other parameters remained fairly stable throughout the reporting period. Safe access prevented sampling in the 4th quarter.
Arsenic - Total	mg/kg	2.8	3.0	4.0	-	
Cadmium - Total	mg/kg	< 1	< 1	< 1	-	
Conductivity - Lab	µS/cm	107	125	135	-	
Lead - Total	mg/kg	13	14	15	-	
Mercury - Total	mg/kg	0.02	0.01	0.01	-	
Zinc - Total	mg/kg	80	23	28	-	

B4	**Units**	**Collect Date**				**Interpretation**
		14/01/2014	1/04/2014	3/07/2014		
Antimony - Total	mg/kg	< 5	< 5	< 5	-	Conductivity increased slightly throughout the reporting period. Arsenic increased slightly. Zinc decreased 2nd quarter and increased in the 3rd quarter. All other parameters remained fairly stable throughout the reporting period. Safe access prevented sampling in the 4th quarter.
Arsenic - Total	mg/kg	2.8	3.4	3.8	-	
Cadmium - Total	mg/kg	< 1	< 1	< 1	-	
Conductivity - Lab	µS/cm	85	91	112	-	
Lead - Total	mg/kg	13	15	13	-	
Mercury - Total	mg/kg	0.02	0.02	0.01	-	
Zinc - Total	mg/kg	79	24	26	-	

B5– EPA ID #18	**Units**	**Collect Date**				**Interpretation**
		14/01/2014	1/04/2014	3/07/2014		
Antimony - Total	mg/kg	< 5	< 5	< 5	-	Conductivity increased slightly throughout the reporting period. Arsenic increased slightly in the 2nd quarter and decreased in the 3rd quarter. Zinc decreased throughout the reporting period. All other parameters remained fairly stable throughout the reporting period. Safe access prevented sampling in the 4th quarter.
Arsenic - Total	mg/kg	3.4	4.3	3.0	-	
Cadmium - Total	mg/kg	< 1	< 1	< 1	-	
Conductivity - Lab	µS/cm	81	107	180	-	
Lead - Total	mg/kg	14	20	15	-	
Mercury - Total	mg/kg	0.02	0.03	0.02	-	
Zinc - Total	mg/kg	73	34	31	-	

B6	**Units**	**Collect Date**				**Interpretation**
Antimony - Total	mg/kg	-	-	-	-	Location was dry from 1st to 4th quarters.
Arsenic - Total	mg/kg	-	-	-	-	
Cadmium - Total	mg/kg	-	-	-	-	
Conductivity - Lab	µS/cm	-	-	-	-	
Lead - Total	mg/kg	-	-	-	-	
Mercury - Total	mg/kg	-	-	-	-	
Zinc - Total	mg/kg	-	-	-	-	

C1	**Units**	**Collect Date**				**Interpretation**
		14/01/2014	1/04/2014	3/07/2014		
Antimony - Total	mg/kg	< 5	< 5	< 5	-	Conductivity increased slightly in the 2nd quarter and decreased in the 3rd quarter. Arsenic increased slightly throughout the reporting period. Zinc decreased throughout the reporting period. All other parameters remained fairly stable throughout the reporting period. Safe access prevented sampling in the 4th quarter.
Arsenic - Total	mg/kg	3.4	3.5	6.0	-	
Cadmium - Total	mg/kg	< 1	< 1	< 1	-	
Conductivity - Lab	µS/cm	165	207	158	-	
Lead - Total	mg/kg	11	14	11	-	
Mercury - Total	mg/kg	0.01	0.02	< 0.01	-	
Zinc - Total	mg/kg	47	21	20	-	

C2	**Units**	**Collect Date**				**Interpretation**
		14/01/2014	1/04/2014	3/07/2014		
Antimony - Total	mg/kg	< 5	< 5	< 5	-	Conductivity increased slightly in the 2nd quarter and decreased in the 3rd quarter. Arsenic decreased in the 2nd quarter and increased in the 3rd quarter. Zinc decreased 2nd quarter and increased in the 3rd quarter. All other parameters remained fairly stable throughout the reporting period. Safe access prevented sampling in the 4th quarter.
Arsenic - Total	mg/kg	3.7	3.0	3.4	-	
Cadmium - Total	mg/kg	< 1	< 1	< 1	-	
Conductivity - Lab	µS/cm	86	163	131	-	
Lead - Total	mg/kg	13	12	11	-	
Mercury - Total	mg/kg	0.02	0.02	< 0.01	-	
Zinc - Total	mg/kg	54	19	23	-	

C3	Units	Collect Date				Interpretation
		14/01/2014	1/04/2014	3/07/2014		
Antimony - Total	mg/kg	< 5	< 5	< 5	-	Conductivity increased slightly throughout the reporting period. Arsenic decreased in the 2nd quarter and increased in the 3rd quarter. Zinc decreased 2nd quarter and increased in the 3rd quarter. All other parameters remained fairly stable throughout the reporting period. Safe access prevented sampling in the 4th quarter.
Arsenic - Total	mg/kg	3.6	3.0	3.9	-	
Cadmium - Total	mg/kg	< 1	< 1	< 1	-	
Conductivity - Lab	µS/cm	96	141	168	-	
Lead - Total	mg/kg	12	11	12	-	
Mercury - Total	mg/kg	0.01	0.02	0.01	-	
Zinc - Total	mg/kg	50	18	23	-	

E1	Units	Collect Date				Interpretation
		14/01/2014	1/04/2014	3/07/2014		
Antimony - Total	mg/kg	< 5	< 5	< 5	-	Conductivity increased slightly in the 2nd quarter and decreased in the 3rd quarter. Arsenic decreased in the 2nd quarter and increased in the 3rd quarter. Zinc decreased 2nd quarter and increased in the 3rd quarter. All other parameters remained fairly stable throughout the reporting period. Safe access prevented sampling in the 4th quarter.
Arsenic - Total	mg/kg	3.7	3.2	3.6	-	
Cadmium - Total	mg/kg	< 1	< 1	< 1	-	
Conductivity - Lab	µS/cm	146	166	153	-	
Lead - Total	mg/kg	16	15	15	-	
Mercury - Total	mg/kg	0.02	0.02	0.01	-	
Zinc - Total	mg/kg	86	25	29	-	

E2	Units	Collect Date				Interpretation
		14/01/2014	1/04/2014	3/07/2014		
Antimony - Total	mg/kg	< 5	< 5	< 5	-	Conductivity decreased slightly in the 2nd quarter and increased in the 3rd quarter. Arsenic increased slightly throughout the reporting period. Zinc decreased throughout the reporting period. All other parameters remained fairly stable throughout the reporting period. Safe access prevented sampling in the 4th quarter.
Arsenic - Total	mg/kg	2.7	3.3	4.5	-	
Cadmium - Total	mg/kg	< 1	< 1	< 1	-	
Conductivity - Lab	µS/cm	117	113	139	-	
Lead - Total	mg/kg	13	16	13	-	
Mercury - Total	mg/kg	0.02	0.02	0.01	-	
Zinc - Total	mg/kg	76	27	25	-	

E3	Units	Collect Date				Interpretation
		14/01/2014	1/04/2014	3/07/2014		
Antimony - Total	mg/kg	< 5	< 5	< 5	-	Conductivity decreased slightly in the 2nd quarter and increased in the 3rd quarter. Arsenic decreased in the 2nd quarter and increased in the 3rd quarter. Zinc decreased 2nd quarter and increased in the 3rd quarter. All other parameters remained fairly stable throughout the reporting period. Safe access prevented sampling in the 4th quarter.
Arsenic - Total	mg/kg	6.1	4.0	4.5	-	
Cadmium - Total	mg/kg	< 1	< 1	< 1	-	
Conductivity - Lab	µS/cm	120	110	149	-	
Lead - Total	mg/kg	16	14	15	-	
Mercury - Total	mg/kg	0.02	0.01	0.01	-	
Zinc - Total	mg/kg	44	23	27	-	

E4	Units	Collect Date				Interpretation
		14/01/2014				
Antimony - Total	mg/kg	< 5	-	-	-	Safe access prevented sampling from the 2nd to 4th quarter.
Arsenic - Total	mg/kg	2.4	-	-	-	
Cadmium - Total	mg/kg	< 1	-	-	-	
Conductivity - Lab	µS/cm	110	-	-	-	
Lead - Total	mg/kg	11	-	-	-	
Mercury - Total	mg/kg	0.01	-	-	-	
Zinc - Total	mg/kg	44	-	-	-	

E5	Units	Collect Date				Interpretation
		14/01/2014				
Antimony - Total	mg/kg	< 5	-	-	-	Safe access prevented sampling from the 2nd to 4th quarter.
Arsenic - Total	mg/kg	2.2	-	-	-	
Cadmium - Total	mg/kg	< 1	-	-	-	
Conductivity - Lab	µS/cm	88	-	-	-	
Lead - Total	mg/kg	10	-	-	-	
Mercury - Total	mg/kg	< 0.01	-	-	-	
Zinc - Total	mg/kg	65	-	-	-	

I1	Units	Collect Date				Interpretation
		14/01/2014	1/04/2014			
Antimony - Total	mg/kg	< 5	< 5	-	-	Conductivity increased in the reporting period. Arsenic remained the same in the 2nd and 3rd quarters. Zinc decreased in the 2nd quarter. All other parameters remained fairly stable throughout the reporting period. Safe access prevented sampling in the 3rd and 4th quarters.
Arsenic - Total	mg/kg	3.2	3.2	-	-	
Cadmium - Total	mg/kg	< 1	< 1	-	-	
Conductivity - Lab	µS/cm	101	169	-	-	
Lead - Total	mg/kg	13	12	-	-	
Mercury - Total	mg/kg	< 0.01	0.01	-	-	
Zinc - Total	mg/kg	52	19	-	-	

I2	Units	Collect Date				Interpretation
		14/01/2014				
Antimony - Total	mg/kg	< 5	-	-	-	Location was dry from 2nd to 4th quarters.
Arsenic - Total	mg/kg	5.4	-	-	-	
Cadmium - Total	mg/kg	< 1	-	-	-	
Conductivity - Lab	µS/cm	111	-	-	-	
Lead - Total	mg/kg	19	-	-	-	
Mercury - Total	mg/kg	0.03	-	-	-	
Zinc - Total	mg/kg	100	-	-	-	

I3	Units	Collect Date				Interpretation
Antimony - Total	mg/kg	-	-	-	-	Location was dry from 1st to 4th quarters.
Arsenic - Total	mg/kg	-	-	-	-	
Cadmium - Total	mg/kg	-	-	-	-	
Conductivity - Lab	µS/cm	-	-	-	-	
Lead - Total	mg/kg	-	-	-	-	
Mercury - Total	mg/kg	-	-	-	-	
Zinc - Total	mg/kg	-	-	-	-	

I4	Units	Collect Date				Interpretation
Antimony - Total	mg/kg	-	-	-	-	Location was dry from 1st to 4th quarters.
Arsenic - Total	mg/kg	-	-	-	-	
Cadmium - Total	mg/kg	-	-	-	-	
Conductivity - Lab	µS/cm	-	-	-	-	
Lead - Total	mg/kg	-	-	-	-	
Mercury - Total	mg/kg	-	-	-	-	
Zinc - Total	mg/kg	-	-	-	-	

L1	Units	Collect Date				Interpretation
		14/01/2014				
Antimony - Total	mg/kg	< 5	-	-	-	Location was dry from 2nd to 4th quarters.
Arsenic - Total	mg/kg	3.6	-	-	-	
Cadmium - Total	mg/kg	< 1	-	-	-	
Conductivity - Lab	µS/cm	115	-	-	-	
Lead - Total	mg/kg	13	-	-	-	
Mercury - Total	mg/kg	0.02	-	-	-	
Zinc - Total	mg/kg	56	-	-	-	

L2	Units	Collect Date				Interpretation
		14/01/2014				
Antimony - Total	mg/kg	< 5	-	-	-	Location was dry from 2nd to 4th quarters.
Arsenic - Total	mg/kg	4.4	-	-	-	
Cadmium - Total	mg/kg	< 1	-	-	-	
Conductivity - Lab	µS/cm	95	-	-	-	
Lead - Total	mg/kg	15	-	-	-	
Mercury - Total	mg/kg	0.02	-	-	-	
Zinc - Total	mg/kg	55	-	-	-	

L3	Units	Collect Date				Interpretation
		14/01/2014				
Antimony - Total	mg/kg	< 5	-	-	-	Location was dry from 2nd to 4th quarters.
Arsenic - Total	mg/kg	3.6	-	-	-	
Cadmium - Total	mg/kg	< 1	-	-	-	
Conductivity - Lab	µS/cm	99	-	-	-	
Lead - Total	mg/kg	16	-	-	-	
Mercury - Total	mg/kg	0.01	-	-	-	
Zinc - Total	mg/kg	32	-	-	-	

L4	Units	Collect Date				Interpretation
Antimony - Total	mg/kg	-	-	-	-	Location was dry from 1st to 4th quarters.
Arsenic - Total	mg/kg	-	-	-	-	
Cadmium - Total	mg/kg	-	-	-	-	
Conductivity - Lab	µS/cm	-	-	-	-	
Lead - Total	mg/kg	-	-	-	-	
Mercury - Total	mg/kg	-	-	-	-	
Zinc - Total	mg/kg	-	-	-	-	

L5	Units	Collect Date				Interpretation
Antimony - Total	mg/kg	-	-	-	-	Location was dry from 1st to 4th quarters.
Arsenic - Total	mg/kg	-	-	-	-	
Cadmium - Total	mg/kg	-	-	-	-	
Conductivity - Lab	µS/cm	-	-	-	-	
Lead - Total	mg/kg	-	-	-	-	
Mercury - Total	mg/kg	-	-	-	-	
Zinc - Total	mg/kg	-	-	-	-	

L6	Units	Collect Date				Interpretation
Antimony - Total	mg/kg	-	-	-	-	Location was dry from 1st to 4th quarters.
Arsenic - Total	mg/kg	-	-	-	-	
Cadmium - Total	mg/kg	-	-	-	-	
Conductivity - Lab	µS/cm	-	-	-	-	
Lead - Total	mg/kg	-	-	-	-	
Mercury - Total	mg/kg	-	-	-	-	
Zinc - Total	mg/kg	-	-	-	-	

L7	Units	Collect Date				Interpretation
Antimony - Total	mg/kg	-	-	-	-	Location was dry from 1st to 4th quarters.
Arsenic - Total	mg/kg	-	-	-	-	
Cadmium - Total	mg/kg	-	-	-	-	
Conductivity - Lab	µS/cm	-	-	-	-	
Lead - Total	mg/kg	-	-	-	-	
Mercury - Total	mg/kg	-	-	-	-	
Zinc - Total	mg/kg	-	-	-	-	

L8	Units	Collect Date				Interpretation
Antimony - Total	mg/kg	-	-	-	-	Location was dry from 1st to 4th quarters.
Arsenic - Total	mg/kg	-	-	-	-	
Cadmium - Total	mg/kg	-	-	-	-	
Conductivity - Lab	µS/cm	-	-	-	-	
Lead - Total	mg/kg	-	-	-	-	
Mercury - Total	mg/kg	-	-	-	-	
Zinc - Total	mg/kg	-	-	-	-	

L9	Units	Collect Date				Interpretation
Antimony - Total	mg/kg	-	-	-	-	Location was dry from 1st to 4th quarters.
Arsenic - Total	mg/kg	-	-	-	-	
Cadmium - Total	mg/kg	-	-	-	-	
Conductivity - Lab	µS/cm	-	-	-	-	
Lead - Total	mg/kg	-	-	-	-	
Mercury - Total	mg/kg	-	-	-	-	
Zinc - Total	mg/kg	-	-	-	-	

L10	Units	Collect Date				Interpretation
Antimony - Total	mg/kg	-	-	-	-	Location was dry from 1st to 4th quarters.
Arsenic - Total	mg/kg	-	-	-	-	
Cadmium - Total	mg/kg	-	-	-	-	
Conductivity - Lab	µS/cm	-	-	-	-	
Lead - Total	mg/kg	-	-	-	-	
Mercury - Total	mg/kg	-	-	-	-	
Zinc - Total	mg/kg	-	-	-	-	

L11	Units	Collect Date				Interpretation
Antimony - Total	mg/kg	-	-	-	-	Location was dry from 1st to 4th quarters.
Arsenic - Total	mg/kg	-	-	-	-	
Cadmium - Total	mg/kg	-	-	-	-	
Conductivity - Lab	µS/cm	-	-	-	-	
Lead - Total	mg/kg	-	-	-	-	
Mercury - Total	mg/kg	-	-	-	-	
Zinc - Total	mg/kg	-	-	-	-	

L12	Units	Collect Date				Interpretation
Antimony - Total	mg/kg	-	-	-	-	Location was dry from 1st to 4th quarters.
Arsenic - Total	mg/kg	-	-	-	-	
Cadmium - Total	mg/kg	-	-	-	-	
Conductivity - Lab	µS/cm	-	-	-	-	
Lead - Total	mg/kg	-	-	-	-	
Mercury - Total	mg/kg	-	-	-	-	
Zinc - Total	mg/kg	-	-	-	-	

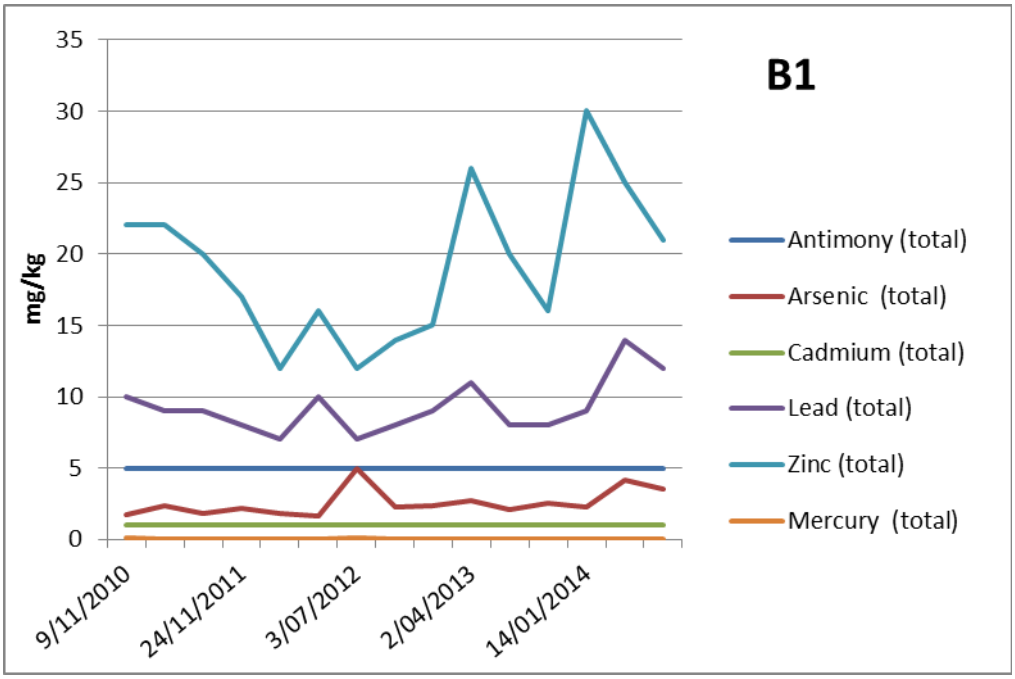
L13	Units	Collect Date				Interpretation
Antimony - Total	mg/kg	-	-	-	-	Location was dry from 1st to 4th quarters.
Arsenic - Total	mg/kg	-	-	-	-	
Cadmium - Total	mg/kg	-	-	-	-	
Conductivity - Lab	µS/cm	-	-	-	-	
Lead - Total	mg/kg	-	-	-	-	
Mercury - Total	mg/kg	-	-	-	-	
Zinc - Total	mg/kg	-	-	-	-	

P1– EPA ID #14	Units	Collect Date				Interpretation
		14/01/2014	1/04/2014	3/07/2014	2/10/2013	
Antimony - Total	mg/kg	< 5	< 5	< 5	-	Conductivity decreased slightly in the 2nd quarter and increased in the 3rd quarter. Arsenic decreased in the 2nd quarter and increased in the 3rd quarter. Zinc decreased 2nd quarter and increased in the 3rd quarter. All other parameters remained fairly stable throughout the reporting period. Safe access prevented sampling in the 4th quarter.
Arsenic - Total	mg/kg	3.3	3.1	3.8	-	
Cadmium - Total	mg/kg	< 1	< 1	< 1	-	
Conductivity - Lab	µS/cm	153	118	148	-	
Lead - Total	mg/kg	15	14	13	-	
Mercury - Total	mg/kg	0.02	0.02	0.01	-	
Zinc - Total	mg/kg	68	21	24	-	

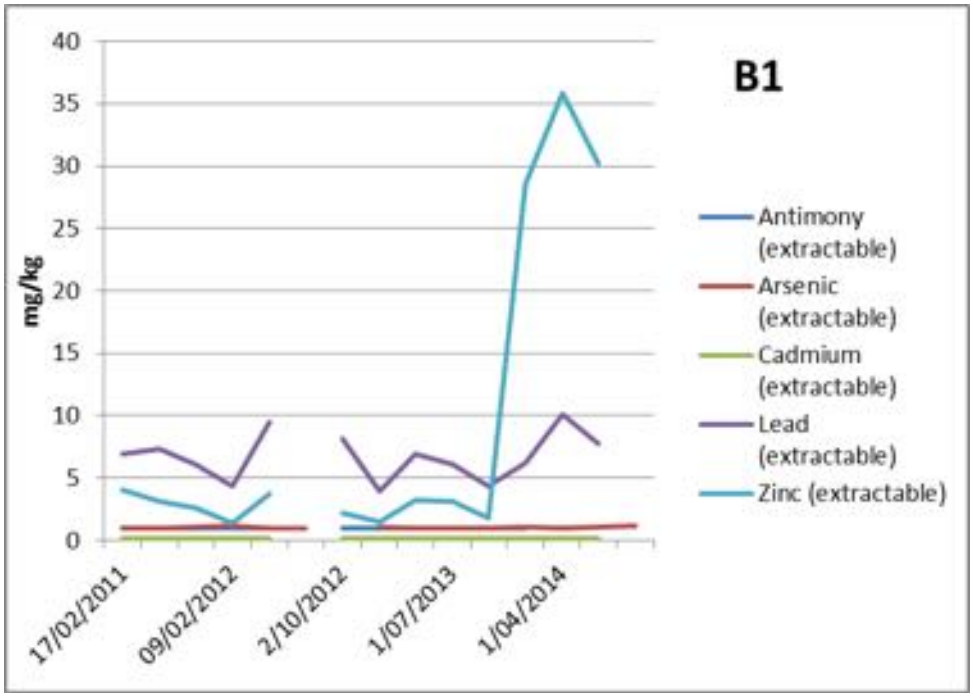
P2– EPA ID #15	**Units**	**Collect Date**				**Interpretation**
		14/01/2014	1/04/2014	3/07/2014		
Antimony - Total	mg/kg	< 5	< 5	< 5	-	Conductivity increased slightly in the 2nd quarter and decreased in the 3rd quarter. Arsenic increased throughout the reporting period. Zinc decreased throughout the reporting period. All other parameters remained fairly stable throughout the reporting period. Safe access prevented sampling in the 4th quarter.
Arsenic - Total	mg/kg	2.9	3.7	4.5	-	
Cadmium - Total	mg/kg	< 1	< 1	< 1	-	
Conductivity - Lab	µS/cm	138	181	134	-	
Lead - Total	mg/kg	14	14	14	-	
Mercury - Total	mg/kg	0.01	0.01	0.01	-	
Zinc - Total	mg/kg	71	28	27	-	

P3– EPA ID #16	**Units**	**Collect Date**				**Interpretation**
		14/01/2014	1/04/2014	3/07/2014		
Antimony - Total	mg/kg	< 5	< 5	< 5	-	Conductivity increased slightly in the 2nd quarter and decreased in the 3rd quarter. Arsenic increased slightly in the 2nd quarter and decreased in the 3rd quarter. Zinc decreased throughout the reporting period. All other parameters remained fairly stable throughout the reporting period. Safe access prevented sampling in the 4th quarter.
Arsenic - Total	mg/kg	3.1	4.2	3.9	-	
Cadmium - Total	mg/kg	< 1	< 1	< 1	-	
Conductivity - Lab	µS/cm	113	188	113	-	
Lead - Total	mg/kg	14	14	13	-	
Mercury - Total	mg/kg	0.01	0.02	0.01	-	
Zinc - Total	mg/kg	70	25	24	-	

B1-Lake Sediment Metals - Total

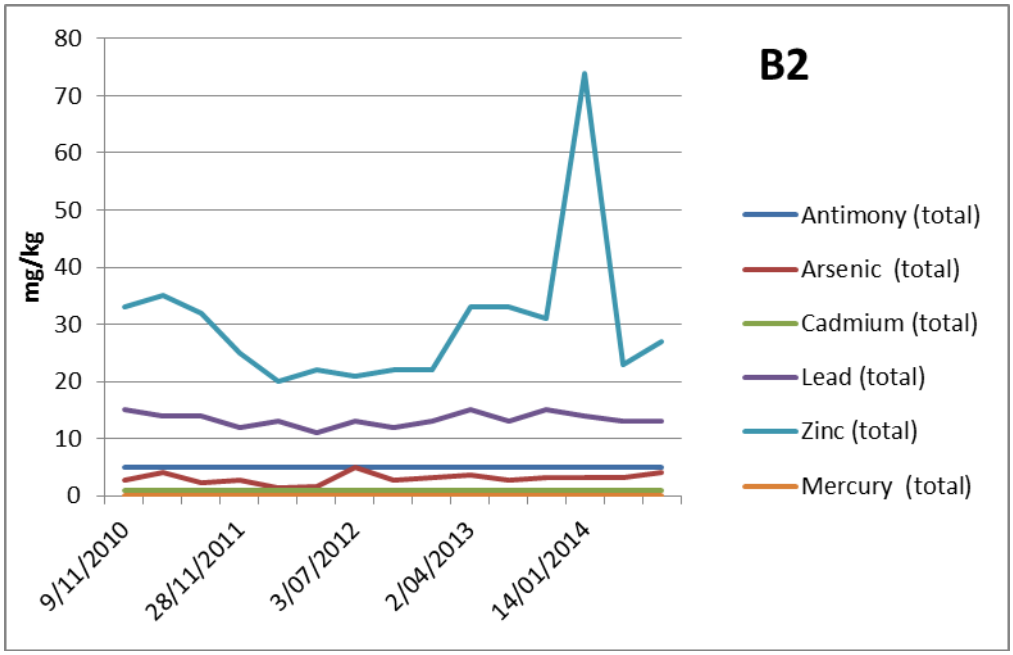


B1-Lake Sediment Metals - Dissolved

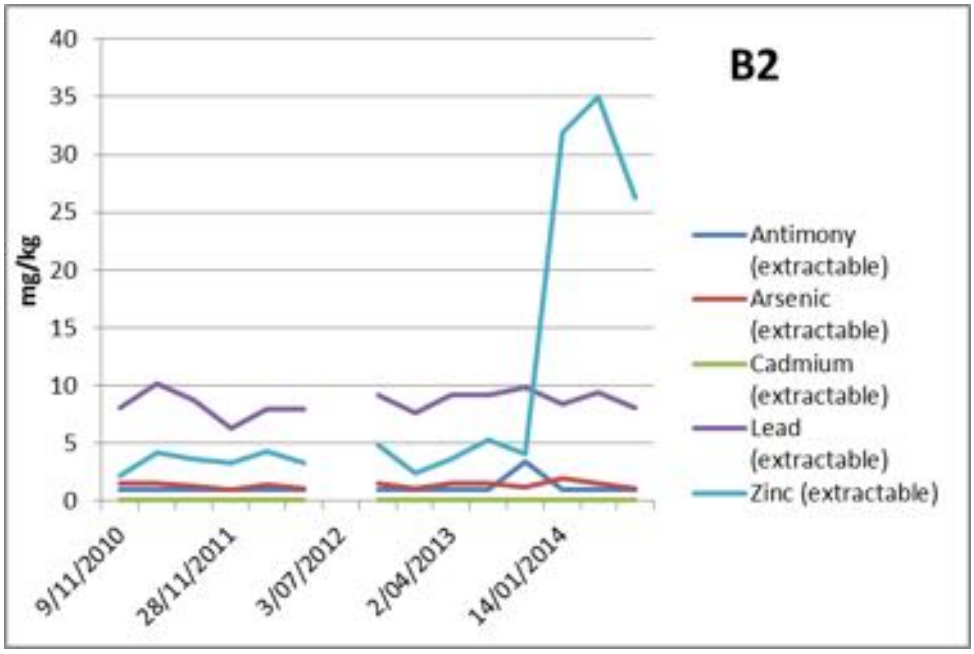


Dissolved metals not analysed in the third quarter 2012

B2-Lake Sediment Metals - Total

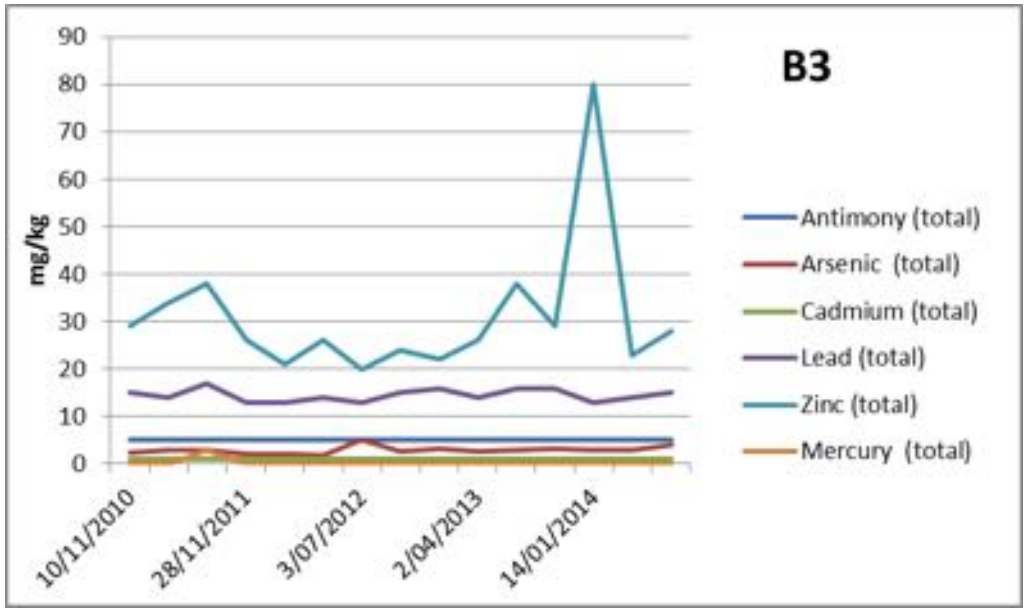


B2-Lake Sediment Metals - Dissolved

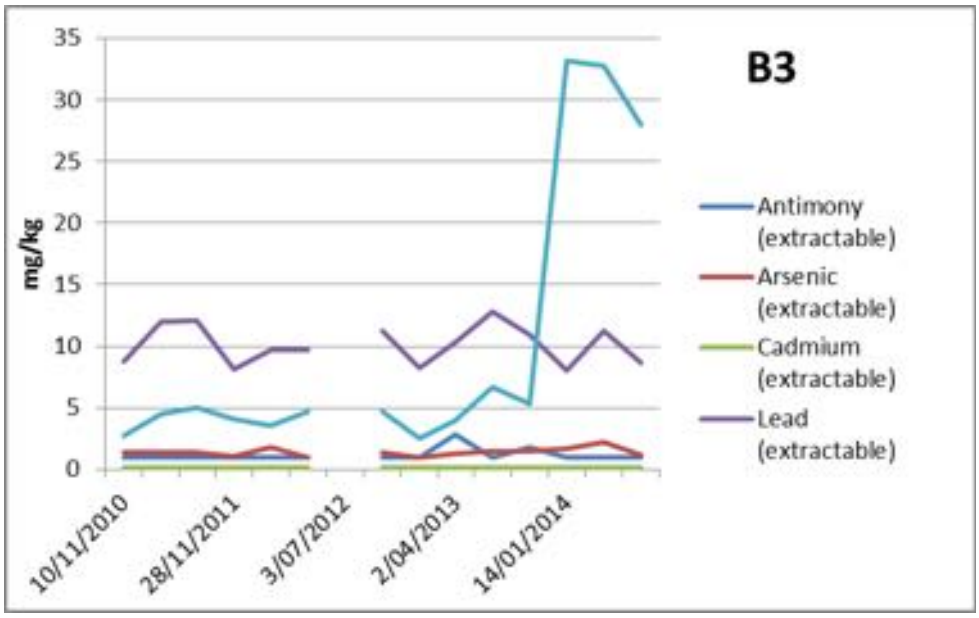


Dissolved metals not analysed in the third quarter 2012

B3-Lake Sediment Metals - Total

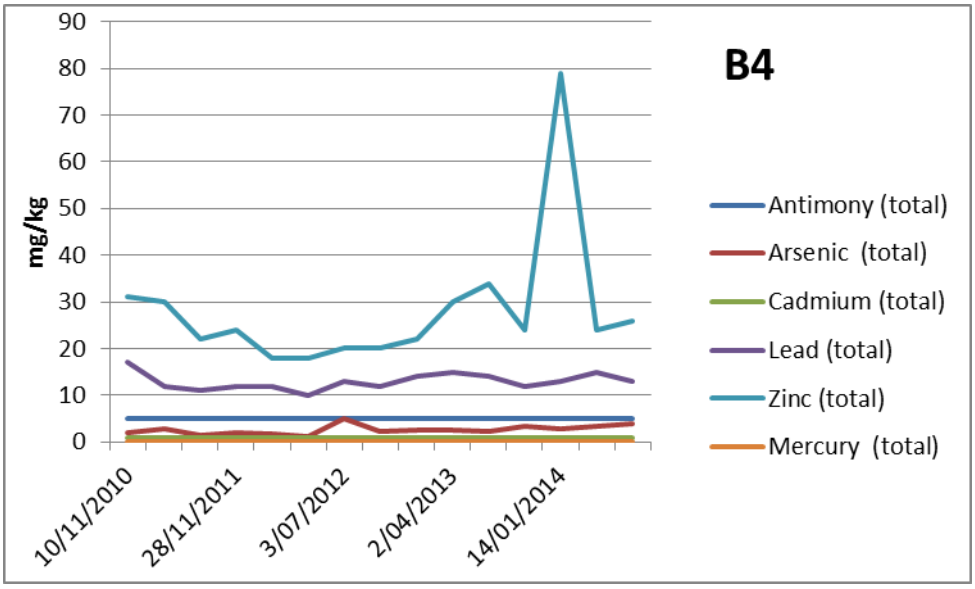


B3-Lake Sediment Metals - Dissolved

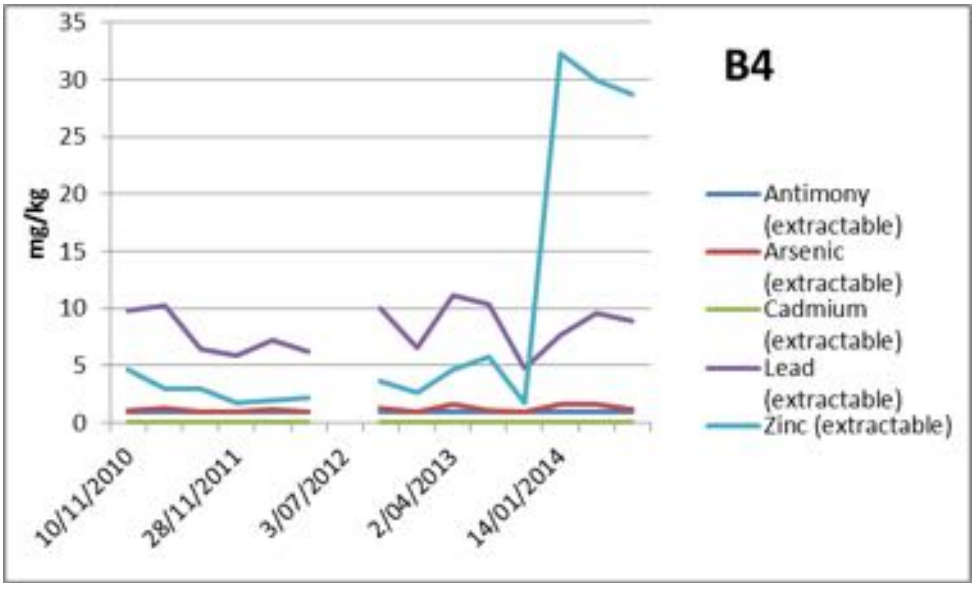


Dissolved metals not analysed in the third quarter 2012

B4-Lake Sediment Metals - Total

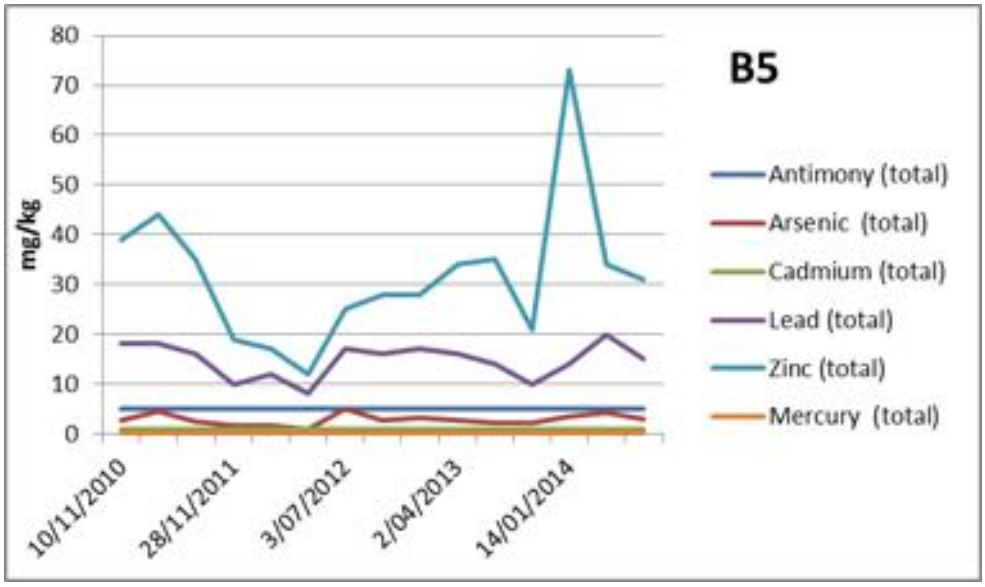


B4-Lake Sediment Metals - Dissolved

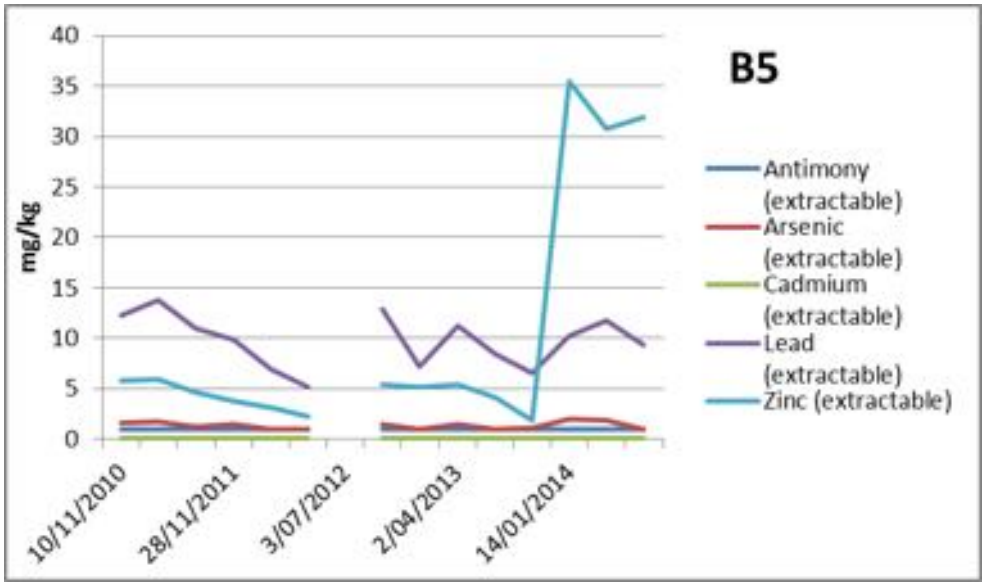


Dissolved metals not analysed in the third quarter 2012

B5-Lake Sediment Metals - Total

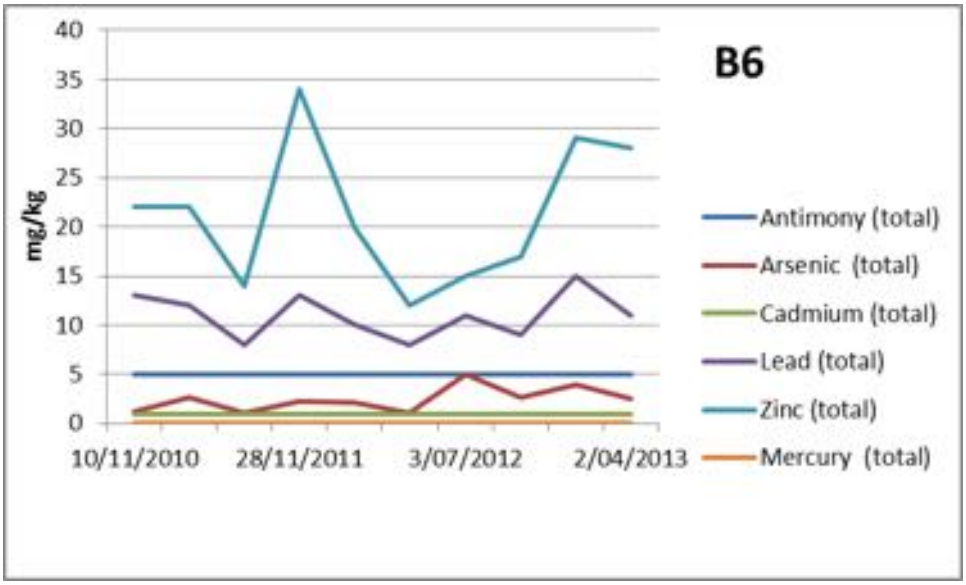


B5-Lake Sediment Metals - Dissolved

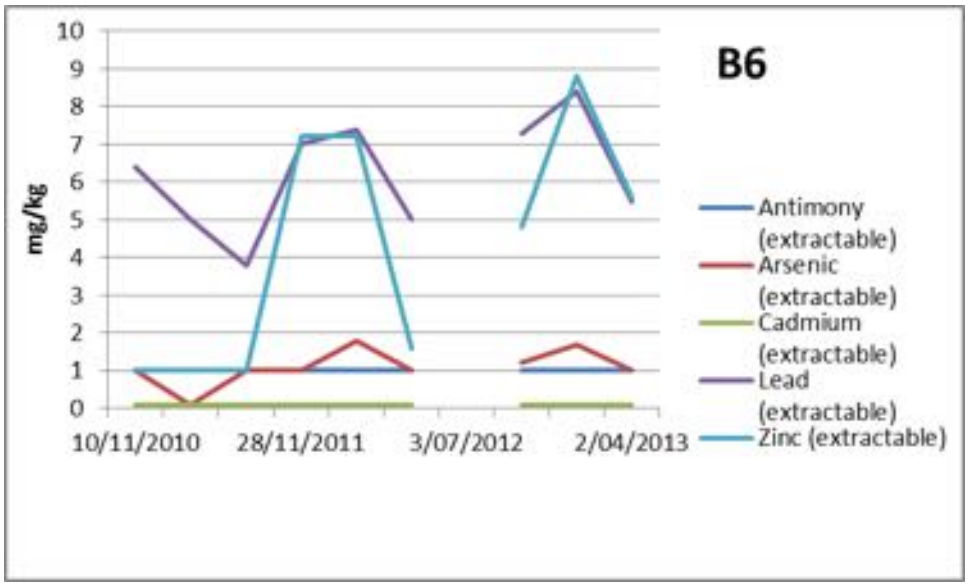


Dissolved metals not analysed in the third quarter 2012

B6-Lake Sediment Metals - Total

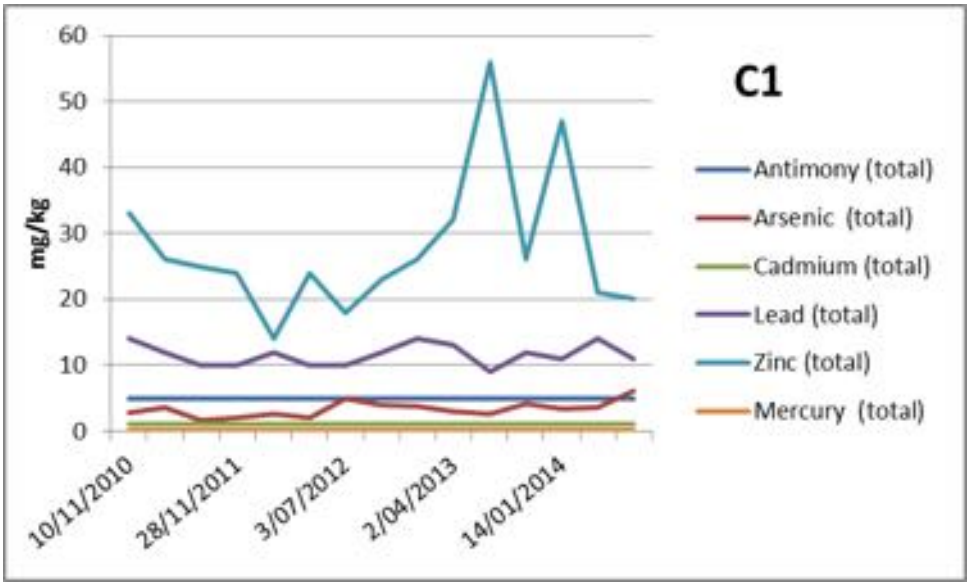


B6-Lake Sediment Metals - Dissolved

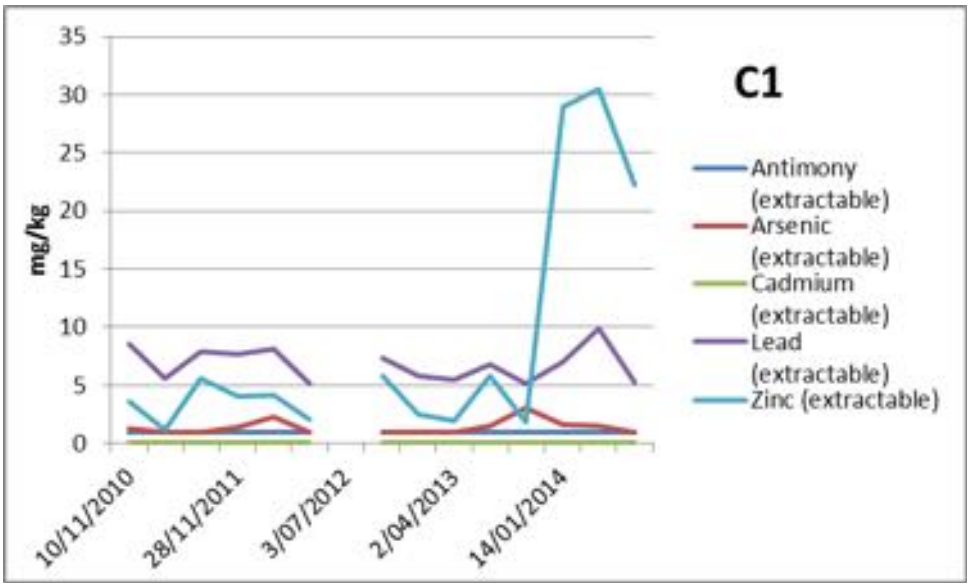


Dissolved metals not analysed in the third quarter 2012

C1-Lake Sediment Metals - Total

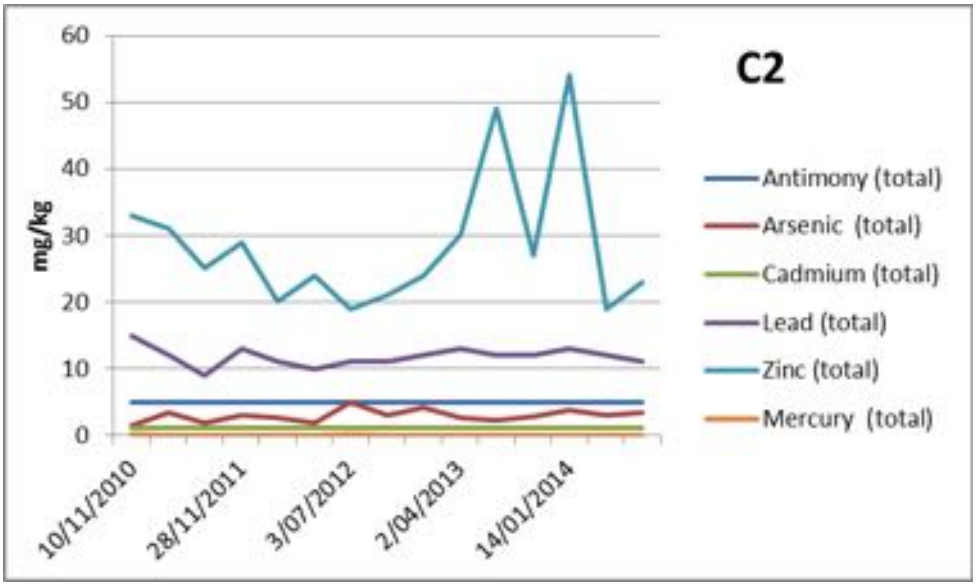


C1-Lake Sediment Metals - Dissolved

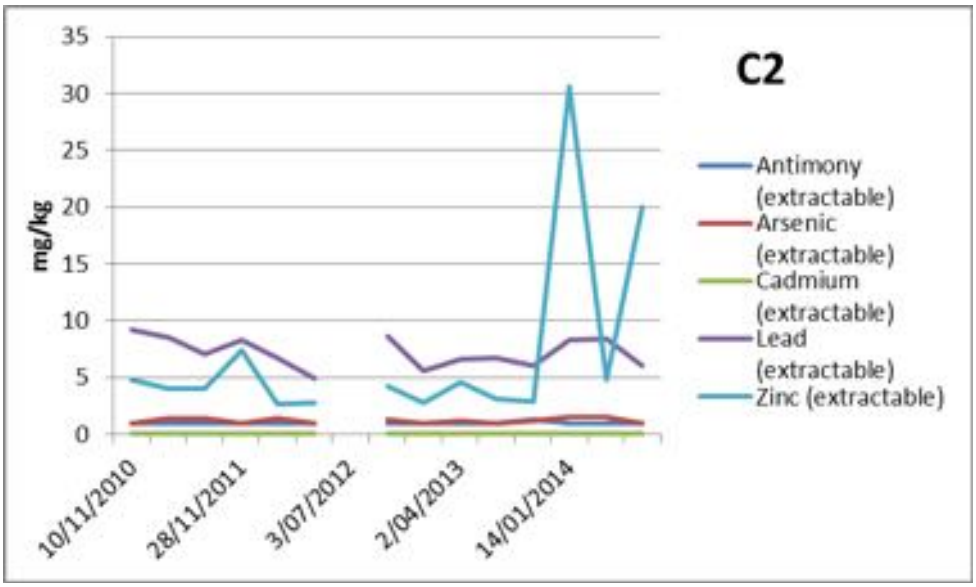


Dissolved metals not analysed in the third quarter 2012

C2-Lake Sediment Metals - Total

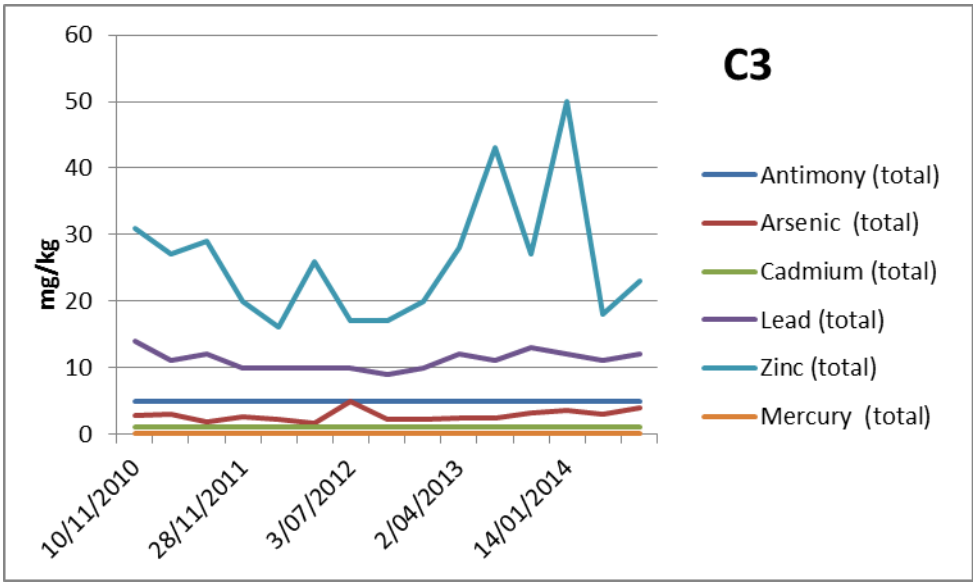


C2-Lake Sediment Metals - Dissolved

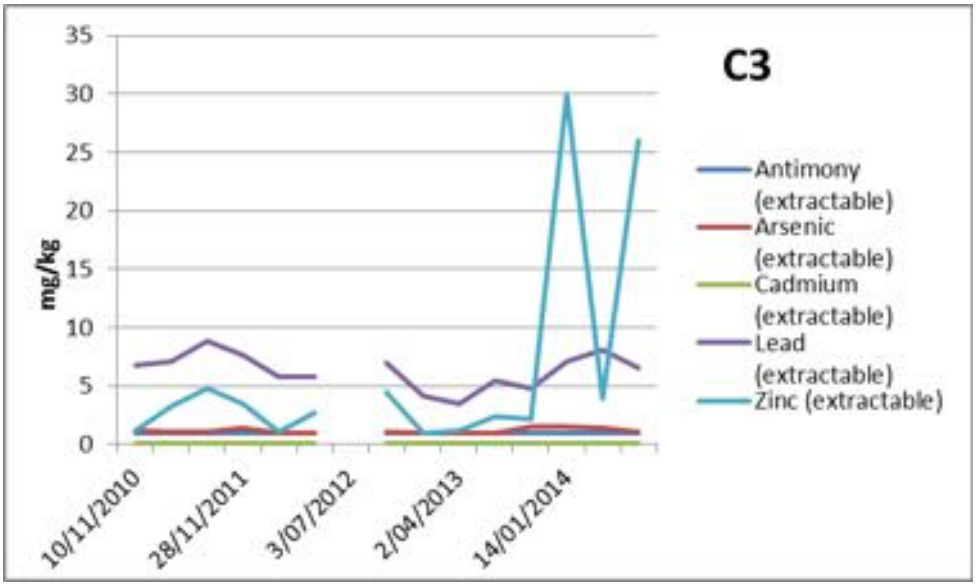


Dissolved metals not analysed in the third quarter 2012

C3-Lake Sediment Metals - Total

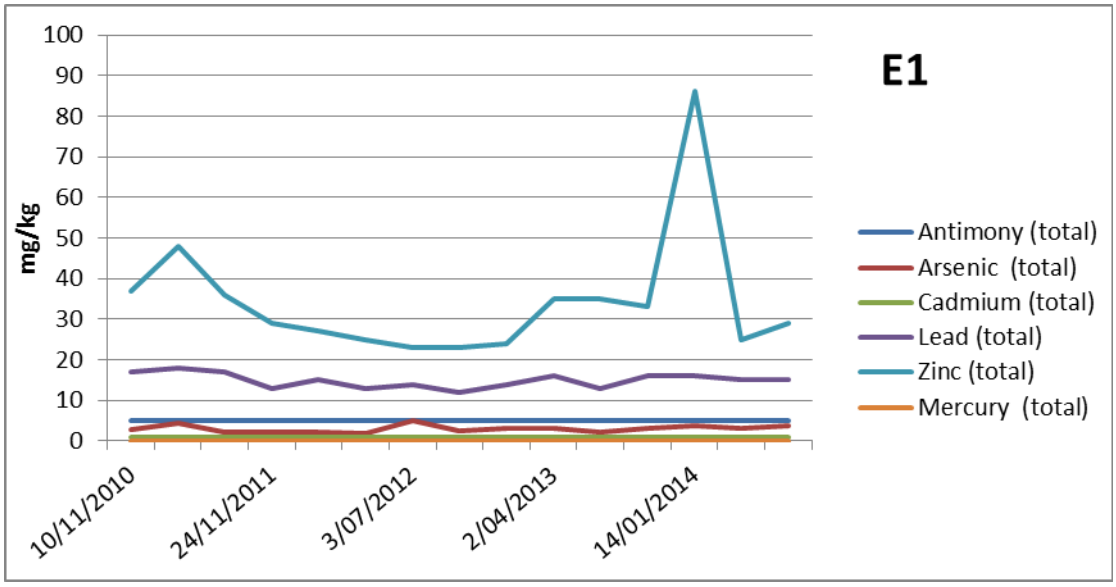


C3-Lake Sediment Metals - Dissolved

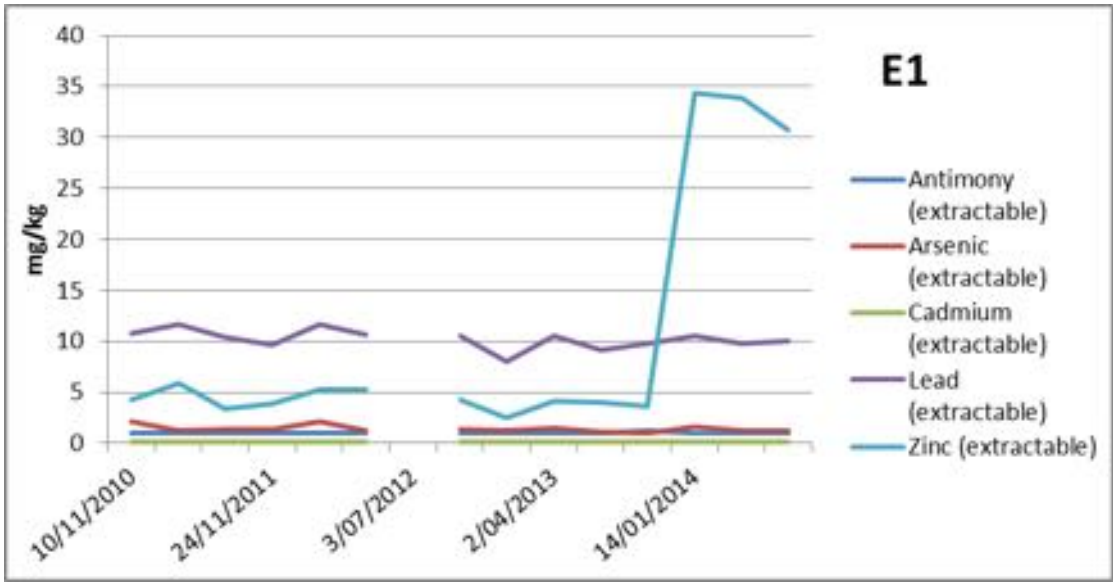


Dissolved metals not analysed in the third quarter 2012

E1-Lake Sediment Metals - Total

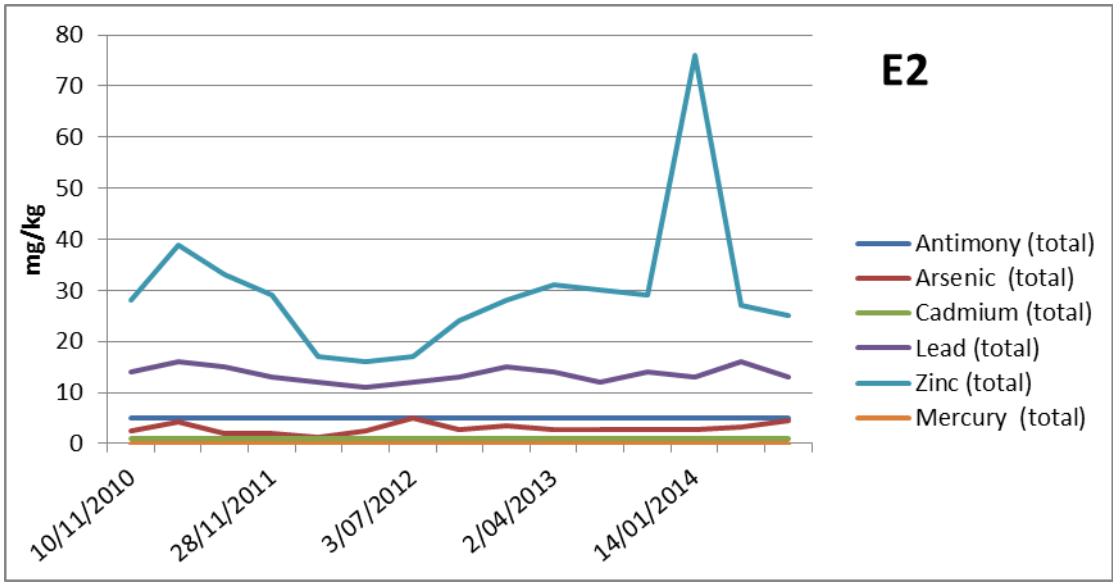


E1-Lake Sediment Metals - Dissolved

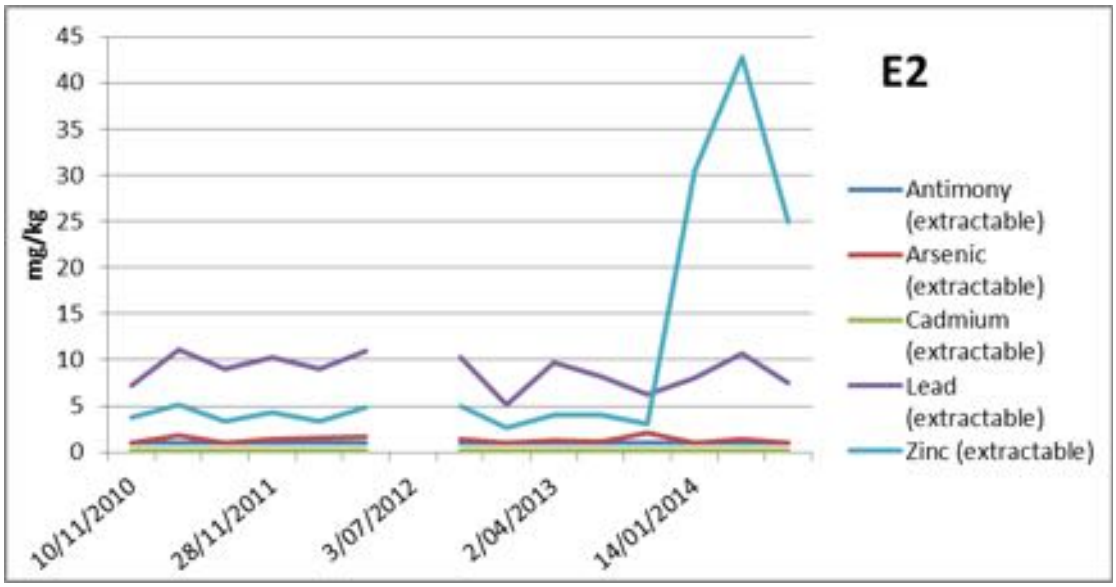


Dissolved metals not analysed in the third quarter 2012

E2-Lake Sediment Metals - Total

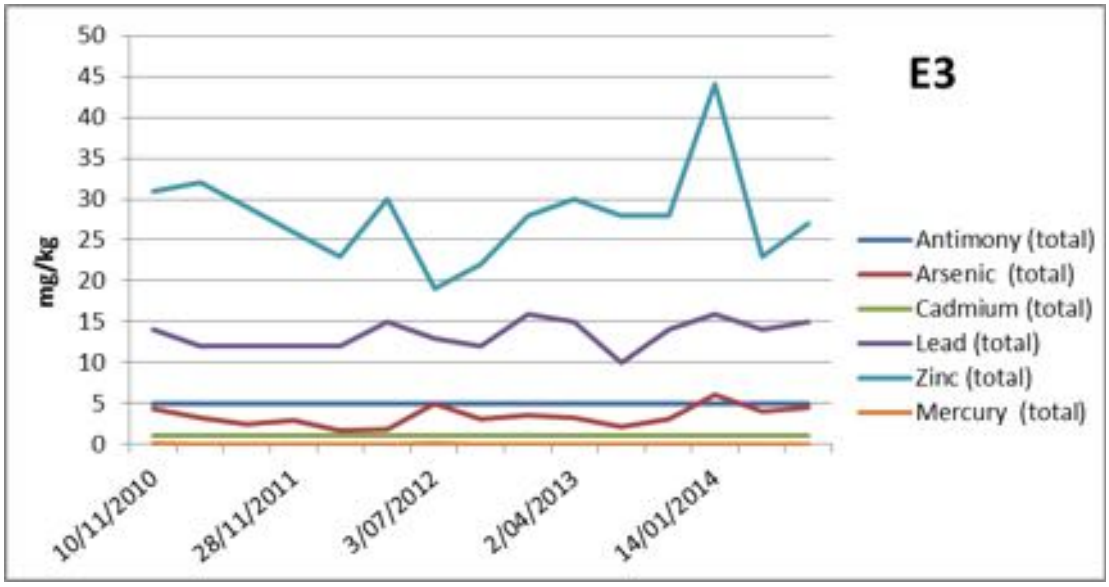


E2-Lake Sediment Metals - Dissolved

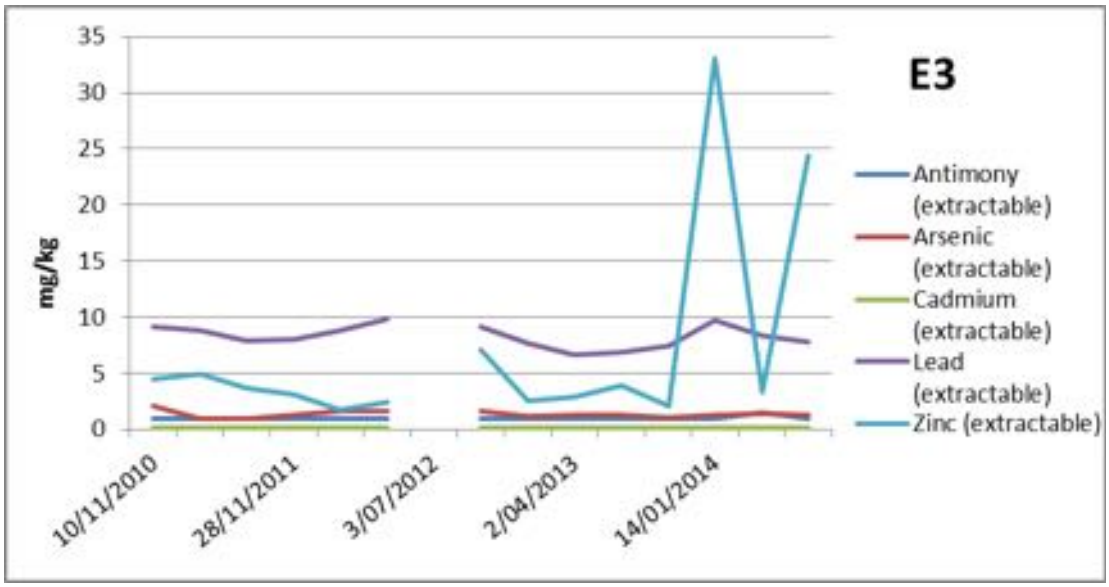


Dissolved metals not analysed in the third quarter 2012

E3-Lake Sediment Metals - Total

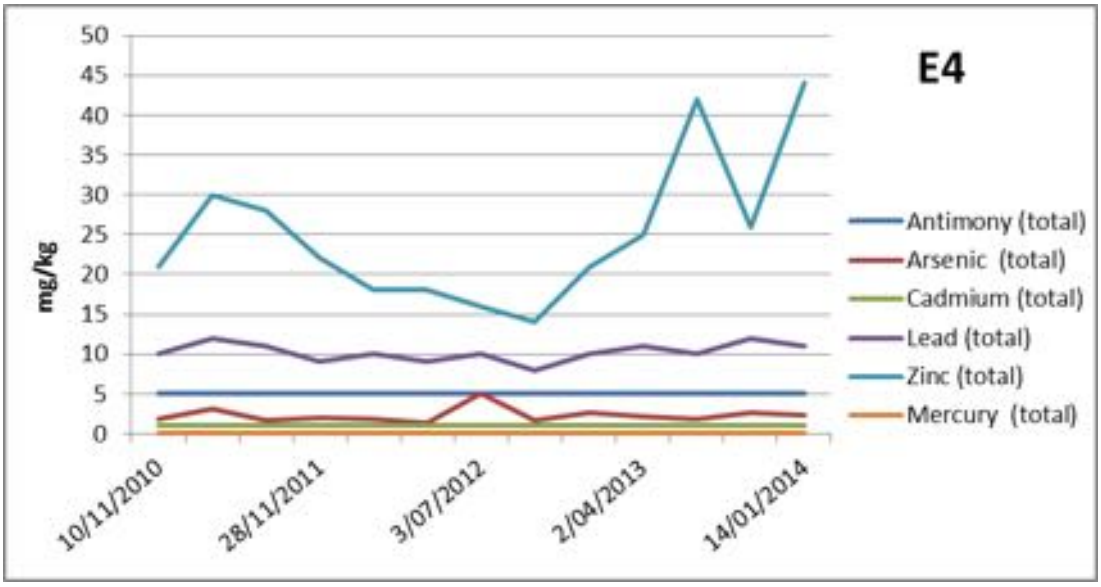


E3-Lake Sediment Metals - Dissolved

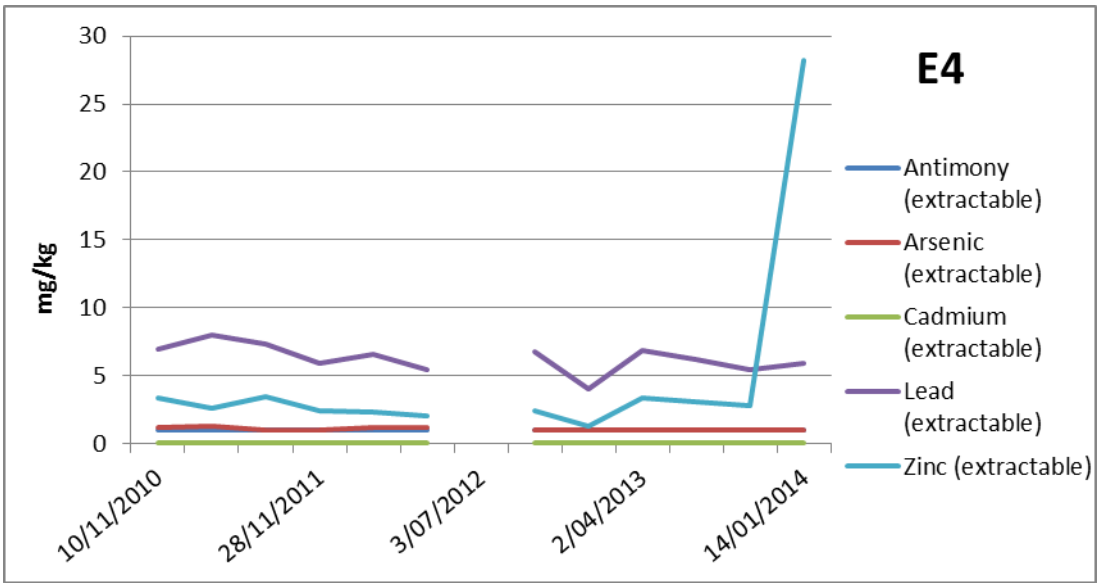


Dissolved metals not analysed in the third quarter 2012

E4-Lake Sediment Metals - Total

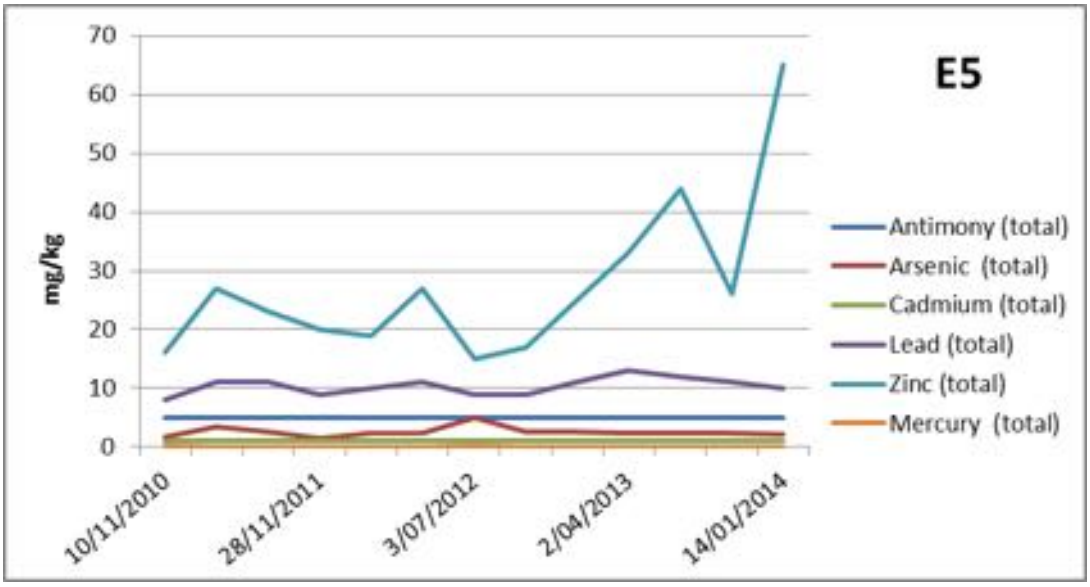


E4-Lake Sediment Metals - Dissolved

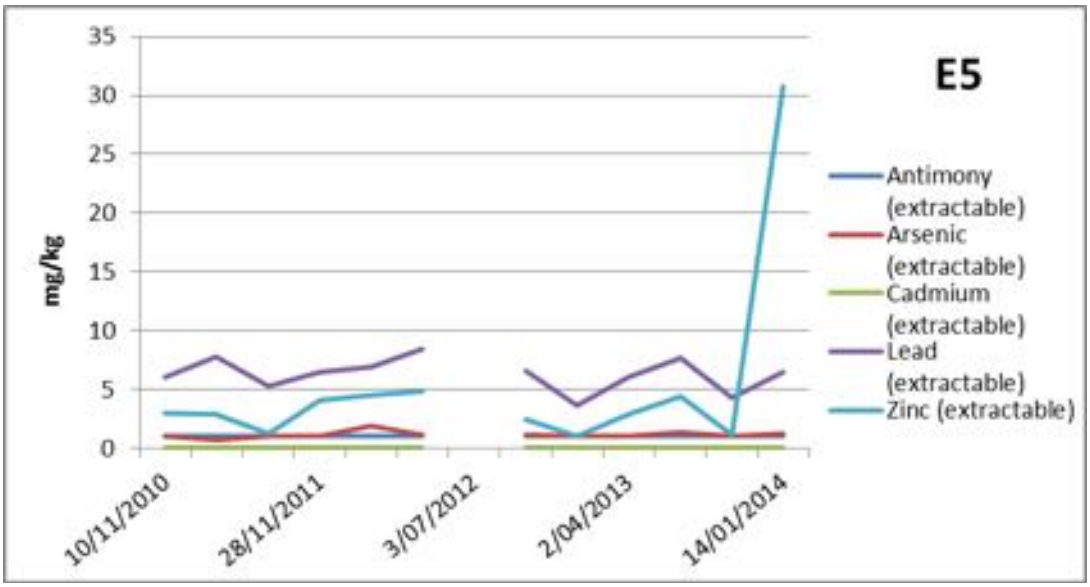


Dissolved metals not analysed in the third quarter 2012

E5-Lake Sediment Metals - Total

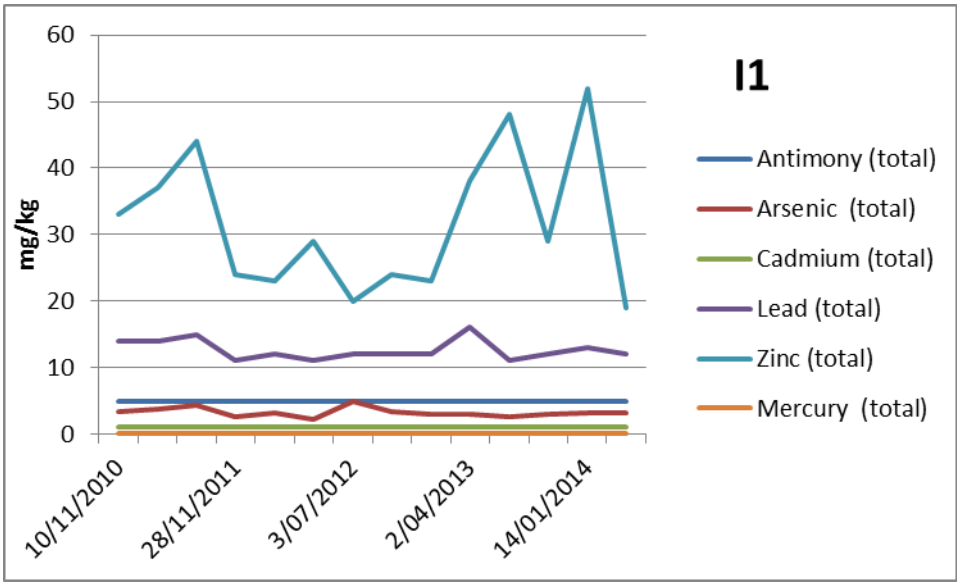


E5-Lake Sediment Metals - Dissolved

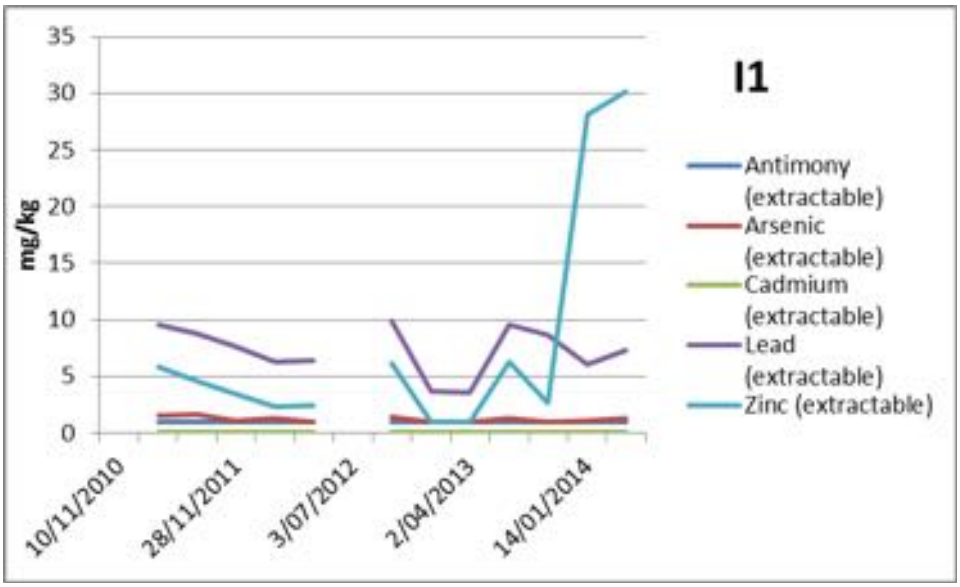


Dissolved metals not analysed in the third quarter 2012

I1-Lake Sediment Metals - Total

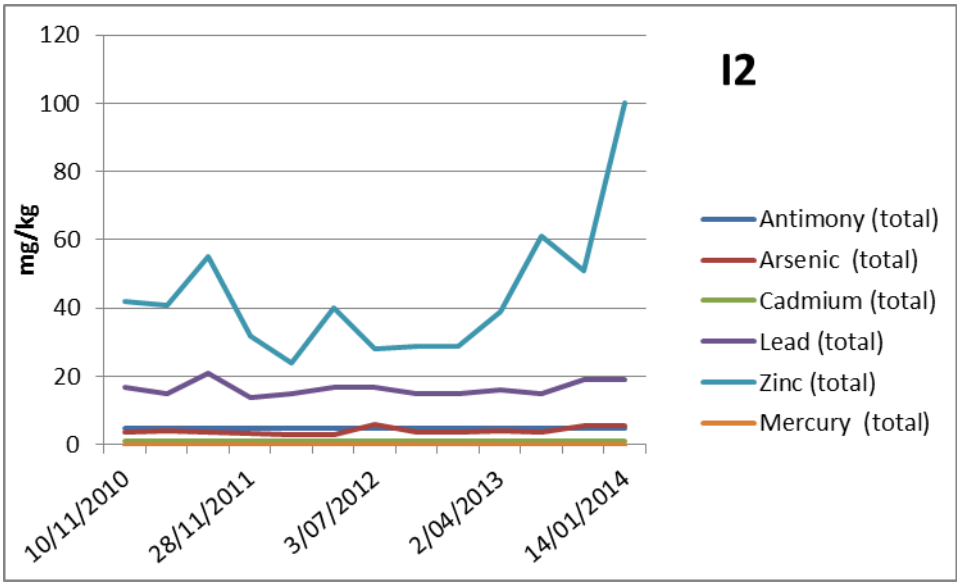


I1-Lake Sediment Metals - Dissolved

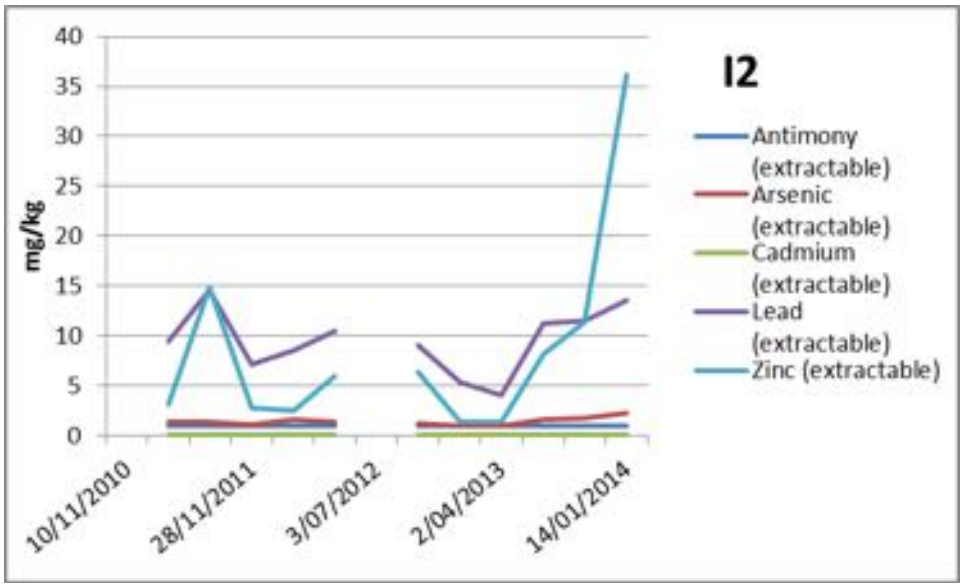


Dissolved metals not analysed in the third quarter 2012

I2-Lake Sediment Metals - Total

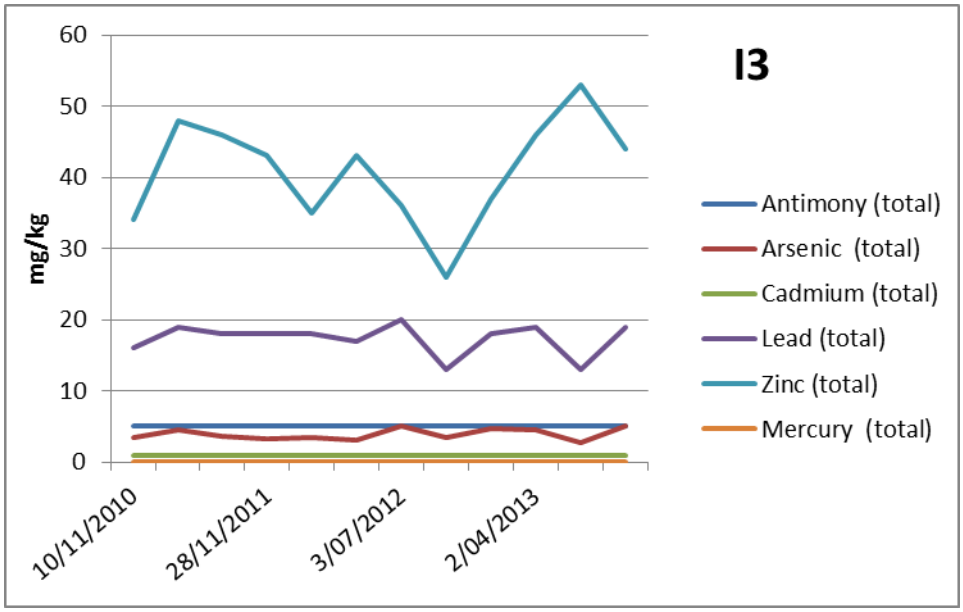


I2-Lake Sediment Metals - Dissolved

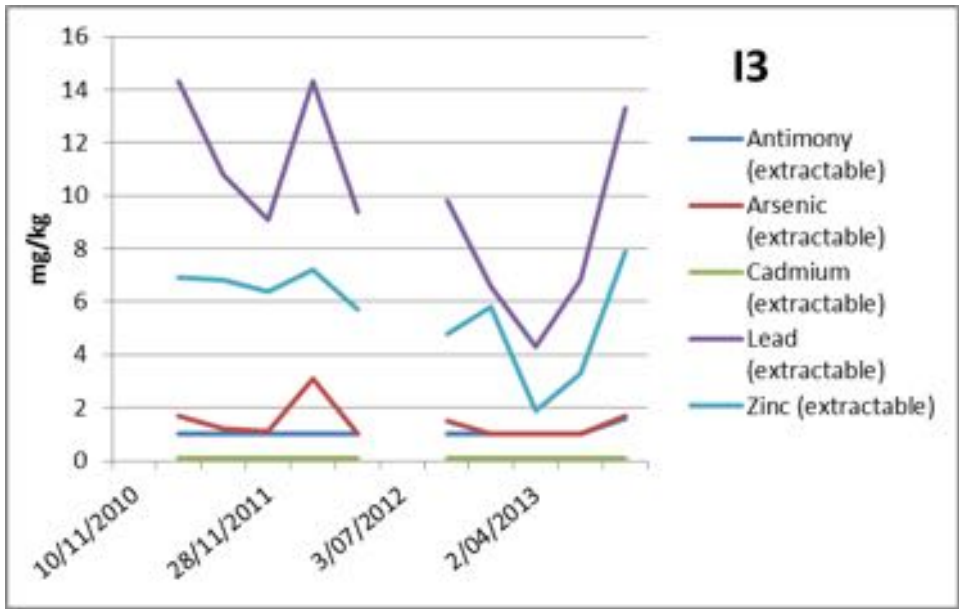


Dissolved metals not analysed in the third quarter 2012

I3-Lake Sediment Metals - Total

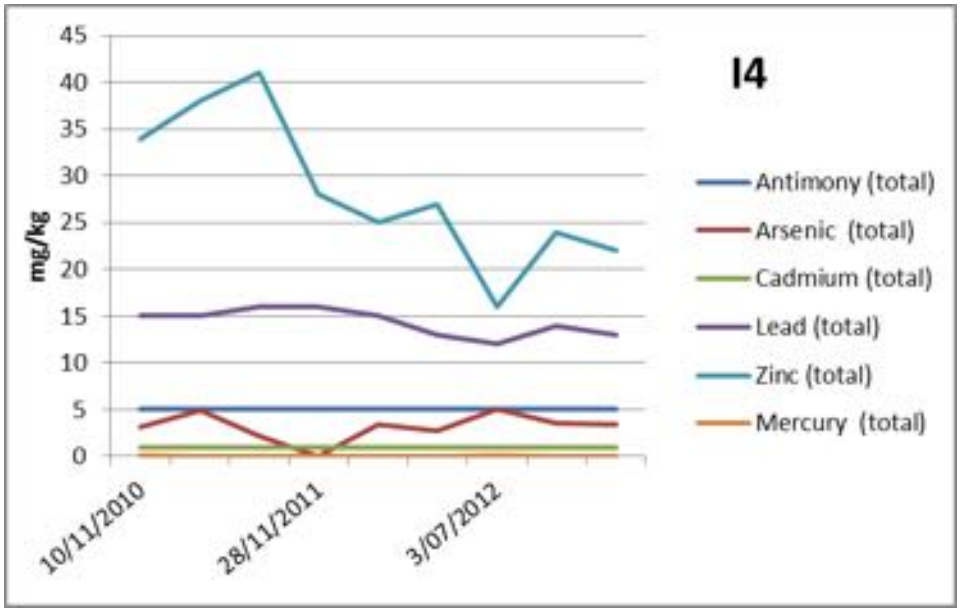


I3-Lake Sediment Metals - Dissolved

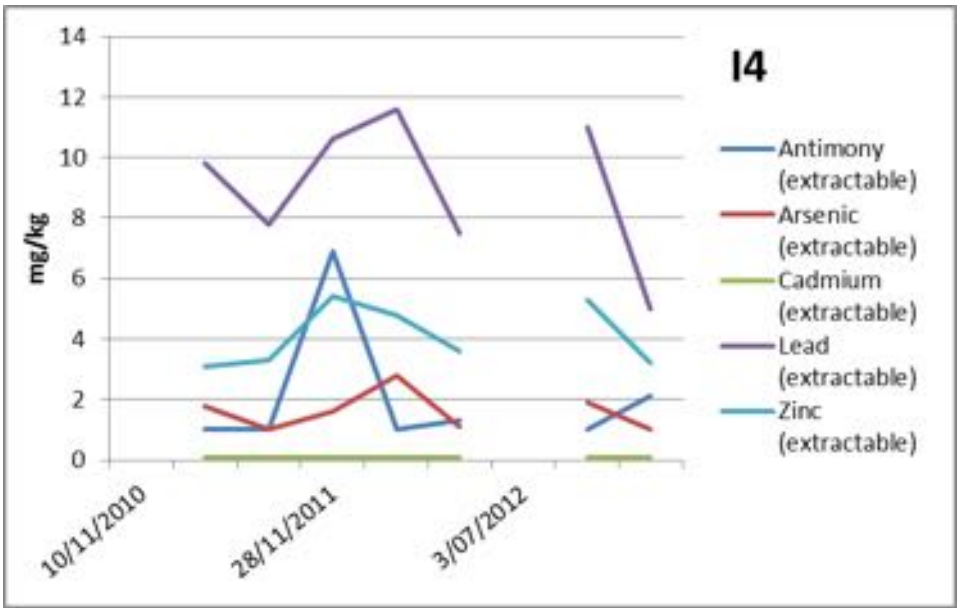


Dissolved metals not analysed in the third quarter 2012

I4-Lake Sediment Metals - Total

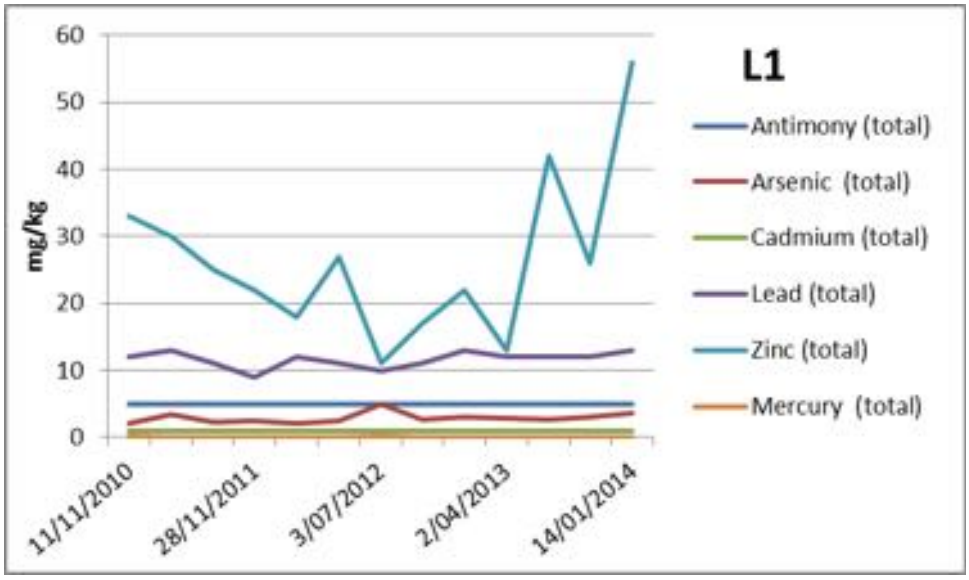


I4-Lake Sediment Metals - Dissolved

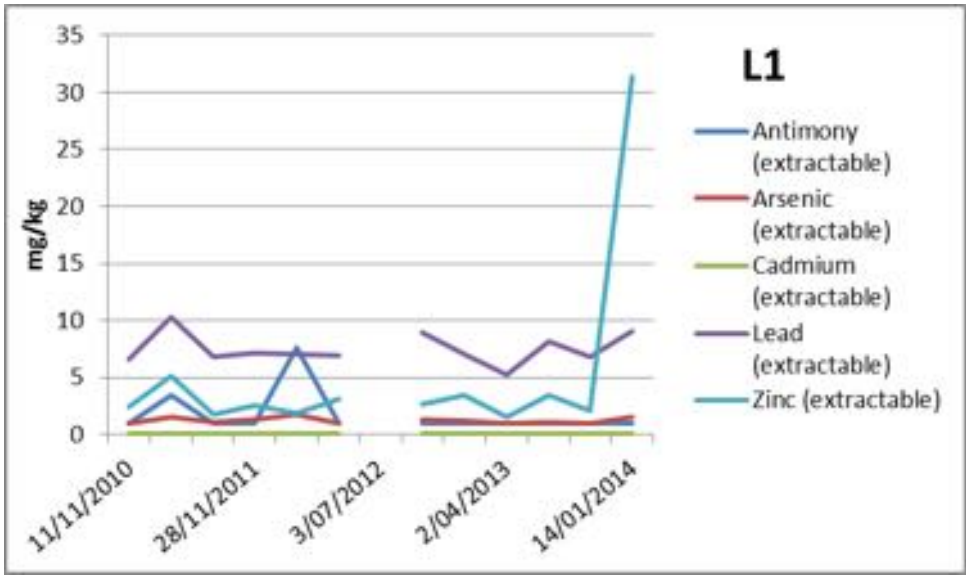


Dissolved metals not analysed in the third quarter 2012

L1-Lake Sediment Metals - Total

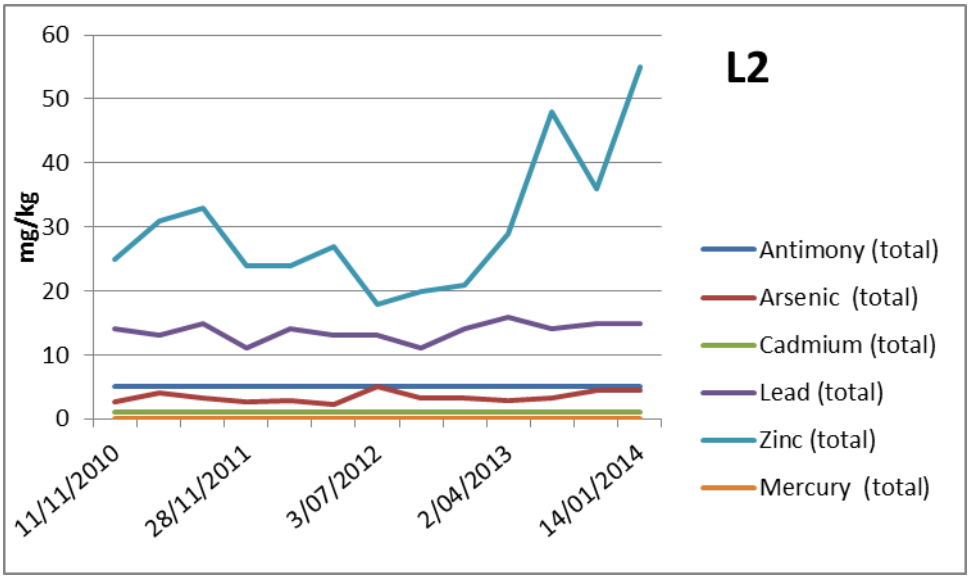


L1-Lake Sediment Metals - Dissolved

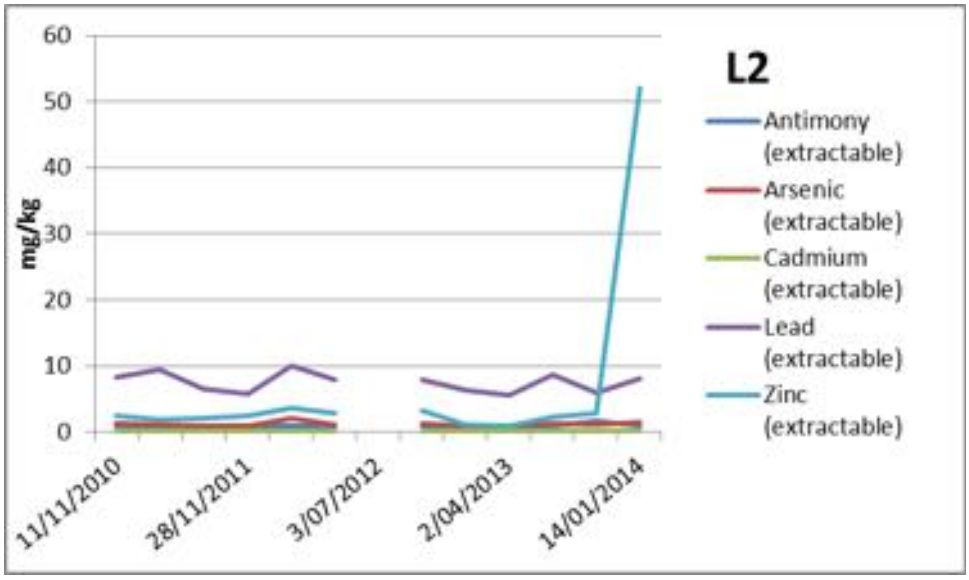


Dissolved metals not analysed in the third quarter 2012

L2-Lake Sediment Metals - Total

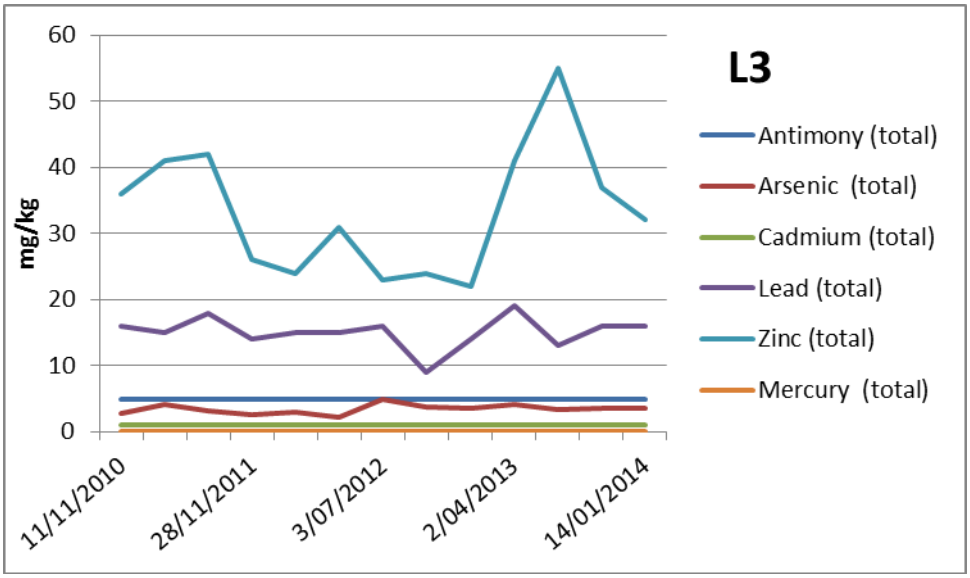


L2-Lake Sediment Metals - Dissolved

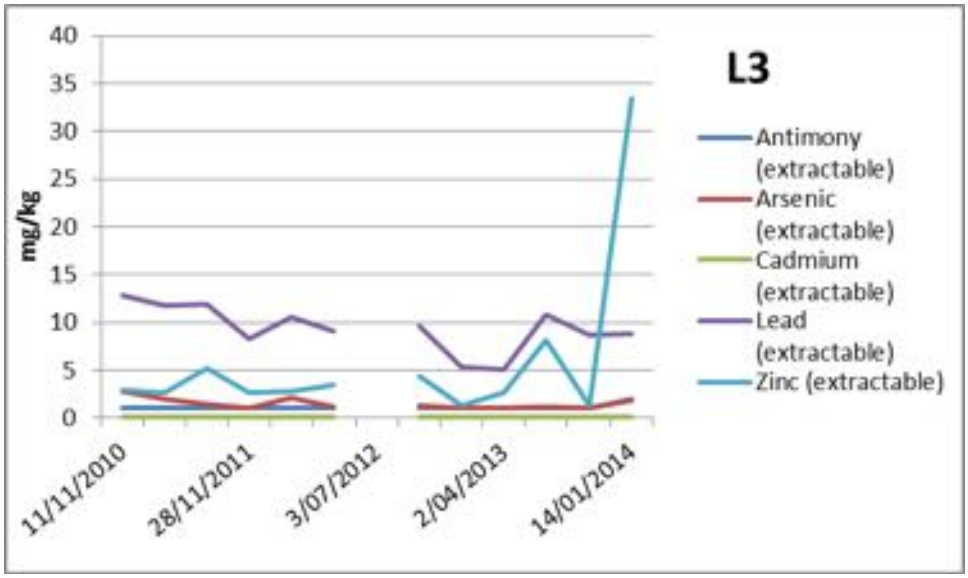


Dissolved metals not analysed in the third quarter 2012

L3-Lake Sediment Metals - Total

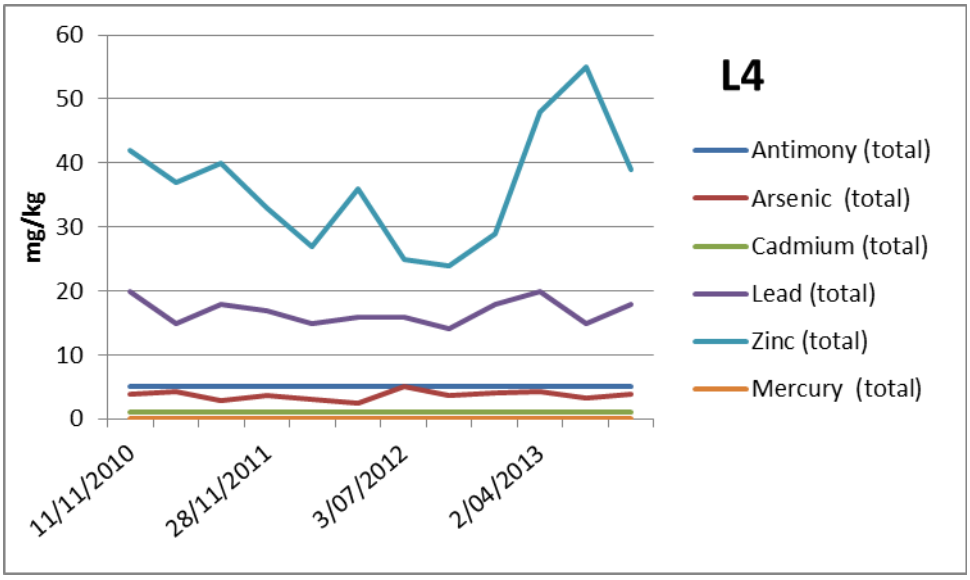


L3-Lake Sediment Metals - Dissolved

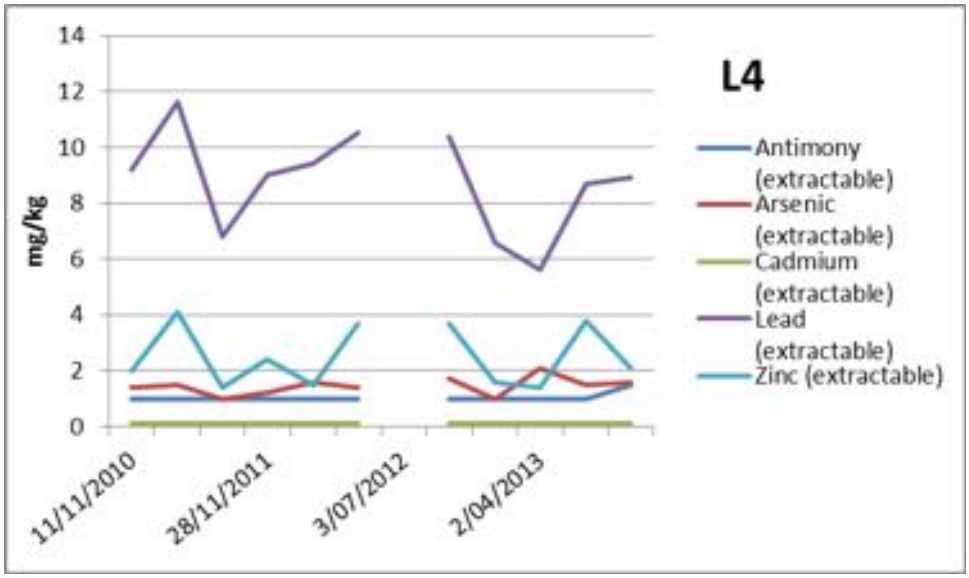


Dissolved metals not analysed in the third quarter 2012

L4-Lake Sediment Metals - Total

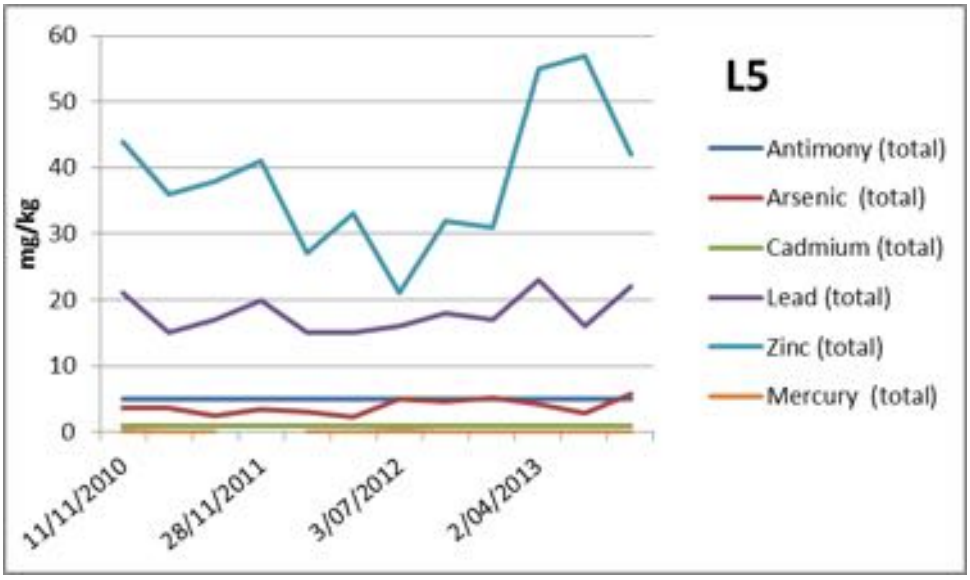


L4-Lake Sediment Metals - Dissolved

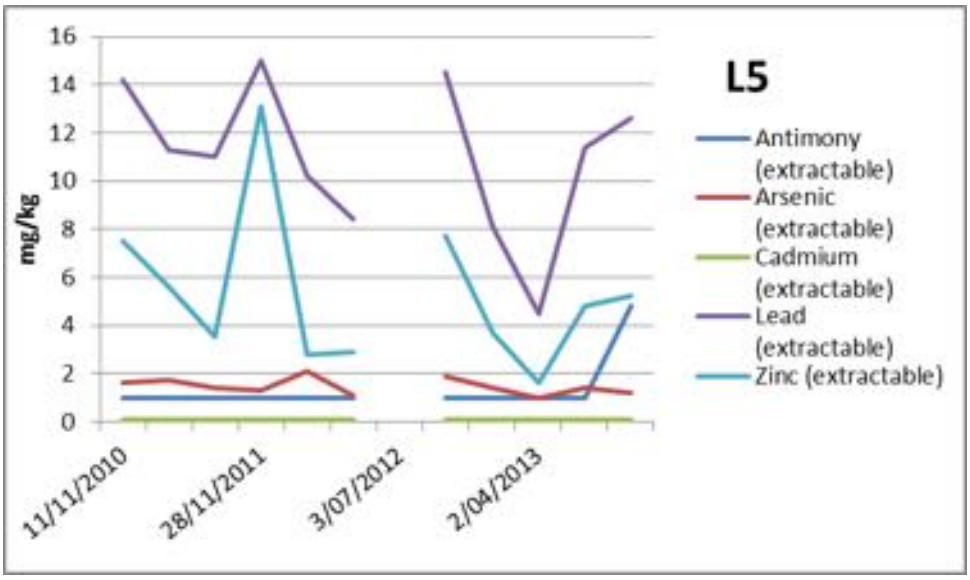


Dissolved metals not analysed in the third quarter 2012

L5-Lake Sediment Metals - Total

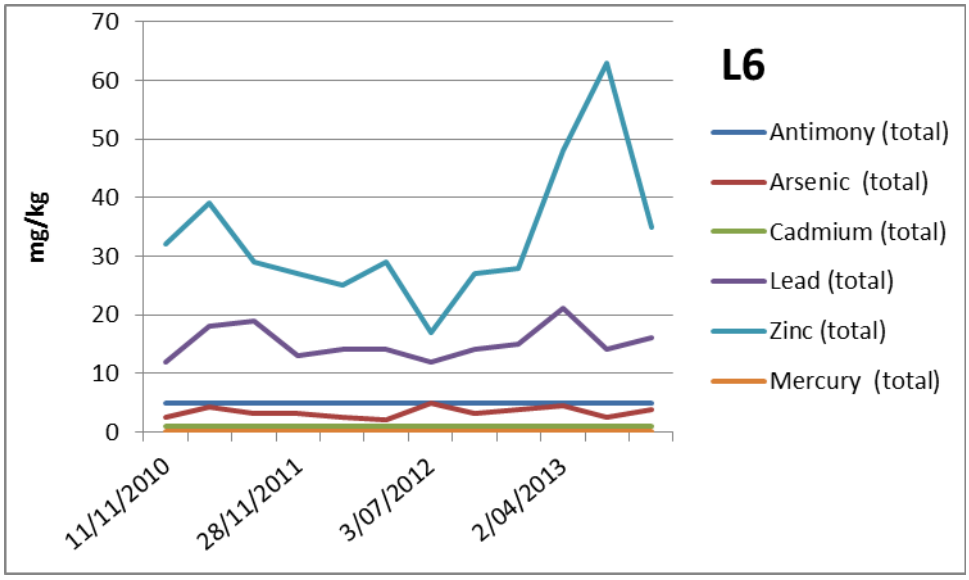


L5-Lake Sediment Metals - Dissolved

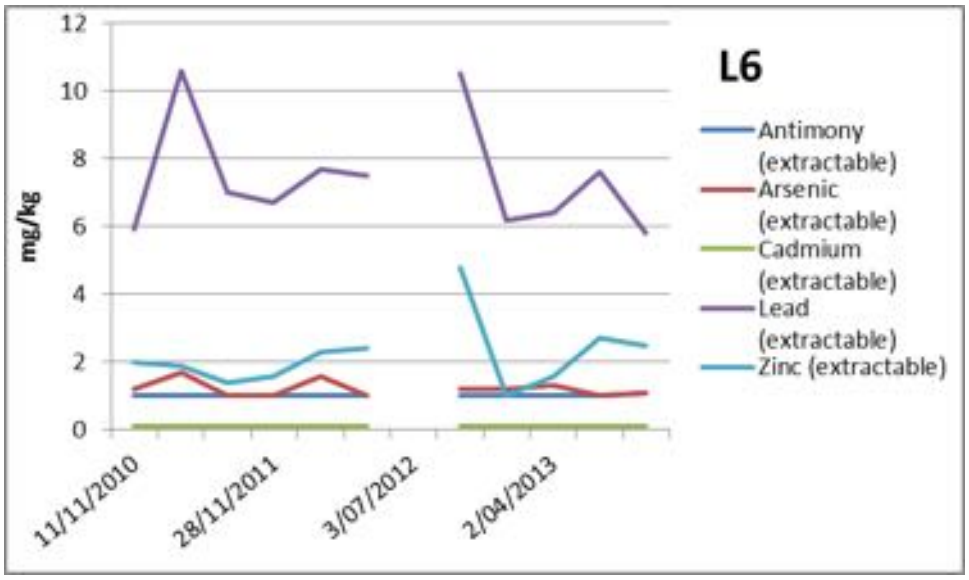


Dissolved metals not analysed in the third quarter 2012

L6-Lake Sediment Metals - Total

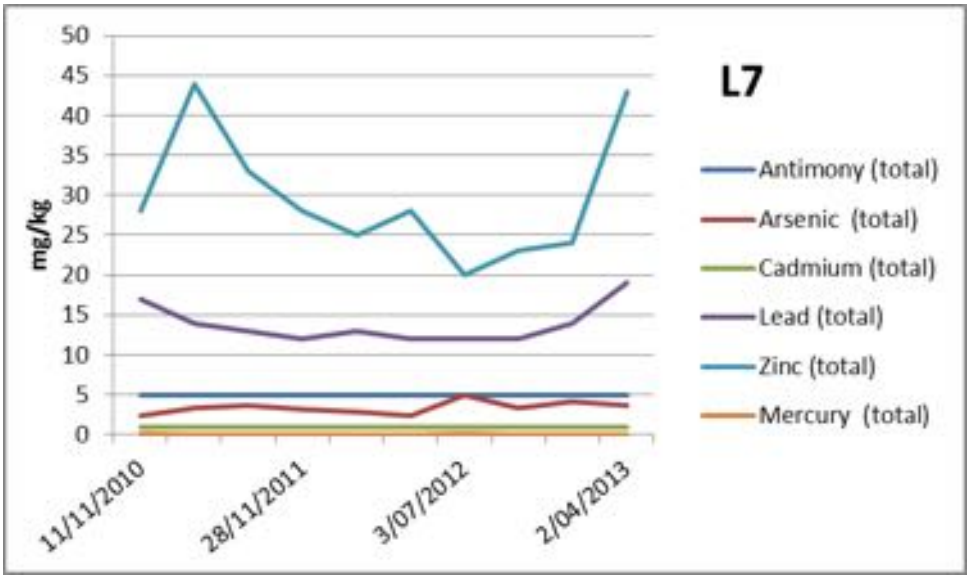


L6-Lake Sediment Metals - Dissolved



Dissolved metals not analysed in the third quarter 2012

L7-Lake Sediment Metals - Total



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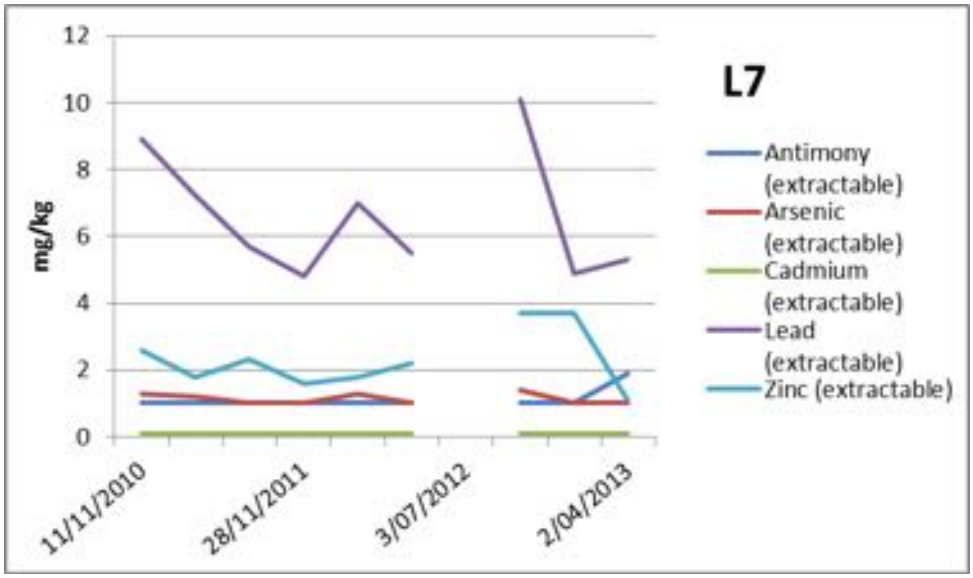
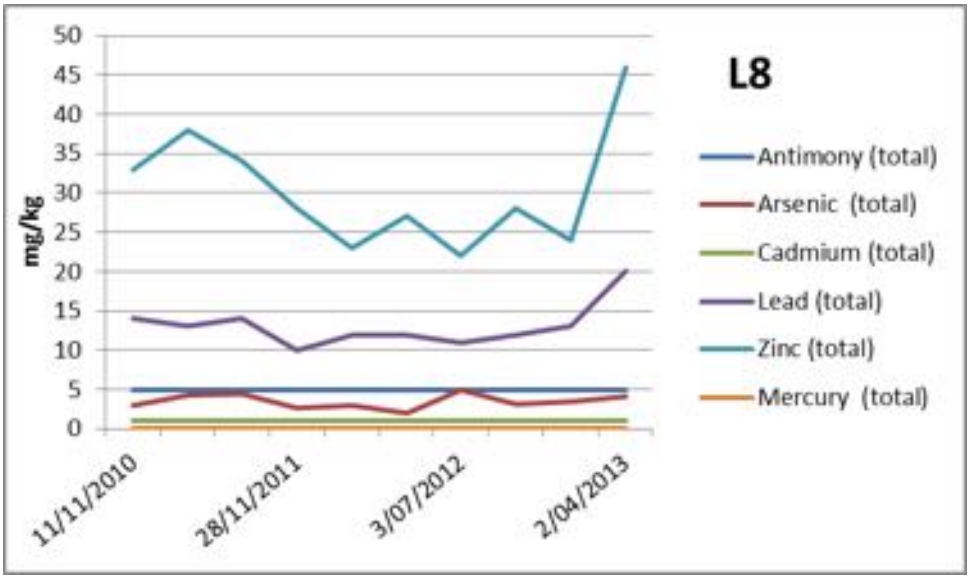
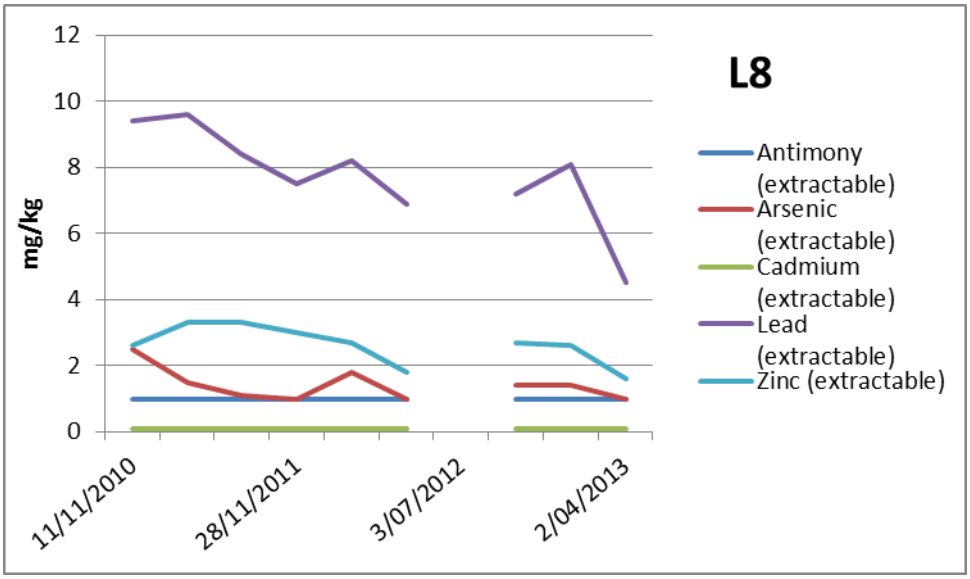


Dissolved metals not analysed in the third quarter 2012

L8-Lake Sediment Metals - Total

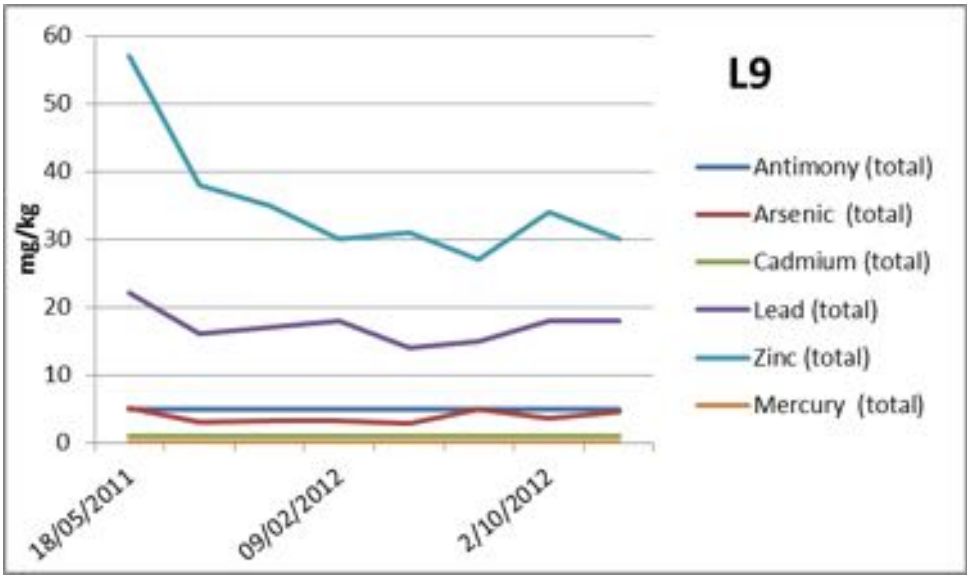


L8-Lake Sediment Metals - Dissolved



Dissolved metals not analysed in the third quarter 2012

L9-Lake Sediment Metals - Total



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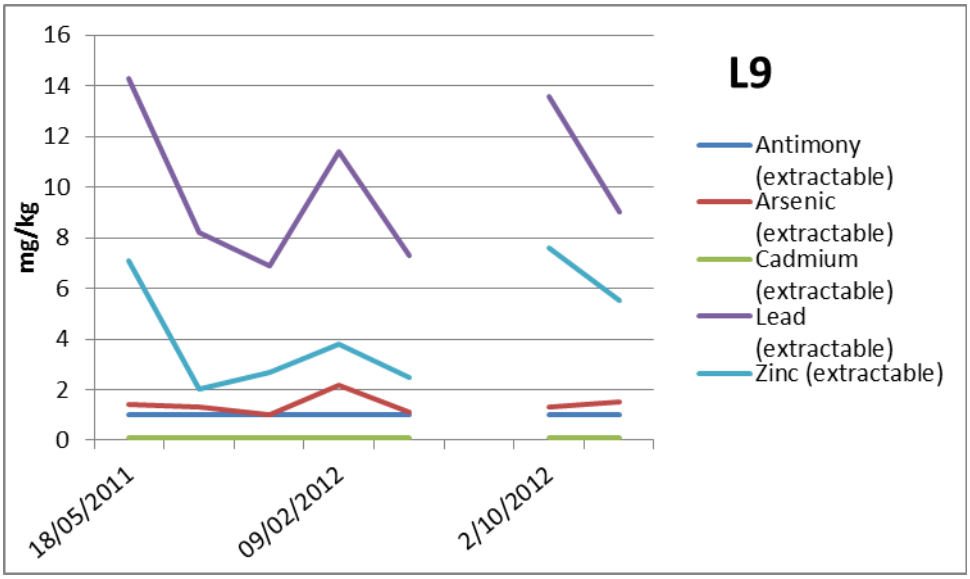
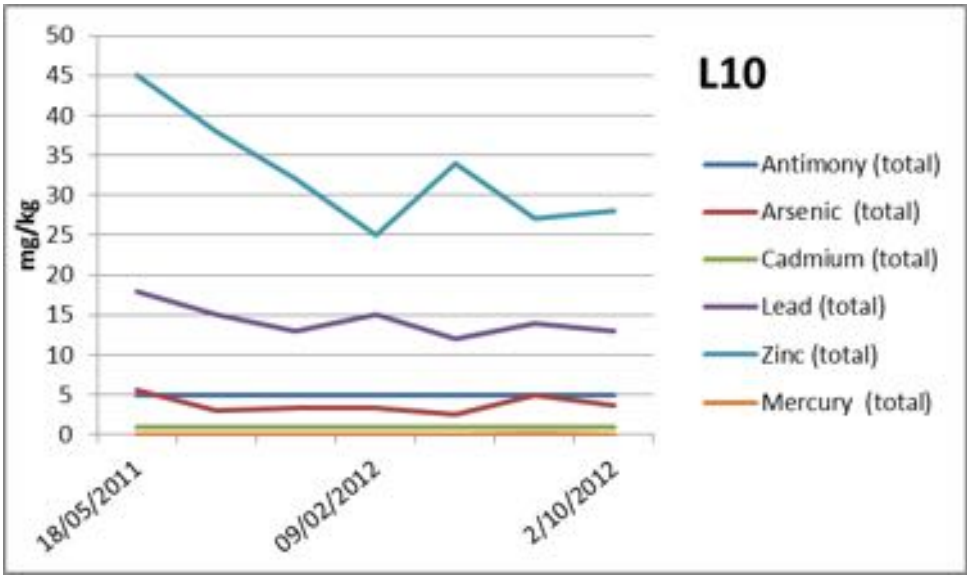
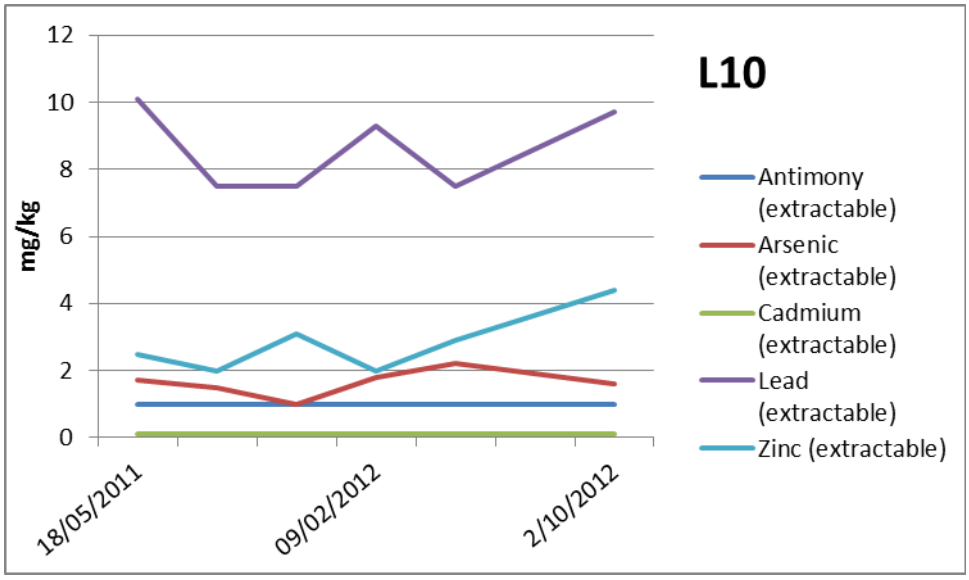


Dissolved metals not analysed in the third quarter 2012

L10-Lake Sediment Metals - Total

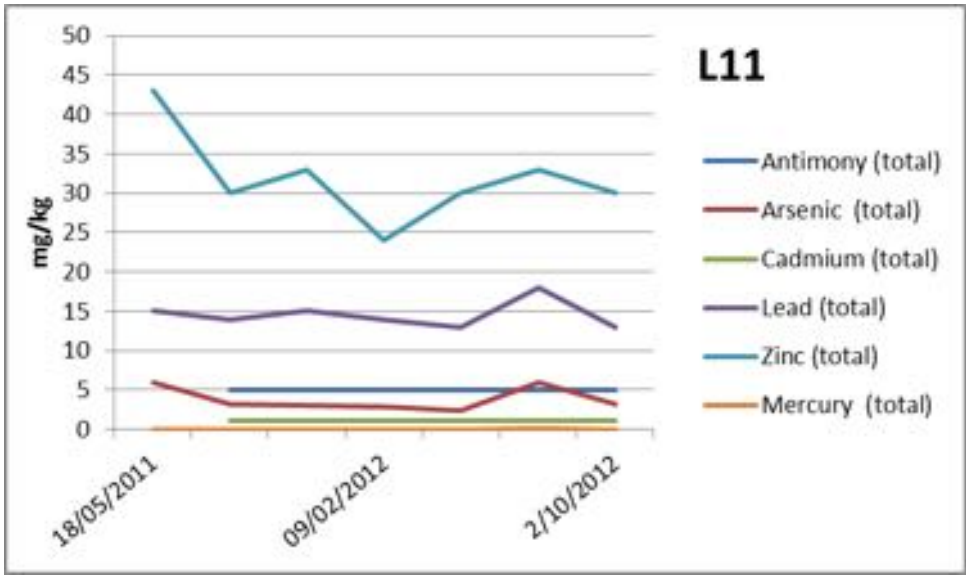


L10-Lake Sediment Metals - Dissolved

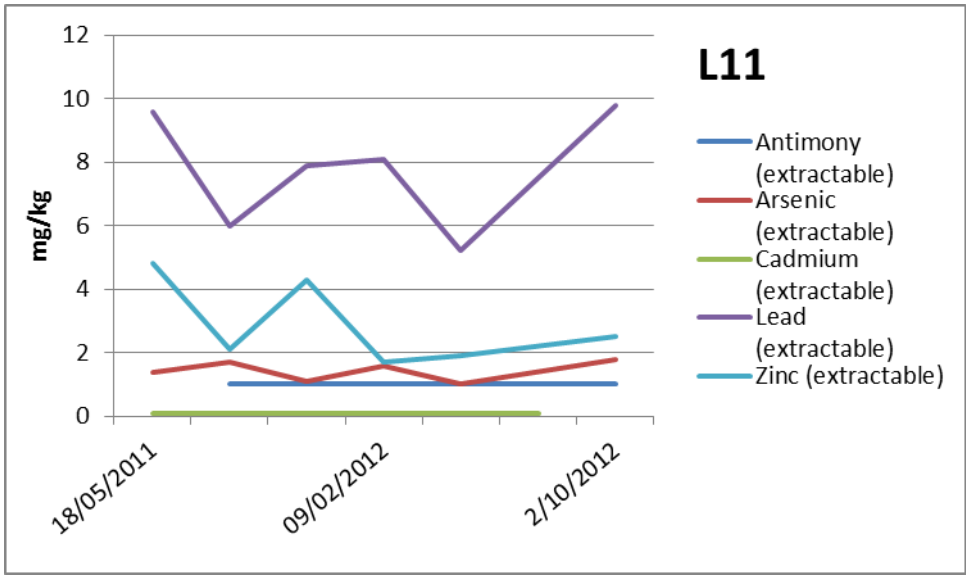


Dissolved metals not analysed in the third quarter 2012

L11-Lake Sediment Metals - Total

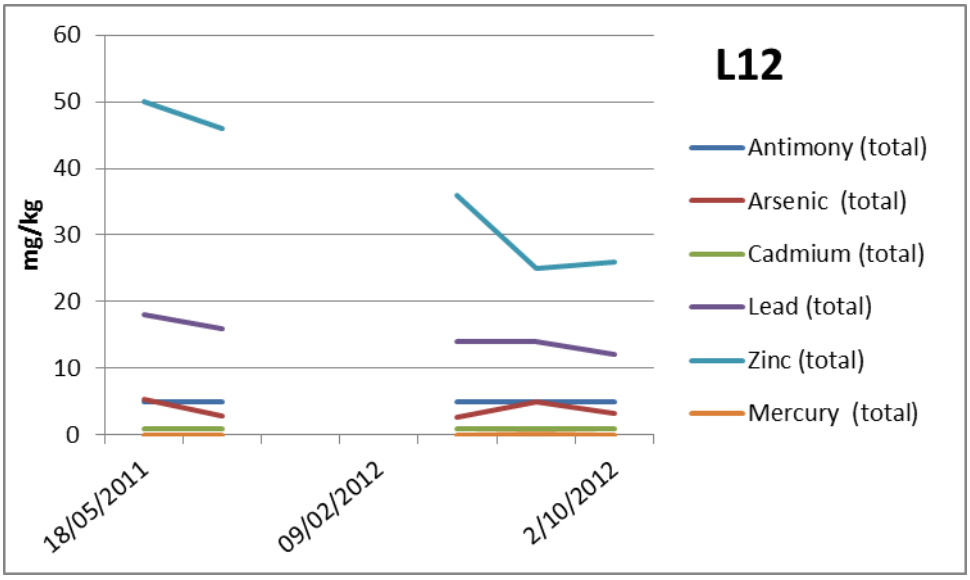


L11-Lake Sediment Metals - Dissolved



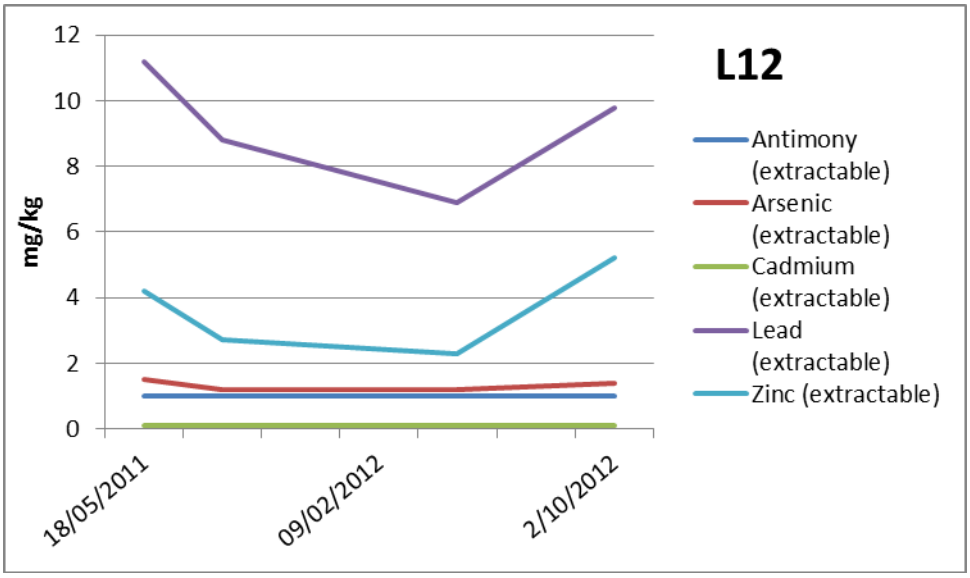
L11 not sampled when water level drops too low

L12-Lake Sediment Metals - Total



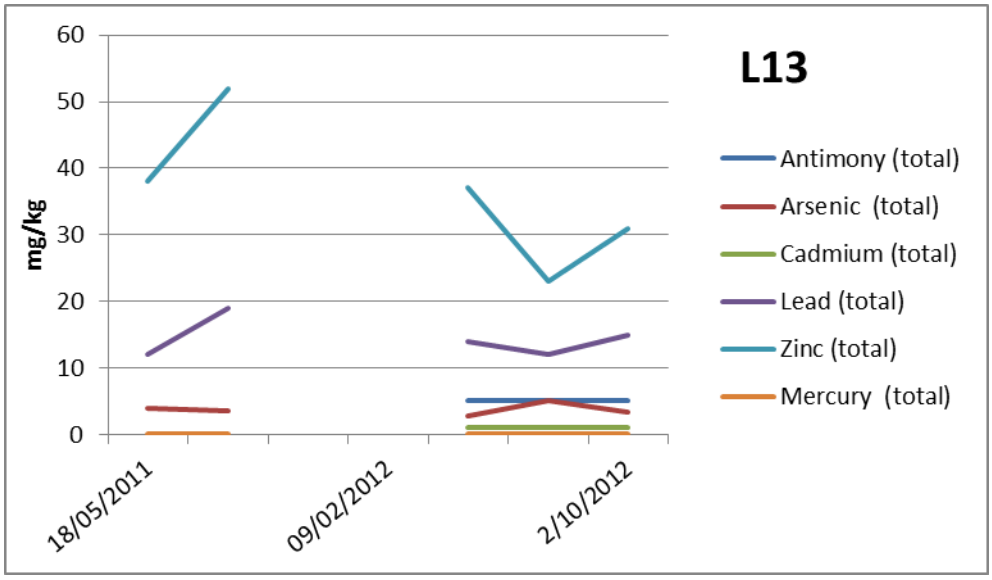
Total metals not analysed in some periods due to low lake water level

L12-Lake Sediment Metals - Dissolved



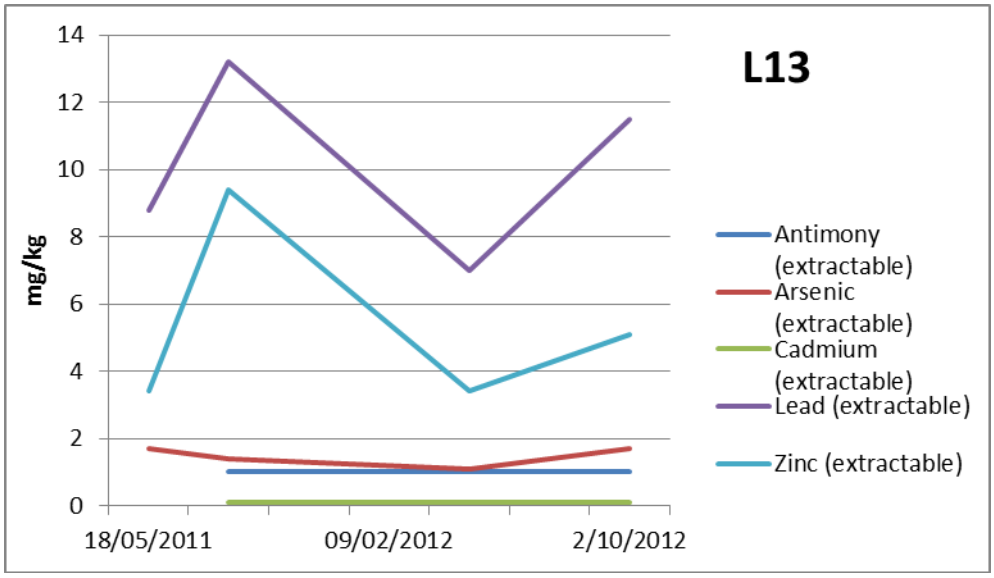
Dissolved metals not analysed in some periods due to low lake water level

L13-Lake Sediment Metals - Total



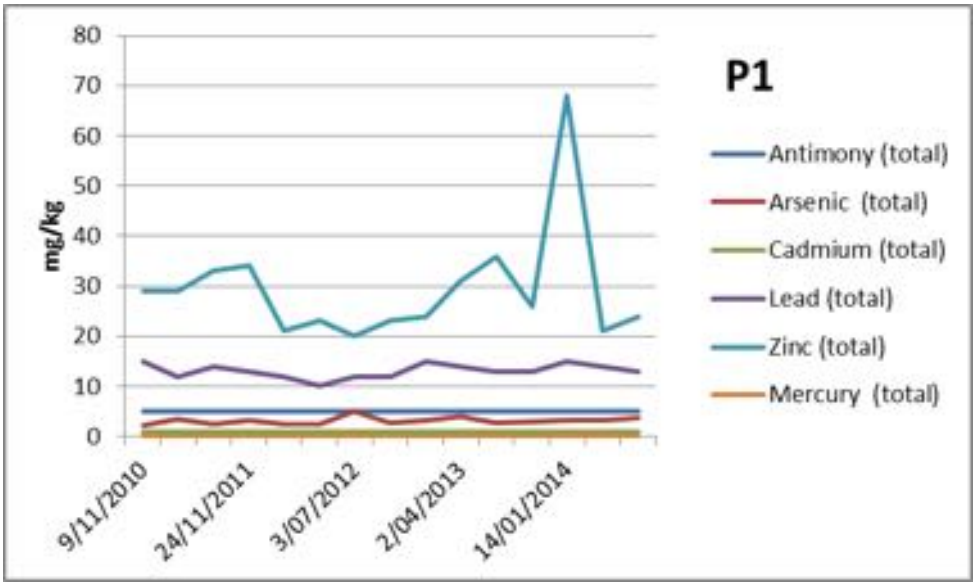
Total metals not analysed in some periods due to low lake water level

L13-Lake Sediment Metals - Dissolved

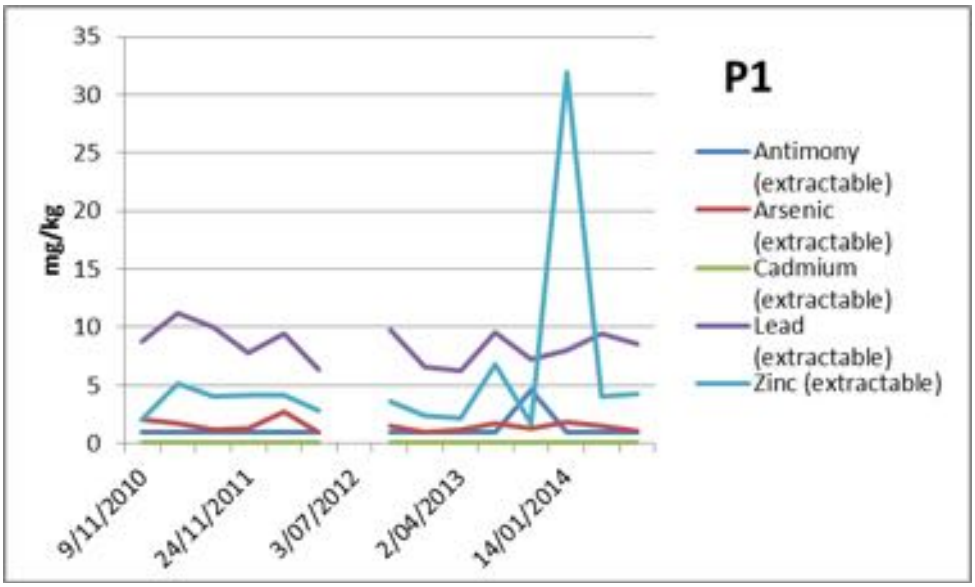


Dissolved metals not analysed in some periods due to low lake water level

P1-Lake Sediment Metals - Total

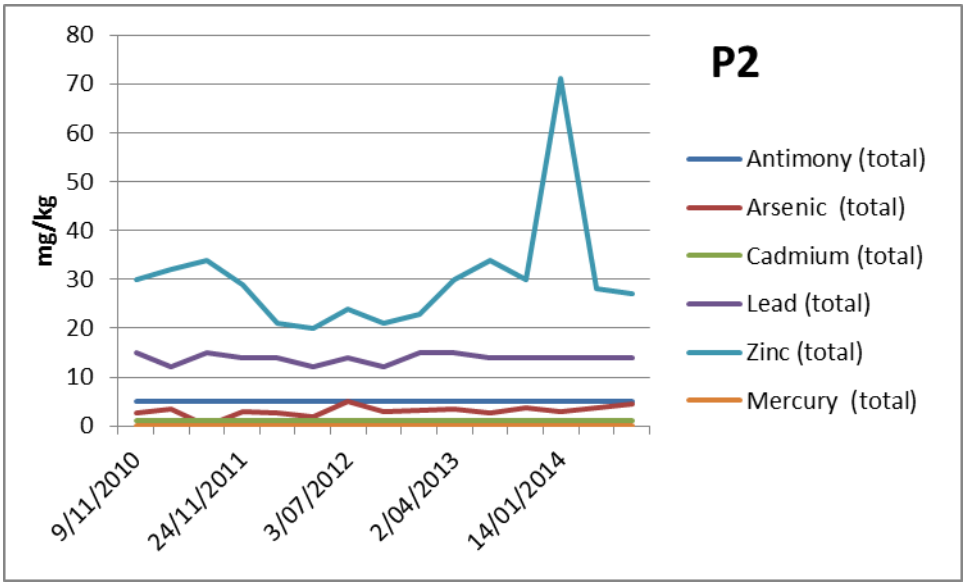


P1-Lake Sediment Metals - Dissolved

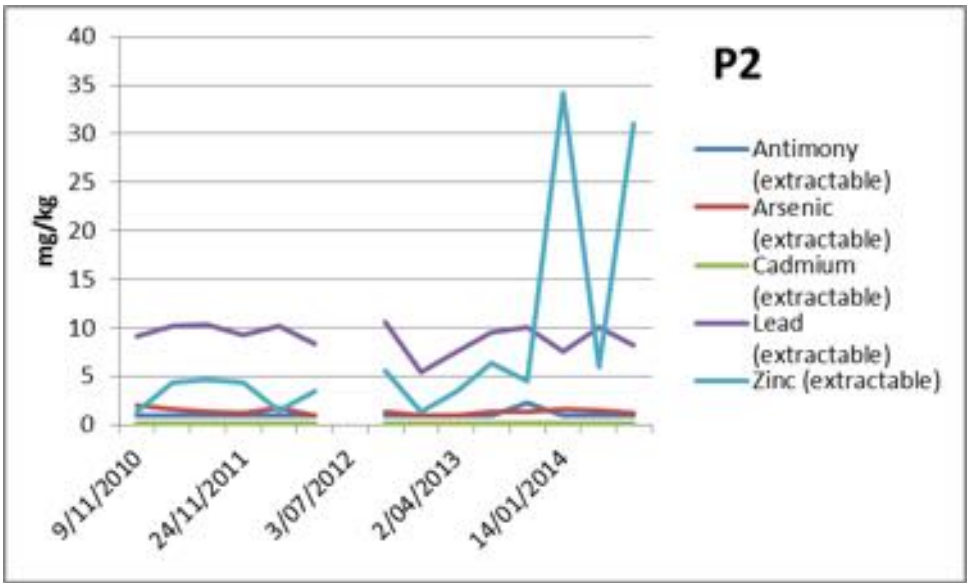


Dissolved metals not analysed in the third quarter 2012

P2-Lake Sediment Metals - Total

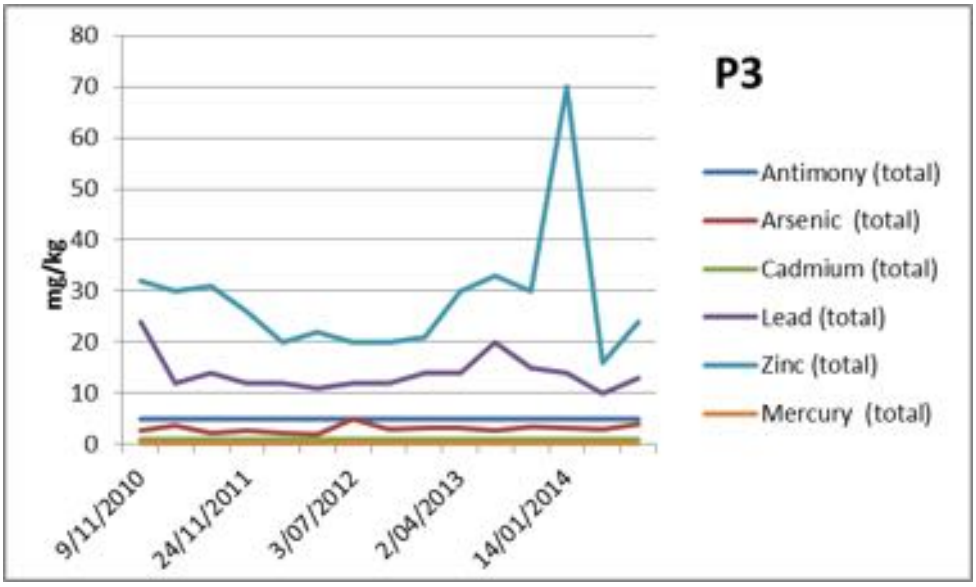


P2-Lake Sediment Metals - Dissolved

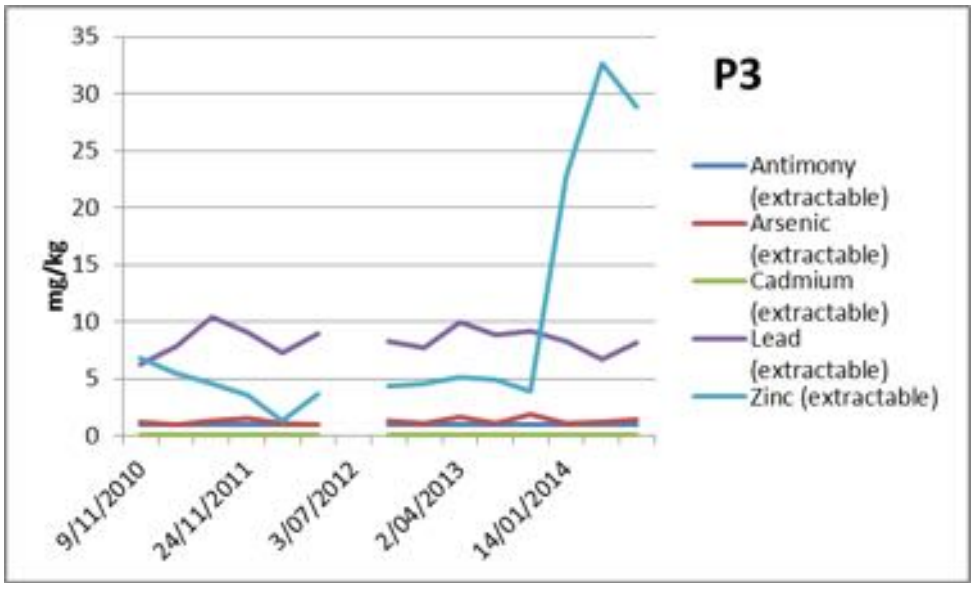


Dissolved metals not analysed in the third quarter 2012

P3-Lake Sediment Metals - Total



P3-Lake Sediment Metals - Dissolved



Dissolved metals not analysed in the third quarter 2012

APPENDIX E

COMMUNITY ENVIRONMENTAL MONITORING AND CONSULTATIVE COMMITTEE MEETING MINUTES

MINUTES OF MEETING

COWAL GOLD MINE
COMMUNITY ENVIRONMENTAL MONITORING
AND CONSULTATIVE COMMITTEE (CEMCC)

Wednesday 4 March 2014
9.00 am – Cowal Gold Mine
Minutes taken by: Shane Goodwin

Attendees:

Independent Chair:	Margaret MacDonald-Hill (MMH)
Barrick:	Garry Pearson (GP), Shane Goodwin (SG)
Community Members:	Angus Stitt (AS), Lucy Buttenshaw (LB) and Dave Carter (DC)
Bland Shire Council:	Neil Pokoney (NP)
Forbes Shire Council:	Graeme Miller (GM)
Lake Cowal Foundation:	Daryl Nielsen (DN)

Apologies: Jenene McGrath, Bruce Dent, Cr Graham Scott, David Carter, Ally Coe, Cr Brian Mattiske, Cr Leeanne Hampton.

ITEM	ACTION
1.0 Welcome Independent Chair, Margaret MacDonald-Hill opened the meeting at 9.08 am.	
2.0 Declaration of Interest Margaret MacDonald-Hill declared her interest as Independent Chair of the CEMCC, appointed by the Director General of the Department of Planning and Infrastructure. For record purposes, Margaret advised the committee she is a member of the Mine Subsidence Board. Margaret also declared that she receives payment via a Trust established by the Bland Shire Council for her work as Chair of the CEMCC. For a full Declaration of Interest for all members, see Attachment A	
3.0 Business Arising from previous Minutes Nil	

Correspondence

In
22/12/14 - email Barrick NF&O incident report
13/2/15 - email Barrick on Revised RMP& Long term Land Use Strategy
13/2/15 - email Barrick NF&O incident report
2/3/15 - email Barrick on Revised Decommissioning Strategy for Water Management Structures & Long term Management of Final Void and Lake Protection Bund

Out
16/2/15 - email to CEMCC Revised RMP & Long term Land Use Strategy
2/3/15 - forward email 2/3/15 to CEMCC

4.0 Reports

Shane Goodwin provided a detailed account of Barrick Cowal's Community Relations Activities over the past three months – See the attached presentation for more information (Attachment B). He also provided a briefing on Barrick's recent Q4 2014 Results Announcement which included comments relevant to the ongoing ownership of the Cowal Gold Mine.

- Community Relations activities
- Complaints/Grievances
- Upcoming activities
- Cowal Partnering Program

Complaints/Grievances

The 5 complaints received since the last meeting were from five individual stakeholders:

- The complaints received relate to:
  - Driver behaviour (3)
  - Employee behaviour (1)
  - Property damage (1)

Garry Pearson provided a detailed account of Barrick Cowal's Environment Department Activities over the past three months – See the attached presentation for more information (Attachment C).	
5.0 General Business It was requested that future meeting minutes include a list of Common Acronyms and their definitions (Attachment D) 2015 Preliminary Meeting Schedule: • 4 March, 2015 – Cowal Gold Mine • 3 June 2015, Venue TBA • 9 September 2015, Venue TBA • 2 December 2015, Venue TBA	
6.0 Meeting Closed –11.45am Available CEMCC Members were invited to go on a guided tour of the Cowal Gold Mine following the meeting.	
7.0 Next Meeting Wednesday 3rd June 2015, at Bland Shire Council Chambers, West Wyalong.	

ATTACHMENT A – CEMCC MEMBERS' DECLARATIONS OF INTEREST

Community Environmental Monitoring and Consultative Committee (CEMCC)

Declarations of interest:

Margaret MacDonald-Hill - Independent Chair

- ***Appointed by DG of DP&E, paid via Trust administered by Bland Shire Council***
- ***Member of the Mine Subsidence Board***

Angus Stitt – Community Representative, West Wyalong

- Receives reimbursement of travel costs for attending CEMCC meetings, from time to time

Lucy Buttenshaw – Community Representative, West Wyalong

- Nil

Jenene McGrath – Community Representative, West Wyalong

- Nil

David Carter – Community Representative, Condobolin

- Nil

Bruce Dent – Lake Cowal Landholders Association

- Noise Mitigation Agreement in accordance with Development Consent Conditions
- Receives reimbursement of travel costs for attending CEMCC meetings, from time to time

Neil Pokoney – Bland Shire Council Representative

- Barrick is a ratepayer within the Bland Shire
- Barrick has entered into a Roads Maintenance MOU with Bland Shire Council
- Barrick has provided financial support for certain community events, initiatives, and infrastructure operated by the Bland Shire Council

Graham Scott – Lachlan Shire Council Representative

- Barrick has been a ratepayer within the Lachlan Shire
- Barrick is a customer (subscriptions and advertising) of The Lachlander newspaper, of which, Cr Scott is the Editor
- Barrick has entered into a Roads Maintenance MOU with Lachlan Shire Council
- Barrick has provided financial support for certain community events, initiatives, and infrastructure operated by the Lachlan Shire Council

Brian Mattiske – Forbes Shire Council Representative

- Barrick is a ratepayer within the Forbes Shire
- Barrick pays annual easement payments to the Forbes Shire Council for properties owned by Council
- Barrick pays annual easement payments to entities which Mr Mattiske maintains a financial interest in for properties owned by those entities
- Barrick pays an annual fee for Temporary Water Transfer Agreements to entities which Mr Mattiske maintains a financial interest
- Barrick has provided financial support for certain community events, initiatives, and infrastructure operated by the Forbes Shire Council

Graeme Miller – Forbes Shire Council Representative

- Barrick is a ratepayer within the Forbes Shire
- Barrick pays annual easement payments to the Forbes Shire Council for properties owned by Council
- Barrick has provided financial support for certain community events, initiatives, and infrastructure operated by the Forbes Shire Council

Daryl Nielsen – Lake Cowal Foundation and Independent Scientist

- Receives reimbursement of travel costs for attending CEMCC meetings, from time to time
- Director of Lake Cowal Foundation which receives annul payments from Barrick

Ally Coe – Wiradjuri Condobolin Corporation

- Wiradjuri Condobolin Corporation receives compensation payments in accordance with Native Title requirements
- Wiradjuri Condobolin Corporation is a contractor to Barrick at the Cowal Gold Project

ATTACHMENT B – COMMUNITY RELATIONS DEPARTMENT PRESENTATION

Community Relations

BARRICK

- Community Relations Team activities
- Complaints/Grievances
- Upcoming activities
- Cowal Partnering Program

Community Relations

BARRICK

Activities since the last CEMCC Meeting:

- 2014 Employee and Contractor Christmas Parties
- 2015 Wiradjuri Scholarships
- 2014 Cowal Partnering Program – Round 1
- Q4 2014 Barrick Announcement
- Cowal Update distributed to stakeholders
- ETBC and CPCC Meetings with Wiradjuri Condobolin Corporation

Upcoming activities:

- Triennial Native Title Deed Implementation Review
- Presentation of Annual Native Title Deed Implementation Report

3

Cowal Update

BARRICK


BARRICK CowalUpdate

INSIDE

Road Safe September back for sixth successful year

4

Complaints/Grievances

BARRICK

- CGM received five (5) complaints since the last meeting of the CEMCC which was held on 3 December 2014.
- The five complaints received relate to:
  - Driver behaviour: 3
  - Employee behaviour: 1
  - Property damage: 1
- The complaints were from a selection of stakeholders:
  - Complainant A: 20% (1)
  - Complainant B: 20% (1)
  - Complainant C: 20% (1)
  - Complainant D: 20% (1)
  - Complainant E: 20% (1)

3

Complaints/Grievances

BARRICK

Employee Behaviour:

- The Complainant attempted to call the Coval Gold Mine's Community Relations Manager directly at 10:53am on 04/12/2015 and left a message on the automated answering service.
- The Community Relations Manager returned the Complainant's call at 11:46am on the same day.
- The Complainant advised that they were dissatisfied with the outcome of an engagement between the Complainant and a representative of the Coval Gold Mine.
- The Complainant advised that the Mine's representative had contacted the Complainant to request that the Complainant remove their stock (cattle) from Coval Gold Mine Mining owned land.
- The Complainant went on to state that the Coval Gold Mine's representative had said they would remove the stock themselves to the nearby travelling stock route unless the complainant promptly removed the stock.
- The Complainant expressed their dissatisfaction with the nature of the conversation.
- The Community Relations Manager apologised to the Complainant and advised the Coval Gold Mine personnel would not take action to have the stock moved to the travelling stock route. The Coval Gold Mine would simply rely on the Complainant to remove their own stock from the mine-owned land when safe to do so.
- The Complainant and The Community Relations Manager discussed what other actions could be taken to prevent stock from moving onto Coval Gold Mine owned land as Lake Coval was receding and fencing was inadequate to prevent unwanted stock movement.
- Fencing is planned to be undertaken by the end of the year (2014) with costs shared between the Coval Gold Mine and the Complainant.
- The call ended with the Community Relations Manager reiterating the earlier apology and reassuring the Complainant that the stock would not be moved by Coval Gold Mine personnel.
- The cattle were removed by the Complainant and boundary fencing completed in 2014.

6

Complaints/Grievances

Property Damage:

- The Complainant called the CGM's Senior Community Relations Advisor at approximately 12:45pm on 29/01/2015 to advise that an exploration drill-rig had damaged one of the water pipes on his property.
- Barrick's representative asked when the Complainant thought that the damage may have occurred and the Complainant responded that it could have occurred prior to Christmas (2014).
- Barrick's representative responded that he was unaware of any exploration activity occurring on the property either before Christmas or since that time, however Barrick's representative undertook to seek confirmation of this and get back to the Complainant.
- Barrick's representative contacted the Complainant again via telephone at 1:10pm on 29/01/2015 to confirm that no Barrick personnel or equipment had entered the Complainant's property either in late 2014 or early 2015.
- The Complainant advised that they had seen drill rigs on the property and identified other nearby properties where drill rigs had been seen. Barrick's representative was able to confirm that Barrick was not undertaking exploration activities on those named properties.
- The Complainant and Barrick's representative agreed that the drill rigs seen by the Complainant may have been operated by another exploration company, not related to Barrick. The Complainant undertook to undertake further investigations of their own and provide further feedback to Barrick if required. It was agreed that it seemed likely that Barrick was not responsible for the property damage initially reported as part of this complaint.

7

Complaints/Grievances

Driver Behaviour:

- The Complainant called the CGM's Community Relations Manager directly on 30/01/2015 to complain about a contractor vehicle which was assumed to be delivering fuel to the Cowal Gold Mine travelling at an estimated 80km/h in a 50km/h zone.
- Barrick's representative undertook to investigate the details on which contractor/driver would be responsible for the observed driving behaviour.
- Barrick's representative attempted to contact the Complainant via telephone at 10:45am on 30/01/2015 however there was no answer so a detailed message was left on the automated answering service.
- Barrick's representative contacted the Complainant via telephone at 4:00pm on 30/01/2015. Barrick's representative sought confirmation of the truck's colour for positive confirmation of the responsible vehicle.
- Barrick's representative advised that the responsible contractor/driver would be contacted directly and counselled on the importance of complying with signed speed limits in the community. The Complainant agreed with this approach to resolving their complaint.
- Barrick's representative contacted the Contractor responsible for the identified vehicle and received follow-up advice on 02/02/2015 that the vehicle's satellite tracking data indicated that the vehicle had not exceeded the 50km/h limit. The contractor also advised that the responsible driver had been interviewed and counselled on the importance of obeying signed speed limits.

8

Complaints/Grievances

BARRICK

Driver Behaviour:

- The Complainant called the CGM's Community Relations Manager at approximately 12:10pm on 16/02/2015 to complain that a Coaster Bus used by the Cowal Gold Mine to transport workforce to and from the mine was parking inconveniently in front of the complainant's home.
- The Complainant identified a number of other locations on the same street that could be used as alternatives for parking the bus.
- The CGM's representative apologised for any inconvenience and undertook to instruct the bus users not to park in front of the complainant's home (address provided by the complainant). The Complainant agreed with this approach.
- The CGM's representative provided his contact details to the complainant and invited the complainant to contact him directly should the bus be parked inconveniently again in future.
- Bus users received written instruction on 16/02/2015 that the bus should not be parked in front of the Complainant's house.
- No further complaint has been received regarding this issue.

9

Complaints/Grievances

BARRICK

Driver Behaviour:

- The Complainant called the CGM's Community Relations Manager directly on 17/02/2015 to complain about a CGM workforce vehicle (private vehicle) which was observed to be driving too closely behind other vehicles on dusty, unsealed roads with poor visibility.
- The Complainant advised that by driving too closely behind other vehicles on unsealed roads, it was difficult for oncoming traffic to see properly due to the dust.
- The CGM's representative apologised for any inconvenience and asked if the complainant was able to identify the vehicle through identifiable signage or markings. The Complainant advised that they were not able to identify the vehicle as it was a privately owned and driven vehicle.
- The CGM's representative undertook to remind the workforce of the importance of driving safely, especially on unsealed roads via one of the site's regular internal communication methods. The Complainant accepted this approach to dealing with the issue.
- The CGM's representative also advised that the CGM had recently taken the step of imposing and administrative speed limit of 80km/h for all workforce transport buses (12 and 21 Seaters) on unsealed roads.
- The Complainant then enquired as to whether their Complaint would be recorded and reported per the requirements of the CGM's Development Consent Conditions. The CGM's Representative responded that all community complaints and concerns are documented and published monthly on the Barrick website. The web address was provided to the Complainant.
- An instruction regarding safe driving on local roads was included in the CGM General Manager's Weekly Newsletter to the entire workforce distributed on 20/02/2015.

10

Barrick Cowal Gold Mine

BARRICK

Cowal Partnering Program Application Round 1 2015

11

Cowal Partnering Program

BARRICK

- Throughout 2013-14, the CR Team have worked to change the CPP to improve the program outcomes for both Barrick and the community.
- Following changes have now fully implemented:
  - Funding rounds
  - Standardised application form
  - Standardised internal assessment form
  - Information sessions at West Wyalong, Condobolin and Forbes
  - Advertising across all three Shires
- These changes have resulted in the highest number of applications we have ever received, and most consistently high quality
- The changes to the Cowal Partnering Program were recently awarded a Barrick Global Excellence Award for Corporate Social Responsibility

12

New applications

New applications for discussion:

- Aboriginal Culture Officer – Bland Shire Council
- Federal Government Mobile Phone Black Spot Programme – Jemalong Irrigation Ltd
- Artefacts Tourism/Heritage Display – West Wyalong Local Aboriginal Land Council
- Ben Hall Festival and Heritage Week 2015 – Forbes Shire Council
- Improvements to Rotary Park – Rotary Club (West Wyalong Branch)
- Brower's Walk – Can Assist West Wyalong
- West Wyalong District Transport Group
- Mining Down the Lachlan – Condobolin and District Historical Society
- PPE for VET Program – Condobolin High School

13

Bland Shire Council

Aboriginal Culture Officer

Project Summary:

Part funding of an Aboriginal Culture Officer at Council. The part time position would act as a cultural advisor, undertake mapping of culturally significant landscapes and act as a network liaison with other Indigenous organizations in the area.

The outcomes of the proposal will include:
Strengthening partnerships between Bland Shire Council and various community organisations

Support the BSC Community Strategic Plan
Support with planning and environmental goal within the Local Environment Plan

Amount requested: $30,000

14

Jemalong Irrigation Limited

BARRICK

Federal Government Mobile Black Spot Program

Project Summary:

Construction of new infrastructure as part of the Federal Government Mobile Phone Black Spot Programme. The criteria for the grant from the Government requires third-party contributions (financial or in-kind) be identified prior to submission of application.

Current partners include:
- Forbes Shire Council
- Lachlan Shire Council
- Vast Solar
- Rural Fire Service
- SES

The mobile phone coverage improvements would benefit residents and businesses in a 30 km radius of the proposed towers at Jemalong and Manna Mountain, including residents of both Lachlan and Forbes Shires.

Amount requested: $30,000

15

West Wyalong Local Aboriginal Land Council

BARRICK

Artefact Tourism and Heritage Display

Project Summary:

The project aims to raise local awareness of Indigenous heritage and history in the Bland Shire. The project will involve improvements to the WWLALC to better serve the community and improve access to indigenous culture.

Improvements to the WWLALC include:
- Display cases for artefacts - $6,000
- Audio recordings relating the artefacts - $10,000
- Indigenous artwork on exterior wall to promote Visitor Centre - $6,000
- Project Management - $3,000

Amount requested: $25,000

16

Forbes Shire Council

BARRICK

Ben Hall Festival and Heritage Week

Project Summary:

Forbes Shire Council in celebrating the 150 anniversary of the death of Ben Hall as part of Heritage Week. The event will include A Ben Hall Bus Tour, Preview of the feature film "The Legend of Ben Hall" and Heritage Advisor workshops.

The Festival will draw visitors from across the State and provide a benefit to the local economy, as well as recognizing an important part of local heritage.

Funds will be used for:

- Band - $2,500
- Colonial Show - $4,050
- Wagon Rides - $1,200
- Authors - $500
- Stage - $3,300
- Advertising - $2,000

Amount requested: $13,550

17

Rotary Club of West Wyalong

BARRICK

Upgrades to Rotary Park

Project Summary:

Improvements to Rotary Park, which is located between Wyalong and West Wyalong.

The improvements will include landscaping, additional shade and works to existing picnic area. The project will benefit locals and tourists passing through town, by providing good quality area to stop and rest. The location of the rest area would enhance Council's work with the Wetland area.

A time capsule will also be buried at the time of works.

Amount requested: $6,000

18

Can Assist – West Wyalong

BARRICK

Brower's Walk

Project Summary:

Brower's Walk is an annual fundraising event started by an employee of Barrick Cowal. The charity walk is from Wargin to Top Town Tavern. The event has been run very successfully for several years

The event raises money to support local families who are affected by cancer, and is primarily used for:

- Travel and accommodation during treatment
- Pharmaceutical needs
- Hire of medical equipment

Amount requested: Not specified

19

West Wyalong and District Community Transport Group

BARRICK

Operation of Community Transport

Project Summary:

The organisation provides approximately 10 social bus outings for elderly people and those with mental health issues.

Given the increasingly elderly population of West Wyalong, this group provides an essential service in improving the quality of life for a large number of residents across the Bland Shire.

The service provides transport for:

- Medical appointments
- Social outings
- Family gatherings
- Funerals
- Hospital visits

Amount requested: Not specified

20

Condobolin and District Historical Society

BARRICK

Mining down the Lachlan – Past, Present and Future

Project Summary:

Expansion to the "Mining along the Lachlan - Past, Present and Future" permanent display at the Condobolin Museum. The funds will be used to purchase a new display case and associated signage.

The funds will be used for the following:

- New glass display case (with shelves, lighting and safety glass) - $2,435
- Adhesive vinyl lettering - $325

Barrick have previously supported the commencement of this permanent display in 2014 with $1,200

Amount requested: $2,778

21

Condobolin High School

BARRICK

PPE for Vocational and Educational Training Program

Project Summary:

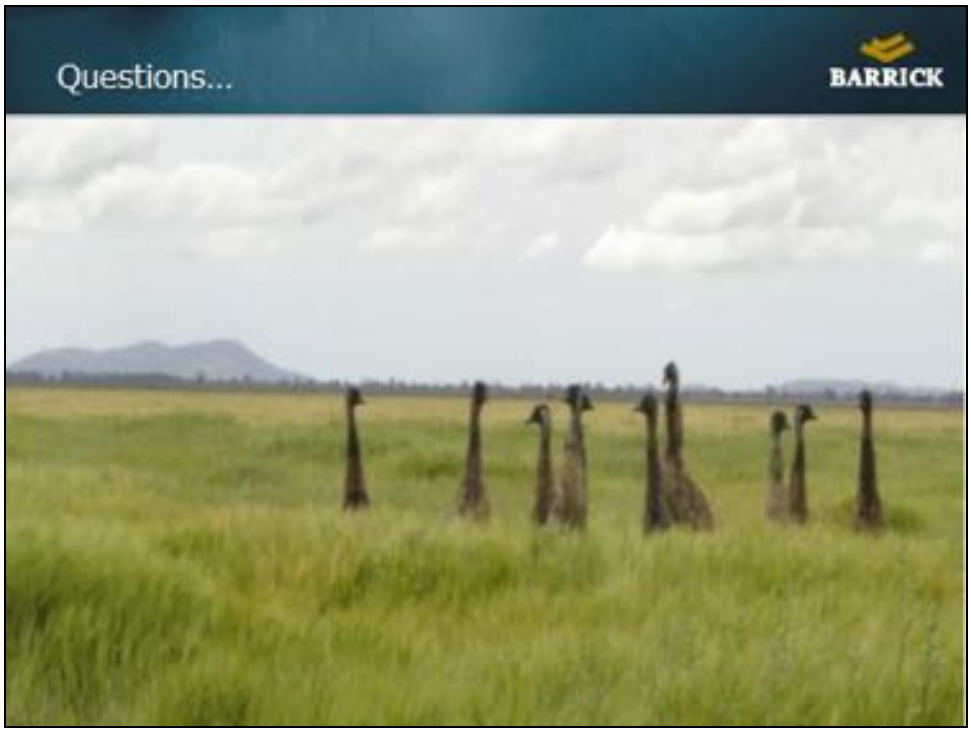
Condobolin High School runs a Vocational and Educational Training course, where students undertake work placements. Often, these placements require students to won PPE, such as steel-capped boots or clogs (catering placements).

The application also sought funds to attend two Job Expo's and hold one in Condobolin at the WSC.

Amount requested:

- $1,260 - steel capped boots
- $1,619 - catering clogs
- $200 – Attendance at Forbes Tertiary Awareness Day
- $400 – Attendance at Orange Jobs Expo
- $500 – Holding a Jobs Expo at the Wiradjuri Study Centre, Condobolin

22


Questions...
BARRICK

ATTACHMENT C – ENVIRONMENTAL DEPARTMENT PRESENTATION

BARRICK

COWAL

Cowal Gold Project
Environmental Management
CEMCC Meeting 04 March 2015

Environmental Management Overview

- Environmental Policy (September 2014)
- Environmental Incidents
- Environmental Summary
- Government Interactions
- Cyanide Management
- 2015 Look Ahead

BARRICK

Barrick Environmental Policy

Barrick Gold Corporation believes that wise environmental stewardship is based on careful work planning, diligent implementation, thoughtful assessment of performance and a desire to improve over time.

Successful implementation of our plans results in some disturbance to our natural environment. However, Barrick believes that we can contribute to the sustainable development of our host communities. We are committed to meeting the needs of current members of that community without jeopardizing the ability of future generations to meet their needs.

Therefore, we believe Barrick must:

Regularly communicate this policy to those who work at Barrick, their families, and our host communities.

Establish, document and maintain an environmental management system and clearly defined environmental requirements.

Educate our people, their families, and our neighboring communities about our systems and practices.

Insist that those who provide services or products adhere to our environmental policy and practices.

Ensure that our leadership and our people understand, support and maintain our environmental management system.

Provide our managers and supervisors the authority and resources necessary to implement our environmental management system and associated environmental standards and practices.

Apply proven management practices to prevent pollution or other environmental impacts, when practical, or to mitigate our impacts.

Set and review environmental objectives and targets aimed at continual improvement.

Conduct periodic reviews of our operations to monitor environmental performance and to guide its environmental management program.

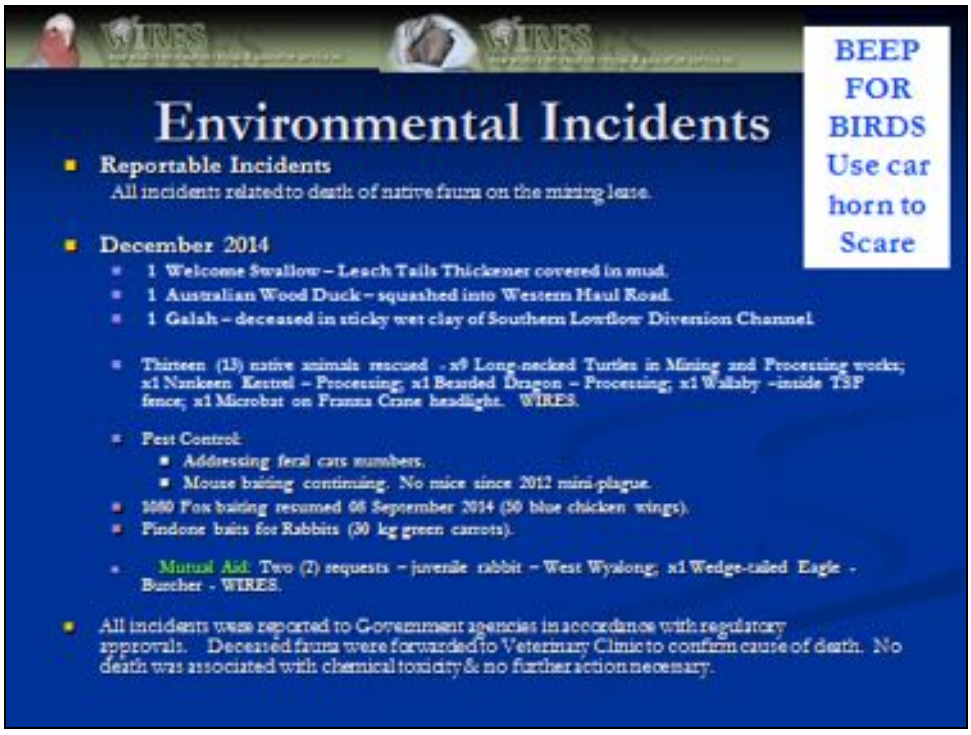
Fully comply with all applicable environmental laws, regulations and other environmental obligations.

Work with governmental and civic leaders, environmental groups, and other concerned parties to develop a mutual understanding of environmental issues.

Aaron Dushnisky
Co-President

Jim Gowans
Co-President

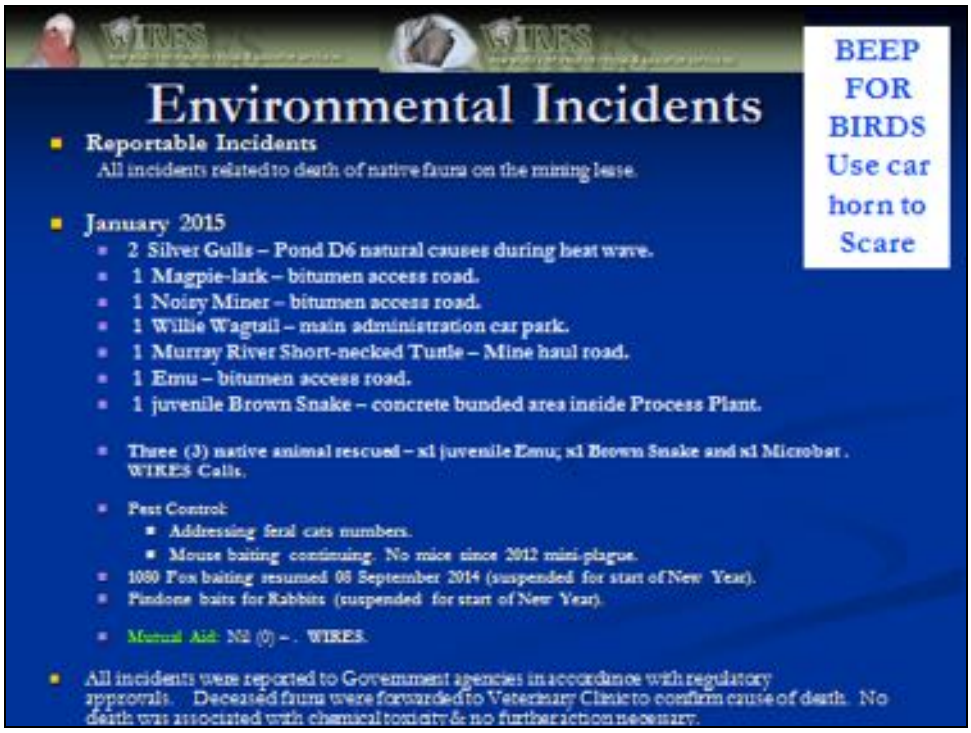
September 2014

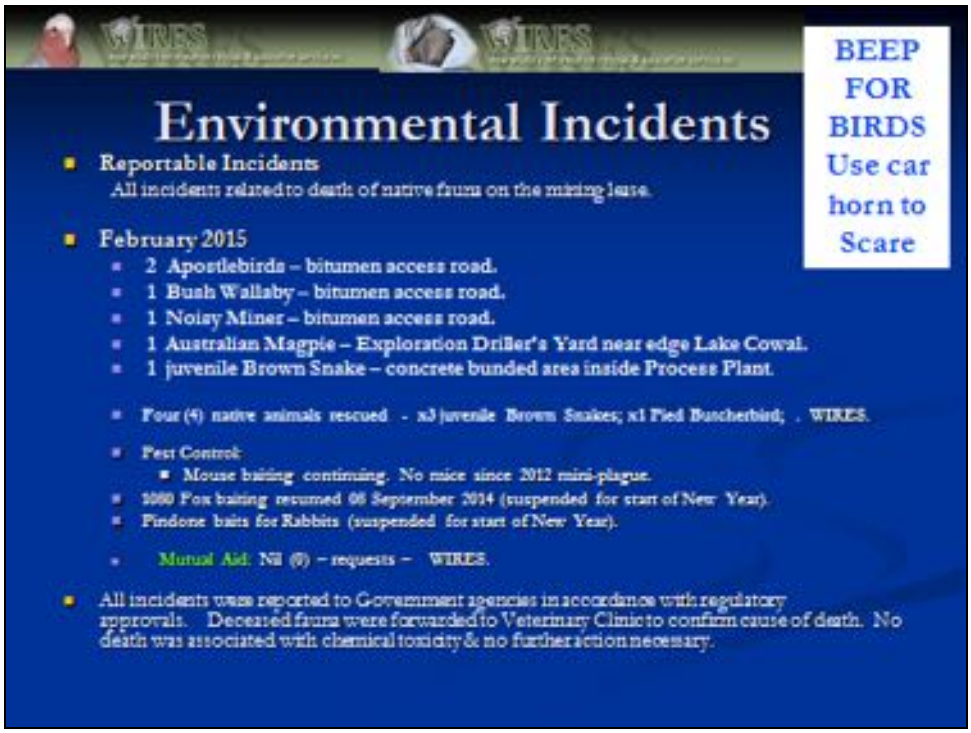


Environmental Incidents

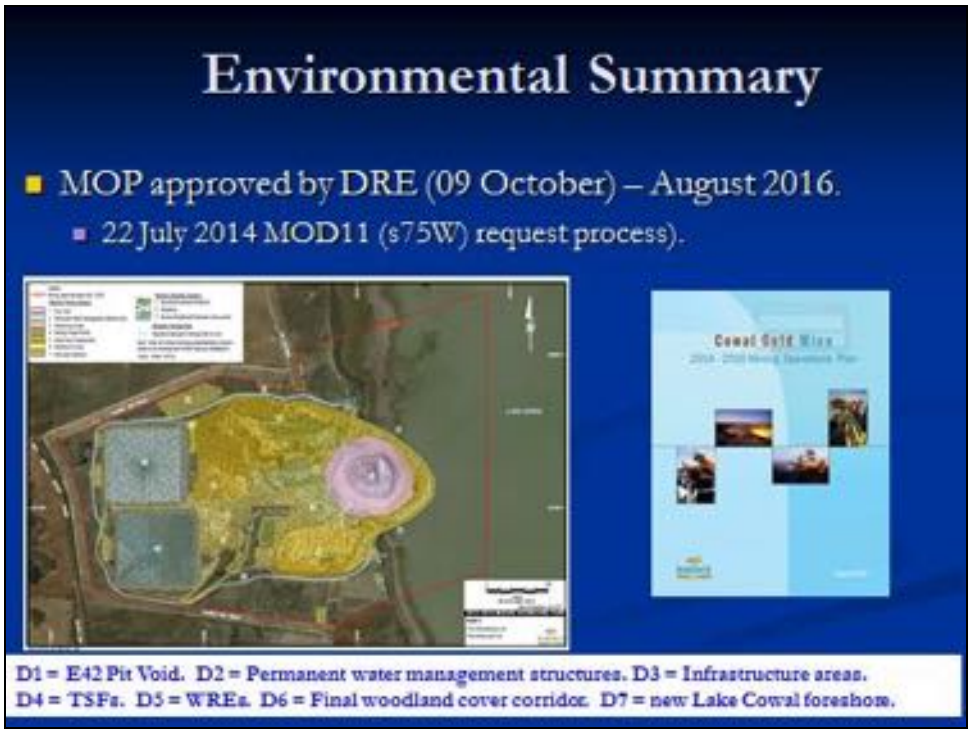
BEEP FOR BIRDS Use car horn to Scare

- **Reportable Incidents**
  All incidents related to death of native fauna on the mining lease.
- **December 2014**
  - 1 Welcome Swallow – Leach Tails Thickener covered in mud.
  - 1 Australian Wood Duck – squashed into Western Haul Road.
  - 1 Galah – deceased in sticky wet clay of Southern Lowflow Diversion Channel.
  - Thirteen (13) native animals rescued - x9 Long-necked Turtles in Mining and Processing works; x1 Nankeen Kestrel – Processing; x1 Bearded Dragon – Processing; x1 Wallaby –inside TSF fence; x1 Microbat on Franna Crane headlight. WIRES.
  - Pest Control:
    - Addressing feral cats numbers.
    - Mouse baiting continuing. No mice since 2012 mini-plague.
  - 1080 Fox baiting resumed 08 September 2014 (50 blue chicken wings).
  - Pindone baits for Rabbits (30 kg green carrots).
  - Mutual Aid: Two (2) requests – juvenile rabbit – West Wyalong; x1 Wedge-tailed Eagle - Buncher - WIRES.
- All incidents were reported to Government agencies in accordance with regulatory approvals. Deceased fauna were forwarded to Veterinary Clinic to confirm cause of death. No death was associated with chemical toxicity & no further action necessary.


Environmental Incidents
Reportable Incidents
All incidents related to death of native fauna on the mining lease.
January 2015
2 Silver Gulls – Pond D6 natural causes during heat wave.
1 Magpie-lark – bitumen access road.
1 Noisy Miner – bitumen access road.
1 Willie Wagtail – main administration car park.
1 Murray River Short-necked Turtle – Mine haul road.
1 Emu – bitumen access road.
1 juvenile Brown Snake – concrete bunded area inside Process Plant.
Three (3) native animal rescued – x1 juvenile Emu; x1 Brown Snake and x1 Microbat . WIRES Calls.
Pest Control:
Addressing feral cats numbers.
Mouse baiting continuing. No mice since 2012 mini-plague.
1080 Fox baiting resumed 08 September 2014 (suspended for start of New Year).
Pindone baits for Rabbits (suspended for start of New Year).
Mutual Aid: Nil (0) – . WIRES.
All incidents were reported to Government agencies in accordance with regulatory approvals. Deceased fauna were forwarded to Veterinary Clinic to confirm cause of death. No death was associated with chemical toxicity & no further action necessary.
BEEP FOR BIRDS Use car horn to Scare


Environmental Incidents
Reportable Incidents
All incidents related to death of native fauna on the mining lease.
February 2015
2 Apostlebirds – bitumen access road.
1 Bush Wallaby – bitumen access road.
1 Noisy Miner – bitumen access road.
1 Australian Magpie – Exploration Driller's Yard near edge Lake Cowal.
1 juvenile Brown Snake – concrete bunded area inside Process Plant.
Four (4) native animals rescued - x3 juvenile Brown Snakes; x1 Pied Butcherbird; . WIRES.
Pest Control:
Mouse baiting continuing. No mice since 2012 mini-plague.
1080 Fox baiting resumed 08 September 2014 (suspended for start of New Year).
Pindone baits for Rabbits (suspended for start of New Year).
Mutual Aid: Nil (0) – requests – WIRES.
All incidents were reported to Government agencies in accordance with regulatory approvals. Deceased fauna were forwarded to Veterinary Clinic to confirm cause of death. No death was associated with chemical toxicity & no further action necessary.
BEEP FOR BIRDS Use car horn to Scare


Sat Image February 2014
Lake level (2010 – 2014)
2010
2012
2014
1206
1205
1204
1203


Environmental Summary
MOP approved by DRE (09 October) – August 2016.
22 July 2014 MOD11 (s75W) request process).
D1 = E42 Pit Void. D2 = Permanent water management structures. D3 = Infrastructure areas.
D4 = TSFs. D5 = WREs. D6 = Final woodland cover corridor. D7 = new Lake Cowal foreshore.

Regulatory Inspections

- s75W Closure Security Bond Review (20 April 2010):
  - Bonded amount at AUD 63.5 million from July 2009.
  - AUD 58.25 m – adequate Security.
- Varied EPL11912 in effect from 4 February 2015
  - (name and noise locations/ frequency changed);
  - x3 EPA Officers Audit (26-27 February 2015); and
  - MOD11 variation request of EPL to follow DP&E app of Revised EMPs (MOD11).

Regulatory Inspections

- MOD11 – by end-July 2015 – VPA with DP&E
- Offset Areas (440 ha):
  - extra 230 ha added MOD11.
  - Separate Security Bond (DP&E).

CEMCC response

CGM revised Strategy for Decommissioning of Water Management Structures & revised Strategy Long-term Management of Final Void and LPB (March 2015).

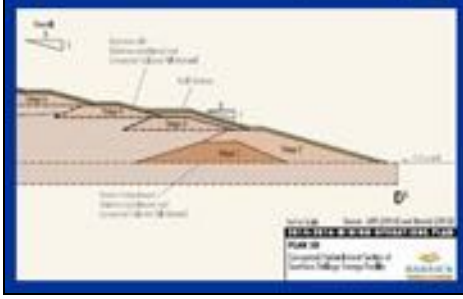
SWE south (Jan – Nov 2014)

PWE s-east (Sept 2014)

12 ha direct seeding trial works on the inside of PWRE 2015.

This area has been re-worked by covering it with the STSF buttress pre-strip works cover materials.

Dynamic Stability Buttressing

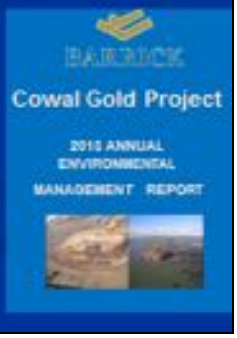


Commenced the 5th Lift STSF, and STSF rock buttress works (1:5,000 year earthquake design mitigation).

Barrick Corporate FOS is 1.5 (Code is 1.3)

Regulatory Inspections

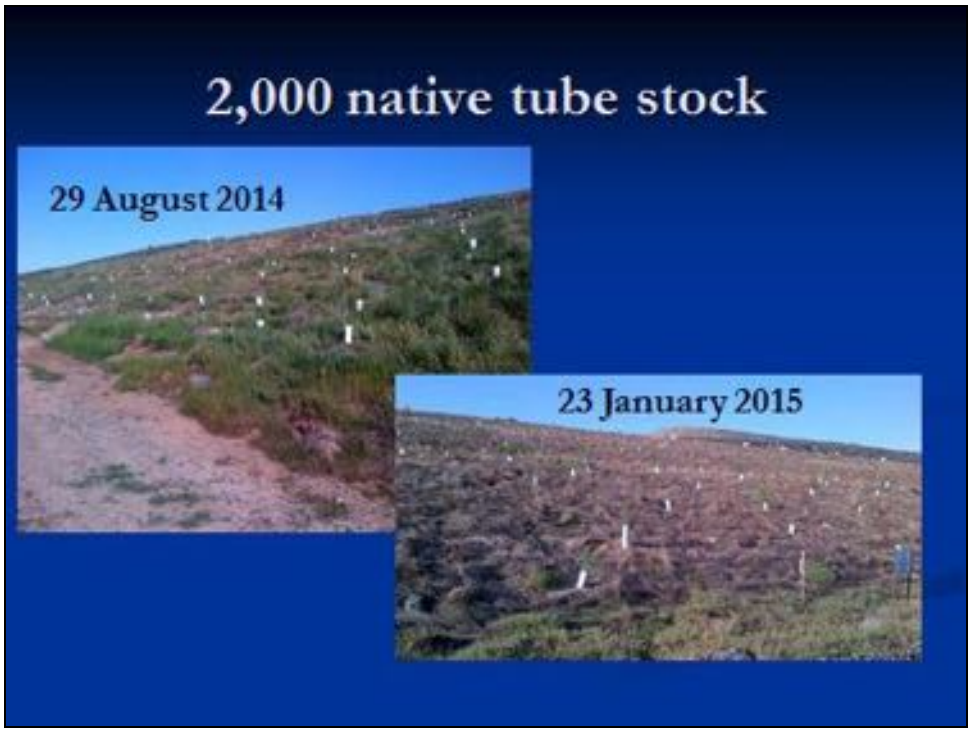
- 11th Independent Monitoring Panel:
  - After lodgment of Annual Review (MOD11 – by the end of May 2015);
  - After 2015 IEA (20-22 April 2015).
  - Likely August 2015.
- All relevant govt depts 2015 visit
  - After lodgment of Annual Review.
  - Likely mid-June 2015.

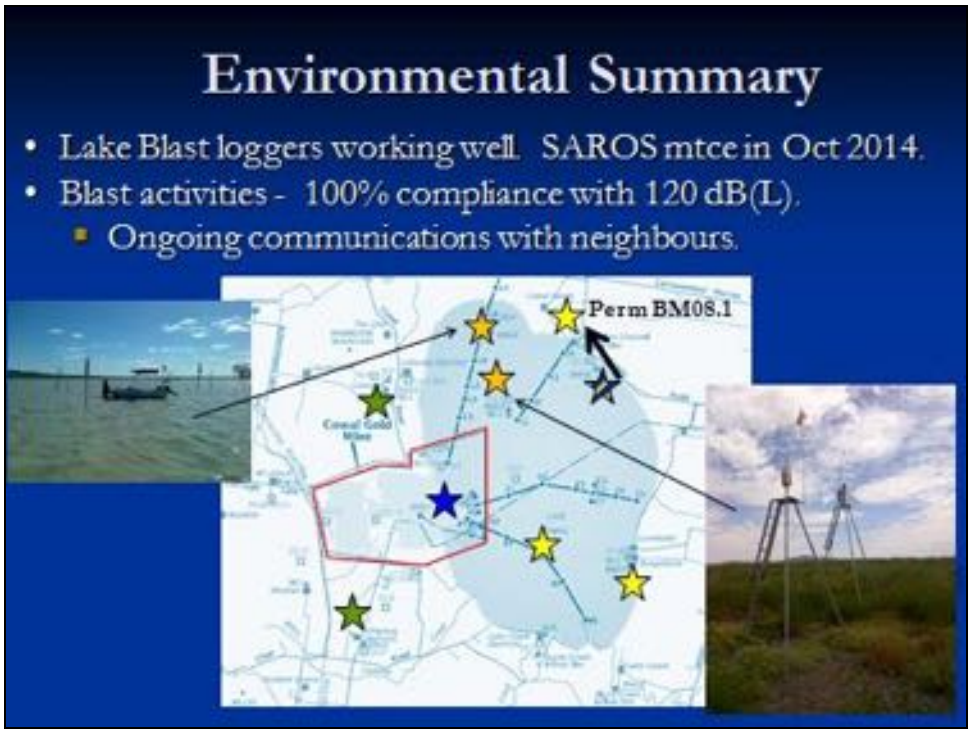


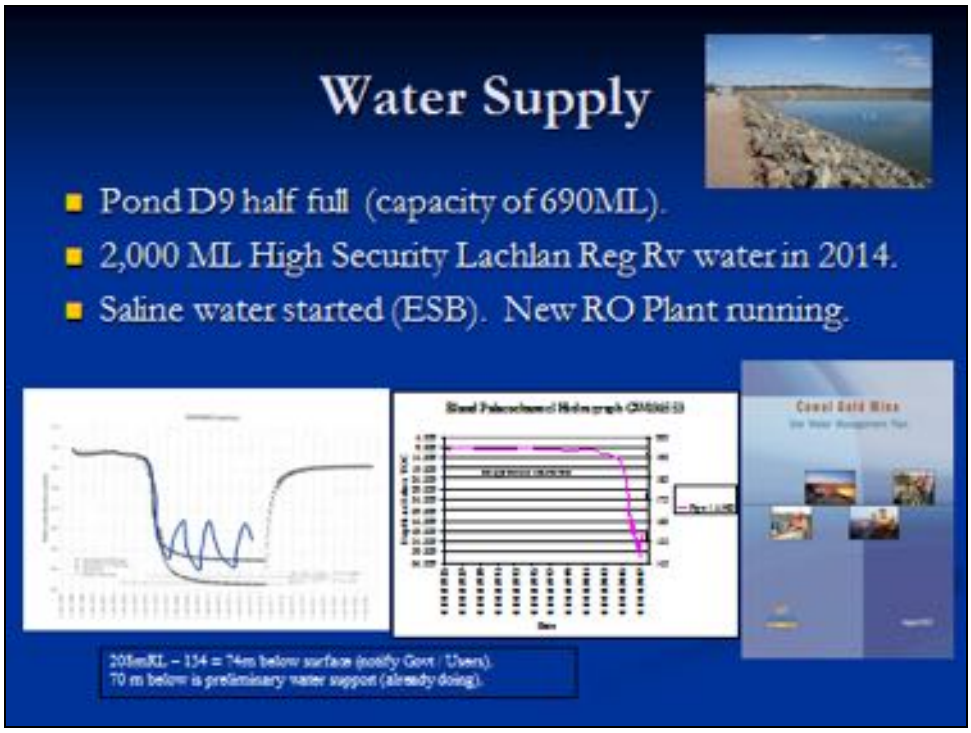
EMPs status update

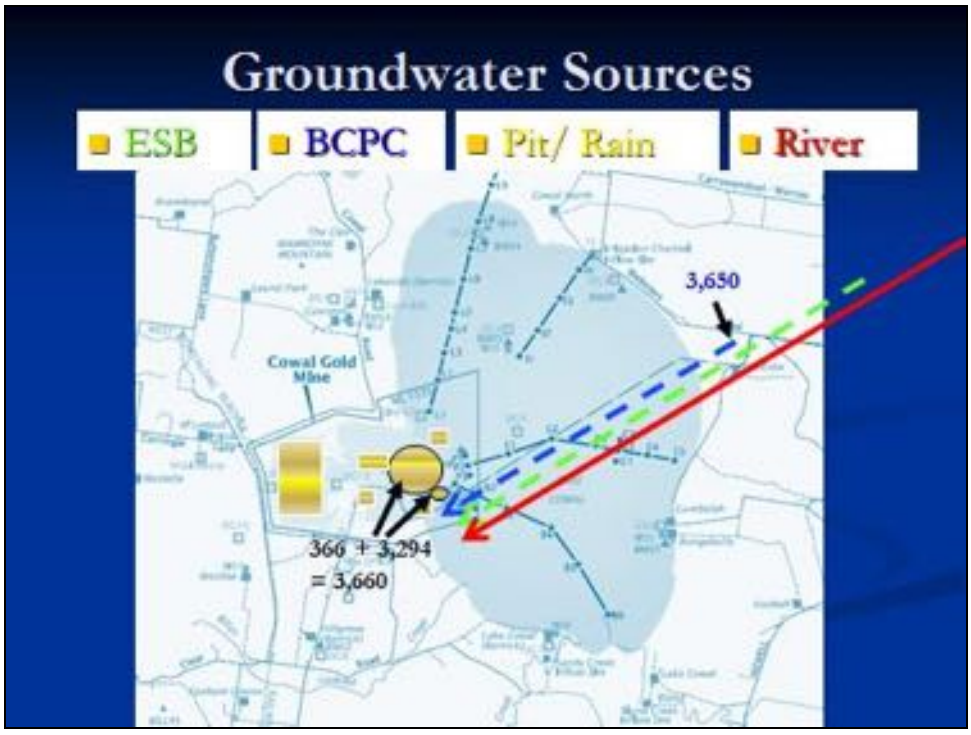
- DP&E verbal instruction to use as approved (26 Sept. 2013).
  - FMP, ESCP, SWMP, CMP, HWCMP, BlastMP, NMP, ROMP.
- MOD11 (22 July 2014), sets the path forward to submit revised EMPs. Delivery date has recently been revised to end-May 2015. All will be held on www.

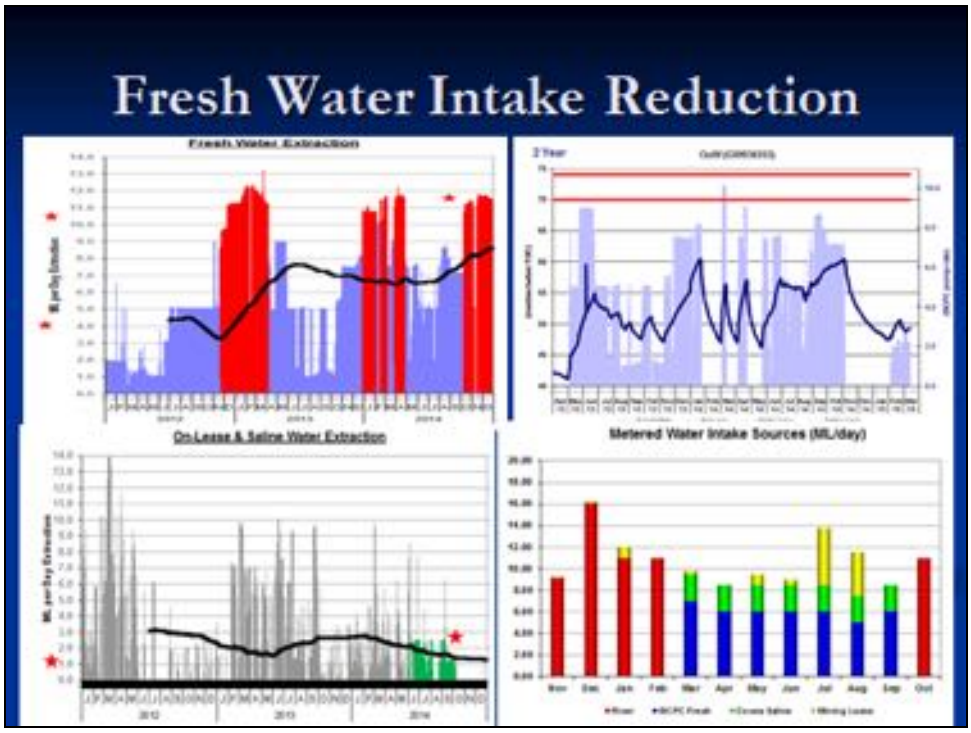
16

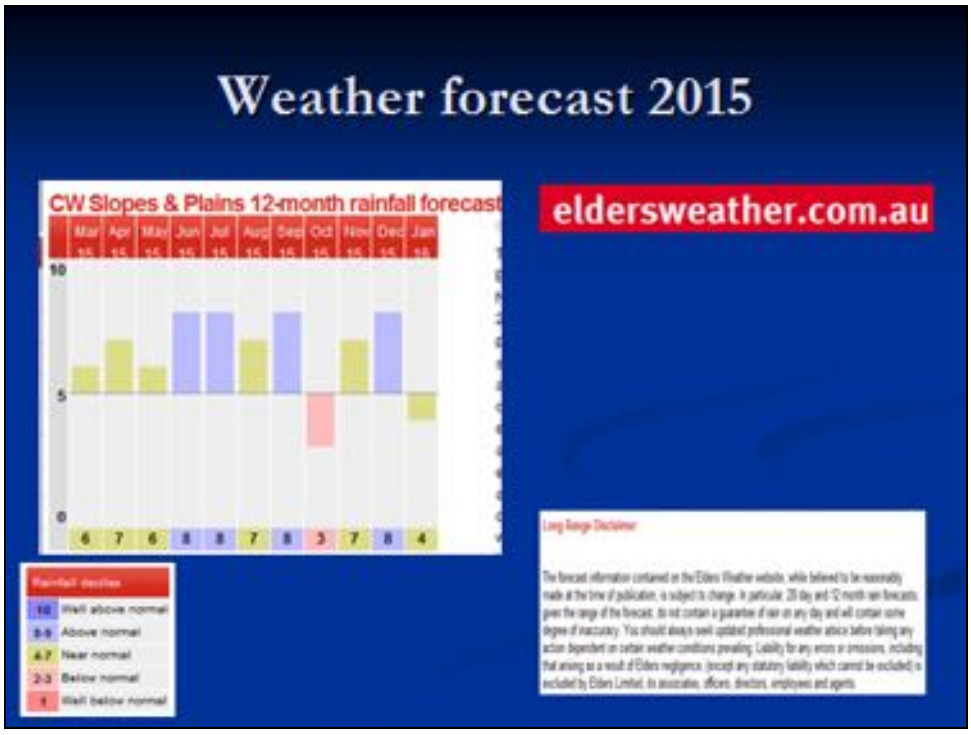

2,000 native tube stock
29 August 2014
23 January 2015


Environmental Summary
• Lake Blast loggers working well. SAROS mtce in Oct 2014.
• Blast activities - 100% compliance with 120 dB(L).
▪ Ongoing communications with neighbours.
Perm BM08.1


Water Supply
Pond D9 half full (capacity of 690ML).
2,000 ML High Security Lachlan Reg Rv water in 2014.
Saline water started (ESB). New RO Plant running.
205mRL – 134 = 74m below surface (notify Govt / Users).
70 m below is preliminary water support (already done).

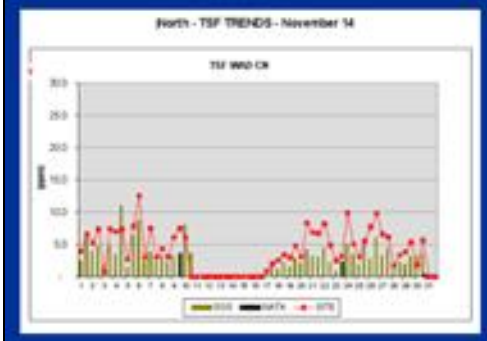

Groundwater Sources
ESB
BCPC
Pit/ Rain
River
3,650
Cowal Gold Mine
366 + 3,294
= 3,660


Fresh Water Intake Reduction
Fresh Water Extraction
On-Lease & Saline Water Extraction
Metered Water Intake Sources (ML/day)


Weather forecast 2015
CW Slopes & Plains 12-month rainfall forecast
eldersweather.com.au
Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan
10
5
0
6 7 6 8 8 7 8 3 7 8 4
Rainfall deciles
10 Well above normal
8-9 Above normal
4-7 Near normal
2-3 Below normal
1 Well below normal
Long Range Disclaimer

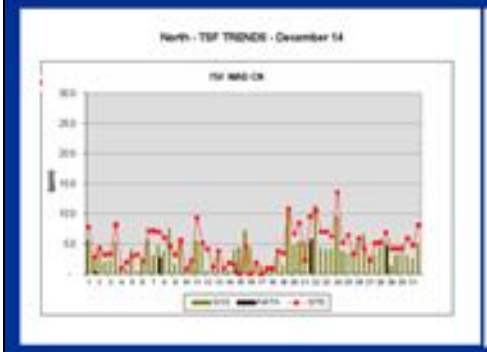
Cyanide Monitoring Results

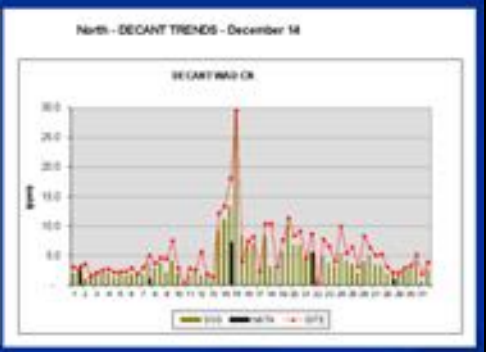
November 2014 – TSF - Decant



Cyanide Monitoring Results

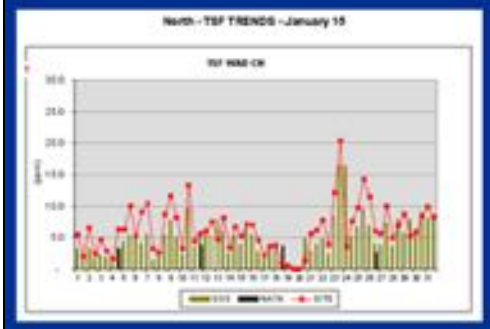
December 2014 – TSF - Decant

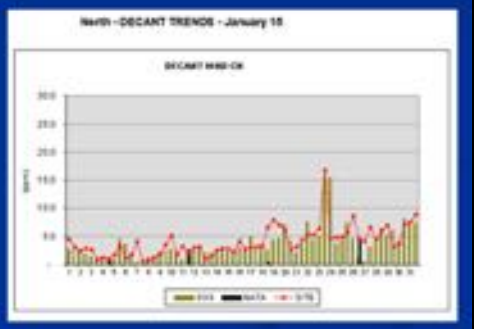




Cyanide Monitoring Results

January 2015 – TSF - Decant





CN SMBS Win – Win Waste Mgt

Env Dept Happenings

BARRICK COWAL

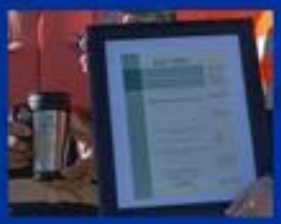
Team Cowal – Enviros

- 2015 targets in progress

Environmental Management
RESPONSIBLE MINING
Cowal Gold Mine 2015

Continual improvement

KPI	Measure	Status
Standards implementation	Biodiversity	
	Climate Change	
	Environmental Incident Reporting	
	Water Conservation	
	Mine Closure	
Closure	Reclamation Cost Estimate	
	Closure Plan	
EMS	Major Non-conformances	
Cyanide Code (Audit 19-21 Nov 2013)		
Certified to ISO 14001:2004		

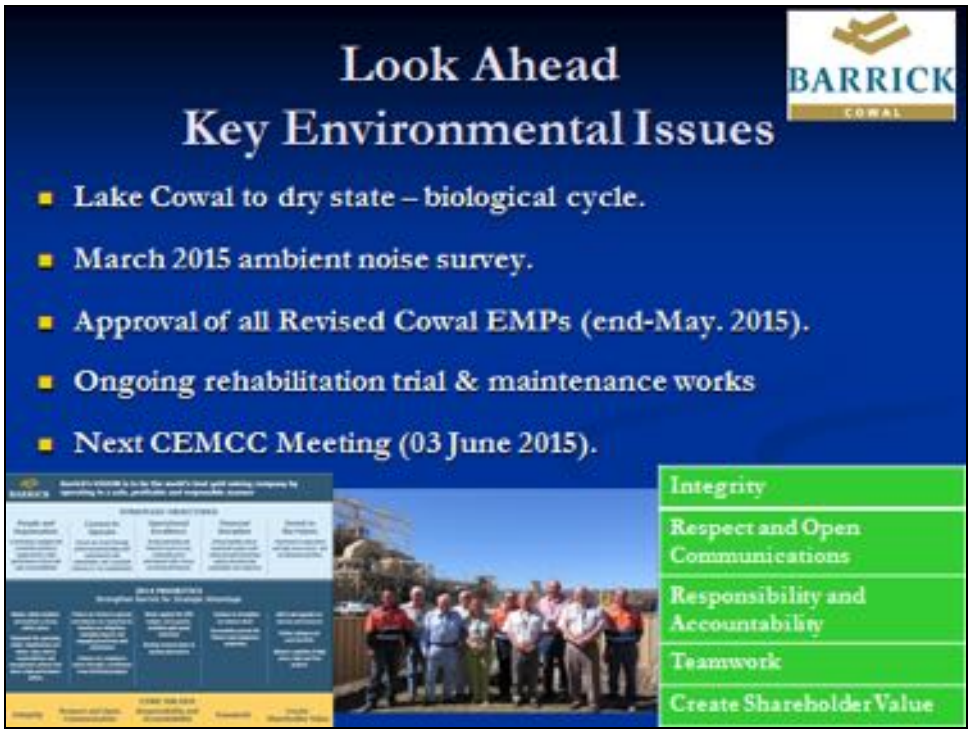


Member's info supply

Barrick Toronto direct link to the Cowal web page:

http://www.barrick.com/operations/australia/cowal


BARRICK
Cowal
297,000
1,800,000
• Extension Modification – Environmental Assessment, September 2013
• Environmental Monitoring Data
• Complaints Register
• Independent Monitoring Panel
• S42 Modified Request - Environmental Assessment, October 2009
• Environmental Management Plans
• Pollution Incident Response Management Plan


Look Ahead
Key Environmental Issues
BARRICK
COWAL
Lake Cowal to dry state – biological cycle.
March 2015 ambient noise survey.
Approval of all Revised Cowal EMPs (end-May. 2015).
Ongoing rehabilitation trial & maintenance works
Next CEMCC Meeting (03 June 2015).
Integrity
Respect and Open Communications
Responsibility and Accountability
Teamwork
Create Shareholder Value

ATTACHMENT D – GLOSSARY OF COMMONLY USED TERMS

8 GLOSSARY OF TERMS

AER	Annual Environmental Return (EPA)
AEMR	Annual Environmental Management Report (DTIRIS [DRE] coordinated for DP&I and other regulators)
ANZECC	Australian New Zealand Environmental Conservation Council
ARD	Acid Rock Drainage
ARMCANZ	Agriculture and Resource Management Council of Australia and New Zealand
ARI	Annual Recurrence Interval
ASWAT	Aggregate Stability in Water
AWS	Automatic Weather Station
BB	Barrick Buddies
BCPC	Bland Creek Paleochannel
BDHS	Bland District Historical Society
BLMP	Blast Management Plan
BMP	Bushfire Management Plan
BSC	Bland Shire Council
CEMCC	Community Environmental Monitoring & Consultative Committee
CGM	Cowal Gold Mine
CHESS	Community Relations, Health, Environmental, Safety and Security
CIL	Carbon in Leach
CLM	Contaminated Land Management
CMP	Cyanide Management Plan
CMS	Chemical Management Strategy
CPCC	Cowal Project Coordinating Committee (WCC - Barrick)
CWHC	Cowal Partnering Program
CRMA	Cowal Risk Management Application
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CW	Compensatory Wetland
CWHC	Cowal West Homestead Complex
CWMP	Compensatory Wetland Management Plan
DMP	Department of Mines & Petroleum
DP&I	Department of Planning and Infrastructure
DECCW	Department of Environment, Climate Change and Water (now EPA)
DII	Department of Industry and Investment - Minerals Resources (DTIRIS)
DPI	Department of Primary Industries – Agriculture, Fisheries
DTIRIS-MR	Department of Trade, Investment and Regional Infrastructure Services – Mineral Resources
DSC	Dams Safety Committee
EA	Environmental Assessment
EC	Electrical Conductivity
EEC	Ecologically Endangered Community
EFA	Ecosystem Function Analysis
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
EMS	Environmental Management System
EMSS	Environmental Management System Standards
EPA	Environment Protection Authority
EPL	Environment Protection License
ERO	Emergency Response Officer
ERP	Emergency Response Plan (see PIRMP)
ERT	Emergency Response Team
ESCP	Erosion and Sediment Control Program
ESB	Eastern Saline Borefield
ESCMP	Erosion and Sediment Control Management Plan
ETBC	Employment Training Business Council (WCC – Barrick)
FFMP	Flora and Fauna Management Plan
FOR	Fuel and Oils Register
FRP	Final Rehabilitation Plan
GDP	Ground Disturbance Protocol

GEM	Geo-Environmental Management
GFZ	Gilmore Fault Zone
HMP	Heritage Management Plan
HSR	Hazardous Substances Register
HWCMP	Hazardous Waste and Chemical Management Plan
HSDG	Hazardous Substances and Dangerous Goods
HSDGR	Hazardous Substances and Dangerous Goods Register
IACHMP	Indigenous Archaeology and Cultural Heritage Management Plan
ICMC	International Cyanide Management Institute Code for Cyanide Management
IEA	Independent Environmental Audit
IMP	Independent Monitoring Panel
INP	Industrial Noise Policy
ISO 14001	International Standards Organisation – Best Practice Environmental Management Standard
KPI	Key Performance Indicator
LCCC	Lake Cowal Conservation Centre
LCF	Lake Cowal Foundation
LCMA	Lachlan Catchment Management Authority. Now reformed as LLS.
LEP	Local Environment Plan
LHPA	Livestock Health and Pest Authority – now LLS (formerly RLPB).
LIDAR	Light detection and ranging. High-speed aerial laser pulses to generate 3-D shot (3-D ± 0.1 m).
LOR	Limit of Reporting
LPB	Lake Protection Bund
LPMBP	Monitoring Programme for Lake Protection Bund, Water Storage and Tailings Structures and Pit-Void Walls
LFA	Landscape Function Analysis
LLS	Local Land Service. Late 2013 replacement of LHPA, LCMA and DPI-Agriculture entities. Lake Cowal sits across the LLS Riverina & LLS Central-west zones (roughly on a north-south line).
LMP	Land Management Plan
LSMP	Landscape Management Plan
MIC	Maximum Instantaneous Charge
ML	Mega Litres = 1 Million Litres
m	metres
ML	Mining Lease
MOP	Mining Operations Plan
MSDS	Material Safety Data Sheet
NAF	Non Acid Forming (rock acid forming potential)
NGER	Australia's National Greenhouse and Energy Reporting Scheme
NMP	Noise Management Plan
NoW	New South Wales Office of Water (formerly DWE within OEH - EPA).
NPI	National Pollutant Inventory
NPWS	National Park and Wildlife Service
NSWFR	NSW Fire and Rescue (formerly NSW Fire Brigade)
NTSF	Northern Tailings Storage Facility
NWRE	Northern Waste (rock) Emplacement
OEH	Office of Environment and Heritage
OSCAR	Australian Online System for Comprehensive Activity Reporting
PIRMP	Pollution Incident Response Management Plan (see ERP)
PPE	Personal Protective Equipment
PRA	Preliminary Risk Assessment
PWRE	Perimeter Waste (rock) Emplacement
RAB	Rotary Air Blast
Registered Site	Registered Site (NSW) NPW Act
RFS	NSW Rural Fire Service
RIMS	Barrick Responsibility Information Management System
RL	Relative Level metres
ROMP	Rehabilitation and Offset Management Plan
RVEP	Revegetation Enhancement Project
SDS	Manufacturer's Safety Data Sheet
SMBS	Sodium metabisulphite (cyanide destruct reagent replacing Caro's Acid)
SOE	State of the Environment

SOI	Southern Oscillation Index
SSMP	Soil Stripping Management Plan
STSF	Southern Tailings Storage Facility
SWRE	Southern Waste (rock) Emplacement
SWGMBMP	Surface Water, Groundwater, Meteorological and Biological Monitoring Programme
SWMP	Site Water Management Plan
THMS	Transport of Hazardous Materials Study
TIB	Temporary Isolation Bund
TNMP	Traffic Noise Management Plan
TSF	Tailings Storage Facility
TSMP	Threatened Species Management Protocol
TSMS	Threatened Species Management Strategy
TSP	Total Suspended Particulates
TSR	Travelling Stock Route
UCDS	Up Catchment Diversion System
VCP	Vegetation Clearance Permit
VCP	Vegetation Clearance Protocol
VPA	Voluntary Planning Agreement
WAD	Weak Acid Dissociated
WCC	Wiradjuri Condobolin Corporation
WCCHC	Wiradjuri Condobolin Cultural Heritage Company
WIRES	Wildlife Information Rescue and Education Service

MINUTES OF MEETING

COWAL GOLD MINE
COMMUNITY ENVIRONMENTAL MONITORING
AND CONSULTATIVE COMMITTEE (CEMCC)

Wednesday 4 June 2014
9.00 am – West Wyalong High School
Minutes taken by: Amy Weber

Attendees:

Independent Chair:	Margaret MacDonald-Hill (MMH)
Barrick:	Alan Fearon (AF), Garry Pearson (GP) and Shane Goodwin (SG)
Community Members:	Angus Stitt (AS) Jenene McGrath (JM) and Lucy Buttenshaw (LB)
Lake Cowal Landholders Association:	Bruce Dent (BD)
Bland Shire Council:	Neil Pokoney (NP)
Lachlan Shire Council:	Graham Scott (GS)
Forbes Shire Council:	Brian Mattiske (BM
Lake Cowal Foundation:	Daryl Neilson (DN)
Wiradjuri Condobolin Corporation:	Terry Williams (TW)
Observers:	West Wyalong High School Students Scott Woodward (SW) and Ken Jeffers (KJ) from Many Rivers Microfinance Liz McGlynn, Bland Shire Council Graeme Miller, Forbes Shire Council Ron Penny, Forbes Shire Council

Apologies: Ally Coe, David Carter

ITEM	ACTION
1.0 Welcome Independent Chair, Margaret MacDonald-Hill opened the meeting at 9.24 am, acknowledging and welcoming new attendees Terry Williams on behalf of the Wiradjuri Condobolin Corporation, Scott Woodward and Ken Jeffers from Many Rivers, Ron Penny, Mayor of Forbes Shire Council, and West Wyalong High School Years 11 & 12 Geography students.	
2.0 Declaration of Interest Margaret MacDonald-Hill declared her interest as Independent Chair of the CEMCC, appointed by the Director General of the Department of Planning and Infrastructure. For record purposes, Margaret advised the committee she is a member of the Mine Subsidence Board and the Minister's Arbitration Panel. Margaret also declared that she receives payment via a Trust established by the Bland Shire Council for her work as Chair of the CEMCC. Members discussed the need for a standard one-page document to be published	SG

with minutes outlining any standing relationships or declarations of interests. Action: SG will before the next meeting work with members on wording of such a document.	
3.0 Confirmation of Minutes NP advised of correction: March meeting minutes page 2 stated that Council had requested that Barrick hold off releasing the Social Impact Assessment (SIA) report which was incorrect. Council agreed with Barrick approach for releasing the report. **Moved:** Angus Stitt **Seconded**: Brian Mattiske **Accepted.**	
4.0 Business Arising from previous Minutes Nil.	
Correspondence **In** Email 4/4//14 from Barrick NF & O I report Email 16/5/14 resignation from Garry Shaw Email 30/5/14 from Barrick NF & O I report Email 2/6/14 from Barrick with 9th IMP report **Out** Email 16/5/14 response and thank you to Garry Shaw Email 2/6/14 to CEMCC with 9th IMP Report	MMH to write to Garry Shaw
5.0 Reports **Shane Goodwin** provided a detailed account of Barrick Cowal's Community Relations Activities over the past three months – See the attached presentation for more information (Attachment A). ▪ Community Relations activities ▪ Wiradjuri update ▪ Complaints/Grievances ▪ Modification Proposal Update ▪ Upcoming activities ▪ Cowal Partnering Program discussion	

Complaints/Grievances

The 5 complaints received since the last meeting were from a selection of stakeholders:

- The complaints received relate to:
  - Blasting (1)
  - Driver behaviour (2)
  - Employee/Contractor behaviour (2)

Cowal Partnering Program – An overview on the new funding and application rounds process to be introduced from August this year was given.

Three proposals were discussed:

- Condobolin Drum and Pipe Band
- George Institute "Driving Change" Program
- Many Rivers Microfinancing Organisation
  - A presentation was given by Scott Woodward, Head of Eastern Region Operations (Attachment B)

All three proposals drew detailed discussion, with positive comments and recommendations from the Committee.

During the discussion on the George Institute "Driving Change" program which currently has a base operating out of Condobolin, the question was raised as to whether there would be an opportunity to broaden the scope of the program to benefit indigenous youth in other areas within the Bland and Forbes Shire Council areas.
This question will be taken back to the George Institute to explore.

SG said a multi-year partnership with Many Rivers could be achievable in the coming year as other existing multi-year partnerships are starting to come to an end. The work of Many Rivers is complementary to the work of the WCC. SG has been working with Ken Jeffers from Many Rivers based in Condobolin and with the WCC for approximately the last 18 months to see how a mutually-beneficial partnership could be agreed upon.

SG

Garry Pearson provided a detailed account of Barrick Cowal's Environment Department Activities over the past three months – See the attached presentation for more information (Attachment C).

6.0 General Business

MMH flagged an item to be discussed more at the next meeting. This was that there is currently $25,000 in Committee trust which members need to decide on the use there of.

MMH to list this as an agenda item for the next meeting.

MMH

BD raised the issue for a need to be prepared in advance of when Lake Cowal completely dries out, particularly in regards to the need for erecting fencing in a short time frame. SG noted that Barrick is aware of this issue and has already begun some fencing work. Future fencing work will be erected via a cost-sharing arrangement with neighbours around the lake. GS raised the issue of approved access to the mine, specifically the use of Bogey's Island Road. Previously Lachlan Shire had an objection to the use of this road, but due to the lake now drying out this objection has been removed. Lachlan Shire Council contacted Forbes Shire Council (where 90% of the road lies within) to understand their view, which is still unclear. GS noted that a letter will be sent to Barrick from the Lachlan Shire Council formally removing their objection for the use of this road. AF noted that when wet, Barrick stops all its vehicles from travelling on these unsealed roads to avoid damaging the road as well as for safety reasons. NP noted that Bland Shire Council recently hosted a visit from the Association of Mining Related Councils. The Council was impressed with what they saw at Barrick and even more impressed with the relationship Barrick has with the community through the CEMCC. JM noted a formal thank you to members for attending the meeting at West Wyalong High School and for allowing West Wyalong High School students to be present for the meeting. Graham Scott (GS) noted full support of Margaret to continue in her current role as Chair. All members agreed.	
7.0 Meeting Closed – 11.23am	
8.0 Next Meeting Wednesday 3rd September 2014, at the Barrick Cowal mine site. Other meetings to occur on December 3rd 2014.	

MINUTES OF MEETING

COWAL GOLD MINE
COMMUNITY ENVIRONMENTAL MONITORING AND CONSULTATIVE COMMITTEE (CEMCC)

Wednesday 3 September 2014
9.00 am – Cowal Gold Mine
Minutes taken by: Elliot Willemsen-Bell

Attendees:

Independent Chair:	Margaret MacDonald-Hill (MMH)
Barrick:	Alan Fearon (AF), Garry Pearson (GP) and Shane Goodwin (SG)
Community Members:	Angus Stitt (AS) and Lucy Buttenshaw (LB)
Lake Cowal Landholders Association:	Bruce Dent (BD)
Bland Shire Council:	Neil Pokoney (NP)
Lachlan Shire Council:	Graham Scott (GS)
Forbes Shire Council:	Brian Mattiske (BM) Graham Miller (GM)
Wiradjuri Condobolin Corporation:	Terry Williams (TW)
Lake Cowal Foundation:	N/A

Observers: Jason Floyd (Barrick Cowal Mining Manager)

Apologies: David Carter, Daryl Neilson, Jenene McGrath, Cr Hampton

ITEM	ACTION
1.0 Welcome Independent Chair, Margaret MacDonald-Hill opened the meeting at 9.16 am.	
2.0 Declaration of Interest Margaret MacDonald-Hill declared her interest as Independent Chair of the CEMCC, appointed by the Director General of the Department of Planning and Infrastructure. For record purposes, Margaret advised the committee she is a member of the Mine Subsidence Board and the Minister's Arbitration Panel. Margaret also declared that she receives payment via a Trust established by the Bland Shire Council for her work as Chair of the CEMCC. For a full Declaration of Interest for all members, see Attachment A	SG
3.0 Confirmation of Minutes **Moved:** Neil Pokoney **Seconded**: Graham Scott **Accepted.**	

4.0 Business Arising from previous Minutes

MMH discussed the Trust Fund, set up to cover costs associated with the running of the CEMCC, including independent review. The Funds currently has approximately $25,000 available. All agree to leave as is for now.

The issue of use of Bogeys Island Road was also raised. SG explained that Lachlan Shire had included a submission with the Modification to have Bogeys Island excluded from the Approved Routes in the Development Consent Conditions. This request was not included in the most recent determination, and as such Barrick have reverted to using Bogeys Island Road.

SG discussed the "Driving Change" Program that was presented as a Cowal Partnering Program at the last CEMCC. Unfortunately, the organisation was not able to broaden the scope of the program, and as such Barrick did not proceed with the partnership.

AS complimented GP and his team for the consistently high standard of the AEMR.

TW will present on the Wiradjuri Condobolin Corporation at a future meeting.

Correspondence

In
Email dated 20/6/14 - Barrick, NF&O incident report
Letter dated 1/7/14 - Barrick enclosing complaints register
Letter dated 2/7/14 - Barrick enclosing Cowal update
Letter dated 9/7/14 - Barrick enclosing IEA
Email dated 21/7/14 - Barrick, NF&O incident report
Letter dated 12/8/14 - Barrick enclosing 2013 AEMR
Out
Letter dated 12/6/14 - thank you to Garry Shaw
Email dated 21/8/14 - to CEMCC on cyanide recertification

5.0 Reports

Shane Goodwin provided a detailed account of Barrick Cowal's Community Relations Activities over the past three months – See the attached presentation for more information (Attachment B).

- Community Relations activities
- Wiradjuri update
- Complaints/Grievances
- Modification Proposal Update
- Upcoming activities
- Cowal Partnering Program discussion

Complaints/Grievances

The 4 complaints received since the last meeting were from two individual stakeholders:

- The complaints received relate to:
  - Blasting (3)
  - Driver behaviour (1)

Modification Proposal Update
SG advised that on 22 July 2014, the DP&E made a Determination and provided revised Development Consent Conditions in response to the Modification Proposal. Whilst Barrick is in the process of reviewing the new requirements, the following are of key significant to the CEMCC:

- Increased environmental monitoring from bi-annually to quarterly. NP stated that it was a key role of the CEMCC to verify monitoring and ensure adequate reporting on environmental issues by Barrick. At no time have the CEMCC expressed any dissatisfaction with the current monitoring and reporting processes, so why have the DP&E doubled the requirements? MMH

  MMH suggested that correspondence be drafted to DP&E noting the changes and stating that the CEMCC feels the previous standard is sufficient.

- SG also discussed new reporting process for complaints and grievances. Complaints/grievances are to be reported monthly, and displayed on the Barrick website. Despite there being no requirement for complaint reports to be published on the Bland Shire Council website, SG said that Barrick would continue to make reports available by this method.

Cowal Partnering Program – An overview of recent activities to promote the new system of funding rounds, including information sessions, advertising and local news media articles.

Ten proposals were discussed:

- Community Mental Health Event – Bland Shire Council
- NAIDOC Celebration – West Wyalong Local Aboriginal Land Council
- Hear the Bush Beat – Burcher Progress Association
- Mining Along the Lachlan – Condobolin and District Historical Society
- Bland Shire Children and Youth Mental Health Program – Murrumbidgee Local Health District
- Harmony – Wyalong Public School
- Safety, Health and Work – Havannah House
- Equipment Upgrade – West Wyalong Men's Shed
- Rural Women and Youth in Agriculture – Central West Farming Systems
- Joey Reading Group – Born to Read

There was discussion over all proposals, with positive comments and recommendations from the Committee.

Garry Pearson provided a detailed account of Barrick Cowal's Environment Department Activities over the past three months – See the attached presentation for more information (Attachment C). He noted that the Rehabilitation Management Plan (RMP) would be sent to all CEMCC Members for review, as would the Independent Monitoring Panel Report.	
6.0 General Business SG discussed the Future Land Use Advisory Committee (FLUAC), which would be formed to discuss options use of Barrick land, following closure. The Committee would be made up of impacted stakeholders, including local landholders, Wiradjuri representatives, Council and the LCF. BM asked if FLUAC discussions will include the borefields, and SG said this issue would be discussed, but any negotiation would be around the existing easement agreements. AS said that there were family burial plots on Barrick land, and that while Barrick gave free access, he wanted to ensure this continued after Barrick left. The Social Impact Assessment was also discussed, and SG stated that Barrick did not want to release the SIA prior to the determination of the Modification. Bland Shire Council has recently formed a Committee to address the issues within the SIA, and that Barrick was involved in that Committee.	
7.0 Meeting Closed – 11.10am	
8.0 Next Meeting Wednesday 3rd December 2014, at the Lake Cowal Conservation Centre.	

Community Environmental Monitoring and Consultative Committee (CEMCC)

Declarations of interest:

Margaret MacDonald-Hill - Independent Chair

- ***Appointed by DG of DP&E, paid via Trust administered by Bland Shire Council***
- ***Member of the Mine Subsidence Board***
- ***Member of the Ministers' Arbitration Panel***

Angus Stitt – Community Representative, West Wyalong

- Receives reimbursement of travel costs for attending CEMCC meetings, from time to time

Lucy Buttenshaw – Community Representative, West Wyalong

- Nil

Jenene McGrath – Community Representative, West Wyalong

- Nil

David Carter – Community Representative, Condobolin

- Nil

Bruce Dent – Lake Cowal Landholders Association

- Noise Mitigation Agreement in accordance with Development Consent Conditions
- Receives reimbursement of travel costs for attending CEMCC meetings, from time to time

Neil Pokoney – Bland Shire Council Representative

- Barrick is a ratepayer within the Bland Shire
- Barrick has entered into a Roads Maintenance MOU with Bland Shire Council
- Barrick has provided financial support for certain community events, initiatives, and infrastructure operated by the Bland Shire Council

Graham Scott – Lachlan Shire Council Representative

- Barrick is a ratepayer within the Lachlan Shire
- Barrick is a customer (subscriptions and advertising) of The Lachlander newspaper, of which, Mr Scott is the Editor
- Barrick has entered into a Roads Maintenance MOU with Lachlan Shire Council
- Barrick has provided financial support for certain community events, initiatives, and infrastructure operated by the Lachlan Shire Council

Brian Mattiske – Forbes Shire Council Representative

- Barrick is a ratepayer within the Forbes Shire
- Barrick pays annual easement payments to the Forbes Shire Council for properties owned by Council
- Barrick pays annual easement payments to entities which Mr Mattiske maintains a financial interest in for properties owned by those entities

- Barrick pays an annual fee for Temporary Water Transfer Agreements to entities which Mr Mattiske maintains a financial interest
- Barrick has provided financial support for certain community events, initiatives, and infrastructure operated by the Forbes Shire Council

Daryl Neilson – Lake Cowal Foundation and Independent Scientist

- Receives reimbursement of travel costs for attending CEMCC meetings, from time to time
- Director of Lake Cowal Foundation which receives annul payments from Barrick

Terry Williams – Wiradjuri Condobolin Corporation

- Wiradjuri Condobolin Corporation receives compensation payments in accordance with Native Title requirements
- Wiradjuri Condobolin Corporation is a contractor to Barrick at the Cowal Gold Project

MINUTES OF MEETING

COWAL GOLD MINE
COMMUNITY ENVIRONMENTAL MONITORING AND CONSULTATIVE COMMITTEE (CEMCC)

Wednesday 3 December 2014
9.00 am – Lake Cowal Conservation Centre
Minutes taken by: Shane Goodwin

Attendees:

Independent Chair:	Margaret MacDonald-Hill (MMH)
Barrick:	Garry Pearson (GP), Shane Goodwin (SG)
Community Members:	Angus Stitt (AS), Lucy Buttenshaw (LB) and Dave Carter (DC)
Bland Shire Council:	Neil Pokoney (NP)
Lachlan Shire Council:	Graham Scott (GS)
Forbes Shire Council:	Brian Mattiske (BM) Graeme Miller (GM)
Wiradjuri Condobolin Corporation:	Ally Coe (TW)
Observers:	Bob Blain (Barrick Cowal Processing Manager) Leeanne Hampton (Bland Shire Council and West Wyalong Local Aboriginal Lands Council)

Apologies: Daryl Neilson, Jenene McGrath, Bruce Dent, Cr Ron Penny

ITEM	ACTION
1.0 Welcome Independent Chair, Margaret MacDonald-Hill opened the meeting at 9.10 am.	
2.0 Declaration of Interest Margaret MacDonald-Hill declared her interest as Independent Chair of the CEMCC, appointed by the Director General of the Department of Planning and Infrastructure. For record purposes, Margaret advised the committee she is a member of the Mine Subsidence Board. Margaret also declared that she receives payment via a Trust established by the Bland Shire Council for her work as Chair of the CEMCC. Margaret advised that she had not sought re-appointment to the Minister's Arbitration Panel which had been part of previous declarations of interest. For a full Declaration of Interest for all members, see Attachment A	
3.0 Confirmation of Minutes of CEMCC Meeting held on 3 September, 2014 **Moved:** Angus Stitt **Seconded**: Lucy Buttenshaw **Accepted.**	

4.0 Business Arising from previous Minutes

Margaret advised that she had written to the Department of Planning and Environment per the resolution at the CEMCC's previous meeting. Copies of the letter and the Department's response had been distributed to CEMCC members via email.

Correspondence

In
15/9/14 - email Barrick NF & O incident report
24/9/14 - letter from BSC on CEMCC reps
24/9/14 - letter from DP&E responding to monitoring
24/10/14 - email Barrick NF & O incident report
18/11/14 email Barrick NF & O incident report
19/11/14 - letter from Forbes Council advising representatives
1/12/14 - email Barrick NF & O incident report
1/12/14 - email Barrick IMP

Out
15/9/14 - letter to DP&E re monitoring

5.0 Reports

Shane Goodwin provided a detailed account of Barrick Cowal's Community Relations Activities over the past three months – See the attached presentation for more information (Attachment B).

- Community Relations activities
- Complaints/Grievances
- Upcoming activities
- Cowal Partnering Program discussion

Complaints/Grievances

The 2 complaints received since the last meeting were from two individual stakeholders:

- The complaints received relate to:
  - Blasting (1)
  - Driver behaviour (1)

Garry Pearson provided a detailed account of Barrick Cowal's Environment Department Activities over the past three months – See the attached presentation for more information (Attachment C). He noted that the Independent Monitoring Panel's (IMP) 10th annual report had been delivered and copies made available to CEMCC Members. The report will also be posted to the Barrick website in accordance with Development Consent Conditions.	
6.0 General Business 2015 Preliminary Meeting Schedule: • 4 March, 2015 – Cowal Gold Mine • 3 June 2015, Venue TBA • 9 September 2015, Venue TBA • 2 December 2015, Venue TBA	
7.0 Meeting Closed – 10.20am	
8.0 Next Meeting Wednesday 4th March 2015, at the Cowal Gold Mine.	

ATTACHMENT A – CEMCC MEMBERS' DECLARATIONS OF INTEREST

Community Environmental Monitoring and Consultative Committee (CEMCC)

Declarations of interest:

Margaret MacDonald-Hill - Independent Chair

- ***Appointed by DG of DP&E, paid via Trust administered by Bland Shire Council***
- ***Member of the Mine Subsidence Board***

Angus Stitt – Community Representative, West Wyalong

- Receives reimbursement of travel costs for attending CEMCC meetings, from time to time

Lucy Buttenshaw – Community Representative, West Wyalong

- Nil

Jenene McGrath – Community Representative, West Wyalong

- Nil

David Carter – Community Representative, Condobolin

- Nil

Bruce Dent – Lake Cowal Landholders Association

- Noise Mitigation Agreement in accordance with Development Consent Conditions
- Receives reimbursement of travel costs for attending CEMCC meetings, from time to time

Neil Pokoney – Bland Shire Council Representative

- Barrick is a ratepayer within the Bland Shire
- Barrick has entered into a Roads Maintenance MOU with Bland Shire Council
- Barrick has provided financial support for certain community events, initiatives, and infrastructure operated by the Bland Shire Council

Graham Scott – Lachlan Shire Council Representative

- Barrick is a ratepayer within the Lachlan Shire
- Barrick is a customer (subscriptions and advertising) of The Lachlander newspaper, of which, Cr Scott is the Editor
- Barrick has entered into a Roads Maintenance MOU with Lachlan Shire Council
- Barrick has provided financial support for certain community events, initiatives, and infrastructure operated by the Lachlan Shire Council

Brian Mattiske – Forbes Shire Council Representative

- Barrick is a ratepayer within the Forbes Shire
- Barrick pays annual easement payments to the Forbes Shire Council for properties owned by Council
- Barrick pays annual easement payments to entities which Mr Mattiske maintains a financial interest in for properties owned by those entities
- Barrick pays an annual fee for Temporary Water Transfer Agreements to entities which Mr Mattiske maintains a financial interest
- Barrick has provided financial support for certain community events, initiatives, and infrastructure operated by the Forbes Shire Council

Graham Miller – Forbes Shire Council Representative

- Barrick is a ratepayer within the Forbes Shire
- Barrick pays annual easement payments to the Forbes Shire Council for properties owned by Council
- Barrick has provided financial support for certain community events, initiatives, and infrastructure operated by the Forbes Shire Council

Daryl Neilson – Lake Cowal Foundation and Independent Scientist

- Receives reimbursement of travel costs for attending CEMCC meetings, from time to time
- Director of Lake Cowal Foundation which receives annul payments from Barrick

Ally Coe – Wiradjuri Condobolin Corporation

- Wiradjuri Condobolin Corporation receives compensation payments in accordance with Native Title requirements
- Wiradjuri Condobolin Corporation is a contractor to Barrick at the Cowal Gold Project