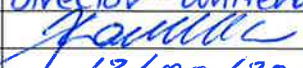


# Annual Review

## Sunnyside Coal Mine

|  |  |
|--|--|
| Name of operation  | Sunnyside Coal Mine  |
| Name of operator   | Whitehaven Coal Mining Pty Ltd   |
| Development consent/project approval number  | PA 06_0308   |
| Name of holder of development consent/project approval   | Namoi Mining Pty Ltd   |
| Mining lease number  | ML 1624  |
| Name of holder of mining lease   | Namoi Mining Pty Ltd   |
| Water licence number   | WAL 29537  |
| Name of holder of water licence  | Namoi Mining Pty Ltd   |
| MOP start date   | 04-08-2017   |
| MOP end date   | 14-08-2018   |
| Annual review start date   | 01-12-2016   |
| Annual review end date   | 31-12-2017   |
| <p><b>I, Jamie Frankcombe, certify that this audit report is a true and accurate record of the compliance status of Sunnyside Coal Mine for the period December 1<sup>st</sup> 2016 until November 30<sup>th</sup> 2017, and that I am authorised to make this statement on behalf of Namoi Mining Pty Ltd.</b></p> <p><i>Note. a) The Annual Review is an 'environmental audit' for the purposes of section 122B (2) of the Environmental Planning and Assessment Act 1979. Section 122E provides that a person must not include false or misleading information (or provide information for inclusion in) an audit report produced to the Minister in connection with an environmental audit if the person knows that the information is false or misleading in a material respect. The maximum penalty is, in the case of a corporation, \$1 million and for an individual, \$250,000.</i></p> <p><i>b) The Crimes Act 1900 contains other offences relating to false and misleading information: section 192G (Intention to defraud by false or misleading statement—maximum penalty 5 years imprisonment); sections 307A, 307B and 307C (False or misleading applications/information/documents—maximum penalty 2 years imprisonment or \$22,000, or both).</i></p> |  |
| Name of authorised reporting officer   | Jamie Frankcombe   |
| Title of authorised reporting officer  | Director - Whitehaven Coal Mining Ltd  |
| Signature of authorised reporting officer  |  |
| Date   | 12/02/2018   |

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# 1 STATEMENT OF COMPLIANCE

The compliance status of the Sunnyside Coal Mine as at 31<sup>st</sup> December 2017 is summarised in Table 1. Table 2 notes non-compliances that occurred during the reporting period, and non-compliances from previous reporting periods that still require management action.

**Table 1 - Statement of Compliance**

| Were all conditions of the relevant approval(s) complied with? |     |
|--|-----|
| PA 06_0308 Consolidated  | No  |
| EPL 12957  | No  |
| ML 1624  | Yes |
| WAL 29537  | Yes |

**Table 2 - Non-compliances**

| Relevant Approval | Schedule (Condition) Number | Condition Description (summary)                               | Compliance status | Comment  | Where Addressed in Annual Review |
|-------------------|-----------------------------|---|-------------------|--|----------------------------------|
| PA 06_0308        | 2(2)                        | Carry out project generally in accordance.                    | Non-compliant     | Refer following conditions.  | n/a                              |
| PA 06_0308        | 3(20)                       | Requirement for continuous meteorological monitoring.         | Non-compliant     | Continuous monitoring was not achieved due to communication issues and breakdowns. | Section 11.2                     |
| EPL 12957         | M2.1                        | Requirement to monitor concentration of pollutants discharged | Non-compliant     | Deposited dust results for April destroyed at Laboratory.                          | Section 6.1.3, 11.2              |
| EPL 12957         | M4.1                        | Requirement for continuous meteorological monitoring.         | Non-compliant     | Continuous monitoring was not achieved due to communication issues and breakdowns. | Section 11.2                     |

Note: Non-compliances identified within the Independent Environmental Audit undertaken during a previous reporting period are listed in Table 12.

**Compliance status key for Table 2**

| Risk level                           | Colour code   | Description   |
|--------------------------------------|---------------|---|
| <b>High</b>                          | Non-compliant | Non-compliance with potential for significant environmental consequences, regardless of the likelihood of occurrence  |
| <b>Medium</b>                        | Non-compliant | Non-compliance with: <ul style="list-style-type: none"><li>• potential for serious environmental consequences, but is unlikely to occur; or</li><li>• potential for moderate environmental consequences, but is likely to occur</li></ul> |
| <b>Low</b>                           | Non-compliant | Non-compliance with: <ul style="list-style-type: none"><li>• potential for moderate environmental consequences, but is unlikely to occur; or</li><li>• potential for low environmental consequences, but is likely to occur</li></ul>     |
| <b>Administrative non-compliance</b> | Non-compliant | Only to be applied where the non-compliance does not result in any risk of environmental harm (e.g. submitting a report to government later than required under approval conditions)  |

## **2 INTRODUCTION**

This is the ninth Annual Review (AR), formerly Annual Environmental Management Report, produced for the Sunnyside Coal Mine (SCM), and it has been prepared in accordance with Conditions 4 and 5 of Mining Lease (ML 1624) (Mining Act 1992) and Condition 5 (Schedule 5) of PA 06\_0308 (consolidated). The AR follows the format required by the NSW Government Annual Review Guideline (October, 2015).

Though primarily covering the period from 1<sup>st</sup> December 2016 to 31<sup>st</sup> December 2017 (the reporting period), where relevant the AR provides information on historical aspects of the operation and longer term trends in environmental monitoring results. This reporting period covers 13 months in order to bring the SCM reporting period to calendar year, as per PA 06\_0308 (consolidated).

The Sunnyside Coal Mine is located within the Gunnedah Shire, approximately 15 km west of Gunnedah (Figure 1). The mine is owned by Namoi Mining Pty Ltd (NMPL) and operated by Whitehaven Coal Mining Pty Ltd. Both companies are wholly owned subsidiaries of Whitehaven Coal Limited (WCL).

On the 25<sup>th</sup> October 2012, Whitehaven announced that mining operations would be suspended at Sunnyside and the mine would be placed into a care and maintenance phase. Mining operations ceased in November 2012, with the remaining ROM coal stockpiled at site crushed and transported to the CHPP until stockpiles were exhausted in May 2013.

During the reporting period WCL confirmed its intention to recommence mining operations at the site, to mine the remaining coal reserves and then rehabilitate the site. Drilling began at SCM on 12<sup>th</sup> September 2017, with full operations recommencing on the 25<sup>th</sup> September 2017.

### **2.1 Mine Contacts**

The management personnel responsible for operational and environmental performance at the SCM and their relevant contact details are as follows:

- Mr Craig Sullivan, Operations Superintendent and Manager Mining Engineering - retains statutory responsibility for mining activities at the site. Contact: (02) 6741 9390
- Mr Nigel Wood, General Manager, Open Cut Operations - oversees Open Cut Operations for the Whitehaven Group. Contact: (02) 6741 9309.

- Mrs Madeline Whitten, Environmental Officer – oversees day to day environmental and rehabilitation performance across the site. Contact: (02) 6740 7009



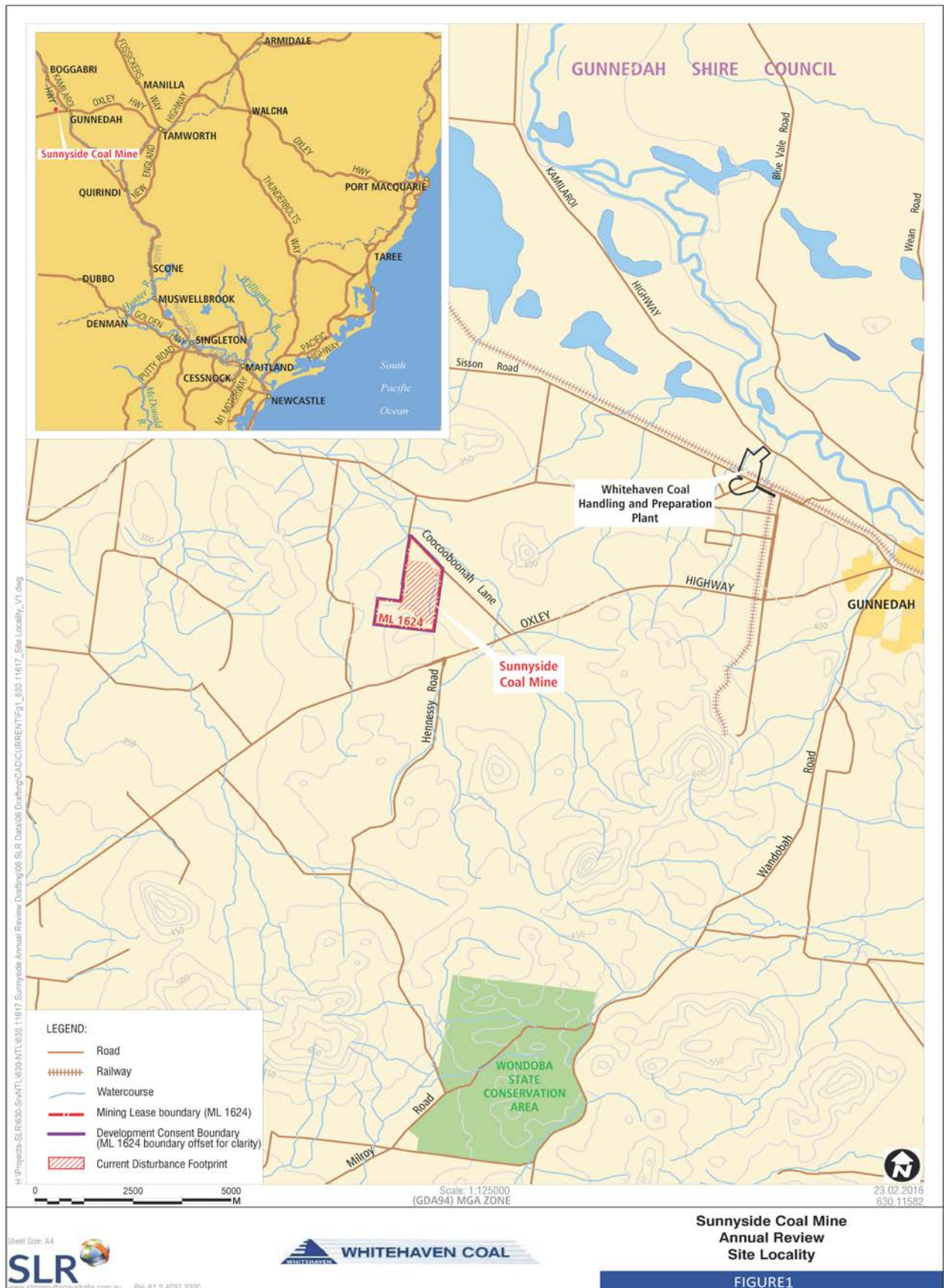


Figure 1 Locality Plan

### 3

## APPROVALS

### 3.1 Tenements, Licences, and Approvals

Table 3 identifies the approvals in place for SCM at the end of the reporting period, the issuing / responsible Authority, dates of issue, expiry date and relevant comments.

**Table 3 - Tenements, Licences and Approvals**

| Issuing / Responsible Authority               | Type of Lease, Licence, Approval         | Date of Issue                   | Expiry                        | Comments  |
|---|--|---------------------------------|-------------------------------|---|
| Department of Planning and Environment (DP&E) | Project Approval (PA) 06_0308            | 24 <sup>th</sup> September 2008 | 5 <sup>th</sup> November 2020 | PA modified December 2016 to update Annual Review period. |
| Environment Protection Authority (EPA)        | Environment Protection Licence No. 12957 | 19 <sup>th</sup> September 2017 | N/A                           | Update to reflect recommencement of operations            |
| Division of Resources and Geoscience (DRG)    | ML 1624                                  | 5 <sup>th</sup> November 2008   | 5 <sup>th</sup> November 2029 |   |
| Division of Resources and Geoscience          | Mining Operations Plan (MOP)             | 4 <sup>th</sup> August 2017     | 14 <sup>th</sup> August 2018  | Update to reflect recommencement of operations            |
| Department of Primary Industry - Water        | WAL 29537 (90WA822534)                   | 27 <sup>th</sup> April 2009     | 17 <sup>th</sup> January 2025 | Mining  |
|   | 90BL253767                               | 9 <sup>th</sup> Feb 2007        | Perpetuity                    | Test  |
|   | 90BL253768                               | 9 <sup>th</sup> Feb 2007        | Perpetuity                    | Test  |
|   | 90BL253769                               | 9 <sup>th</sup> Feb 2007        | Perpetuity                    | Test  |
|   | 90BL254686                               | 26 <sup>th</sup> Mar 2008       | Perpetuity                    | Monitoring  |
|   | 90BL254687                               | 26 <sup>th</sup> Mar 2008       | Perpetuity                    | Monitoring  |
|   | 90BL254688                               | 26 <sup>th</sup> Mar 2008       | Perpetuity                    | Monitoring  |
|   | 90BL254689                               | 26 <sup>th</sup> Mar 2008       | Perpetuity                    | Monitoring  |
|   | 90BL254690                               | 26 <sup>th</sup> Mar 2008       | Perpetuity                    | Monitoring  |

## **4 OPERATIONS SUMMARY**

### **4.1 Mining Operations**

Mining operations during the period were limited to the drilling, blasting and handling of waste rock/overburden material. No coal was mined during the reporting period. Table 4 presents the Production Summary at the end of the reporting period.

**Table 4 – Production Summary**

| Material              | Approved Limit                    | Previous Reporting Period (actual) | This Reporting Period (actual) | Next Reporting Period (forecast) |
|-----------------------|-----------------------------------|------------------------------------|--------------------------------|----------------------------------|
| Waste Rock/Overburden | 4.9 M m <sup>3</sup> <sup>1</sup> | 0                                  | 673,188 m <sup>3</sup>         | 1,221,928 m <sup>3</sup>         |
| ROM Coal/Ore          | 1 Mtpa <sup>2</sup>               | 0                                  | 0                              | 715,500 t                        |
| Reject material       | n/a                               | 0                                  | 0                              | 0                                |
| Saleable Product      | n/a                               | 0                                  | 0                              | 419,800 t                        |

<sup>1</sup> Environmental Assessment

<sup>2</sup> PA 06\_0308 Consolidated

### **4.2 Other Operations**

#### **4.2.1 Hours of Operations**

Mining operations were undertaken during the reporting period within permitted operating times, i.e. 7:00am to 10:00pm Monday to Friday and 7:00am to 6:00pm on Saturdays, and not on public holidays.

#### **4.2.2 Infrastructure Management**

Management of infrastructure (e.g. buildings, roads, generators and pumps) and other facilities not specified elsewhere within this AR is undertaken on an as-needs basis or in accordance with statutory requirements in order to maintain them in an operationally efficient, safe, neat and tidy condition, and one which does not result in the direct or indirect generation of unacceptable environmental impacts.

### **4.2.3 Exploration Drilling**

Exploration drilling was undertaken on Mining Lease during the reporting period. All holes drilled have subsequently been sealed.

### **4.3 Next Reporting Period**

The mine production rates are planned for approximately 0.72Mt of ROM coal and approximately 1.2 million bank cubic metres (Mbcm) of overburden during the next reporting period.

Vegetation clearing activities in mining areas over the next reporting period will be conducted in accordance with the approved MOP.

## **5 ACTIONS REQUIRED FROM PREVIOUS ANNUAL REVIEW**

There were no actions required from the previous Annual Review.

## **6 ENVIRONMENTAL PERFORMANCE**

The following sub-sections document the implementation and effectiveness of the various control strategies adopted at the SCM, together with monitoring data for the reporting period. Existing monitoring sites are shown in Figure 2. Life of mine monitoring data is included as Appendices in this AR, where relevant, to allow for discussion on longer-term trends.

### **6.1 Air Quality**

#### **6.1.1 Criteria**

The air quality criteria applicable to the SCM are specified in PA 06\_0308 (consolidated) Schedule 3, Tables 7, 8 & 9, which are summarised below.

- Acceptable mean annual increase in deposited dust – 2 g/m<sup>2</sup>/month.
- Mean annual dust deposition (all sources) – 4 g/m<sup>2</sup>/month.
- Mean annual Total Suspended Particulate (TSP) matter (all sources) concentration – 90 µg/m<sup>3</sup>.
- Mean annual PM<sub>10</sub> particulate level – 30 µg/m<sup>3</sup>.
- 24 hour average PM<sub>10</sub> particulate level – 50 µg/m<sup>3</sup>.

Monitoring of deposited dust is undertaken on a monthly basis whilst PM<sub>10</sub> levels are monitored every 6 days.

#### **6.1.2 Environmental Management Measures**

In order to satisfy the criteria identified above, SCM has ensured that revegetation of disturbed areas has progressed as far as practicable and been maintained.

#### **6.1.3 Dust Monitoring**

Table 5 presents a summary of the deposited dust monitoring data. Figure 2 identifies the locations of the various deposited dust gauges maintained during the reporting period.

**Table 5 - Deposited Dust Monitoring Data Summary**

| Site<br>(See Figure 2) | EPL ID<br>no. | Property Name | Annual Mean Total<br>Insoluble Solids<br>(g/m <sup>2</sup> /month) | Annual Mean<br>Ash<br>(g/m <sup>2</sup> /month) |
|------------------------|---------------|---------------|--|---|
| SD1                    | 1             | Ferndale      | 0.9  | 0.5   |
| SD3                    | 2             | Plainview     | 1.7  | 0.9   |
| SD4                    |               | Lilydale      | 0.8  | 0.4   |
| SD5                    | 4             | Ivanhoe       | 3.3  | 1.8   |
| SD6                    | 5             | Illili        | 2.3  | 0.7   |
| SD7                    | 6             | Innisvale     | 3.1  | 0.5   |
| SD8                    |               | Woodlawn      | 0.9  | 0.4   |

A review of Table 5 shows that the annual average limit for deposited dust was not exceeded at any location during the reporting period. It should be noted that the annual average has been determined over 11 months, following a laboratory error. Although data was recorded continuously during the period, when the samples were sent to the laboratory for analysis the box of samples was dropped and destroyed.

SCM has one High Volume Air Sampler (HVAS - PM<sub>10</sub>) located at the property Illili (EPL ID 7), to the north-west of the mine site (refer Figure 2).

The PM<sub>10</sub> results for the reporting period show compliance with the 24hr criteria, and the annual average criteria. Results have remained relatively stable, with the annual average dropping slightly to 12.42µg/m<sup>3</sup> at the end of the reporting period. This is below the EA annual prediction of 22.1 µg/m<sup>3</sup>.

#### **6.1.4 Key Environmental Performance/Management Issues**

No key environmental performance/management issues were identified during the reporting period.

#### **6.1.5 Proposed Improvements to Environmental Management**

No improvements are proposed within the next reporting period.



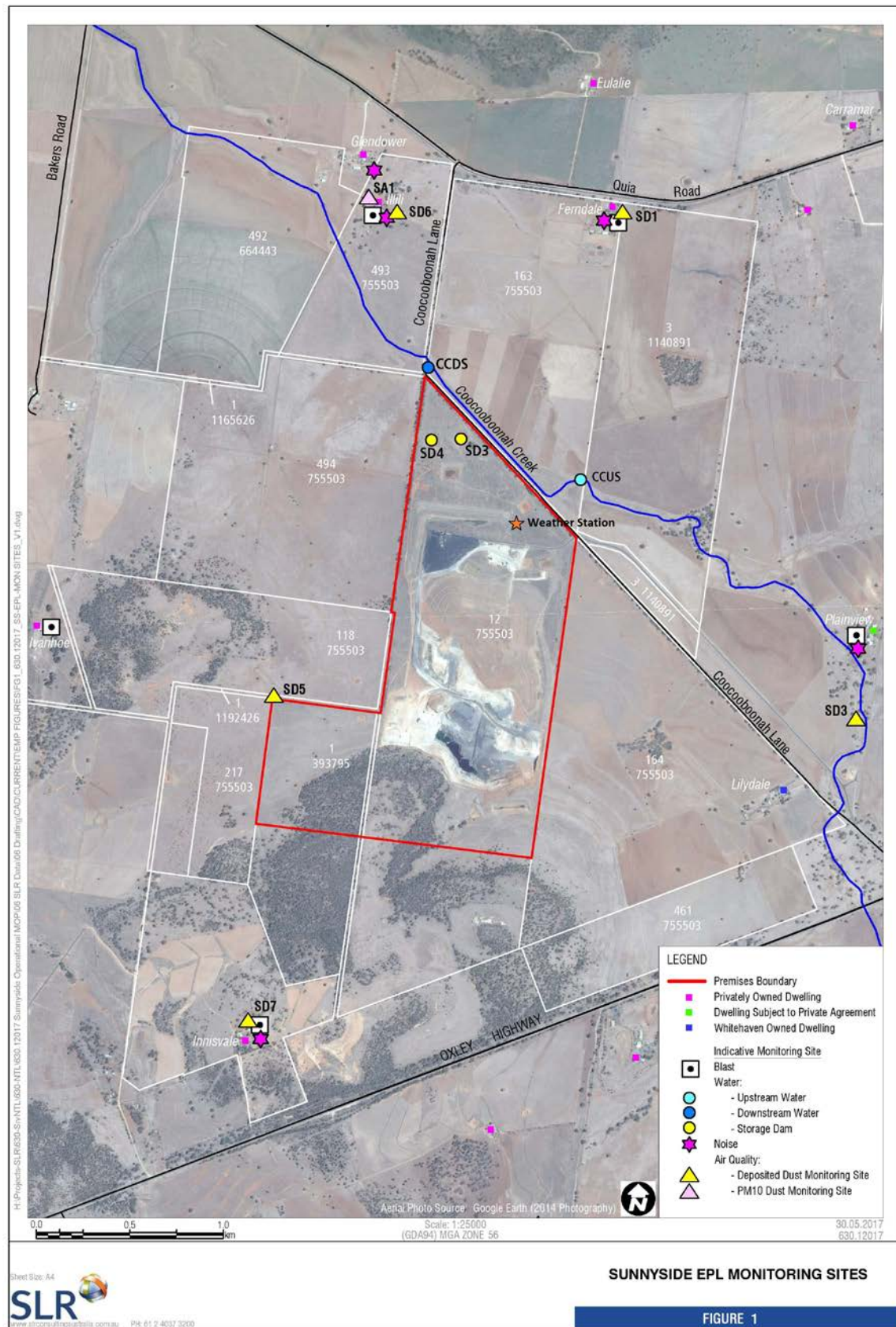


Figure 2 Environmental Monitoring Locations

## **6.2 Biodiversity**

### **6.2.1 Threatened Flora**

Investigations into the occurrence of threatened flora within the Project Approval Area were undertaken as part of the Environmental Assessment by Geoff Cunningham Natural Resource Consultants Pty Ltd in 2007, following field surveys in October and December 2006. The investigation identified no significant impact on threatened flora species, endangered ecological communities, endangered flora populations or critical habitat as a consequence of the development, either because they do not exist in the area or avoidance is possible due to project design.

Investigations identified a remnant of the White Box Yellow Box Blakely's Red Gum Woodland endangered ecological community within the study area but concluded that it would not be affected in any significant manner by the mine.

A remnant of the Native Vegetation on Cracking Clay Soils of the Liverpool Plains endangered ecological community was also identified within the study area. It was noted that a small section of this community would be temporarily affected by the Coocooboonah Lane re-alignment but the community would be rehabilitated and enhanced following rehabilitation after mining ceases. It was assessed that this action, due to its temporary impact and final environmental enhancement, would not require approval under the Commonwealth EPBC Act.

Much of the area has been cleared in the past and most of this cleared area has been cultivated. The vegetation on the cleared areas has been invaded by introduced species. The establishment of the mine site did not involve clearing of native vegetation and as such no biodiversity offsets were required.

### **6.2.2 Threatened Fauna**

Investigations into the occurrence of threatened fauna within the Project Approval Area were undertaken by Kevin Mills and Associates as part of the Environmental Assessment, following surveys conducted in September 2006. These investigations identified that the proposed development was unlikely to significantly affect any of the threatened species, fauna populations or communities listed under the *Threatened Species Conservation Act 1995*, or their habitats.



It was also concluded that development of the mine was not likely to have a significant impact on any matter of national environmental significance listed under the *Environment Protection and Biodiversity Conservation Act 1999*. Referral to the Commonwealth Minister for the Environment for assessment and approval was therefore not warranted.

The area surrounding the mine site supports a viable koala population. NMPL has undertaken a number of measures to minimise the impacts on this population, including:

- Relocating the southern section of Coochooboonah Lane to avoid disturbing remnant koala habitat;
- Erecting a koala-proof fence around the active mine area;
- Minimising clearing and utilising local tree species for revegetation with an emphasis on koala feed trees. This has continued since the last reporting period with koala feed trees planted in koala corridor.

Fauna quadrat establishment was undertaken in November 2010 by Dr Leong Lim (Countrywide Ecological Services), where two grassland monitoring plots were established. Since establishment, roof tiles have been scattered throughout the quadrats to enhance the ground habitat structure and provide refuges for the ground fauna. The establishment of two woodland plots to the south of the active mining area occurred in February 2011, during a monitoring campaign. These plots are placed in open woodland, and open woodland with grassy understory communities.

Monitoring undertaken in September 2012 identified seven new bird species and the reoccurrence of a family group of Grey-crowned Babblers. The previously identified koala population was noted as not having been impacted by mining operations, and up to 10 species of micro bats were noted as being active in the vicinity of the mine, including the listed Yellow-bellied Sheathtail Bat.

Ecological monitoring for biodiversity was undertaken at SCM during December 2017, with a report on findings expected early in the next reporting period.

### **6.2.3 Weeds**

Weed management within the project area predominately involves targeted monthly inspections to determine levels of weed infestation, and is control spraying is usually undertaken by Whitehaven's own qualified personnel, although additional broad scale

spraying and slashing was also undertaken across the SCM during autumn in preparation for recommencement. Spot spraying following monthly inspections was undertaken during the reporting period in July, October, and December 2017.

#### **6.2.4 Feral Animal Control**

Feral animal control for the SCM consisted of targeted trapping of pigs, with 8 captured and disposed of during the reporting period.

In view of the low frequency of occurrence, and in the absence of an extensive programme by all surrounding landowners, no other broad scale feral animal control programmes were considered warranted during the reporting period. In accordance with prior commitments, mine personnel will continue to monitor feral animal occurrences and implement further necessary control programmes if and when necessary.

#### **6.2.5 Koala Management**

During the reporting period 6 koalas were recorded onsite. The koala fence was inspected each month during the environmental inspections, and remains in functional condition. Additional plantings of 160 koala feed tree species were planted during the reporting period, along the koala corridor.

#### **6.2.6 Key Environmental Performance/Management Issues**

No key environmental performance/management issues were identified during the reporting period.

#### **6.2.7 Proposed Improvements to Environmental Management**

No improvements are proposed within the next reporting period.

### **6.3 Blasting**

#### **6.3.1 Criteria**

Blasting criteria for the SCM are noted in PA 06\_0308, and Condition L5 of EPL 12957, and included below:

The overpressure level from blasting operations must not:

- exceed 115dB (Lin Peak) for more than 5% of the total number of blasts over each reporting period; and
- exceed 120dB (Lin Peak) at any time, at any residence on privately-owned land.

Ground vibration peak particle velocity from the blasting operations must not:

- exceed 5mm/s for more than 5% of the total number of blasts during each reporting period; and
- exceed 10mm/s at any time, at any residence on privately-owned land.

### 6.3.2 Key Environmental Performance/Management Issues

No blasts undertaken during the reporting period exceeded the criteria. Results for the period are provided below in Table 6.

### 6.3.3 Proposed Improvements to Environmental Management

No improvements are proposed for the next reporting period.

**Table 6 - Blast Monitoring Results**

| Location  | Parameter                             | 100 <sup>th</sup> ile limit | Average | Max   | 95 <sup>th</sup> ile limit | >95 <sup>th</sup> ile |
|-----------|---------------------------------------|-----------------------------|---------|-------|----------------------------|-----------------------|
| Ivanhoe   | Air blast overpressure (dB(Lin Peak)) | 120                         | 79.0    | 89.9  | 115                        | 0                     |
|           | Vibration (mm/s)                      | 10                          | 0.86    | 1.45  | 5                          | 0                     |
| Plainview | Air blast overpressure (dB(Lin Peak)) | 120                         | 77.8    | 112.8 | 115                        | 0                     |
|           | Vibration (mm/s)                      | 10                          | 0.61    | 1.0   | 2                          | 0                     |
| Innisvale | Air blast overpressure (dB(Lin Peak)) | 120                         | 105.4   | 109.8 | 115                        | 0                     |
|           | Vibration (mm/s)                      | 10                          | 0.52    | 0.98  | 5                          | 0                     |
| Illili    | Air blast overpressure (dB(Lin Peak)) | 120                         | 103.6   | 109.1 | 115                        | 0                     |
|           | Vibration (mm/s)                      | 10                          | 0.84    | 0.84  | 5                          | 0                     |
| Ferndale  | Air blast overpressure (dB(Lin Peak)) | 120                         | 98.2    | 105.2 | 115                        | 0                     |
|           | Vibration (mm/s)                      | 10                          | 0.71    | 1.38  | 5                          | 0                     |

## 6.4 Operational Noise

### 6.4.1 Criteria

Operational noise criteria for SCM are specified in PA 06\_0308 and EPL 12957, as follows:

| <i>Location</i>                 | <i>Day</i>                      | <i>Evening</i>                  |
|---------------------------------|---------------------------------|---------------------------------|
|                                 | <i>L<sub>Aeq</sub> (15 min)</i> | <i>L<sub>Aeq</sub> (15 min)</i> |
| <i>All privately-owned land</i> | 35                              | 35                              |

### 6.4.2 Environmental Management Measures

Control of noise generation and propagation at the mine is by a combination of general source and propagation path methods including:

- Where operationally feasible, scheduling activities to minimise operation of equipment in exposed locations when winds are blowing towards residences and elevated locations when temperature inversions are present;
- Equipment removal or replacement;
- Changing operational procedures;
- Restricting hours of operations;
- Enclosure of fixed items of plant, e.g. generators;
- Bunding close to noise sources to create obstructions to the propagation path;
- On-going site road maintenance using the mine-based grader; and
- Regular equipment maintenance.

### 6.4.3 Key Environmental Performance/Management Issues

No key environmental performance/management issues were identified during the reporting period. The first round of quarterly noise monitoring since recommencement occurred in November 2017, and returned compliant results. Testing will continue on a quarterly basis through the next reporting period.

#### 6.4.4 Proposed Improvements to Environmental Management

No improvements are proposed within the next reporting period.

### 6.5 Aboriginal Heritage Management

#### 6.5.1 Environmental Management Measures

An assessment of the cultural heritage of the mine site was conducted by Archaeological Surveys and Reports Pty Ltd (ASR). Prior to the investigation, ASR contacted the Red Chief Local Aboriginal Land Council (LALC) and Bigundi Biame Gunnedarr Traditional People to arrange for site officers to assist in the survey. A representative from each group was present for the site survey conducted on the 12<sup>th</sup> September 2006 and the coal transport route survey on the 7<sup>th</sup> December 2006. The ASR assessment was used in the preparation of the Environmental Assessment for the mine, undertaken by R.W. Corkery & Co. Pty Ltd on behalf of Namoi Mining Pty.

Four sites were recorded during the investigation, as detailed in Table 7. Only one site (AGG1) was recorded within the mine site while the three isolated artefact sites were identified to the south of the mine site.

All Aboriginal Heritage sites are managed in accordance with the Sunnyside Coal Mine Aboriginal Cultural Heritage Management Plan, prepared in accordance with Schedule 3 Condition 32 of PA 06\_0308 Consolidated.

#### 6.5.2 Consultation

No soil stripping of previously undisturbed areas took place during the reporting period. No additional Aboriginal cultural heritage items have been discovered during the reporting period and no consultation with Aboriginal stakeholders was conducted.

**Table 7 - Aboriginal Artefacts**

| Site Name         | Site Type              | Site Description/Comments  |
|-------------------|------------------------|--|
| Sunnyside<br>AGG1 | Axe Grinding<br>Groove | Axe grinding groove at the rim of a cliff-like scarp (beside a small water-filled natural depression in the rock). Dimensions: 28cm (L) x 6cm (W) x 2cm (D). Located approximately 150m from the southern side of the open cut area. |
| Sunnyside ISO1    | Isolated<br>Artefact   | Flake with possible retouch to one margin located on the bank beside the upper reaches of a dry creek (on a  |

|  |                   |  |
|--|-------------------|--|
|  |                   | vehicle track). Dimensions: 21 x 12 x 3mm  |
| Sunnyside ISO2                                     | Isolated Artefact | Proximal fragment of a flake located on the bank beside the upper reaches of a dry creek. Dimensions: 22 x 22 x 5mm.   |
| Sunnyside OS1                                      | Artefact Scatter  | Artefact scatter of at least ten artefacts in a lozenge-shaped area of 30 x 8m, on the upper slopes down slope of a contour bank down slope of a saddle. Artefact types: flakes and flaked pieces, including a backed blade. |
| Source: Modified after ASR (2007) – EA SCSC Part 7 |                   |  |

### 6.5.3 Key Environmental Performance/Management Issues

No key environmental performance/management issues were identified during the reporting period.

### 6.5.4 Proposed Improvements to Environmental Management

No improvements are proposed within the next reporting period.

## 6.6 Natural Heritage

There are no features of natural heritage within the Project Approval area and hence, no specific management procedures are required.

## 6.7 Spontaneous Combustion

### 6.7.1 Environmental Management Measures

SCM is located within the Hoskissons Coal Seam which has been mined for over 120 years with a number of reported outbreaks of spontaneous combustion. Tests confirmed that coal from the SCM has the potential to spontaneously combust, and this was evident during the care and maintenance phase of the site. The Spontaneous Combustion Management Plan was reviewed in relation to the recommencement of operations, and monitoring of the affected areas has been ongoing.

### 6.7.2 Key Environmental Performance/Management Issues

There has been an improvement in spontaneous combustion onsite through the period, with conditions improved from the end of the previous reporting period.

### 6.7.3 Proposed Improvements to Environmental Management

No improvements are proposed within the next reporting period.

## 6.8 Bushfire Management

### 6.8.1 Environmental Management Measures

SCM is located within an area of cleared agricultural land. Whitehaven Coal personnel liaise with the local (Coocooboonah) Rural Fire Service, as required.

There was one grass fire adjacent to SCM on Coocooboonah lane during the reporting period, which was extinguished by the Rural Fire Brigade. No damage to SCM or neighbouring properties occurred.

### 6.8.2 Key Environmental Performance/Management Issues

No key environmental performance/management issues were identified during the reporting period.

### 6.8.3 Proposed Improvements to Environmental Management

No improvements are proposed within the next reporting period.

## 6.9 Environmental Performance Summary

An environmental performance summary for SCM is presented in Table 8.

**Table 8 - Environmental Performance**

| Aspect       | Approval Criteria / EIS Prediction                     | Performance during the reporting period                                  | Trend / Key Management Implications | Implemented / proposed management actions  |
|--------------|--|--|-------------------------------------|--|
| Air Quality  | Refer Section 6.1.1                                    | Approval criteria met.   | Nil                                 | Nil  |
| Biodiversity | EIS prediction of no impact on known koala population. | No recorded impact on koala population. No koala deaths recorded onsite. | Nil                                 | The Koala Management Plan will continue to be implemented in order to meet the requirements of the koala population. |

|                        |  |  |     |  |
|------------------------|--|--|-----|--|
| Heritage               | EIS prediction of potential blast impact on a recorded site. | No recorded impact on site.                                | Nil | Heritage site inspected quarterly to ensure precautionary measures still in place. |
| Spontaneous Combustion | EIS prediction of no material spontaneous combustion         | Area of previous heating now within active pit once again. | Nil | Ongoing implementation of Spontaneous Combustion Management Plan.                  |



## **7 WATER MANAGEMENT**

The SCM lies within the catchment of the Namoi River. The majority of the surface water runoff flows northwards across the mine site. It then flows into Coocooboonah Creek which flows north-west within a constructed waterway paralleling Coocooboonah Lane. From there, it flows into Rock Well Creek then into Native Cat Creek which continues to flow north-west for 6km. Runoff then flows northwards within Collygra Creek where it flows across a floodplain area before flowing into the Namoi River some 25km north of the Mine Site. The remainder of the mine's surface water flows south into Coocooboonah Creek ultimately flowing into the Namoi River to the north.

The design of sediment detention basins within the disturbed area of the mine limits the opportunity for discharge of runoff from mine-disturbed area, i.e. after appropriate detention time to satisfy licensed discharge criteria.

Two wet weather discharge points are nominated in the current EPL 12957. These are Storage Dam 3 (EPL ID No. 9) and Storage Dam 4 (EPL ID No. 10) (refer Figure 2). Two additional monitoring points are nominated on the EPL for water quality monitoring during discharge events. These are Coocooboonah Creek Upstream (CCUS – EPL ID No. 11) and Coocooboonah Creek Downstream (CCDS – EPL ID No. 12) (refer Figure 2).

### **7.1.1 Surface Water Management**

All sediment basins, storage dams and associated banks and drains have been designed and constructed in accordance with the *Managing Urban Stormwater: Soils and Construction Vol 2E Mines and Quarries* (DECC, 2008) in conjunction with the references to Volume 1 (Landcom, 2004).

As directed by the EPA (EPA letter dated 21<sup>st</sup> August 2015), where runoff from coal contact areas is captured in storage dams designed for sediment control, Sunnyside Coal Mine will need to establish whether the discharge from these structures contains pollutants that pose a risk of non-trivial harm to human health and/or the environment. Whitehaven is working with the EPA to determine appropriate licencing measures to address coal contact water requirements.

### **7.1.2 Surface Water Monitoring Results**

SCM has a requirement to undertake surface water monitoring on a quarterly basis in addition to the monitoring of any wet weather discharge event. Due to below average

rainfall for much of the year, several dams were dry and unable to be sampled at each quarterly monitoring event.

Water quality monitoring locations are shown on Figure 2, and complete surface water quality monitoring results are provided in Appendix 1.

The quarterly monitoring results show that water quality within onsite storages was generally consistent with previous records, although both SB4 and SD4 remained dry for most of the period and therefore were unable to sample for the last 3 quarters of 2017. Results of electrical conductivity and total organic carbon remain generally consistent with previous years. Void water results were largely consistent with previous reporting periods with the exception of a slight increase in EC to 5790  $\mu\text{S}/\text{cm}$ , still remaining well below the previous maximum of 7270  $\mu\text{S}/\text{cm}$ , and below the range predicted within the Project's Environmental Assessment, being 5831  $\mu\text{S}/\text{cm}$  – 10999  $\mu\text{S}/\text{cm}$ .

The water in all sediment basins and storage dams is well within the discharge limits for oil and grease.

There were no wet weather discharges during the reporting period.

### 7.1.3 Key Environmental Performance/Management Issues

The construction of a new void water storage dam was completed during the reporting period to facilitate ongoing in-pit water management.

### 7.1.4 Proposed Improvements to Environmental Management

No improvements are proposed within the next reporting period.

### 7.1.5 Water Take

During the reporting period approximately 2.03ML of water was used on site. The water taken by the operation is summarised in Table 9.

**Table 9 - Water Take**

| Water Licence Number | Water Sharing Plan, Source and Management Zone (as applicable) | Entitlement | Passive take/ inflows | Active Pumping | TOTAL |
|----------------------|--|-------------|-----------------------|----------------|-------|
| WAL 29537            | Gunnedah - Oxley Basin Mdb Groundwater Source                  | 120 units   | 0                     | 2.8ML          | 2.8ML |

## 7.2 Groundwater Management

### 7.2.1 Environmental Performance/Management

The mine's performance with respect to groundwater performance/management, the prevention of pollution, and the assessment of impacts on groundwater availability to other surrounding users, has been assessed through groundwater level and chemistry monitoring undertaken at a series of piezometers and bores within the Project Area and adjacent properties.

### 7.2.2 Groundwater Monitoring

The details of groundwater monitoring throughout the reporting period are listed in Table 10. Monitoring sites are shown in Figure 2 and complete monitoring datasets are provided in Appendix 2.

Groundwater sampling and analysis was undertaken by ALS Acirl Pty Ltd during the reporting period. Below are some points to note regarding monitoring locations and frequencies:

- Bore 27356 has not been monitored since June 2012, as there is a windmill over the bore which no longer functions.
- Standing Water Level (SWL) data is unavailable for bores 27356, 44884, 3709, and Werona due to pumps in place over the bores.

**Table 10 - Groundwater Monitoring Points**

| Site ID (see Figure 2) | Registered Bore No. & Licence No | Property/ Location | Frequency                                   |                                | Purpose                                      |
|------------------------|----------------------------------|--------------------|---|--------------------------------|--|
|                        |                                  |                    | SWL* <sup>2</sup> , EC* <sup>3</sup> and pH | Representative Metals and Ions |  |
| P1* <sup>1</sup>       | GW968386<br>90BL253767           | "Plainview"        | Quarterly                                   | Six monthly                    | To determine existing status and any impacts |
| P2* <sup>1</sup>       | GW968387<br>90BL253768           | "Ferndale"         | Quarterly                                   | Six monthly                    |  |
| P3                     | GW968388<br>90BL253769           | "Sunnyside"        | Quarterly                                   | Six monthly                    |  |
| P7                     | GW968392<br>90BL254689           | "Sunnyside"        | Quarterly                                   | Six monthly                    | To determine existing status and any impacts |
| P8                     | GW968393<br>90BL254690           | "Sunnyside"        | Quarterly                                   | Six monthly                    |  |
| 3709* <sup>1</sup>     | N/A                              | "Ivanhoe"          | Quarterly                                   | Six monthly* <sup>5</sup>      |  |

|   |                        |                |                         |                           |  |
|---|------------------------|----------------|-------------------------|---------------------------|--|
| 22497* <sup>1</sup>   | N/A                    | “Coocooboonah” | Quarterly               | Six monthly               |  |
| 44677* <sup>1</sup>   | N/A                    | “Werona”       | Quarterly* <sup>5</sup> | Six monthly               |  |
| 44884* <sup>1</sup>   | N/A                    | “Lilydale”     | Quarterly               | Six monthly               |  |
| 6249* <sup>1</sup>  | N/A                    | “Lilydale”     | Quarterly               | Six monthly               |  |
| 901460  | GW901460<br>90BL249138 | “Illili”       | Quarterly               | Six monthly* <sup>5</sup> | To determine existing status and any impacts |
| 27356   | GW027356<br>90BL020042 | “Sunnyside”    | Quarterly               | Six monthly* <sup>5</sup> |  |
| 45061   | N/A                    | “Coocooboonah” | Quarterly               | Six monthly* <sup>5</sup> |  |
| Werona<br>Production  | 90BL255246             | “Werona”       | Quarterly               | Six monthly* <sup>5</sup> |  |
| * <sup>1</sup> Non-Company owned bore                      * <sup>2</sup> SWL – Standing Water Level                      * <sup>3</sup> EC = Electrical Conductivity |                        |                |                         |                           |  |
| * <sup>4</sup> Company production bore                      * <sup>5</sup> – Not available this reporting period<br>due to lack of access                             |                        |                |                         |                           |  |

### Groundwater levels

Groundwater levels have remained consistent at all locations monitored during the reporting period.

### Groundwater quality

Analysis of samples taken during the reporting period has shown that groundwater quality has remained generally in line with historical data at all locations monitored. Water quality has been compared to the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2000) (ANZECC) guidelines for stock watering (cattle). P3 continues to show Total Dissolved Solids (TDS) levels above the guidelines, (greater than 4000mg/L), although results for the period are the lowest in almost 9 years, finishing the period with a reading of 7100mg/L. Ivanhoe has shown a spike in iron, with a reading of 27.2mg/L. A similar spike occurred in April 2012 before returning to normal during the next quarter. The Ivanhoe bore will be tested again early in the next reporting period, and further investigation will be undertaken should levels not return to a normal range.

All other parameters remained stable during the reporting period.

## 7.2.3 Groundwater Management

Inflows into the open cut result from a combination of:

- Direct rainfall runoff and infiltration through the emplaced overburden which flows down-dip to the open cut sump(s); and
- Inflows from the exposed coal seam.

At the end of the reporting period an estimated 130 ML of water was held in the pit from rainfall and groundwater seepage. This water is contained within the void itself, and within a separate void water dam within the pit.

Contamination of groundwater is controlled by the management of chemical, oil and grease spills and storage, with:

- Vehicle maintenance carried out in designated areas;
- Any spills being cleaned up; and
- Fuels, oil and grease being stored within a bunded area.

Groundwater from surrounding bores, as well as the mine production bore, is monitored on a regular basis to detect and assess any changes in groundwater quality or level that may be attributable to the mine.

#### **7.2.4 Key Environmental Performance/Management Issues**

Pumping from the Werona Production bore was recommenced during the reporting period, and void water is being pumped from the pit to other void water storages onsite.

#### **7.2.5 Proposed Improvements to Environmental Management**

SCM will continue to undertake regular water monitoring to assess water chemistry and quality, along with management to ensure ongoing water supply for operational demand.

## 8 REHABILITATION

### 8.1 Rehabilitation Performance during the Reporting Period

#### 8.1.1 Status of Mining and Rehabilitation

The status of mining and rehabilitation at the completion of the reporting period is presented in Table 11 and Figure 3.

**Table 11 - Rehabilitation Status**

| Mine Area Type <sup>1</sup>               | Previous Reporting Period | This Reporting Period (Actual) | Next Reporting Period (Forecast) |
|---|---------------------------|--------------------------------|----------------------------------|
|   | 2015/16 (ha)              | 2016/17 (ha)                   | 2018 (ha)                        |
| A. Total Mine Footprint                   | 231.3                     | 231.4                          | 231.4                            |
| B. Total Active Disturbance               | 73.6                      | 74.6                           | 74.6                             |
| C. Land Being Prepared for Rehabilitation | 0                         | 0                              | 0                                |
| D. Land Under Active Rehabilitation       | 31.2                      | 31.2                           | 31.2                             |
| E. Completed Rehabilitation               | 0                         | 0                              | 0                                |

<sup>1</sup> Refer Annual Review Guideline (p.11) for description of mine area types.

#### 8.1.2 Post Rehabilitation Land Uses

Two final rehabilitation land uses are to be established at Sunnyside, being Pasture and Woodland. The eastern, northern and western slopes of the out of pit emplacement area will be planted with locally occurring tree and shrub species, with the objective of re-establishing woodland areas and providing habitat and food trees for the local koala population. The plateau on top of the waste emplacement and the flatter areas around the base of the emplacement area will be returned to pasture.

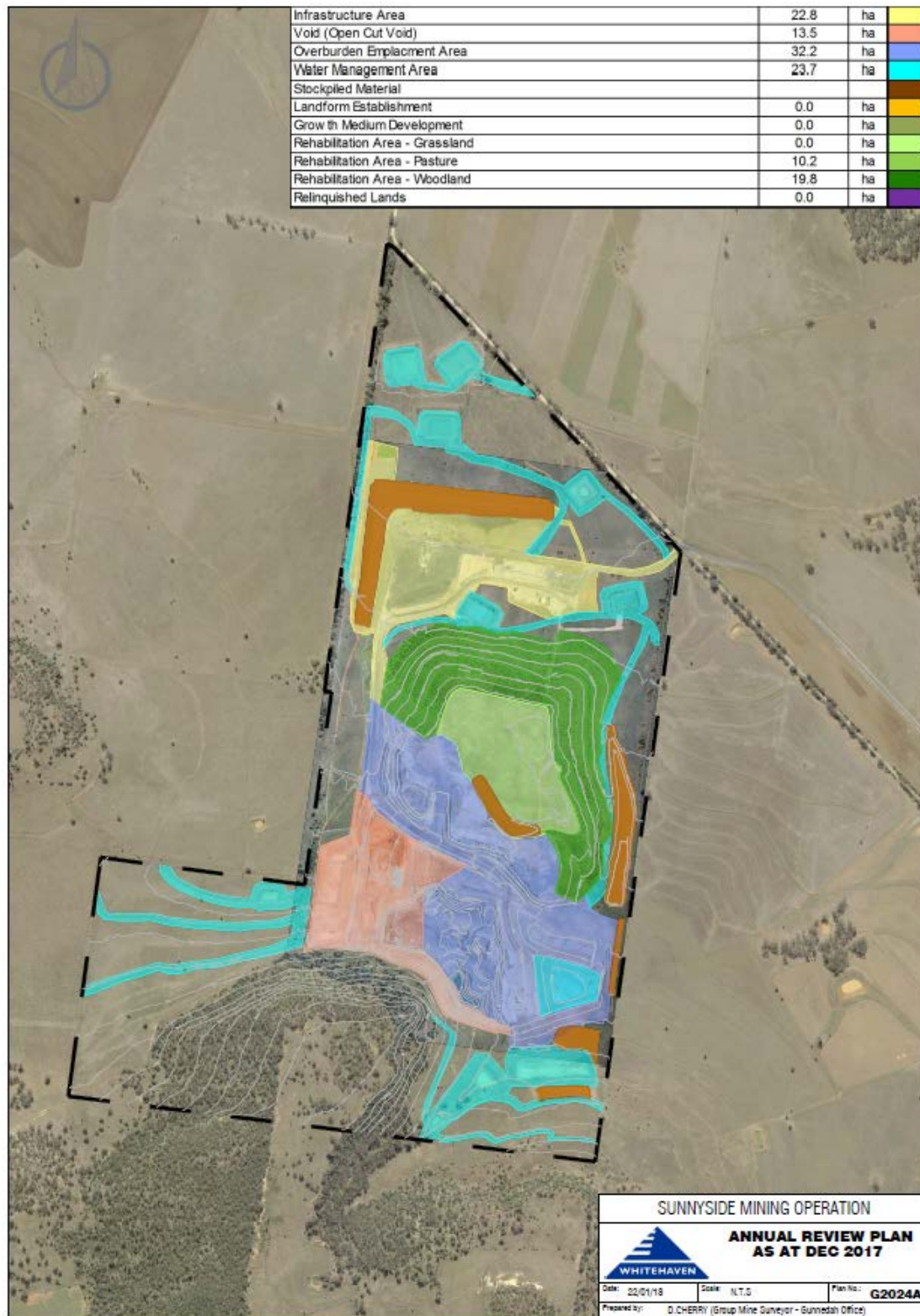


Figure 3 - Status of Mining and Rehabilitation

### **8.1.3 Rehabilitation Undertaken**

There was no additional rehabilitation undertaken on site during the reporting period, although some additional tree planting was undertaken within the koala corridor.

### **8.1.4 Rehabilitation Monitoring**

Winter and spring monitoring programmes were historically undertaken on site in accordance with the then Rehabilitation Management Plan. Part of this monitoring provided an annual snapshot of the habitats available in these areas and habitat utilisation by fauna. This was then compared to baseline data collected from adjacent unaffected land surrounding the mine to determine its success and progression in regards to habitat value for native and threatened species. No rehabilitation monitoring was undertaken during the reporting period.

Rehabilitation condition is monitored through monthly environmental inspections. The monitoring of rehabilitation condition involves the regular inspections of ground cover, trees and the presence of erosion and weeds.

Ecological rehabilitation monitoring was undertaken at SCM during December 2017, with a report on findings expected early in the next reporting period.

### **8.1.5 Weeds Management**

Monthly inspections of rehabilitation areas, as well as periodic general observations of the site, are undertaken in order to identify the presence of noxious weeds. No noxious weed infestations were identified within rehabilitated areas during the reporting period. As detailed in Section 6.2.3 there were occurrences of non-noxious weeds across the site, however broad scale spraying and slashing was undertaken across the SCM during Autumn in preparation for recommencement, and additional spot spraying following monthly inspections was undertaken during the reporting period in July, October, and December 2017.

### **8.1.6 Renovation or Removal of Buildings**

One unused work shop area was decommissioned during the period, involving the removal of 3 storage containers from site.



### **8.1.7 Other Rehabilitation Undertaken**

Recommencement activities resulted in minor repairs and clean ups of the administration buildings and work shop areas, along with similar maintenance undertaken on bunds, wind rows and roads onsite to a safe an operational standard.

### **8.1.8 Departmental Sign-off of Rehabilitated Areas**

Departmental sign-off has not been requested for any rehabilitated areas.

### **8.1.9 Variations in Activities against MOP/RMP**

An operational MOP was developed and approved during the reporting period to address recommencement. A Closure MOP will be developed for SCM during the next reporting period.

### **8.1.10 Trials, Research Projects and Initiatives**

No rehabilitation trials, research projects or other initiatives were undertaken during the reporting period.

### **8.1.11 Key Issues to Achieving Successful Rehabilitation**

Two key issues to achieving successful rehabilitation are:-

- Landform stability (Final Void), and
- Spontaneous combustion.

Ongoing management of spontaneous combustion will continue to be undertaken on site, as per the Spontaneous Combustion Management Plan. Management measures to address the issues of landform instability will be described in the site Closure MOP to be developed in consultation with DRE.

## **8.2 Actions for Next Reporting Period**

- The submission and approval of the Closure MOP will provide the strategies to achieve agreed final rehabilitation outcomes.
- Rehabilitation condition is monitored through monthly environmental inspections. The monitoring of rehabilitation condition involves the regular inspections of ground cover, trees and the presence of erosion and weeds.

- In accordance with the Koala Management Plan, the expanding of koala habitat and the protection of existing habitat will be undertaken during the next reporting period through additional plantings and the fencing of designated areas

## **9 COMMUNITY**

SCM maintains a designated complaints line and, in the event of a complaint, details pertaining to the complainant, complaint and action taken are recorded.

There were no complaints received for the SCM during the reporting period. The five year period of records indicate a low steady trend of complaints, with 1 complaint in 2015/16, 0 complaints in 2014/15, 1 in 2013/14, 7 in 2012/13, and 2 in 2011/12.

Any complaints that are made are reported to the Community Consultative Committee and documented in the AR. A complaints register is also maintained on Whitehaven's website.

Community contributions are managed in accordance the Whitehaven Coal Donations and Sponsorship Policy.

## **10 INDEPENDENT AUDIT**

An Independent Environmental Audit (IEA) was undertaken by ERM during the previous reporting period.

Non-compliances with project approvals identified by the IEA were risk ranked by the auditor in accordance with the compliance status key for Table 2, and SCM subsequently developed an Audit Action Plan for these non-compliances. The Audit Action Plan is available on the Whitehaven Coal website and the individual non-compliances have not been replicated in Table 3.

Outstanding items from the 2016 Audit Action Plan, and how they are being addressed, are summarised in Table 12 below.

Table 12- 2016 IEA Outstanding Action Table

| Condition/Plan                  | IEA Proposed Action  | IEA Action Plan Timing   |
|---------------------------------|--|--|
| <b>Statement of Commitments</b> |  |  |
| 9.12                            | Future work towards mine closure and relinquishment will require significant renewed rehabilitation efforts to improve the currently poor native non-tree species presence (e.g. ground and shrub layers). | As per Mining Operations Plan  |
| 9.20                            | Activities described in the Rehabilitation and Landscape Management Plan were not undertaken in previous periods because of low feral species prevalence. Pig trapping is ongoing.                         | Ongoing  |
| 11.1                            | Identify areas suitable for fencing to encourage natural regeneration in those boundary corridors as stated.   | Areas of native vegetation are fenced to the south of the site, along with a fenced boundary corridor on the western boundary of the SCM. Additional tree planting and subsequent fencing will be undertaken within the next reporting period. |
| 14.3                            | No evidence of SMU segregation aside from topsoil emplacement.   | Review currently stockpiled material. Work has commenced on this action, with a report due early within the next reporting period.   |
| 14.4                            | Recommended that soil pH is recorded during soil management and emplacement.   | As required  |
| 14.5                            | If mining is recommenced in future, recommendation for sediment fencing around bare stockpiles.  | Inspections following recommencement have identified limited areas in need of sediment fencing. These areas are due to be completed during the next reporting period.  |
| 14.6                            | Topsoil stockpiles exceed committed height.  | Review currently stockpiled material. Work has commenced on this action, with a report due early within the next reporting period.   |
| 14.8                            | Soil stockpile segregation should be improved.   | Soil resource audit to be undertaken prior to commencement of final rehabilitation activities.   |

|      |  |  |
|------|--|--|
| 17.5 | Future tree planting should be done with a more random planting. | Incorporate into final revegetation works. |
|------|--|--|

## **11 INCIDENTS AND NON-COMPLIANCES DURING THE REPORTING PERIOD**

### **11.1 Reportable Incidents**

No environmental incidents occurred at SCM during the reporting period.

### **11.2 Non-compliances**

All of the non-compliances with PA 06\_0308 have been ranked as either administrative or low, with very limited potential for significant environmental harm, and are addressed below.

- Condition M2.1 of EPL 12957 requires the sampling and analysis of deposited dust. Samples were collected for each month of the reporting period, as per the licence, however as noted in section 6.1.3 the samples were unfortunately destroyed at the laboratory prior to analysis.
- Schedule 3 Condition 20 of PA 06\_0308 and condition M4.1 of EPL 12957 refer to the requirement of continuous real time meteorological monitoring. Periodic connection failure and equipment malfunction resulted in minor data gaps during the reporting period. Regular maintenance is performed on the meteorological station.

### **11.3 Regulatory Actions**

No regulatory actions (official cautions or warning letters, penalty notices or prosecution proceedings) were undertaken with respect to the Sunnyside Coal Mine during the reporting period.

## **12 ACTIONS TO BE COMPLETED IN THE NEXT REPORTING PERIOD**

The following measures will be continued, or implemented, in the next reporting period to improve the environmental or community performance of the operation:-

- Undertake activities in accordance with the MOP;
- The continuation of environmental monitoring and management;

- Completion of outstanding IEA actions;
- Review and revision of various Environmental Management Plans; and
- Continued community liaison and engagement with local stakeholders.

## Appendix 1

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### SURFACE WATER MONITORING DATA

## Sunnyside Surface Water Monitoring Data

| Sample No.     | Sample Location | Date      | Time  | pH Field | pH Lab | Electrical Conductivity @25C (µS/cm) | Electrical Conductivity (µS/cm) | Total Suspended Solids (mg/L) | Total Organic Carbon (TOC) | Grease & Oil (mg/L) | Total Alkalinity | Hydroxide Alkalinity as CaCO3 | Carbonate Alkalinity as CaCO3 | Bicarbonate Alkalinity as CaCO3 | Aluminium | Antimony | Chloride | Molybdenum | Selenium | Sodium | Arsenic | Manganese | Iron | Comments      |
|----------------|-----------------|-----------|-------|----------|--------|--------------------------------------|---------------------------------|-------------------------------|----------------------------|---------------------|------------------|-------------------------------|-------------------------------|---------------------------------|-----------|----------|----------|------------|----------|--------|---------|-----------|------|---------------|
| ES1117295-002  | SB1             | 10-Aug-11 | 10:45 | 9.3      | 9.07   | 648                                  | 536                             | 46                            | 47                         | <5                  |                  |                               |                               |                                 |           | <0.001   |          | 0.007      | <0.01    |        | 0.002   |           |      |               |
| ES1125734-002  | SB1             | 22-Nov-11 | 10:15 | 10.1     | 9.22   | 592                                  | 486                             | 208                           | 73                         | <5                  |                  |                               |                               |                                 |           | <0.001   |          | 0.008      | <0.01    |        | 0.009   |           |      |               |
| ES1203324-002  | SB1             | 14-Feb-12 | 10:00 | 9.1      | 9.02   | 329                                  | 279                             | 100                           | 14                         | <5                  |                  |                               |                               |                                 |           | 0.001    |          | 0.004      | <0.01    |        | 0.005   |           |      |               |
| ES1210728-003  | SB1             | 01-May-12 | 10:00 | 8.7      | 9.82   | 422                                  | 364                             | 136                           | 21                         | <5                  |                  |                               |                               |                                 |           | <0.001   |          | 0.005      | <0.01    |        | 0.006   |           |      |               |
| ES1303279002   | SB1             | 12-Feb-13 | 11:10 | 8.79     | 8.23   | 310                                  | 296                             | 86                            | 4                          | <5                  |                  |                               |                               |                                 |           | <0.001   |          | 0.002      | <0.01    |        | 0.006   |           |      |               |
| ES1318099-002  | SB1             | 13-Aug-13 | 8:30  | 8.87     | 8.47   | 405                                  | 513                             | 343                           | 22                         | <5                  |                  |                               |                               |                                 |           | <0.001   |          | 0.003      | 0.01     |        | 0.005   |           |      |               |
| ES1325115-001  | SB1             | 18-Nov-13 | 10:20 | 9.7      | 8.88   | 399                                  | 390                             | 46                            | 13                         | <5                  |                  |                               |                               |                                 |           | <0.001   |          | 0.007      | <0.01    |        | 0.005   |           |      |               |
| ES1410234-002  | SB1             | 07-May-14 | 10:15 | 8.8      | 8.35   | 452                                  | 453                             | 196                           | 4                          | <5                  |                  |                               |                               |                                 |           | <0.001   |          | 0.003      | <0.01    |        | 0.005   |           |      |               |
| ES1417254-001  | SB1             | 05-Aug-14 | 11:10 | 8.6      | 8.53   | 609                                  | 644                             | 40                            | 20                         | <5                  |                  |                               |                               |                                 |           | <0.001   |          | 0.006      | <0.01    |        | 0.003   |           |      |               |
| ES1521694-002  | SB1             | 11-May-15 | 14:05 | 9        | 8.32   | 323                                  | 314                             | 107                           | 6                          | <5                  |                  |                               |                               |                                 |           | <0.001   |          | 0.002      | <0.01    |        | 0.002   |           |      |               |
| ES1528398-002  | SB1             | 13-Aug-15 | 9:25  | 9.2      | 8.58   | 508                                  | 497                             | 24                            | 7                          | 5                   |                  |                               |                               |                                 |           | <0.001   |          | 0.004      | <0.01    |        | 0.003   |           |      |               |
| ES1536059-004  | SB1             | 11-Nov-15 | 9:10  | 9.5      | 8.64   | 366                                  | 391                             | 194                           | 8                          | <5                  |                  |                               |                               |                                 |           | <0.001   |          | 0.003      | <0.01    |        | 0.007   |           |      |               |
|                |                 |           |       |          |        |                                      |                                 |                               |                            |                     |                  |                               |                               |                                 |           |          |          |            |          |        |         |           |      |               |
| ES1004139      | SB2             | 04-Mar-10 | 13:00 |          | 8.3    |                                      | 554                             | 17                            | <1                         | 8                   |                  |                               |                               |                                 |           |          |          |            |          |        |         |           |      |               |
| ES1009878      | SB2             | 24-May-10 | 9:35  |          | 8.14   |                                      | 586                             | 30                            | 2                          | 7                   |                  |                               |                               |                                 |           |          |          |            |          |        |         |           |      |               |
| ES1109425-002  | SB2             | 05-May-11 | 10:30 |          | 8.85   |                                      | 663                             | 233                           | 9                          | <1                  |                  |                               |                               |                                 |           |          |          |            |          |        |         |           |      | Turbid/Odour  |
| ES1117295-003  | SB2             | 10-Aug-11 | 10:30 | 8.9      | 8.2    | 608                                  | 513                             | 82                            | 11                         | <5                  |                  |                               |                               |                                 |           | <0.001   |          | 0.005      | <0.01    |        | 0.001   |           |      |               |
| ES1125734-003  | SB2             | 22-Nov-11 | 10:00 | 10.2     | 9.24   | 486                                  | 389                             | 64                            | 5                          | <5                  |                  |                               |                               |                                 |           | <0.001   |          | 0.018      | <0.01    |        | 0.002   |           |      |               |
| ES1203324-003  | SB2             | 14-Feb-12 | 11:50 | 9.5      | 9.12   | 481                                  | 398                             | 51                            | 3                          | <5                  |                  |                               |                               |                                 |           | <0.001   |          | 0.018      | <0.01    |        | 0.002   |           |      |               |
| ES1210728-004  | SB2             | 01-May-12 | 9:40  | 8.2      | 8.92   | 682                                  | 562                             | 356                           | 9                          | <5                  |                  |                               |                               |                                 |           | <0.001   |          | 0.017      | <0.01    |        | 0.007   |           |      |               |
| ES1219038-002  | SB2             | 02-Aug-12 | 10:40 | 8.85     | 8.84   | 376                                  | 441                             | 24                            | 11                         | <5                  |                  |                               |                               |                                 |           | <0.001   |          | 0.008      | <0.01    |        | <0.001  |           |      |               |
| ES1303279003   | SB2             | 12-Feb-13 | 10:40 | 8.33     | 8.2    | 322                                  | 309                             | 436                           | 2                          | <5                  |                  |                               |                               |                                 |           | <0.001   |          | 0.004      | <0.01    |        | 0.004   |           |      |               |
| ES1310164-001  | SB2             | 02-May-13 | 9:30  | 8.62     | 7.92   | 402                                  | 396                             | 61                            | 3                          | <5                  |                  |                               |                               |                                 |           | <0.001   |          | 0.004      | <0.01    |        | 0.002   |           |      |               |
| ES1318099-003  | SB2             | 13-Aug-13 | 9:50  | 8.19     | 8.15   | 312                                  | 318                             | 82                            | 4                          | <5                  |                  |                               |                               |                                 |           | <0.001   |          | 0.002      | <0.01    |        | 0.003   |           |      |               |
| ES1325115-002  | SB2             | 18-Nov-13 | 11:15 | 9.2      | 8.31   | 410                                  | 420                             | 27                            | 8                          | <5                  |                  |                               |                               |                                 |           | <0.001   |          | 0.002      | <0.01    |        | 0.005   |           |      |               |
| ES1402292-001  | SB2             | 04-Feb-14 | 11:30 | 9.9      | 8.97   | 713                                  | 663                             | 66                            | 31                         | <5                  |                  |                               |                               |                                 |           |          |          |            |          |        | 0.002   |           |      |               |
| ES1410234-003  | SB2             | 07-May-14 | 11:30 | 8        | 8.45   | 492                                  | 474                             | 59                            | 3                          | <5                  |                  |                               |                               |                                 |           |          |          |            |          |        | 0.001   |           |      |               |
| ES1417254-002  | SB2             | 05-Aug-14 | 12:00 | 9.3      | 8.53   | 522                                  | 494                             | 11                            | 5                          | <5                  |                  |                               |                               |                                 |           |          |          |            |          |        | 0.001   |           |      |               |
| ES142449-001   | SB2             | 06-Nov-14 | 9:00  | 9.1      | 8.41   | 738                                  | 702                             | 21                            | 6                          | <5                  |                  |                               |                               |                                 |           |          |          |            |          |        |         |           |      |               |
| ES1503593-001  | SB2             | 12-Feb-15 | 9:25  | 9.2      | 8.49   | 497                                  | 446                             | 20                            | 4                          | <5                  |                  |                               |                               |                                 |           | <0.001   |          | 0.003      | <0.01    |        | 0.002   |           |      |               |
| ES1521694-004  | SB2             | 11-May-15 | 12:45 | 8.7      | 8.27   | 283                                  | 278                             | 40                            | 3                          | <5                  |                  |                               |                               |                                 |           | <0.001   |          | 0.002      | <0.01    |        | 0.002   |           |      |               |
| ES1528398-003  | SB2             | 13-Aug-15 | 10:35 | 8.9      | 8.38   | 332                                  | 315                             | 5                             | <1                         | <5                  |                  |                               |                               |                                 |           | <0.001   |          | 0.001      | <0.01    |        | 0.001   |           |      |               |
| ES1536059-003  | SB2             | 11-Nov-15 | 10:20 | 9.2      | 8.85   | 384                                  | 371                             | 13                            | 5                          | <5                  |                  |                               |                               |                                 |           | <0.001   |          | 0.003      | <0.01    |        | <0.001  |           |      |               |
| ES1602640-002  | SB2             | 04-Feb-16 | 9:25  | 9.1      | 8.6    | 308                                  | 294                             | 29                            | 4                          | <5                  |                  |                               |                               |                                 |           |          |          |            |          |        |         |           |      |               |
| ES1609755-002  | SB2             | 05-May-16 | 9:20  | 8.7      | 8.11   | 292                                  | 292                             | 33                            | 8                          | <5                  |                  |                               |                               |                                 |           | <0.001   |          | <0.001     | <0.01    |        | 0.002   |           |      |               |
| ES1617490-003  | SB2             | 08-Aug-16 | 9:25  | 7.9      | 8.27   | 386                                  | 390                             | 40                            | 4                          | <5                  |                  |                               |                               |                                 |           | <0.001   |          | <0.001     | <0.01    |        | <0.001  |           |      |               |
| ES1624857-002  | SB2             | 01-Nov-16 | 9:50  | 8.4      | 8.05   | 243                                  | 279                             | 14                            | 4                          | <5                  |                  |                               |                               |                                 |           |          |          |            |          |        |         |           |      |               |
| ES17002106-002 | SB2             | 30-Jan-17 | 9:50  | 8.5      | 8.29   | 273                                  | 285                             | 47                            | 6                          | <5                  |                  |                               |                               |                                 |           |          |          |            |          |        |         |           |      |               |
| ES1711022-003  | SB2             | 08-May-17 | 11:40 | 9.2      | 8.91   | 350                                  | 433                             | 6                             | 6                          | <5                  |                  |                               |                               |                                 |           | <0.001   |          | 0.002      | <0.01    |        | <0.001  |           |      |               |
| ES1719717-001  | SB2             | 08-Aug-17 | 9:50  | 9        | 8.46   | 383                                  | 380                             | 61                            | 6                          | <5                  |                  |                               |                               |                                 |           | <0.001   |          | 0.001      | <0.01    |        | 0.001   |           |      |               |
| ES1728336-001  | SB2             | 09-Nov-17 | 9:35  | 8.3      | 7.9    | 1690                                 | 1760                            | 121                           | 11                         | <5                  |                  |                               |                               |                                 |           | <0.001   |          | 0.008      | <0.01    |        | 0.002   |           |      |               |
|                |                 |           |       |          |        |                                      |                                 |                               |                            |                     |                  |                               |                               |                                 |           |          |          |            |          |        |         |           |      |               |
| ES1104965-001  | SB3             | 08-Mar-11 | 9:30  |          | 8.49   |                                      | 1300                            | 20                            | <1                         | <5                  |                  |                               |                               |                                 |           |          |          |            |          |        |         |           |      |               |
| ES1109425-001  | SB3             | 05-May-11 | 9:55  |          | 8.3    |                                      | 3020                            | 147                           | 6                          | <5                  |                  |                               |                               |                                 |           |          |          |            |          |        |         |           |      | Turbid/Odour  |
| ES1117295-004  | SB3             | 10-Aug-11 | 10:10 | 8.8      | 8.35   | 2250                                 | 1800                            | 82                            | 12                         | <5                  |                  |                               |                               |                                 |           | <0.001   |          | 0.012      | <0.01    |        | <0.001  |           |      |               |
| ES1123157-001  | SB3             | 18-Oct-11 | 16:00 | 7.84     | 7.84   |                                      | 267                             | 91                            | 4                          | <5                  |                  |                               |                               |                                 |           |          |          |            |          |        |         |           |      |               |
| ES1125734-004  | SB3             | 22-Nov-11 | 9:15  | 8.8      | 8.26   | 353                                  | 283                             | 79                            | 3                          | <5                  |                  |                               |                               |                                 |           | <0.001   |          | 0.003      | <0.01    |        | 0.002   |           |      |               |
| ES1203324-004  | SB3             | 14-Feb-12 | 12:10 | 9.3      | 8.83   | 437                                  | 360                             | 26                            | 1                          | <5                  |                  |                               |                               |                                 |           | <0.001   |          | 0.014      | <0.01    |        | 0.002   |           |      |               |
| ES1210728-005  | SB3             | 01-May-12 | 9:00  | 8        | 8.44   | 498                                  | 417                             | 42                            | 2                          | <5                  |                  |                               |                               |                                 |           | <0.001   |          | 0.015      | <0.01    |        | 0.002   |           |      |               |
| ES1219038-003  | SB3             | 02-Aug-12 | 10:20 | 8.78     | 8.47   | 349                                  | 393                             | 14                            | 5                          | <5                  |                  |                               |                               |                                 |           | <0.001   |          | 0.008      | <0.01    |        | 0.002   |           |      |               |
| ES1227200-002  | SB3             | 15-Nov-12 | 9:45  | 9.18     | 8.89   | 1120                                 | 926                             | 96                            | 29                         | <5                  |                  |                               |                               |                                 |           | <0.001   |          | 0.025      | <0.01    |        | 0.004   |           |      | Dam level low |
| ES1303279004   | SB3             | 12-Feb-13 | 10:00 | 8.29     | 7.96   | 324                                  | 315                             | 18                            | 3                          | <5                  |                  |                               |                               |                                 |           | <0.001   |          | 0.004      | <0.01    |        | 0.003   |           |      |               |
| ES1310164-002  | SB3             | 02-May-13 | 9:50  | 8.25     | 8.09   | 394                                  | 403                             | 144                           | 4                          | <5                  |                  |                               |                               |                                 |           | <0.001   |          | 0.004      | <0.01    |        | 0.002   |           |      |               |
| ES1318099-004  | SB3             | 13-Aug-13 | 10:10 | 8.45     | 8.35   | 331                                  | 320                             | 72                            | 5                          | <5                  |                  |                               |                               |                                 |           | <0.001   |          | 0.002      | <0.01    |        | 0.003   |           |      |               |
| ES1521694-005  | SB3             | 11-May-15 | 12:25 | 7.5      | 7.6    | 353                                  | 343                             | 26                            | 7                          | <5                  |                  |                               |                               |                                 |           | <0.001   |          | 0.002      | <0.01    |        | 0.002   |           |      |               |
|                |                 |           |       |          |        |                                      |                                 |                               |                            |                     |                  |                               |                               |                                 |           |          |          |            |          |        |         |           |      |               |
| ES1109617-002  | SB4             | 09-May-11 | 12:05 |          | 8.65   |                                      | 512                             | 32                            | 14                         | <5                  |                  |                               |                               |                                 |           |          |          |            |          |        |         |           |      |               |
| ES1117295-005  | SB4             | 10-Aug-11 | 11:40 | 8.8      | 8.36   | 546                                  | 474                             | 62                            | 8                          | <5                  |                  |                               |                               |                                 |           | <0.001   |          | 0.008      | <0.01    |        | <0.001  |           |      |               |
| ES1125734-005  | SB4             | 22-Nov-11 | 10:30 | 9.7      | 8.95   | 352                                  | 286                             | 40                            | 4                          | <5                  |                  |                               |                               |                                 |           | <0.001   |          | 0.006      | <0.01    |        | <0.001  |           |      |               |
| ES1203324-005  | SB4             | 14-Feb-12 | 11:30 | 9        | 8.74   | 335                                  | 276                             | 13                            | 2                          | <5                  |                  |                               |                               |                                 |           | <0.001   |          | 0.011      | <0.01    |        | <0.001  |           |      |               |
| ES1210728-006  | SB4             | 01-May-12 | 10:30 | 8.1      | 8.21   | 400                                  | 334                             | 39                            | 1                          | <5                  |                  |                               |                               |                                 |           | <0.001   |          | 0.011      | <0.01    |        | 0.001   |           |      |               |
| ES1219038-004  | SB4             | 02-Aug-12 | 11:10 | 8.89     | 8.79   | 298                                  | 339                             | 8                             | 3                          | <5                  |                  |                               |                               |                                 |           | <0.001   |          | 0.008      | <0.01    |        | <0.001  |           |      |               |
| ES1227200-003  | SB4             | 15-Nov-12 | 9:20  | 8.37     | 8.36   | 939                                  | 754                             | 149                           | 5                          | <5                  |                  |                               |                               |                                 |           | <0.001   |          | 0.02       | <0.01    |        | 0.001   |           |      | Dam level low |
| ES1303279005   | SB4             | 12-Feb-13 | 11:40 | 8.37     | 7.79   | 243                                  | 234                             | 113                           | 2                          | <5                  |                  |                               |                               |                                 |           | <0.001   |          | 0.005      | <0.01    |        | 0.001   |           |      |               |
| ES1318099-005  | SB4             | 13-Aug-13 | 9:00  | 7.99     | 8.07   | 347                                  | 340                             | 110                           | 9                          | <5                  |                  |                               |                               |                                 |           | <0.001   |          | 0.001      | <0.01    |        | 0.005   |           |      |               |
| ES1410234-004  | SB4             | 07-May-14 | 11:05 | 8.2      | 7.76   | 484                                  | 457                             | 647                           | 6                          | <5                  |                  |                               |                               |                                 |           |          |          |            |          |        | 0.005   |           |      |               |
| ES1521694-006  | SB4             | 11-May-15 | 13:30 | 8.6      | 7.95   | 209                                  | 204                             | 32                            | 4                          | <5                  |                  |                               |                               |                                 |           | <0.001   |          | 0.001      | <0.01    |        | 0.001   |           |      |               |
| ES1624857-003  | SB4             | 01-Nov-16 | 11:50 | 8.5      | 7.62   | 235                                  | 255                             | 98                            | 15                         | <5                  |                  |                               |                               |                                 |           |          |          |            |          |        |         |           |      |               |
|                |                 |           |       |          |        |                                      |                                 |                               |                            |                     |                  |                               |                               |                                 |           |          |          |            |          |        |         |           |      |               |
| ES1004139      | SB5             | 04-Mar-10 | 12:50 |          | 7.85   |                                      | 412                             |                               |                            |                     |                  |                               |                               |                                 |           |          |          |            |          |        |         |           |      |               |



| Sample No.    | Sample Location | Date      | Time  | pH Field | pH Lab | Electrical Conductivity @25C (µS/cm) | Electrical Conductivity (µS/cm) | Total Suspended Solids (mg/L) | Total Organic Carbon (TOC) | Grease & Oil (mg/L) | Total Alkalinity | Hydroxide Alkalinity as CaCO3 | Carbonate Alkalinity as CaCO3 | Bicarbonate Alkalinity as CaCO3 | Aluminium | Antimony | Chloride | Molybdenum | Selenium | Sodium | Arsenic | Manganese | Iron  | Comments |                 |
|---------------|-----------------|-----------|-------|----------|--------|--------------------------------------|---------------------------------|-------------------------------|----------------------------|---------------------|------------------|-------------------------------|-------------------------------|---------------------------------|-----------|----------|----------|------------|----------|--------|---------|-----------|-------|----------|-----------------|
| ES1303279006  | SB5             | 12-Feb-13 | 10:20 | 8.02     | 7.53   | 152                                  | 144                             | 266                           | 2                          | <5                  |                  |                               |                               |                                 |           | <0.001   |          | <0.001     | <0.01    |        | 0.008   |           |       |          |                 |
| ES1318099-006 | SB5             | 13-Aug-13 | 10:30 | 7.55     | 7.63   | 160                                  | 158                             | 471                           | 10                         | <5                  |                  |                               |                               |                                 |           | <0.001   |          | 0.012      | 0.02     |        | <0.001  |           |       |          | Dam level low   |
| ES1410234-005 | SB5             | 07-May-14 | 12:05 | 8.5      | 7.48   | 225                                  | 221                             | 6750                          | 56                         | <5                  |                  |                               |                               |                                 |           |          |          |            |          |        | 0.019   |           |       |          |                 |
| ES1417254-003 | SB5             | 05-Aug-14 | 12:10 | 8.1      | 7.81   | 177                                  | 162                             | 5500                          | 54                         | 8                   |                  |                               |                               |                                 |           |          |          |            |          |        | <0.001  |           |       |          |                 |
| ES1521694-007 | SB5             | 11-May-15 | 12:00 | 8.2      | 7.66   | 104                                  | 102                             | 202                           | 2                          | 25                  |                  |                               |                               |                                 |           | <0.001   |          | <0.001     | 0.02     |        | 0.012   |           |       |          |                 |
| ES1528398-004 | SB5             | 13-Aug-15 | 10:15 | 8.4      | 7.61   | 130                                  | 138                             | 2330                          | 4                          | 6                   |                  |                               |                               |                                 |           | <0.001   |          | <0.001     | 0.04     |        | 0.021   |           |       |          |                 |
| ES1536059-002 | SB5             | 11-Nov-15 | 9:55  | 8.8      | 7.54   | 184                                  | 169                             | 568                           | 9                          | <5                  |                  |                               |                               |                                 |           | <0.001   |          | <0.001     | 0.01     |        | 0.01    |           |       |          |                 |
| ES1602640-003 | SB5             | 04-Feb-16 | 9:10  | 8        | 7.44   | 106                                  | 105                             | 696                           | 4                          | <5                  |                  |                               |                               |                                 |           |          |          |            |          |        |         |           |       |          |                 |
| ES1609755-003 | SB5             | 05-May-16 | 9:00  | 8.3      | 7.69   | 101                                  | 135                             | 344                           | 6                          | <5                  |                  |                               |                               |                                 |           | <0.001   | 0.004    | <0.001     | <0.01    |        |         |           |       |          |                 |
| ES1617490-004 | SB5             | 08-Aug-16 | 10:45 | 7.8      | 7.66   | 150                                  | 142                             | 91                            | 4                          | <5                  |                  |                               |                               |                                 |           | <0.001   | <0.001   | <0.001     | <0.01    |        |         |           |       |          |                 |
| ES1624857-004 | SB5             | 01-Nov-16 | 11:35 | 8        | 7.67   | 117                                  | 143                             | 26                            | 4                          | <5                  |                  |                               |                               |                                 |           |          |          |            |          |        |         |           |       |          |                 |
| ES1702106-003 | SB5             | 30-Jan-17 | 10:10 | 8.2      | 7.46   | 81                                   | 156                             | 492                           | 2                          | <5                  |                  |                               |                               |                                 |           |          |          |            |          |        |         |           |       |          |                 |
| ES1711022-002 | SB5             | 08-May-17 | 12:05 | 7.6      | 7.75   | 254                                  | 262                             | 5950                          | 8                          | <5                  |                  |                               |                               |                                 |           | <0.001   |          | <0.001     | 0.01     |        | 0.02    |           |       |          |                 |
| ES1719717-002 | SB5             | 08-Aug-17 | 12:00 | 8.9      | 7.79   | 163                                  | 159                             | 138                           | 4                          | <5                  |                  |                               |                               |                                 |           | <0.001   |          | <0.001     | <0.01    |        | 0.006   |           |       |          |                 |
|               |                 |           |       |          |        |                                      |                                 |                               |                            |                     |                  |                               |                               |                                 |           |          |          |            |          |        |         |           |       |          |                 |
| ES1318099-002 | SD1             | 13-Aug-13 | 8:30  | 8.87     | 8.47   | 405                                  | 513                             | 343                           | 22                         | <5                  |                  |                               |                               |                                 |           | <0.001   |          | 0.005      | 0.01     |        | 0.003   |           |       |          | Dam level low   |
| ES1325115-001 | SD1             | 18-Nov-13 | 10:20 | 9.7      | 8.88   | 399                                  | 390                             | 46                            | 13                         | <5                  |                  |                               |                               |                                 |           | <0.001   |          | 0.005      | <0.01    |        | 0.007   |           |       |          | Low water level |
| ES1410234-002 | SD1             | 07-May-14 | 10:15 | 8.8      | 8.35   | 453                                  | 452                             | 196                           | 4                          | <5                  |                  |                               |                               |                                 |           |          |          |            |          |        | 0.005   |           |       |          |                 |
| ES1417254-001 | SD1             | 05-Aug-14 | 11:10 | 8.6      | 8.53   | 609                                  | 644                             | 40                            | 20                         | <5                  |                  |                               |                               |                                 |           |          |          |            |          |        | 0.003   |           |       |          |                 |
| ES1521694-002 | SD1             | 11-May-15 | 14:05 | 9        | 8.32   | 323                                  | 314                             | 107                           | 6                          | <5                  |                  |                               |                               |                                 |           | <0.001   |          | 0.002      | <0.01    |        | 0.002   |           |       |          |                 |
| ES1528398-002 | SD1             | 13-Aug-15 | 9:25  | 9.2      | 8.58   | 508                                  | 497                             | 24                            | 7                          | 5                   |                  |                               |                               |                                 |           | <0.001   |          | 0.004      | <0.01    |        | 0.003   |           |       |          |                 |
| ES1536059-004 | SD1             | 11-Nov-15 | 9:10  | 9.5      | 8.64   | 366                                  | 391                             | 194                           | 8                          | <5                  |                  |                               |                               |                                 |           | <0.001   |          | 0.003      | <0.01    |        | 0.007   |           |       |          |                 |
| ES1602640-001 | SD1             | 04-Feb-16 | 10:25 | 9.2      | 8.03   | 228                                  | 240                             | 193                           | 55                         | 6                   |                  |                               |                               |                                 |           |          |          |            |          |        |         |           |       |          |                 |
| ES1609755-001 | SD1             | 05-May-16 | 10:00 | 9.4      | 8.45   | 217                                  | 332                             | 24                            | 6                          | <5                  |                  |                               |                               |                                 |           | <0.001   |          | 0.002      | <0.01    |        | 0.006   |           |       |          |                 |
| ES1617490-002 | SD1             | 08-Aug-16 | 11:15 | 8.3      | 7.97   | 265                                  | 258                             | 65                            | 6                          | <5                  |                  |                               |                               |                                 |           | <0.001   |          | 0.001      | <0.01    |        | 0.004   |           |       |          |                 |
|               |                 |           |       |          |        |                                      |                                 |                               |                            |                     |                  |                               |                               |                                 |           |          |          |            |          |        |         |           |       |          |                 |
| ES1023171-002 | SD3             | 15-Nov-10 | 9:40  |          | 7.54   |                                      | 166                             | 140                           | 3                          | <5                  |                  |                               |                               |                                 |           |          |          |            |          |        |         |           |       |          |                 |
|               |                 |           |       |          |        |                                      |                                 |                               |                            |                     |                  |                               |                               |                                 |           |          |          |            |          |        |         |           |       |          |                 |
|               |                 |           |       |          |        |                                      |                                 |                               |                            |                     |                  |                               |                               |                                 |           |          |          |            |          |        |         |           |       |          |                 |
| ES1004139     | SD4             | 04-Mar-10 | 13:15 |          | 8.08   |                                      | 321                             | 12                            | <1                         | <5                  |                  |                               |                               |                                 |           |          |          |            |          |        |         |           |       |          |                 |
| ES1009878     | SD4             | 24-May-10 | 9:25  |          | 8.11   |                                      | 351                             | 9                             | 2                          | 6                   |                  |                               |                               |                                 |           |          |          |            |          |        |         |           |       |          |                 |
| ES1016142-001 | SD4             | 11-Aug-10 | 13:00 |          | 7.82   |                                      | 312                             | 26                            | <1                         | <5                  |                  |                               |                               |                                 |           |          |          |            |          |        |         |           |       |          |                 |
| ES1023171-001 | SD4             | 15-Nov-10 | 9:20  |          | 7.81   |                                      | 186                             | 56                            | 3                          | <5                  |                  |                               |                               |                                 |           |          |          |            |          |        |         |           |       |          |                 |
| ES1104965-002 | SD4             | 08-Mar-11 | 9:50  |          | 8.72   |                                      | 271                             | 15                            | 2                          | <5                  |                  |                               |                               |                                 |           |          |          |            |          |        |         |           |       |          |                 |
| ES1109617-001 | SD4             | 09-May-11 | 11:51 |          | 8.43   |                                      | 394                             | 62                            | 5                          | <5                  |                  |                               |                               |                                 |           |          |          |            |          |        |         |           |       |          |                 |
| ES1117295-001 | SD4             | 10-Aug-11 | 11:15 | 8.9      | 8.17   | 360                                  | 313                             | 13                            | 10                         | <5                  |                  |                               |                               |                                 |           | <0.001   |          | 0.003      | <0.01    |        | <0.001  |           |       |          |                 |
| ES1016142-001 | SD4             | 11-Aug-11 | 13:00 |          | 7.82   |                                      | 312                             | 26                            | <1                         | <5                  |                  |                               |                               |                                 |           |          |          |            |          |        |         |           |       |          |                 |
| ES1125734-001 | SD4             | 22-Nov-11 | 10:45 | 9.5      | 8.74   | 372                                  | 299                             | 19                            | 8                          | <5                  |                  |                               |                               |                                 |           | <0.001   |          | 0.005      | <0.01    |        | 0.002   |           |       |          |                 |
| ES1203324-001 | SD4             | 14-Feb-12 | 10:40 | 8.9      | 8.2    | 274                                  | 227                             | 16                            | 5                          | <5                  |                  |                               |                               |                                 |           | <0.001   |          | 0.006      | <0.01    |        | <0.001  |           |       |          |                 |
| ES1210728-002 | SD4             | 01-May-12 | 11:00 | 8.1      | 7.9    | 330                                  | 276                             | 26                            | 2                          | <5                  |                  |                               |                               |                                 |           | <0.001   |          | 0.005      | <0.01    |        | 0.001   |           |       |          |                 |
| ES1219038-001 | SD4             | 02-Aug-12 | 11:30 | 8.94     | 8.63   | 269                                  | 311                             | 8                             | 5                          | <5                  |                  |                               |                               |                                 |           | <0.001   |          | 0.005      | <0.01    |        | <0.001  |           |       |          |                 |
| ES1227200-001 | SD4             | 15-Nov-12 | 9:10  | 8.22     | 8.24   | 582                                  | 546                             | 66                            | 6                          | <5                  |                  |                               |                               |                                 |           | <0.001   |          | 0.007      | <0.01    |        | 0.003   |           |       |          |                 |
| ES1303279001  | SD4             | 12-Feb-13 | 12:00 | 9.14     | 8.49   | 458                                  | 429                             | 248                           | 9                          | <5                  |                  |                               |                               |                                 |           | <0.001   |          | 0.005      | <0.01    |        | 0.004   |           |       |          |                 |
| ES1318099-001 | SD4             | 13-Aug-13 | 9:30  | 8.33     | 8.07   | 799                                  | 762                             | 318                           | 26                         | <5                  |                  |                               |                               |                                 |           | <0.001   |          | 0.004      | <0.01    |        | 0.005   |           |       |          |                 |
| ES1410234-001 | SD4             | 07-May-14 | 10:35 | 8.1      | 7.69   | 717                                  | 677                             | 3190                          | 13                         | <5                  |                  |                               |                               |                                 |           |          |          |            |          |        | 0.013   |           |       |          |                 |
| ES1521694-001 | SD4             | 11-May-15 | 13:05 | 8.2      | 7.86   | 299                                  | 286                             | 176                           | 7                          | <5                  |                  |                               |                               |                                 |           | <0.001   |          | <0.001     | 0.01     |        | 0.01    |           |       |          |                 |
| ES1528398-001 | SD4             | 13-Aug-15 | 10:55 | 8.4      | 8.01   | 403                                  | 389                             | 255                           | 8                          | 5                   |                  |                               |                               |                                 |           | <0.001   |          | <0.001     | 0.01     |        | 0.01    |           |       |          |                 |
| ES1617490-001 | SD4             | 08-Aug-16 | 9:50  | 7.8      | 7.33   | 230                                  | 235                             | 232                           | 12                         | <5                  |                  |                               |                               |                                 |           | <0.001   |          | <0.001     | 0.02     |        | 0.012   |           |       |          |                 |
| ES1624857-001 | SD4             | 01-Nov-16 | 10:10 | 7.8      | 7.63   | 300                                  | 314                             | 85                            | 13                         | <5                  |                  |                               |                               |                                 |           |          |          |            |          |        |         |           |       |          |                 |
| ES1702106-001 | SD4             | 30-Jan-17 | 10:30 | 8.1      | 7.81   | 186                                  | 180                             | 179                           | 11                         | <5                  |                  |                               |                               |                                 |           |          |          |            |          |        |         |           |       |          |                 |
|               |                 |           |       |          |        |                                      |                                 |                               |                            |                     |                  |                               |                               |                                 |           |          |          |            |          |        |         |           |       |          |                 |
| ES1104965-003 | VOID            | 08-Mar-11 | 9:15  |          | 7.68   |                                      | 4220                            | 23                            | <1                         | <5                  |                  |                               |                               |                                 |           |          |          |            |          |        |         |           |       |          |                 |
| ES1109617-003 | VOID            | 09-May-11 | 12:40 |          | 8.3    |                                      | 4550                            | 6                             | 58                         | <5                  |                  |                               |                               |                                 |           |          |          |            |          |        |         |           |       |          |                 |
| ES1117295-007 | VOID            | 10-Aug-11 | 12:15 | 8.4      | 8.3    | 5240                                 | 4050                            | 10                            | 5                          | <5                  | 444              | <1                            | <1                            | 444                             | 0.1       |          | 1140     |            |          | 720    | 0.005   | 0.054     | 0.11  |          |                 |
| ES1203324-007 | VOID            | 14-Feb-12 | 12:45 | 8.6      | 8.59   | 2280                                 | 1810                            | 10                            | <1                         | <5                  | 398              | <1                            | 46                            | 352                             | 0.03      |          | 278      |            |          | 420    | 0.005   | 0.004     | 0.06  |          |                 |
| ES1219038-006 | VOID            | 02-Aug-12 | 10:00 | 8.64     | 8.4    | 3490                                 | 4400                            | 9                             | <1                         | <5                  |                  |                               |                               |                                 |           |          |          |            |          |        |         |           |       |          |                 |
| ES1227200-004 | VOID            | 15-Nov-12 | 10:30 | 8.46     | 8.44   | 5360                                 | 4720                            | 30                            | <1                         | <5                  |                  |                               |                               |                                 |           |          |          |            |          |        |         |           |       |          |                 |
| ES1303279007  | VOID            | 12-Feb-13 | 12:40 | 8.68     | 8.58   | 5090                                 | 4480                            | 5                             | 2                          | <5                  |                  |                               |                               |                                 |           |          |          |            |          |        |         |           |       |          |                 |
| ES1310164-003 | VOID            | 02-May-13 | 9:00  | 8.78     | 8.54   | 4870                                 | 5350                            | 6                             | 1                          | <5                  |                  |                               |                               |                                 |           |          |          |            |          |        |         |           |       |          |                 |
| ES1318099-007 | VOID            | 13-Aug-13 | 8:00  | 8.48     | 8.51   | 5080                                 | 4810                            | 22                            | 2                          | <5                  |                  |                               |                               |                                 |           | 0.001    |          | 0.002      | 0.04     |        | 0.088   |           |       |          |                 |
| ES1325115-003 | VOID            | 18-Nov-13 | 10:45 | 8.8      | 8.5    | 5850                                 | 5370                            | 6                             | 3                          | <5                  | 403              | <1                            | 43                            | 360                             | 0.02      |          | 1120     | 0.004      |          |        |         | 0.011     | <0.05 |          |                 |
| ES1402292-002 | VOID            | 05-Feb-14 | 11:10 | 8.9      | 8.5    | 7270                                 | 6210                            | <5                            | 52                         | <5                  |                  |                               |                               |                                 |           |          |          |            |          |        |         |           |       |          |                 |
| ES1410234-006 | VOID            | 07-May-14 | 9:30  | 8.7      | 8.51   | 6620                                 | 6140                            | 26                            | <1                         | <5                  | 629              | <1                            | 28                            | 401                             | 0.02      |          | 1210     |            |          | 933    | 0.002   | 0.007     | <0.05 |          |                 |
| ES1417254-004 | VOID            | 05-Aug-14 | 10:55 | 8.7      | 8.57   | 6410                                 | 5930                            | <5                            | 4                          | <5                  |                  |                               |                               |                                 |           |          |          |            |          |        |         |           |       |          |                 |
| ES142449-002  | VOID            | 06-Nov-14 | 9:20  | 8.8      | 8.66   | 6610                                 | 6330                            | 6                             | 3                          | <5                  |                  |                               |                               |                                 |           |          |          |            |          |        | 0.001   |           |       |          |                 |
| ES1503593-002 | VOID            | 12-Feb-15 | 825   | 9.1      | 8.66   | 5940                                 | 6100                            | 7                             | 3                          | <5                  |                  |                               |                               |                                 |           |          |          |            |          |        |         |           |       |          |                 |
| ES1521694-008 | VOID            | 11-May-15 | 13:50 | 8.8      | 8.44   | 5590                                 | 5270                            | 10                            | 2                          | <5                  | 304              | <1                            | 24                            | 280                             | 0.31      |          | 1150     |            |          | 764    | 0.002   |           |       |          |                 |
| ES1528398-005 | VOID            | 13-Aug-15 | 9:05  | 8.8      | 8.46   | 5580                                 | 5190                            | 9                             | <1                         | <5                  |                  |                               |                               |                                 |           |          |          |            |          |        |         |           |       |          |                 |
| ES1536059-001 | VOID            | 11-Nov-15 | 8:50  | 8.7      | 8.53   | 5850                                 | 5270                            | 9                             | 2                          | <5                  |                  |                               |                               |                                 |           |          |          |            |          |        |         |           |       |          |                 |
| ES1602640-004 | VOID            | 04-Feb-16 | 10:05 | 9.1      | 8.68   | 5580                                 | 5040                            | 6                             | 1                          | <5                  |                  |                               |                               |                                 |           |          |          |            |          |        |         |           |       |          |                 |
| ES1609755-004 | VOID            | 05-May-16 | 9:40  |          |        |                                      |                                 |                               |                            |                     |                  |                               |                               |                                 |           |          |          |            |          |        |         |           |       |          |                 |

## Appendix 2

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### GROUNDWATER MONITORING DATA



[illegible]



