



# Balranald Mineral Sands Project

## 2019 Annual Review

Trim reference:	2073397	Publish date:	30 March 2020
Approved date:	30 March 2020	Review date:	N/A
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Related documents:	2034613 (2018 Annual Review)		

## ANNUAL REVIEW DETAILS – TITLE BLOCK

Details of the operations are summarised in Table 1 below.

**Table 1: Annual Review title block**

Name of operation	Balranald Mineral Sands Project
Name of operator	Iluka Resources Limited
Development consent / project approval #	SSD – 5285
Name of holder of development consent / project approval	Iluka Resources Limited
Mining Lease #	ML 1736
Name of holder of mining lease	Iluka Resources Limited
Water licence #	WAL31101 and WAL31102
Name of holder of water licence	Iluka Resources Limited
MOP / RMP start date	18 May 2016 (OUT16/19802)
MOP / RMP end date	31 May 2021
Annual Review start date	01 January 2019
Annual Review end date	31 December 2019

*I, Stephan Esterhuysen, certify that this audit report is a true and accurate record of the compliance status of the Balranald Mineral Sands Project for the period 1<sup>st</sup> January – 31<sup>st</sup> December 2019 and that I am authorised to make this statement on behalf of Iluka Resources.*

Name of authorised reporting officer	Stephan Esterhuysen
Title of authorised reporting officer	Project Manager
Signature of authorised reporting officer	
Date	30 March 2020

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## 1 STATEMENT OF COMPLIANCE

This report is the 2019 Annual Review for the Balranald Mineral Sands Project (the 'Balranald Project' or the 'Project') as required by Condition 4, Schedule 5 of the development consent granted under the provisions of the *NSW Environmental Planning and Assessment Act 1979* (EP&A Act).

A summary of the compliance status of the operation with the conditions of the relevant approvals is provided in Table 2.

**Table 2: Statement of compliance**

Statutory approval	All conditions complied with
SSD Development consent (SSD-5285)	Yes
Mining Lease 1736	Yes

## 2 INTRODUCTION

### 2.1 Operations overview

On 5 April 2016 Iluka Resources Limited (Iluka) were granted development consent for the Balranald Mineral Sands Project under Part 4 of the EP&A Act.

The Balranald Project includes construction, mining, primary processing and rehabilitation of two linear mineral sand deposits, known as the West Balranald and Nepean deposits located approximately 12 kilometres (km) and 66 km north-west of the town of Balranald, respectively. Figure 2.1 shows the regional location of the Project.

In addition, the Balranald Project includes undertaking a bulk sampling activity (the activity) at the West Balranald deposit involving the removal of up to 100,000 tonnes (t) of mineral ore.

In 2016 the bulk sampling activity was commenced for the Balranald Project. This bulk sampling activity was a continuation of smaller bulk sampling activities completed in Q1-2015 and Q1-2016 in accordance with approval under Part 5 of the EP&A Act from NSW Trade & Investment, Resources & Energy (Reference OUT13/28341 and OUT15/27702).

The initial bulk sampling trial was completed in September 2016. From September 2016 to September 2019 the site was in a care and maintenance period. In July 2019, Iluka initiated discussions with the regulators to commence a further trial (known as T3). Site re-establishment commenced in September 2019 in preparation for mining in Q2 2020.

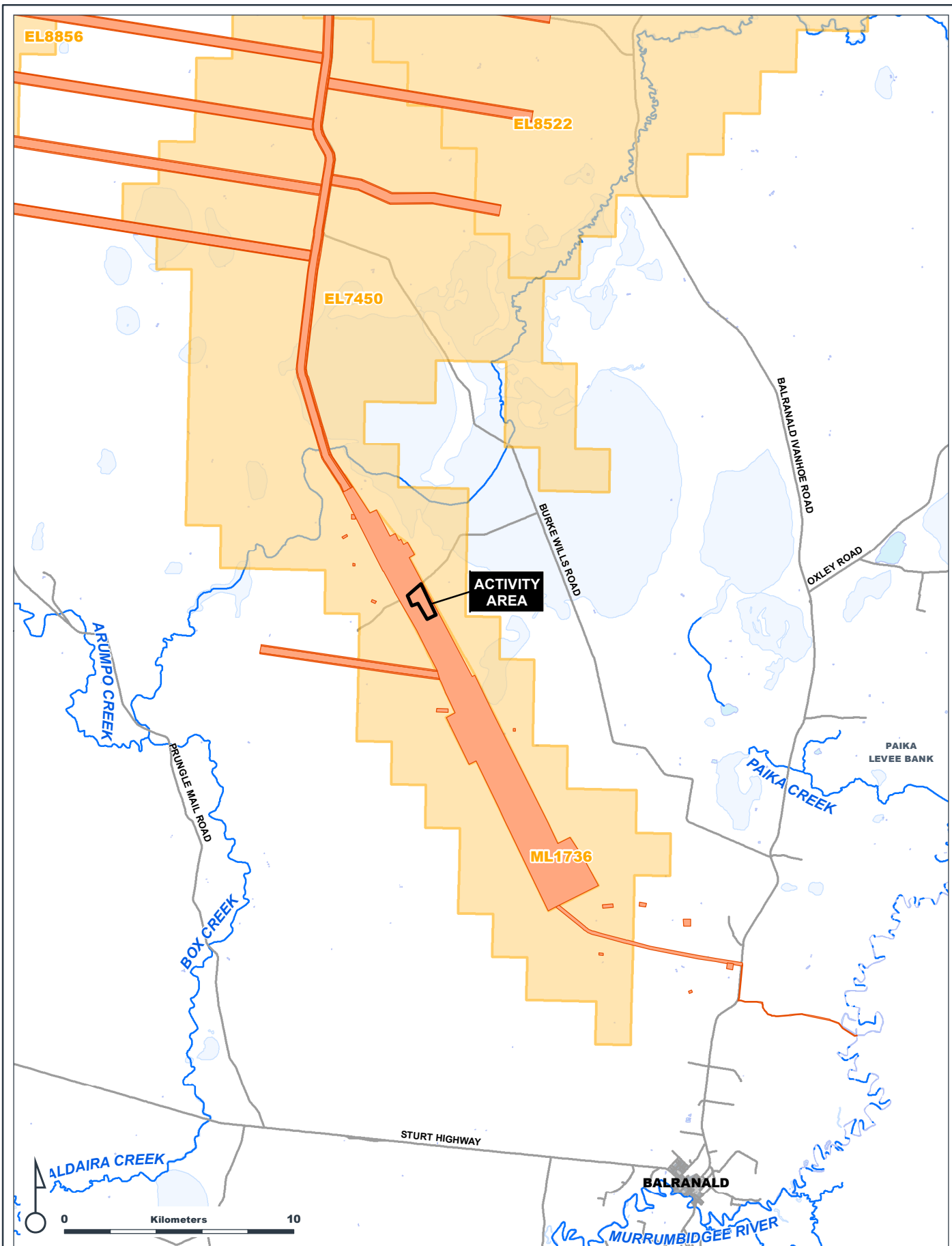
The location of the bulk sampling activities, termed the 'Activity Area', within the approved Project boundary is provided in Figure 2.2.

## 2.2 Environmental management responsibilities

Table 3 provides the details of the Iluka personnel with environmental management responsibilities during the reporting period.

**Table 3: Environmental management responsibilities**

Name	Role	Contact details
Stephan Esterhuysen	Project Manager	<a href="mailto:Stephan.Esterhuysen@iluka.com">Stephan.Esterhuysen@iluka.com</a>
Rathy Brandes de Roos	Principal Mining Engineer	<a href="mailto:Rathy.BrandesdeRoos@iluka.com">Rathy.BrandesdeRoos@iluka.com</a>
Lisa McGrath	HSEC Manager	<a href="mailto:Lisa.McGrath@iluka.com">Lisa.McGrath@iluka.com</a>
Joel Butcher	Site Manager	<a href="mailto:Joel.Butcher@iluka.com">Joel.Butcher@iluka.com</a>



## ANNUAL REVIEW PROJECT LOCATION

- Major watercourse
- Activity Area
- Balranald approved project boundary (2016)
- Iluka Tenements
- Relic and ephemeral lake
- Perennial lake

**BALRANALD**



**ILUKA**

ORIG: GB

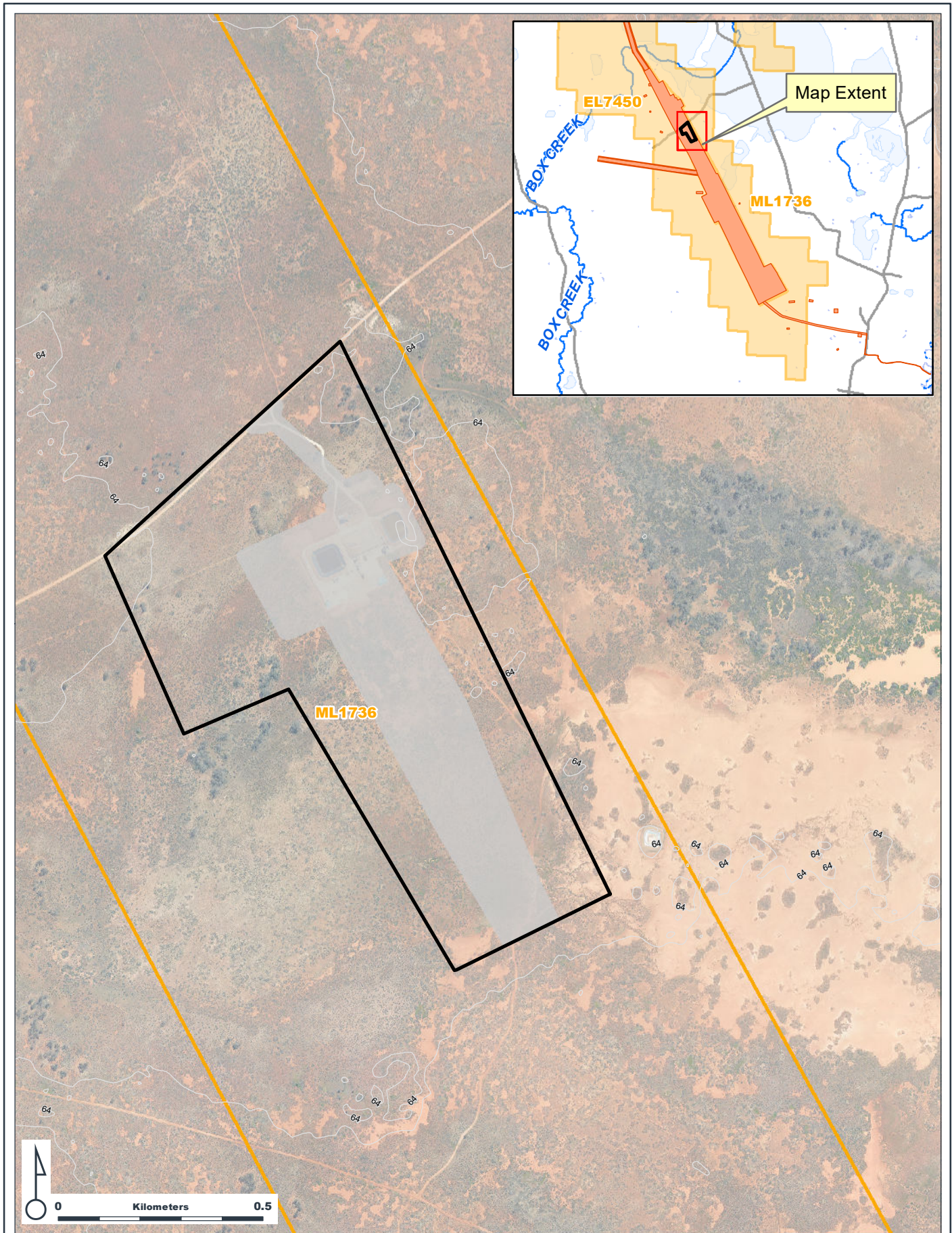
DRAWN: GB

SCALE (A4): 1:225,000




DATE: 12/03/2020

DWG No: 244895v00

**FIGURE: 2.1**



## 2019 ANNUAL REVIEW ACTIVITY SITE LOCATION

-  Activity Area
-  2018 Operations Area
-  Iluka Mining Lease

**BALRANALD**



**ILUKA**

**ORIG:** GB

**DRAWN:** GB

**SCALE (A4):** 1:12,500

**DATE:** 23/03/2020

**DWG No:** 244896v1

**FIGURE: 2.2**

### 3 APPROVALS

The Balranald Project is a Level 1 mine and was assessed as a State Significant development under Part 4 of the EP&A Act.

The current approvals (including consents, authorisations, licences and management plans) for the Project are summarised in Tables 4 and 5 below.

In discussion with regulators, updates were made to the Environmental Management Plan and Mining Operations Plan during 2019 to cover the T3 activities which recommenced in September 2019.

**Table 4: Current consents, authorisations and licences**

Type	Identification	Details
Development Consent	SSD-5285	Granted: April 2016 Duration: 16 years
Mining Lease	ML1736	Granted: May 2016 Duration: 21 years
Environment Projection Licence	EPL20795	Granted: June 2016 Duration: 5 years
Water Access Licence(s)	WAL31101 WAL31102	Total allocation volume – 2,500 ML

**Table 5: Approved management plans**

Management Plan	Date of approval and approving agency
Environmental Management Plan (EMP): Bulk Sampling Activities (21 October 2019, Version 2)	15 November 2019; NSW Environment Protection Authority; Reference: DOC19/530575-8
Mining Operations Plan (MOP): Bulk Sampling Activities (21 October 2019, Version 2)	10 December 2019; Resources Regulator, NSW Department of Planning, Industry and Environment; Reference: MAAG0004861, LETT0003348
Balranald Project: Aboriginal Cultural Heritage Management Plan (ACHMP) (14 April 2016, Version 1)	14 April 2016; NSW Office of Environment and Heritage; Reference: DOC16/184303 29 April 2016; NSW Department of Planning and Environment; Reference: 11/22089-2

## **4 OPERATIONS SUMMARY**

### **4.1 Introduction**

The first stage of the bulk sampling activity commenced in June 2016 and was completed in September 2016. The Project was placed on hold and the site entered a non-operational care and maintenance phase from September 2016 to September 2019.

The 2018 Annual Review anticipated the recommencement of T3 site activities in late 2019. Site re-establishment works commenced in September 2019 with mining expected to commence in Q2 2020.

### **4.2 Site civil works**

The following civil works were undertaken for the period September – December 2019, as part of site re-establishment:

- re-establishment of site offices, power supply, water supply and amenities;
- clearing of approximately 9.2 hectares (ha) of land to accommodate an additional water storage dam, stockpile areas and a drainage basin; and
- other minor civil works to support the commencement of mining.

### **4.3 Mining operations**

A summary of the mining operations for the previous, current and next reporting period is provided in Table 6.

The objective is to further test the selective in-situ removal of the remaining 93,600 tonnes (t) of mineral ore to determine whether the unconventional mining method can:

- sustain production over a larger sample set (i.e. longer stope length);
- undertake a backfill process to deliver a whole of mine life cycle process; and
- further validate groundwater and subsidence impact prediction models.

In 2016, the T2 activity created three underground cavities (Stopes 1B, 3 and 4) and removed approximately 6,400 t of mineral ore.

The T3 activities will create up to three additional underground cavities (Stopes 5, 6 and one of either the remainder of Stope 4, or 3B), each with an approximate volume of 21,000 cubic meters (m<sup>3</sup>) located approximately 65 - 69 m below natural surface level.

**Table 6: Production summary**

<b>Material</b>	<b>Approved limit (SSD-5285)</b>	<b>Previous reporting period (2018) (actual)</b>	<b>This reporting period (2019) (actual)</b>	<b>Next reporting period (2020) (forecast)</b>
HMC (tpa <sup>^</sup> ) – open cut operations	500,000	0	0	0
Ilmenite (tpa <sup>^</sup> ) – open cut operations	600,000	0	0	0
Ore (tonnes) – bulk sampling activity	100,000	0	0	Up to 95,000**
Backfill – process water (litres)	NA	0	0	Up to 167,000,000**
Backfill – slurry (tonnes)	NA	0	0	Up to 55,000**
Backfill – slurry (litres)	NA	0	0	Up to 102,000,000**
Saleable product – HMC (tpa <sup>^</sup> )*	500,000	0	0	0
Saleable product – Ilmenite (tpa <sup>^</sup> )*	600,000	0	0	0

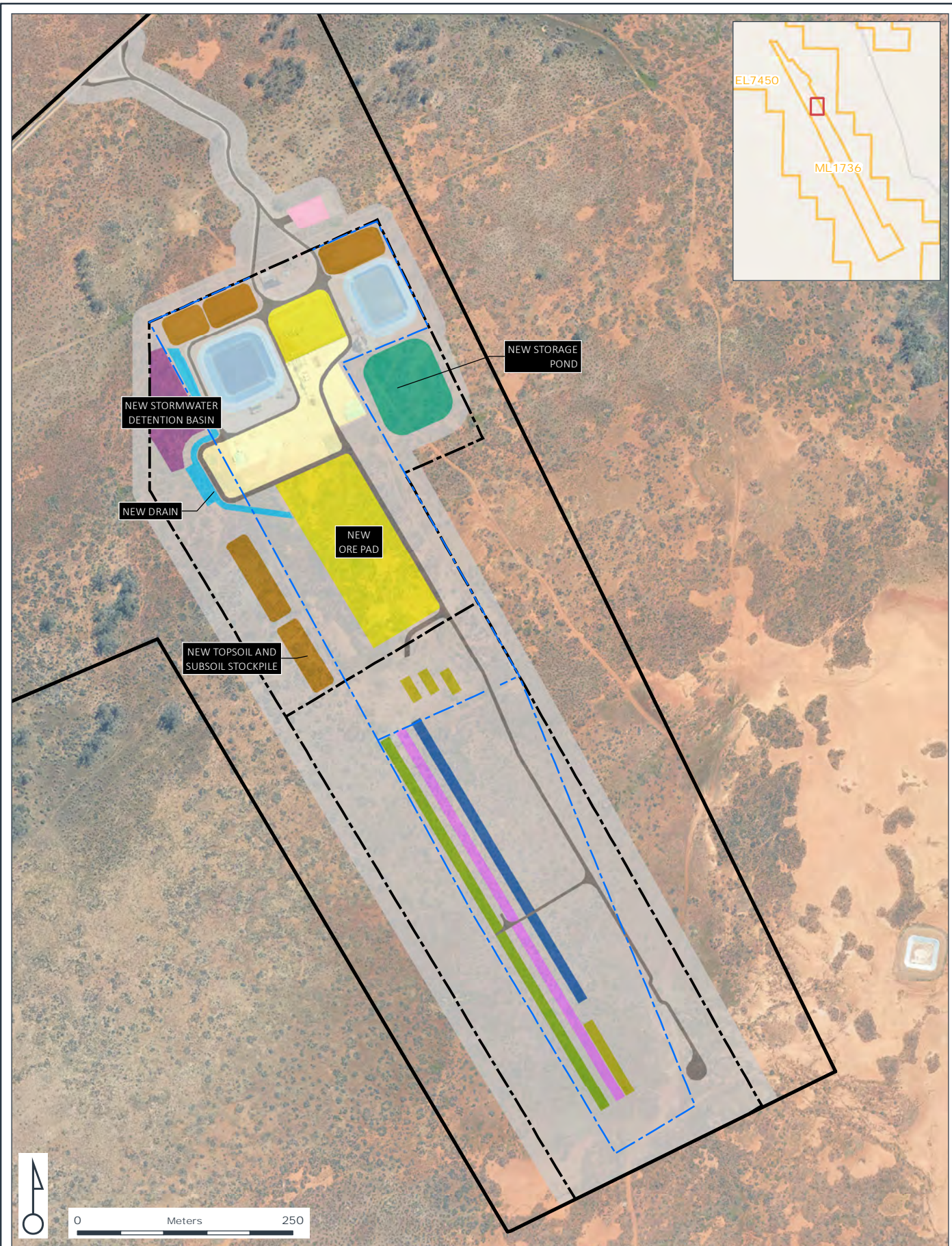
<sup>^</sup>Tonnes per annum

\* Statutory approval (SSD-5285) covering the bulk sampling activity does not allow Iluka to sell the extracted ore. The ore extracted during previous and future bulk sampling activities will remain on stockpile on site unless necessary statutory approvals are obtained to allow otherwise.

\*\* Estimated – actual numbers will be dependent on successful progress of T3 activities.

#### **4.4 Next reporting period**

Iluka plans to undertake the T3 activities for the majority of the 2020 reporting period. Following completion of site works in Q4 2020, Iluka will evaluate the success of T3 and an Iluka Board decision will be made whether to progress the Project through to production.



### T3 GENERAL ARRANGEMENT

- |                    |                                       |                                               |                         |
|--------------------|---------------------------------------|-----------------------------------------------|-------------------------|
| Previous Fenceline | Access road                           | Plant, equipment and administration buildings | Stockpile               |
| New Fenceline      | 2019 Operations Area                  | Process water dam                             | Previously Mined Stopes |
| Activity Area      | Site office and light vehicle carpark | Spoon drain                                   | Stope 3B                |
| Ore pad            | Fines storage pond                    | Stormwater detention basin                    | Stope 5                 |
|                    |                                       |                                               | Stope 6                 |

BALRANALD



GDA 1994 MGA Zone 54

L:\Maps\2020\Registered\Murray Basin\Balranald\244897v00\_T3\_GA.mxd

## 5 ACTIONS REQUIRED FROM PREVIOUS ANNUAL REVIEW

No actions required from the previous Annual Review.

## 6 ENVIRONMENTAL PERFORMANCE

As a result of no mining activities occurring and the site being in a care and maintenance phase, limited environmental monitoring occurred during the reporting period.

Table 7 provides a summary of the environmental performance monitoring completed during the reporting period.

**Table 7: Environmental performance summary**

Aspect	Approval criteria / EIS prediction	Performance during period	Trend / key management implications
Weeds	SSD-5285. Condition 17, Schedule 3 – Control weeds	No new weed populations identified during monitoring undertaken in 2019.	None identified. Continued monitoring.
Subsidence	No specific condition, Subsidence Management Plan (SMP) prepared as part of Environmental Management Plan (EMP)	Post bulk sampling activity monitoring in November 2019.  Updated SMP for T3 activities developed and approved by regulators in October 2019, as part of EMP.	No measurable movement observed since the final post mining survey performed in November 2016.  Upswell noted in November 2016 settled to pre-mining levels.
Groundwater	SSD-5285. Condition 15, Schedule 3 – Groundwater Management Plan (GMP)	Groundwater monitoring events completed during reporting period (July and December 2019).	Consistent with historical baseline results at the targeted monitoring well locations and also historical groundwater baseline data collected across the wider Balranald area.
Noise	SSD-5285. Condition 3, 4 and 5, Schedule 3 – Noise	Site was in care and maintenance, hence no noise performance monitoring was completed during the Annual Review reporting period.	
Air quality	SSD-5285. Condition 6, 7, 8 and 9, Schedule 3 – Air	Site was in care and maintenance, hence no air quality performance monitoring was completed during the Annual Review reporting period.	
Biodiversity	SSD-5285. Condition 16 and 17, Schedule 3 – Biodiversity	Site was in care and maintenance, hence no vegetation clearing or biodiversity performance monitoring was undertaken during the Annual Review reporting period.	

Aspect	Approval criteria / EIS prediction	Performance during period	Trend / key management implications
Cultural heritage	SSD-5285. Condition 18, 19, 20 and 21 – Heritage	In accordance with the approved Aboriginal Cultural Heritage Management Plan, in September 2019 an Aboriginal Cultural Heritage Due Diligence Survey was undertaken within the Activity Site to inform the siting of new groundwater monitoring well infrastructure during the 2019 site re-establishment activities. The assessment included a desktop review of sites and studies and visual inspection of the survey area by an archaeologist and members of the Balranald Aboriginal Heath Service to identify any Aboriginal objects or areas of potential archaeological deposit (PAD) being present or likely to occur within the impact areas.	An approved Aboriginal Cultural Heritage Management Plan remains in place.

### 6.1 Subsidence monitoring outcomes

In November 2019, post mining subsidence survey activities were undertaken utilising the monitoring network established during the 2016 T2 activities.

Monitoring in November 2019 was completed in and around the mining cavities (stopes) as well as a regional network. Results of the monitoring are contained in Appendix A with the outcomes summarised in Table 8.

As identified above, no measurable movement has been observed since the final post mining survey performed in November 2016. In addition, the area of upsidence (upswell) noted in the November 2016 results has settled down to essentially pre-mining levels.

**Table 8: Subsidence monitoring outcomes summary**

Monitoring event	Outcomes
November 2019	<p><u>Mining stopes monitoring</u></p> <p>Nil to negligible movement. No movement was detected that is inconsistent with regional background observations.</p> <p>Little to no measurable change in the 12 months from November 2018 to November 2019.</p> <p><u>Regional monitoring</u></p> <p>Negligible vertical movement detected. Recorded movements (typically 5-7 mm of ground lowering)</p>

Monitoring event	Outcomes
	were consistent with drier conditions, and near the limits of accuracy of surveying techniques.

## 6.2 Groundwater monitoring outcomes

### 6.2.1 Groundwater quality results

Continued baseline groundwater quality monitoring was completed in July 2019 and December 2019. For all aquifer units sampled (Lower Renmark, Shepparton Formation and Loxton Parilla Sands), reported water quality results were generally consistent with historical baseline results at the targeted monitoring well locations and also historical groundwater baseline data collected across the wider Balranald area.

Given the non-operational care and maintenance status of the site, the July and December 2019 groundwater analytical data has been compared against the ANZECC (2000) Irrigation and Stock Water Guidelines as well as the Site-Specific Trigger Levels (SSTLs). The tables provided in Appendix B detail the historical analytical data and the results reported for the July and December 2019 monitoring events for all aquifer units.

The results from the 2019 monitoring events are consistent with baseline data for the Project collected since 2013. As with the previous baseline results, exceedances of the guidelines and SSTLs have been noted, mostly for groundwater sampled from monitoring wells installed in the Shepparton and Loxton Parilla Sands aquifer units. While exceedances have occurred, most of these have been once-off, irregular yellow trigger level exceedances that have returned within normal historical ranges during the subsequent monitoring periods. In the absence of evidence of an increasing trend in the analyte, or evidence of acidification observed in indicators such as pH, TDS and alkalinity, these exceedances can be attributed to natural geochemical processes, rather than associated with past bulk sampling studies.

It should also be noted that the Shepparton and Loxton Parilla Sands aquifer units do not support irrigation or stock water as a beneficial use of groundwater and comparison against the guidelines has been undertaken, in line with industry standards, where potential groundwater beneficial uses based on environmental settings are to be considered during groundwater quality assessments, whether those uses are realistic or otherwise.

### 6.2.2 Groundwater level results

Continued baseline groundwater level monitoring was completed in July 2019 and December 2019. The historical groundwater level results recorded in metres below top of casing (mbTOC) are shown in Appendix B, including the results for the July and December 2019 monitoring events.

For all aquifer units monitored (Shepparton Formation and Loxton Parilla Sands), measured groundwater levels were generally consistent with historical baseline levels measured at the targeted monitoring well locations and also historical groundwater baseline data collected across the wider Balranald area.

The post T2 trial groundwater levels are within historical ranges and have recovered from the localised pressure responses measured during the T2 trial period (between April and September 2016).

## 7 WATER MANAGEMENT

Water use for the previous water year (1 July 2018 – 30 June 2019) is summarised in Table 9.

**Table 9: Summary of water use**

Water Licence #	Water Source and Water Sharing Plan	Entitlement / allocation*	Passive take / inflows	Active pumping	Total (ML)
31101	Western Murray Porous Rock Groundwater Source	150 ML	0 ML	0 ML	0 ML
31102	NSW Murray Darling Basin Porous Rock Groundwater Sources	2350 ML	0 ML	0 ML	0 ML

\*Temporary allocation leased from permanent allocation holder for the water licensing period 2016-2019.

## 8 REHABILITATION

Following completion of the activity in 2016 all mining plant and equipment was decommissioned and removed from site. Basic surface equipment remains on site – screen, cyclones, thickener, pumps plus associated pipes and spares. In addition, a stabilised stockpile of extracted material (Heavy Mineral stockpile) also remains on site. The material was sprayed with a proprietary binding material to minimise dust generation. During the 2018 reporting period, the stockpile was assessed and treated for Acid Sulfate Soils (ASS), as described in the 2018 Annual Review report. No further treatment of this stockpile was required during the 2019 reporting period.

An ESF2 Rehabilitation Completion Report in relation to the 2018 Sonic Drill Program (DPE work approval DOC18/344623) was submitted to DPIE on 6 June 2019 (DPIE Reference: SF19-56053 and DOC19/483205 and DOC19/483215). Approval of the rehabilitation was received from DPIE on 4 March 2020 (DPIE Reference: EAMSG0003267/LETT0003327).

## 9 COMMUNITY

No community complaints were received during the 2019 reporting period. A copy of the complaints register for the Project is provided on the Iluka Resources website in accordance with the Condition 11, Schedule 5 of SD-5285.

Engagement with the landowner, neighbours and the Balranald Shire Council increased in 2019 as site activities re-commenced. Landowner sign-off of rehabilitation also occurred as part of the rehabilitation completion form submittal.

## 10 INDEPENDENT AUDIT

NSW Department of Planning, Industry and Environment (DPIE) undertook one site inspection across the Balranald Project site and associated exploration titles during the reporting period to assess the current status of rehabilitation and operations and review the areas following submission of the Mining Operations Plan (MOP) amendment.

On 22 and 23 January 2019 DPIE Environment Inspector Stephen Clipperton undertook a site inspection on ML1736 and EL7450. Observations from the inspection are detailed in the Inspection Outcome letter report (DOC19/83578, dated 1 January 2019) and summarised below:

- Observation 1: All matters outlined in Inspection Outcome letter DOC18/497847 have been completed to the satisfaction of the Department.
- Observation 2: There were several (up to six) spoil/sumps that require removal and covering with topsoil. These spoil/sumps were identified and logged during the inspection. This measure will need to be completed prior to submission of the Form ESF2 Rehabilitation completion and/or review of rehabilitation cost estimate. This observation was actioned in early 2019 prior to submission of the ESF2 form as noted above.

No other independent audits were completed during the reporting period.

## 11 INCIDENTS AND NON-COMPLIANCE

### 11.1 Non-compliances

No non-compliances with the conditions of the relevant statutory approvals occurred during the 2019 reporting period.

### 11.2 Reportable incidents or exceedances

No reportable incidents with the conditions of the relevant statutory approvals occurred during the 2019 reporting period.

### 11.3 Official cautions or warnings

No official cautions, warning letters, penalty notices or prosecution proceedings were received by any regulatory agency for the Project during the 2019 reporting period.

## 12 ACTIVITIES FOR NEXT REPORTING PERIOD (2020)

Activities in 2020 will be concentrated around facilitating the T3 bulk sampling activities. Environment and community monitoring and support activities have been built into the T3 MOP and EMP. This includes radiation management, stockpile management, groundwater monitoring, noise monitoring, dust monitoring and regular inspections.

**Table 10: Environment and community activities for the next reporting period**

Activity	Likely timing
Updated Groundwater Management Plan (GMP)* endorsement sought from NSW DPIE	GMP – March 2020
Environment Protection Licence (EPL20795) variation application to be submitted to NSW EPA for approval	EPL – March 2020
Community Update Newsletter	Q2 2020

\*Updated GMP submitted in October 2019 for endorsement by DPIE (expected March 2020).

## **APPENDICES**

**Appendix A: Subsidence Monitoring Results (November 2019)**

**Appendix B: Baseline Groundwater Monitoring Results (July and December 2019)**

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**Appendix A: Subsidence Monitoring Results (November 2019)**

Appendix A: West Balranald Trial 2 Post-mining Subsidence Survey Results - Stopes 1 - 3 (May 2016 to November 2019)

Iluka Resources - West Balranald Trial2 - Stopes 1 - 3 3D Survey Results (9 mths post-mining)										
POINT	PRE-MINING SURVEY - 27/5/16			POST-MINING SURVEY - 23/05/17			TOTAL MOVEMENT			COMMENTS
	E (MGA)	N (MGA)	Ht (AHD)	E (MGA)	N (MGA)	Ht (AHD)	dE (mm)	dN (mm)	dHt (mm)	
N10.0108	723357.986	6189341.432	62.302	723357.988	6189341.427	62.287	1	-5	-15	
N10.0208	723365.964	6189346.133	62.329	723365.962	6189346.124	62.327	-1	-9	-3	
N10.0308	723375.206	6189351.479	62.341	723375.206	6189351.479	62.338	0	0	-3	
N10.0408	723383.271	6189356.736	62.366	723383.277	6189356.735	62.368	6	-1	2	
N10.0508	723392.281	6189361.960	62.368	723392.287	6189361.965	62.371	6	5	4	
N10.0608	723400.670	6189367.036	62.393	723400.679	6189367.041	62.418	9	6	26	mark disturbed
N10.0808	723418.350	6189377.584	62.440	723418.353	6189377.622	62.435	3	39	-5	
N10.0908	723426.614	6189382.472	62.485	723426.589	6189382.508	62.452	-25	36	-33	
N10.1008	723436.204	6189386.483	62.568	723436.175	6189386.505	62.544	-29	22	-24	
N10.1208	723451.473	6189397.914	62.642	723451.436	6189397.937	62.616	-37	23	-25	
N10.1308	723460.862	6189403.205	62.739	723460.840	6189403.226	62.738	-22	21	-1	
N10.1408	723469.259	6189408.235	62.781	723469.232	6189408.253	62.779	-27	18	-2	
N10.1508	723477.904	6189413.184	63.021	723477.884	6189413.199	63.019	-20	15	-2	
N10.1608	723486.551	6189418.495	63.106	723486.538	6189418.505	63.110	-13	9	4	
N10.1808	723503.477	6189429.570	63.399	723503.471	6189429.593	63.398	-6	23	-1	
N10.1908	723512.428	6189433.938	63.534	723512.424	6189433.964	63.534	-4	26	1	
N10.2008	723521.157	6189439.038	63.475	723521.151	6189439.063	63.475	-6	25	0	
N10.2108	723529.543	6189444.202	63.639	723529.537	6189444.234	63.636	-6	31	-3	
N10.1817	723457.363	6189506.191	63.477	723457.326	6189506.207	63.489	-37	16	12	
N10.1514	723447.076	6189464.888	63.185	723447.053	6189464.888	63.200	-23	1	15	
N10.1413	723443.840	6189450.959	63.008	723443.818	6189450.948	63.006	-23	-10	-2	
N10.1312	723440.217	6189437.605	62.961	723440.219	6189437.580	62.871	2	-25	-90	
N10.1211	723436.630	6189423.747	62.758	723436.623	6189423.754	62.677	-7	6	-81	
N10.1110	723433.383	6189410.037	62.603	723433.374	6189410.051	62.555	-9	13	-49	
N10.1009	723429.441	6189394.657	62.572	723429.372	6189394.690	62.514	-69	33	-58	right next to sink hole
N10.0807	723422.582	6189368.173	62.604	723422.586	6189368.183	62.595	4	10	-9	
N10.0706	723419.614	6189354.982	62.423	723419.615	6189354.988	62.428	2	6	5	
N10.0605	723416.045	6189341.370	62.344	723416.057	6189341.375	62.346	11	5	3	
N10.0504	723412.860	6189327.750	62.659	723412.880	6189327.755	62.658	20	5	-1	
N10.0403	723409.154	6189313.837	62.343	723409.163	6189313.835	62.347	9	-2	4	
N10.0302	723405.357	6189300.076	62.380	723405.374	6189300.086	62.390	17	10	10	
N10.0201	723402.392	6189286.495	62.352	723402.411	6189286.484	62.338	19	-11	-14	
N20.1003	723493.285	6189270.982	62.538	723493.320	6189271.003	62.539	35	21	1	
N20.1004	723482.894	6189287.223	62.504	723482.920	6189287.239	62.523	26	16	19	
N20.1005	723472.547	6189305.158	62.492	723472.582	6189305.182	62.474	34	24	-18	
N10.0901	723462.513	6189322.504	62.482	723462.535	6189322.515	62.499	22	11	17	
N10.0902	723456.823	6189330.434	62.523	723456.839	6189330.445	62.541	16	11	18	
N10.0905	723442.266	6189357.162	62.747	723442.270	6189357.175	62.743	4	14	-4	
N10.0906	723436.819	6189365.361	62.472	723436.829	6189365.380	62.460	10	19	-12	
N10.0907	723431.804	6189373.943	62.654	723431.801	6189373.966	62.638	-3	23	-16	
N10.0909	723420.773	6189389.606	62.514							not able to be measured
N10.0910	723415.961	6189398.305	62.452							not able to be measured
N10.0911	723411.218	6189408.369	62.507	723411.232	6189408.345	62.451	14	-24	-56	
N10.0912	723405.895	6189417.104	62.626	723405.923	6189417.084	62.611	28	-21	-14	
N10.0913	723401.046	6189425.727	62.741	723401.067	6189425.708	62.742	21	-19	1	
N10.0914	723395.528	6189433.894	62.896							not able to be measured
N10.0915	723390.467	6189442.678	62.796	723390.468	6189442.664	62.786	1	-14	-9	
N10.0916	723385.370	6189451.112	62.811	723385.370	6189451.101	62.812	0	-11	1	
N10.0917	723380.211	6189459.940	62.985	723380.196	6189459.924	62.984	-14	-16	-1	
N10.0919	723370.187	6189476.846	62.966	723370.173	6189476.828	62.966	-15	-18	0	
N10.0920	723365.173	6189485.561	62.988	723365.157	6189485.542	62.987	-16	-20	-1	
N10.0921	723359.800	6189494.081	63.077	723359.779	6189494.063	63.079	-21	-19	1	
N10.0116	723316.254	6189409.899	62.307	723316.248	6189409.880	62.311	-6	-19	5	
N10.0215	723330.721	6189406.837	62.346	723330.728	6189406.824	62.357	7	-13	11	
N10.0314	723342.377	6189402.396	62.371	723342.386	6189402.385	62.369	9	-10	-2	
N10.0512	723371.445	6189396.609	62.394	723371.461	6189396.605	62.397	17	-3	3	
N10.0611	723384.924	6189392.800	62.419	723384.944	6189392.793	62.424	21	-7	4	
N10.0710	723399.155	6189389.760	62.436	723399.184	6189389.760	62.427	30	0	-9	
N10.0809	723412.735	6189386.101	62.470	723412.786	6189386.145	62.467	51	44	-3	right next to sink hole
N10.0908A	723426.614	6189382.472	62.485	723426.591	6189382.508	62.452	-23	36	-33	
N10.1007	723440.220	6189379.254	62.547	723440.207	6189379.270	62.541	-13	16	-5	
N10.1106	723454.131	6189375.630	62.562	723454.131	6189375.644	62.563	0	13	1	
N10.1205	723467.530	6189372.201	62.513	723467.533	6189372.227	62.523	3	26	9	
N10.1304	723481.252	6189369.012	62.535	723481.260	6189369.026	62.543	8	14	8	
N10.1403	723494.948	6189365.266	62.596	723494.957	6189365.296	62.602	9	30	6	
N10.0507	723397.297	6189353.565	62.329	723397.312	6189353.560	62.329	15	-5	0	
N10.0509	723387.106	6189370.521	62.373	723387.115	6189370.517	62.376	9	-4	3	
N10.0510	723382.018	6189379.314	62.405	723382.029	6189379.315	62.408	11	1	4	
N10.0511	723376.960	6189387.711	62.378	723376.971	6189387.703	62.388	10	-9	10	
N10.0513	723365.876	6189405.955	62.546	723365.879	6189405.943	62.549	3	-12	4	
N10.0514	723361.380	6189413.591	62.467	723361.387	6189413.584	62.477	8	-7	10	

N10.0609	723395.558	6189375.757	62.381	723395.577	6189375.768	62.380	19	10	-1	
N10.0610	723390.441	6189384.418	62.408	723390.451	6189384.420	62.401	10	2	-7	
N10.0612	723380.200	6189401.675	62.406	723380.204	6189401.672	62.404	4	-3	-2	
N10.0613	723375.326	6189409.179	62.597	723375.333	6189409.181	62.593	7	2	-4	
N10.0614	723370.081	6189418.574	62.879	723370.081	6189418.570	62.876	0	-4	-3	
N10.0707	723414.524	6189363.570	62.370	723414.535	6189363.577	62.356	11	7	-14	
N10.0709	723404.357	6189382.265	62.399	723404.384	6189382.276	62.401	26	11	3	
N10.0711	723394.900	6189398.004	62.469	723394.929	6189398.005	62.456	29	1	-13	
N10.0712	723390.386	6189406.427	62.759	723390.406	6189406.418	62.756	20	-9	-3	
N10.0713	723383.919	6189415.357	62.542	723383.935	6189415.347	62.543	16	-9	0	
N10.0714	723378.651	6189423.603	62.644	723378.653	6189423.590	62.645	2	-13	1	
N10.0810	723407.597	6189394.715	62.527	723407.634	6189394.731	62.484	37	16	-43	right next to sink hole
N10.0811	723402.479	6189402.843	62.511	723402.513	6189402.840	62.499	35	-2	-12	
N10.0812	723397.283	6189411.901	62.564	723397.312	6189411.897	62.558	28	-4	-6	
N10.0813	723392.592	6189420.455	62.597	723392.604	6189420.440	62.594	12	-16	-3	
N10.0814	723386.929	6189428.640	62.658	723386.941	6189428.631	62.661	13	-10	3	
N10.1010	723424.529	6189405.240	62.677	723424.505	6189405.228	62.609	-24	-13	-68	
N10.1011	723419.089	6189413.564	62.600	723419.095	6189413.547	62.570	6	-17	-30	
N10.1012	723414.606	6189422.191	62.689							disturbed
N10.1013	723409.860	6189430.597	62.851	723409.890	6189430.570	62.817	30	-27	-34	
N10.1014	723403.352	6189438.684	62.898	723403.356	6189438.662	62.904	5	-22	6	
N10.1107	723449.223	6189384.165	62.605	723449.200	6189384.191	62.587	-24	26	-18	
N10.1109	723438.470	6189401.407	62.575	723438.431	6189401.417	62.531	-39	10	-44	
N10.1111	723428.457	6189418.701	62.681	723428.462	6189418.697	62.637	5	-5	-44	
N10.1113	723417.987	6189435.902	62.858	723418.004	6189435.883	62.821	18	-19	-38	
N10.1114	723412.918	6189444.297	62.913	723412.932	6189444.278	62.907	14	-19	-6	
N10.1207	723457.394	6189389.098	62.610	723457.369	6189389.117	62.588	-25	19	-21	
N10.1209	723446.132	6189406.108	62.669	723446.098	6189406.138	62.653	-34	30	-16	
N10.1210	723441.997	6189415.244	62.717	723441.976	6189415.268	62.646	-21	24	-71	
N10.1212	723432.359	6189432.215	62.915	723432.379	6189432.198	62.841	19	-18	-74	
N10.1213	723427.315	6189439.473	62.922	723427.334	6189439.441	62.874	18	-31	-48	
N10.1214	723421.446	6189449.552	62.981	723421.449	6189449.524	62.978	3	-29	-4	
N10.1307	723466.951	6189394.284	62.667	723466.943	6189394.309	62.675	-8	24	8	
N10.1309	723456.963	6189412.404	62.748	723456.918	6189412.420	62.738	-45	16	-10	
N10.1310	723450.759	6189420.181	62.775	723450.722	6189420.205	62.719	-36	24	-57	
N10.1311	723445.342	6189428.635	62.882	723445.314	6189428.639	62.783	-29	4	-99	
N10.1313	723435.369	6189446.169	62.937	723435.373	6189446.135	62.920	4	-34	-17	
N10.1314	723430.258	6189454.981	63.011	723430.250	6189454.962	63.018	-8	-19	6	
N10.1407	723474.385	6189399.456	62.731	723474.377	6189399.477	62.733	-8	21	2	
N10.1409	723464.453	6189416.928	62.837	723464.425	6189416.937	62.831	-28	9	-6	
N10.1410	723459.267	6189425.429	62.778	723459.223	6189425.433	62.769	-44	3	-9	
N10.1411	723454.081	6189433.948	62.903	723454.036	6189433.938	62.848	-45	-10	-56	
N10.1412	723448.900	6189442.252	62.967	723448.864	6189442.222	62.934	-37	-30	-33	
N10.1414	723439.100	6189460.899	63.151	723439.090	6189460.883	63.163	-11	-16	13	
N10.1507	723483.345	6189404.814	62.921	723483.331	6189404.829	62.919	-14	15	-2	
N10.1508	723477.904	6189413.184	63.021	723477.885	6189413.200	63.019	-19	16	-1	
N10.1509	723473.070	6189421.926	62.781							disturbed
N10.1510	723467.729	6189430.641	63.107	723467.703	6189430.644	63.103	-27	3	-5	
N10.1511	723462.798	6189438.872	63.079	723462.780	6189438.877	63.077	-18	5	-2	
N10.1512	723457.395	6189447.375	63.076	723457.373	6189447.372	63.076	-21	-2	0	
N10.1513	723452.237	6189456.476	63.135	723452.221	6189456.478	63.140	-16	2	5	
N10.1514	723447.076	6189464.888	63.185	723447.053	6189464.886	63.200	-22	-1	15	

Iluka Resources - West Balranald Trial2 - Stopes 1 - 3 3D Survey Results (15 mths post-mining)										
POINT	PRE-MINING SURVEY - 27/5/16			POST-MINING SURVEY - 22/11/17			TOTAL MOVEMENT			COMMENTS
	E (MGA)	N (MGA)	Ht (AHD)	E (MGA)	N (MGA)	Ht (AHD)	dE (mm)	dN (mm)	dHt (mm)	
N10.0108	723357.986	6189341.432	62.302	723357.971	6189341.436	62.282	-15	3	-20	
N10.0208	723365.964	6189346.133	62.329	723365.943	6189346.132	62.322	-21	-2	-7	
N10.0308	723375.206	6189351.479	62.341	723375.186	6189351.489	62.341	-20	10	0	
N10.0408	723383.271	6189356.736	62.366	723383.264	6189356.742	62.368	-7	7	2	
N10.0508	723392.281	6189361.960	62.368	723392.273	6189361.973	62.365	-8	13	-2	
N10.0608	723400.670	6189367.036	62.393	723400.675	6189367.040	62.405	4	4	13	mark disturbed
N10.0808	723418.350	6189377.584	62.440	723418.347	6189377.625	62.420	-3	42	-19	
N10.0908	723426.614	6189382.472	62.485	723426.579	6189382.510	62.456	-35	38	-29	
N10.1008	723436.204	6189386.483	62.568	723436.168	6189386.503	62.546	-36	20	-22	
N10.1208	723451.473	6189397.914	62.642	723451.429	6189397.931	62.612	-44	17	-29	
N10.1308	723460.862	6189403.205	62.739							
N10.1408	723469.259	6189408.235	62.781	723469.229	6189408.245	62.778	-30	10	-3	
N10.1508	723477.904	6189413.184	63.021	723477.879	6189413.191	63.020	-24	7	-1	
N10.1608	723486.551	6189418.495	63.106							
N10.1808	723503.477	6189429.570	63.399	723503.472	6189429.580	63.399	-5	10	0	
N10.1908	723512.428	6189433.938	63.534	723512.426	6189433.947	63.534	-2	10	0	
N10.2008	723521.157	6189439.038	63.475	723521.153	6189439.044	63.475	-4	6	0	
N10.2108	723529.543	6189444.202	63.639	723529.540	6189444.214	63.636	-3	11	-4	
N10.1817	723457.363	6189506.191	63.477	723457.346	6189506.199	63.486	-17	8	9	
N10.1514	723447.076	6189464.888	63.185	723447.060	6189464.881	63.194	-16	-6	9	
N10.1413	723443.840	6189450.959	63.008	723443.820	6189450.945	63.006	-20	-14	-2	
N10.1312	723440.217	6189437.605	62.961	723440.222	6189437.579	62.872	5	-27	-89	
N10.1211	723436.630	6189423.747	62.758	723436.620	6189423.754	62.674	-10	6	-84	
N10.1110	723433.383	6189410.037	62.603	723433.369	6189410.053	62.549	-14	16	-54	
N10.1009	723429.441	6189394.657	62.572	723429.364	6189394.694	62.517	-77	37	-55	right next to sink hole
N10.0807	723422.582	6189368.173	62.604	723422.575	6189368.185	62.596	-7	12	-8	
N10.0706	723419.614	6189354.982	62.423							
N10.0605	723416.045	6189341.370	62.344	723416.042	6189341.382	62.345	-3	12	2	
N10.0504	723412.860	6189327.750	62.659	723412.863	6189327.757	62.658	3	8	-1	
N10.0403	723409.154	6189313.837	62.343	723409.144	6189313.843	62.344	-9	6	1	
N10.0302	723405.357	6189300.076	62.380	723405.357	6189300.087	62.382	0	11	1	
N10.0201	723402.392	6189286.495	62.352	723402.384	6189286.487	62.331	-8	-8	-21	
N20.1003	723493.285	6189270.982	62.538	723493.293	6189270.993	62.535	8	11	-3	
N20.1004	723482.894	6189287.223	62.504	723482.902	6189287.230	62.516	8	7	12	
N20.1005	723472.547	6189305.158	62.492	723472.557	6189305.169	62.470	10	11	-22	
N10.0901	723462.513	6189322.504	62.482	723462.516	6189322.512	62.491	3	8	10	
N10.0902	723456.823	6189330.434	62.523	723456.821	6189330.442	62.531	-2	8	8	
N10.0905	723442.266	6189357.162	62.747	723442.258	6189357.173	62.744	-8	11	-3	
N10.0906	723436.819	6189365.361	62.472							
N10.0907	723431.804	6189373.943	62.654	723431.792	6189373.966	62.641	-12	23	-13	
N10.0909	723420.773	6189389.606	62.514							not able to be measured
N10.0910	723415.961	6189398.305	62.452							not able to be measured
N10.0911	723411.218	6189408.369	62.507	723411.231	6189408.352	62.451	12	-17	-56	
N10.0912	723405.895	6189417.104	62.626	723405.923	6189417.087	62.611	28	-17	-15	
N10.0913	723401.046	6189425.727	62.741							
N10.0914	723395.528	6189433.894	62.896	723395.538	6189433.880	62.895				not able to be measured
N10.0915	723390.467	6189442.678	62.796	723390.472	6189442.672	62.773	5	-7	-22	
N10.0916	723385.370	6189451.112	62.811	723385.371	6189451.107	62.812	1	-5	1	
N10.0917	723380.211	6189459.940	62.985	723380.201	6189459.932	62.986	-10	-7	1	
N10.0919	723370.187	6189476.846	62.966	723370.181	6189476.838	62.968	-6	-8	2	
N10.0920	723365.173	6189485.561	62.988	723365.166	6189485.553	62.989	-8	-9	1	
N10.0921	723359.800	6189494.081	63.077	723359.791	6189494.073	63.080	-9	-8	2	
N10.0116	723316.254	6189409.899	62.307	723316.248	6189409.898	62.311	-6	-1	4	
N10.0215	723330.721	6189406.837	62.346	723330.721	6189406.837	62.356	0	0	10	
N10.0314	723342.377	6189402.396	62.371	723342.384	6189402.397	62.372	7	1	1	
N10.0512	723371.445	6189396.609	62.394							
N10.0611	723384.924	6189392.800	62.419	723384.944	6189392.801	62.425	20	1	6	
N10.0710	723399.155	6189389.760	62.436	723399.179	6189389.763	62.428	24	2	-8	
N10.0809	723412.735	6189386.101	62.470	723412.785	6189386.157	62.455	50	56	-15	right next to sink hole
N10.0908A	723426.614	6189382.472	62.485	723426.584	6189382.510	62.456	-30	38	-29	
N10.1007	723440.220	6189379.254	62.547	723440.198	6189379.273	62.540	-22	19	-6	
N10.1106	723454.131	6189375.630	62.562	723454.121	6189375.643	62.564	-10	12	2	
N10.1205	723467.530	6189372.201	62.513	723467.523	6189372.223	62.522	-7	22	9	
N10.1304	723481.252	6189369.012	62.535	723481.254	6189369.016	62.545	2	3	11	
N10.1403	723494.948	6189365.266	62.596	723494.946	6189365.284	62.601	-3	18	5	
N10.0507	723397.297	6189353.565	62.329	723397.310	6189353.558	62.328	13	-7	-1	
N10.0509	723387.106	6189370.521	62.373	723387.116	6189370.518	62.376	10	-3	3	
N10.0510	723382.018	6189379.314	62.405	723382.029	6189379.318	62.410	11	4	6	
N10.0511	723376.960	6189387.711	62.378	723376.970	6189387.701	62.387	9	-11	9	
N10.0513	723365.876	6189405.955	62.546	723365.881	6189405.942	62.548	5	-13	3	
N10.0514	723361.380	6189413.591	62.467	723361.388	6189413.582	62.475	9	-9	8	
				0.003	0.001	-0.002				

N10.0609	723395.558	6189375.757	62.381	723395.579	6189375.769	62.378	21	11	-3	
N10.0610	723390.441	6189384.418	62.408	723390.452	6189384.421	62.399	11	3	-9	
N10.0612	723380.200	6189401.675	62.406	723380.207	6189401.669	62.406	7	-6	0	
N10.0613	723375.326	6189409.179	62.597	723375.331	6189409.179	62.595	5	0	-2	
N10.0614	723370.081	6189418.574	62.879	723370.079	6189418.572	62.874	-2	-2	-5	
N10.0707	723414.524	6189363.570	62.370	723414.525	6189363.578	62.356	0	8	-14	
N10.0709	723404.357	6189382.265	62.399	723404.377	6189382.273	62.390	19	8	-9	
N10.0711	723394.900	6189398.004	62.469	723394.928	6189398.011	62.455	27	7	-14	
N10.0712	723390.386	6189406.427	62.759							
N10.0713	723383.919	6189415.357	62.542							
N10.0714	723378.651	6189423.603	62.644							
N10.0810	723407.597	6189394.715	62.527	723407.630	6189394.731	62.487	33	16	-40	right next to sink hole
N10.0811	723402.479	6189402.843	62.511	723402.515	6189402.845	62.501	36	2	-10	
N10.0812	723397.283	6189411.901	62.564	723397.311	6189411.901	62.557	28	0	-7	
N10.0813	723392.592	6189420.455	62.597	723392.603	6189420.439	62.594	11	-17	-2	
N10.0814	723386.929	6189428.640	62.658							
N10.1010	723424.529	6189405.240	62.677	723424.502	6189405.228	62.615	-27	-12	-62	
N10.1011	723419.089	6189413.564	62.600	723419.099	6189413.547	62.567	10	-16	-33	
N10.1012	723414.606	6189422.191	62.689	723414.630	6189422.170	62.642	24	-21	-47	disturbed
N10.1013	723409.860	6189430.597	62.851	723409.892	6189430.570	62.819	32	-27	-33	
N10.1014	723403.352	6189438.684	62.898							
N10.1107	723449.223	6189384.165	62.605	723449.193	6189384.191	62.579	-31	26	-26	
N10.1109	723438.470	6189401.407	62.575	723438.427	6189401.420	62.535	-43	13	-39	
N10.1111	723428.457	6189418.701	62.681	723428.463	6189418.697	62.632	5	-4	-49	
N10.1113	723417.987	6189435.902	62.858	723418.008	6189435.880	62.817	21	-22	-41	
N10.1114	723412.918	6189444.297	62.913							
N10.1207	723457.394	6189389.098	62.610	723457.364	6189389.119	62.600	-30	21	-9	
N10.1209	723446.132	6189406.108	62.669	723446.095	6189406.138	62.649	-37	30	-20	
N10.1210	723441.997	6189415.244	62.717	723441.979	6189415.268	62.645	-18	24	-72	
N10.1212	723432.359	6189432.215	62.915	723432.378	6189432.195	62.841	19	-21	-73	
N10.1213	723427.315	6189439.473	62.922	723427.335	6189439.437	62.874	19	-36	-49	
N10.1214	723421.446	6189449.552	62.981	723421.449	6189449.523	62.954	3	-30	-28	
N10.1307	723466.951	6189394.284	62.667	723466.937	6189394.304	62.676	-14	20	9	
N10.1309	723456.963	6189412.404	62.748	723456.913	6189412.416	62.733	-49	12	-15	
N10.1310	723450.759	6189420.181	62.775	723450.717	6189420.203	62.722	-42	22	-53	
N10.1311	723445.342	6189428.635	62.882	723445.313	6189428.638	62.785	-29	3	-98	
N10.1313	723435.369	6189446.169	62.937	723435.373	6189446.131	62.917	4	-38	-20	
N10.1314	723430.258	6189454.981	63.011	723430.253	6189454.963	63.009	-6	-18	-2	
N10.1407	723474.385	6189399.456	62.731	723474.371	6189399.472	62.735	-14	16	4	
N10.1409	723464.453	6189416.928	62.837	723464.422	6189416.934	62.834	-32	6	-3	
N10.1410	723459.267	6189425.429	62.778	723459.224	6189425.431	62.770	-43	2	-8	
N10.1411	723454.081	6189433.948	62.903	723454.036	6189433.935	62.843	-45	-13	-60	
N10.1412	723448.900	6189442.252	62.967	723448.864	6189442.215	62.931	-36	-37	-36	
N10.1414	723439.100	6189460.899	63.151	723439.091	6189460.884	63.162	-10	-15	12	
N10.1507	723483.345	6189404.814	62.921	723483.329	6189404.828	62.921	-16	14	0	
N10.1508	723477.904	6189413.184	63.021	723477.884	6189413.202	63.017	-20	18	-3	
N10.1509	723473.070	6189421.926	62.781							disturbed
N10.1510	723467.729	6189430.641	63.107	723467.704	6189430.647	63.103	-25	6	-5	
N10.1511	723462.798	6189438.872	63.079	723462.781	6189438.879	63.078	-17	7	-1	
N10.1512	723457.395	6189447.375	63.076	723457.374	6189447.373	63.075	-20	-1	-1	
N10.1513	723452.237	6189456.476	63.135	723452.218	6189456.481	63.140	-19	5	5	
N10.1514	723447.076	6189464.888	63.185	723447.051	6189464.884	63.200	-24	-3	15	

Iluka Resources - West Balranald Trial2 - Stopes 1 - 3 3D Survey Results (27 mths post-mining)										
POINT	PRE-MINING SURVEY - 27/5/16			POST-MINING SURVEY - 20/11/18			TOTAL MOVEMENT			COMMENTS
	E (MGA)	N (MGA)	Ht (AHD)	E (MGA)	N (MGA)	Ht (AHD)	dE (mm)	dN (mm)	dHt (mm)	
N10.0108	723357.986	6189341.432	62.302	723357.973	6189341.442	62.283	-14	10	-19	
N10.0208	723365.964	6189346.133	62.329	723365.951	6189346.139	62.330	-12	6	1	
N10.0308	723375.206	6189351.479	62.341	723375.187	6189351.493	62.338	-19	14	-3	
N10.0408	723383.271	6189356.736	62.366	723383.266	6189356.745	62.368	-5	9	2	
N10.0508	723392.281	6189361.960	62.368	723392.277	6189361.975	62.370	-4	15	2	
N10.0608	723400.670	6189367.036	62.393	723400.675	6189367.047	62.419	4	11	27	
N10.0808	723418.350	6189377.584	62.440	723418.345	6189377.626	62.421	-5	42	-19	
N10.0908	723426.614	6189382.472	62.485	723426.581	6189382.514	62.452	-33	42	-33	
N10.1008	723436.204	6189386.483	62.568	723436.165	6189386.509	62.546	-40	27	-21	
N10.1208	723451.473	6189397.914	62.642	723451.430	6189397.935	62.619	-43	21	-22	
N10.1308	723460.862	6189403.205	62.739	723460.829	6189403.220	62.745	-33	15	6	
N10.1408	723469.259	6189408.235	62.781	723469.193	6189408.269	62.782	-66	35	1	
N10.1508	723477.904	6189413.184	63.021	723477.878	6189413.191	63.023	-26	7	3	
N10.1608	723486.551	6189418.495	63.106	723486.535	6189418.497	63.111	-16	1	5	
N10.1808	723503.477	6189429.570	63.399	723503.472	6189429.576	63.401	-5	7	2	
N10.1908	723512.428	6189433.938	63.534	723512.424	6189433.947	63.536	-3	9	3	
N10.2008	723521.157	6189439.038	63.475	723521.152	6189439.044	63.478	-5	6	3	
N10.2108	723529.543	6189444.202	63.639							not able to be measured
N10.1817	723457.363	6189506.191	63.477	723457.346	6189506.198	63.488	-17	7	10	
N10.1514	723447.076	6189464.888	63.185	723447.058	6189464.884	63.205	-18	-3	20	
N10.1413	723443.840	6189450.959	63.008	723443.821	6189450.947	63.005	-19	-12	-3	
N10.1312	723440.217	6189437.605	62.961	723440.220	6189437.577	62.871	3	-29	-90	
N10.1211	723436.630	6189423.747	62.758	723436.619	6189423.756	62.677	-11	9	-81	
N10.1110	723433.383	6189410.037	62.603	723433.365	6189410.059	62.553	-18	21	-50	
N10.1009	723429.441	6189394.657	62.572	723429.365	6189394.698	62.513	-76	41	-59	
N10.0807	723422.582	6189368.173	62.604	723422.573	6189368.189	62.597	-8	15	-7	
N10.0706	723419.614	6189354.982	62.423							
N10.0605	723416.045	6189341.370	62.344	723416.038	6189341.383	62.344	-8	12	0	
N10.0504	723412.860	6189327.750	62.659	723412.860	6189327.760	62.659	0	10	0	
N10.0403	723409.154	6189313.837	62.343	723409.142	6189313.841	62.350	-12	5	7	
N10.0302	723405.357	6189300.076	62.380	723405.347	6189300.095	62.387	-10	18	7	
N10.0201	723402.392	6189286.495	62.352	723402.384	6189286.492	62.339	-8	-3	-13	
N20.1003	723493.285	6189270.982	62.538	723493.282	6189270.991	62.540	-3	9	2	
N20.1004	723482.894	6189287.223	62.504	723482.894	6189287.229	62.522	0	6	18	
N20.1005	723472.547	6189305.158	62.492	723472.532	6189305.170	62.473	-15	12	-19	
N10.0901	723462.513	6189322.504	62.482	723462.510	6189322.509	62.495	-3	5	14	
N10.0902	723456.823	6189330.434	62.523	723456.817	6189330.444	62.532	-6	9	9	
N10.0905	723442.266	6189357.162	62.747	723442.254	6189357.175	62.744	-13	13	-3	
N10.0906	723436.819	6189365.361	62.472							
N10.0907	723431.804	6189373.943	62.654	723431.792	6189373.966	62.641	-12	24	-13	
N10.0909	723420.773	6189389.606	62.514							not able to be measured
N10.0910	723415.961	6189398.305	62.452							not able to be measured
N10.0911	723411.218	6189408.369	62.507	723411.231	6189408.355	62.449	12	-14	-58	
N10.0912	723405.895	6189417.104	62.626	723405.922	6189417.091	62.609	27	-13	-17	
N10.0913	723401.046	6189425.727	62.741	723401.075	6189425.720	62.740	29	-8	-1	
N10.0914	723395.528	6189433.894	62.896	723395.541	6189433.883	62.897	13	-11	1	
N10.0915	723390.467	6189442.678	62.796	723390.477	6189442.673	62.773	10	-5	-23	
N10.0916	723385.370	6189451.112	62.811	723385.377	6189451.109	62.807	7	-3	-4	
N10.0917	723380.211	6189459.940	62.985	723380.207	6189459.936	62.988	-4	-4	3	
N10.0919	723370.187	6189476.846	62.966	723370.187	6189476.842	62.969	-1	-3	3	
N10.0920	723365.173	6189485.561	62.988	723365.173	6189485.554	62.990	0	-7	2	
N10.0921	723359.800	6189494.081	63.077	723359.796	6189494.079	63.083	-4	-3	6	
N10.0116	723316.254	6189409.899	62.307	723316.248	6189409.908	62.311	-6	9	4	
N10.0215	723330.721	6189406.837	62.346	723330.725	6189406.848	62.365	4	11	19	
N10.0314	723342.377	6189402.396	62.371	723342.382	6189402.409	62.373	5	13	2	
N10.0512	723371.445	6189396.609	62.394	723371.455	6189396.618	62.397	11	9	3	
N10.0611	723384.924	6189392.800	62.419	723384.940	6189392.807	62.416	16	7	-3	
N10.0710	723399.155	6189389.760	62.436	723399.176	6189389.768	62.426	21	8	-10	
N10.0809	723412.735	6189386.101	62.470	723412.795	6189386.173	62.445	60	73	-25	disturbed
N10.0908A	723426.614	6189382.472	62.485							
N10.1007	723440.220	6189379.254	62.547	723440.198	6189379.272	62.540	-22	18	-7	
N10.1106	723454.131	6189375.630	62.562	723454.114	6189375.640	62.562	-17	9	0	
N10.1205	723467.530	6189372.201	62.513	723467.520	6189372.223	62.520	-11	22	7	
N10.1304	723481.252	6189369.012	62.535	723481.242	6189369.014	62.542	-10	2	8	
N10.1403	723494.948	6189365.266	62.596	723494.940	6189365.280	62.603	-9	14	7	
N10.0507	723397.297	6189353.565	62.329	723397.296	6189353.572	62.330	-1	7	1	
N10.0509	723387.106	6189370.521	62.373	723387.104	6189370.530	62.375	-2	9	3	
N10.0510	723382.018	6189379.314	62.405	723382.021	6189379.326	62.413	2	12	9	
N10.0511	723376.960	6189387.711	62.378	723376.964	6189387.717	62.388	4	5	10	
N10.0513	723365.876	6189405.955	62.546	723365.876	6189405.955	62.547	0	0	1	
N10.0514	723361.380	6189413.591	62.467	723361.385	6189413.599	62.479	5	7	13	

N10.0609	723395.558	6189375.757	62.381	723395.569	6189375.778	62.383	11	21	2
N10.0610	723390.441	6189384.418	62.408	723390.454	6189384.425	62.401	13	7	-7
N10.0612	723380.200	6189401.675	62.406	723380.211	6189401.680	62.401	11	5	-5
N10.0613	723375.326	6189409.179	62.597	723375.336	6189409.184	62.597	10	5	0
N10.0614	723370.081	6189418.574	62.879	723370.085	6189418.575	62.880	4	0	1
N10.0707	723414.524	6189363.570	62.370	723414.521	6189363.582	62.362	-3	13	-8
N10.0709	723404.357	6189382.265	62.399	723404.380	6189382.281	62.414	22	16	15
N10.0711	723394.900	6189398.004	62.469	723394.923	6189398.018	62.456	22	14	-13
N10.0712	723390.386	6189406.427	62.759	723390.410	6189406.428	62.757	24	0	-1
N10.0713	723383.919	6189415.357	62.542	723383.938	6189415.359	62.544	19	2	1
N10.0714	723378.651	6189423.603	62.644	723378.653	6189423.600	62.640	2	-3	-3
N10.0810	723407.597	6189394.715	62.527	723407.627	6189394.736	62.486	30	21	-40
N10.0811	723402.479	6189402.843	62.511	723402.514	6189402.850	62.503	35	7	-8
N10.0812	723397.283	6189411.901	62.564	723397.309	6189411.903	62.556	26	2	-8
N10.0813	723392.592	6189420.455	62.597	723392.606	6189420.446	62.588	14	-9	-9
N10.0814	723386.929	6189428.640	62.658	723386.944	6189428.642	62.658	15	2	0
N10.1010	723424.529	6189405.240	62.677	723424.498	6189405.232	62.610	-31	-8	-67
N10.1011	723419.089	6189413.564	62.600	723419.097	6189413.550	62.560	8	-14	-40
N10.1012	723414.606	6189422.191	62.689						
N10.1013	723409.860	6189430.597	62.851	723409.894	6189430.573	62.813	33	-24	-38
N10.1014	723403.352	6189438.684	62.898	723403.360	6189438.665	62.903	8	-19	5
N10.1107	723449.223	6189384.165	62.605	723449.186	6189384.191	62.585	-38	26	-20
N10.1109	723438.470	6189401.407	62.575	723438.424	6189401.420	62.532	-46	13	-43
N10.1111	723428.457	6189418.701	62.681	723428.459	6189418.700	62.630	2	-2	-51
N10.1113	723417.987	6189435.902	62.858	723418.010	6189435.878	62.812	23	-24	-46
N10.1114	723412.918	6189444.297	62.913	723412.943	6189444.265	62.934	26	-32	21
N10.1207	723457.394	6189389.098	62.610	723457.357	6189389.116	62.593	-37	18	-17
N10.1209	723446.132	6189406.108	62.669	723446.088	6189406.141	62.662	-44	34	-7
N10.1210	723441.997	6189415.244	62.717	723441.973	6189415.270	62.641	-24	26	-75
N10.1212	723432.359	6189432.215	62.915	723432.376	6189432.197	62.839	16	-19	-76
N10.1213	723427.315	6189439.473	62.922	723427.334	6189439.437	62.869	18	-36	-53
N10.1214	723421.446	6189449.552	62.981	723421.452	6189449.524	62.953	6	-29	-28
N10.1307	723466.951	6189394.284	62.667	723466.930	6189394.301	62.681	-21	16	14
N10.1309	723456.963	6189412.404	62.748	723456.911	6189412.420	62.742	-52	16	-6
N10.1310	723450.759	6189420.181	62.775	723450.718	6189420.204	62.718	-41	23	-57
N10.1311	723445.342	6189428.635	62.882	723445.311	6189428.638	62.782	-31	3	-100
N10.1313	723435.369	6189446.169	62.937	723435.378	6189446.132	62.923	9	-37	-14
N10.1314	723430.258	6189454.981	63.011	723430.257	6189454.961	63.013	-1	-20	2
N10.1407	723474.385	6189399.456	62.731	723474.366	6189399.470	62.739	-19	14	8
N10.1409	723464.453	6189416.928	62.837	723464.421	6189416.932	62.832	-32	4	-5
N10.1410	723459.267	6189425.429	62.778	723459.222	6189425.435	62.764	-45	5	-14
N10.1411	723454.081	6189433.948	62.903	723454.032	6189433.934	62.843	-49	-14	-61
N10.1412	723448.900	6189442.252	62.967	723448.867	6189442.216	62.931	-34	-36	-36
N10.1414	723439.100	6189460.899	63.151	723439.097	6189460.884	63.161	-4	-14	10
N10.1507	723483.345	6189404.814	62.921	723483.329	6189404.818	62.919	-17	4	-2
N10.1508	723477.904	6189413.184	63.021	723477.878	6189413.192	63.022	-25	8	1
N10.1509	723473.070	6189421.926	62.781	723473.037	6189421.933	62.751	-34	7	-30
N10.1510	723467.729	6189430.641	63.107	723467.700	6189430.637	63.105	-29	-4	-3
N10.1511	723462.798	6189438.872	63.079	723462.780	6189438.871	63.076	-18	-1	-3
N10.1512	723457.395	6189447.375	63.076	723457.371	6189447.365	63.073	-23	-9	-3
N10.1513	723452.237	6189456.476	63.135	723452.224	6189456.473	63.140	-13	-3	4
N10.1514	723447.076	6189464.888	63.185	723447.060	6189464.880	63.201	-16	-8	16

Iluka Resources - West Balranald Trial2 - Stopes 1 - 3 3D Survey Results (39 mths post-mining)										
POINT	PRE-MINING SURVEY - 27/5/16			POST-MINING SURVEY - 7/11/19			TOTAL MOVEMENT			COMMENTS
	E (MGA)	N (MGA)	Ht (AHD)	E (MGA)	N (MGA)	Ht (AHD)	dE (mm)	dN (mm)	dHt (mm)	
N10.0108	723357.986	6189341.432	62.302	723357.972	6189341.439	62.283	-14	7	-19	
N10.0208	723365.964	6189346.133	62.329	723365.948	6189346.136	62.327	-16	3	-2	
N10.0308	723375.206	6189351.479	62.341	723375.186	6189351.491	62.339	-19	13	-2	
N10.0408	723383.271	6189356.736	62.366	723383.265	6189356.744	62.368	-6	8	2	
N10.0508	723392.281	6189361.960	62.368	723392.276	6189361.970	62.363	-5	10	-5	
N10.0608	723400.670	6189367.036	62.393	723400.671	6189367.058	62.411	1	22	18	
N10.0808	723418.350	6189377.584	62.440	723418.338	6189377.632	62.434	-12	48	-6	
N10.0908	723426.614	6189382.472	62.485	723426.574	6189382.513	62.459	-40	41	-26	
N10.1008	723436.204	6189386.483	62.568	723436.165	6189386.507	62.552	-39	24	-16	
N10.1208	723451.473	6189397.914	62.642	723451.411	6189397.932	62.618	-62	18	-24	
N10.1308	723460.862	6189403.205	62.739	723460.829	6189403.220	62.742	-33	15	3	
N10.1408	723469.259	6189408.235	62.781	723469.204	6189408.261	62.780	-55	26	-1	
N10.1508	723477.904	6189413.184	63.021	723477.877	6189413.183	63.030	-27	-1	10	
N10.1608	723486.551	6189418.495	63.106	723486.542	6189418.496	63.109	-10	1	3	
N10.1808	723503.477	6189429.570	63.399	723503.472	6189429.577	63.400	-5	8	1	
N10.1908	723512.428	6189433.938	63.534	723512.425	6189433.947	63.535	-3	9	2	
N10.2008	723521.157	6189439.038	63.475	723521.152	6189439.044	63.477	-5	6	2	
N10.2108	723529.543	6189444.202	63.639							not able to be measured
N10.1817	723457.363	6189506.191	63.477	723457.346	6189506.198	63.487	-17	7	10	
N10.1514	723447.076	6189464.888	63.185	723447.057	6189464.876	63.201	-19	-12	16	
N10.1413	723443.840	6189450.959	63.008	723443.820	6189450.950	63.008	-20	-9	0	
N10.1312	723440.217	6189437.605	62.961	723440.223	6189437.574	62.872	6	-31	-89	
N10.1211	723436.630	6189423.747	62.758	723436.617	6189423.753	62.679	-13	6	-79	
N10.1110	723433.383	6189410.037	62.603	723433.364	6189410.051	62.553	-19	14	-50	
N10.1009	723429.441	6189394.657	62.572	723429.366	6189394.697	62.513	-75	40	-59	
N10.0807	723422.582	6189368.173	62.604	723422.560	6189368.196	62.598	-22	23	-6	
N10.0706	723419.614	6189354.982	62.423							
N10.0605	723416.045	6189341.370	62.344	723416.039	6189341.383	62.344	-6	12	1	
N10.0504	723412.860	6189327.750	62.659	723412.862	6189327.759	62.658	1	9	-1	
N10.0403	723409.154	6189313.837	62.343	723409.143	6189313.842	62.348	-11	5	5	
N10.0302	723405.357	6189300.076	62.380	723405.351	6189300.092	62.385	-6	15	4	
N10.0201	723402.392	6189286.495	62.352	723402.384	6189286.490	62.336	-8	-5	-16	
N20.1003	723493.285	6189270.982	62.538	723493.286	6189270.992	62.538	1	10	0	
N20.1004	723482.894	6189287.223	62.504	723482.897	6189287.230	62.519	3	7	15	
N20.1005	723472.547	6189305.158	62.492	723472.542	6189305.169	62.472	-5	11	-20	
N10.0901	723462.513	6189322.504	62.482	723462.512	6189322.511	62.494	-1	7	12	
N10.0902	723456.823	6189330.434	62.523	723456.819	6189330.443	62.531	-4	9	8	
N10.0905	723442.266	6189357.162	62.747	723442.255	6189357.174	62.744	-11	12	-3	
N10.0906	723436.819	6189365.361	62.472							not able to be measured
N10.0907	723431.804	6189373.943	62.654	723431.789	6189373.963	62.652	-15	20	-2	
N10.0909	723420.773	6189389.606	62.514							not able to be measured
N10.0910	723415.961	6189398.305	62.452							not able to be measured
N10.0911	723411.218	6189408.369	62.507	723411.229	6189408.353	62.456	11	-16	-51	
N10.0912	723405.895	6189417.104	62.626	723405.923	6189417.086	62.608	28	-18	-18	
N10.0913	723401.046	6189425.727	62.741	723401.073	6189425.714	62.740	27	-13	-1	
N10.0914	723395.528	6189433.894	62.896	723395.539	6189433.888	62.903	11	-6	7	
N10.0915	723390.467	6189442.678	62.796	723390.475	6189442.673	62.773	8	-6	-23	
N10.0916	723385.370	6189451.112	62.811	723385.375	6189451.108	62.809	5	-4	-2	
N10.0917	723380.211	6189459.940	62.985	723380.204	6189459.934	62.987	-6	-5	2	
N10.0919	723370.187	6189476.846	62.966	723370.184	6189476.841	62.969	-3	-5	2	
N10.0920	723365.173	6189485.561	62.988	723365.170	6189485.554	62.990	-3	-8	2	
N10.0921	723359.800	6189494.081	63.077	723359.794	6189494.077	63.082	-6	-5	4	
N10.0116	723316.254	6189409.899	62.307	723316.248	6189409.904	62.311	-6	5	4	
N10.0215	723330.721	6189406.837	62.346	723330.724	6189406.844	62.361	3	7	15	
N10.0314	723342.377	6189402.396	62.371							not able to be measured
N10.0512	723371.445	6189396.609	62.394	723371.452	6189396.616	62.397	8	7	3	
N10.0611	723384.924	6189392.800	62.419	723384.941	6189392.815	62.416	17	15	-3	
N10.0710	723399.155	6189389.760	62.436	723399.172	6189389.765	62.429	17	5	-7	
N10.0809	723412.735	6189386.101	62.470	723412.789	6189386.184	62.435	54	83	-35	disturbed
N10.0908A	723426.614	6189382.472	62.485							
N10.1007	723440.220	6189379.254	62.547	723440.203	6189379.271	62.542	-17	17	-5	
N10.1106	723454.131	6189375.630	62.562	723454.117	6189375.641	62.563	-15	10	1	
N10.1205	723467.530	6189372.201	62.513	723467.521	6189372.223	62.521	-9	22	8	
N10.1304	723481.252	6189369.012	62.535	723481.247	6189369.015	62.543	-5	2	9	
N10.1403	723494.948	6189365.266	62.596	723494.942	6189365.282	62.602	-6	16	6	
N10.0507	723397.297	6189353.565	62.329	723397.292	6189353.571	62.334	-5	6	5	
N10.0509	723387.106	6189370.521	62.373	723387.102	6189370.522	62.375	-4	1	3	
N10.0510	723382.018	6189379.314	62.405	723382.017	6189379.334	62.408	-1	20	3	
N10.0511	723376.960	6189387.711	62.378	723376.962	6189387.717	62.389	2	6	11	
N10.0513	723365.876	6189405.955	62.546	723365.875	6189405.947	62.545	-1	-8	-1	
N10.0514	723361.380	6189413.591	62.467	723361.383	6189413.599	62.485	3	8	18	

N10.0609	723395.558	6189375.757	62.381	723395.564	6189375.781	62.385	6	24	4
N10.0610	723390.441	6189384.418	62.408	723390.448	6189384.427	62.407	7	9	-1
N10.0612	723380.200	6189401.675	62.406	723380.203	6189401.680	62.409	3	5	3
N10.0613	723375.326	6189409.179	62.597	723375.332	6189409.188	62.600	6	9	3
N10.0614	723370.081	6189418.574	62.879	723370.083	6189418.576	62.883	2	2	4
N10.0707	723414.524	6189363.570	62.370	723414.519	6189363.581	62.369	-5	11	-1
N10.0709	723404.357	6189382.265	62.399	723404.381	6189382.280	62.402	24	15	3
N10.0711	723394.900	6189398.004	62.469	723394.922	6189398.018	62.460	22	14	-9
N10.0712	723390.386	6189406.427	62.759	723390.409	6189406.434	62.755	23	7	-4
N10.0713	723383.919	6189415.357	62.542	723383.920	6189415.355	62.540	1	-2	-2
N10.0714	723378.651	6189423.603	62.644	723378.650	6189423.600	62.646	-1	-3	2
N10.0810	723407.597	6189394.715	62.527	723407.620	6189394.738	62.492	23	23	-35
N10.0811	723402.479	6189402.843	62.511	723402.513	6189402.849	62.512	35	6	1
N10.0812	723397.283	6189411.901	62.564	723397.304	6189411.909	62.559	21	8	-5
N10.0813	723392.592	6189420.455	62.597	723392.601	6189420.451	62.588	9	-4	-9
N10.0814	723386.929	6189428.640	62.658	723386.951	6189428.641	62.645	22	1	-13
N10.1010	723424.529	6189405.240	62.677	723424.496	6189405.231	62.615	-33	-9	-62
N10.1011	723419.089	6189413.564	62.600	723419.097	6189413.549	62.565	8	-15	-35
N10.1012	723414.606	6189422.191	62.689						
N10.1013	723409.860	6189430.597	62.851	723409.894	6189430.577	62.820	34	-20	-31
N10.1014	723403.352	6189438.684	62.898	723403.348	6189438.675	62.908	-3	-9	10
N10.1107	723449.223	6189384.165	62.605	723449.185	6189384.196	62.584	-38	31	-21
N10.1109	723438.470	6189401.407	62.575	723438.419	6189401.415	62.541	-51	8	-34
N10.1111	723428.457	6189418.701	62.681	723428.457	6189418.698	62.635	0	-3	-46
N10.1113	723417.987	6189435.902	62.858	723418.006	6189435.883	62.820	19	-19	-38
N10.1114	723412.918	6189444.297	62.913	723412.941	6189444.267	62.944	23	-30	31
N10.1207	723457.394	6189389.098	62.610	723457.356	6189389.122	62.601	-38	24	-8
N10.1209	723446.132	6189406.108	62.669	723446.091	6189406.142	62.673	-41	34	4
N10.1210	723441.997	6189415.244	62.717	723441.972	6189415.269	62.646	-25	25	-71
N10.1212	723432.359	6189432.215	62.915	723432.376	6189432.195	62.840	17	-20	-75
N10.1213	723427.315	6189439.473	62.922	723427.320	6189439.442	62.876	5	-31	-46
N10.1214	723421.446	6189449.552	62.981	723421.453	6189449.521	62.961	7	-31	-20
N10.1307	723466.951	6189394.284	62.667	723466.928	6189394.300	62.683	-23	16	16
N10.1309	723456.963	6189412.404	62.748	723456.908	6189412.414	62.734	-54	10	-14
N10.1310	723450.759	6189420.181	62.775	723450.718	6189420.201	62.719	-41	20	-56
N10.1311	723445.342	6189428.635	62.882	723445.314	6189428.641	62.790	-28	6	-92
N10.1313	723435.369	6189446.169	62.937	723435.371	6189446.122	62.899	2	-47	-38
N10.1314	723430.258	6189454.981	63.011	723430.259	6189454.959	63.013	1	-22	2
N10.1407	723474.385	6189399.456	62.731	723474.366	6189399.466	62.739	-19	10	8
N10.1409	723464.453	6189416.928	62.837	723464.417	6189416.935	62.832	-36	7	-5
N10.1410	723459.267	6189425.429	62.778	723459.228	6189425.433	62.775	-39	4	-3
N10.1411	723454.081	6189433.948	62.903	723454.031	6189433.940	62.837	-50	-8	-66
N10.1412	723448.900	6189442.252	62.967	723448.872	6189442.218	62.923	-28	-34	-44
N10.1414	723439.100	6189460.899	63.151	723439.093	6189460.888	63.168	-7	-11	17
N10.1507	723483.345	6189404.814	62.921	723483.319	6189404.805	62.922	-26	-9	1
N10.1508	723477.904	6189413.184	63.021	723477.877	6189413.183	63.030	-27	-1	10
N10.1509	723473.070	6189421.926	62.781	723473.038	6189421.932	62.749	-32	6	-32
N10.1510	723467.729	6189430.641	63.107	723467.701	6189430.630	63.114	-28	-11	7
N10.1511	723462.798	6189438.872	63.079	723462.781	6189438.876	63.082	-17	4	3
N10.1512	723457.395	6189447.375	63.076	723457.377	6189447.367	63.079	-18	-8	3
N10.1513	723452.237	6189456.476	63.135	723452.225	6189456.470	63.146	-12	-6	11
N10.1514	723447.076	6189464.888	63.185	723447.057	6189464.876	63.201	-19	-12	16

Appendix A: West Balranald Trial 2 Post-mining Subsidence Survey Results - Slope 4 (May 2016 to November 2019)

Iluka Resources - West Balranald Trial2 - Slope 4 - Survey Results (9 mths post-mining)										
POINT	PRE-MINING SURVEY - 18/8/16			POST-MINING SURVEY - 23/05/17			TOTAL MOVEMENT			COMMENTS
	E (MGA)	N (MGA)	Ht (AHD)	E (MGA)	N (MGA)	Ht (AHD)	dE (mm)	dN (mm)	dHt (mm)	
1001	723615.888	6188945.010	63.857	723615.897	6188945.010	63.853	9	-1	-4	Fixed prism
1002	723590.728	6188989.940	63.693	723590.740	6188989.928	63.687	12	-12	-6	Fixed prism
2001	723660.693	6188943.426	64.050	723660.691	6188943.426	64.047	-2	0	-3	Fixed prism
2002	723653.197	6188955.426	63.882	723653.201	6188955.429	63.875	4	2	-8	Fixed prism
2003	723644.875	6188969.082	63.853	723644.878	6188969.075	63.837	3	-7	-16	Fixed prism
2004	723635.477	6188984.363	63.885	723635.480	6188984.358	63.876	3	-6	-9	Fixed prism
2005	723626.042	6188999.864	63.861	723626.041	6188999.851	63.847	-1	-13	-14	Fixed prism
2006	723612.443	6189021.818	63.846	723612.449	6189021.801	63.833	6	-18	-13	Fixed prism
2007	723603.927	6189035.514	63.869	723603.935	6189035.505	63.866	8	-9	-3	Fixed prism
2008	723595.595	6189049.219	63.658	723595.582	6189049.209	63.659	-13	-10	1	deep wet location
3001	723673.515	6188979.840	63.823	723673.511	6188979.838	63.817	-3	-1	-6	Fixed prism
3002	723646.200	6189022.981	63.850	723646.198	6189022.976	63.845	-2	-5	-6	Fixed prism
POINT	PRE-MINING SURVEY - 18/8/16			POST-MINING SURVEY - 23/05/17			TOTAL MOVEMENT			COMMENTS
	E (MGA)	N (MGA)	Ht (AHD)	E (MGA)	N (MGA)	Ht (AHD)	dE (mm)	dN (mm)	dHt (mm)	
5031	723539.266	6189041.326	62.649	723539.268	6189041.318	62.649	2	-8	0	
5032	723549.264	6189024.349	62.684	723549.274	6189024.345	62.689	10	-4	5	
5033	723559.911	6189007.656	62.720	723559.921	6189007.649	62.729	10	-7	9	
5034	723570.241	6188990.737	62.744	723570.244	6188990.728	62.744	3	-9	0	
5035	723580.474	6188973.282	62.779	723580.480	6188973.275	62.768	6	-7	-11	
5036	723590.332	6188956.352	62.799	723590.338	6188956.342	62.785	7	-9	-14	
5037	723600.921	6188938.286	62.819	723600.931	6188938.277	62.811	10	-9	-8	
5038	723611.337	6188922.360	62.770	723611.350	6188922.358	62.759	13	-2	-11	
5039	723620.801	6188906.008	62.728	723620.813	6188906.003	62.738	12	-5	10	
5045	723649.183	6188897.383	62.928	723649.192	6188897.384	62.936	9	1	8	
5046	723639.124	6188914.477	62.885	723639.132	6188914.478	62.887	8	2	2	
5047	723629.415	6188931.691	62.875	723629.419	6188931.679	62.867	5	-12	-8	
5048	723618.883	6188951.625	62.821	723618.895	6188951.631	62.816	12	6	-5	
5049	723607.938	6188967.799	62.820	723607.939	6188967.791	62.806	1	-8	-14	
5050	723597.478	6188983.475	62.781	723597.485	6188983.470	62.784	7	-5	3	
5051	723587.135	6189001.770	62.753	723587.137	6189001.759	62.756	2	-11	3	
5052	723576.781	6189017.743	62.782	723576.783	6189017.739	62.790	2	-4	8	
5053	723566.597	6189034.976	62.762	723566.592	6189034.964	62.771	-5	-12	9	
5054	723555.756	6189051.136	62.706	723555.749	6189051.122	62.718	-7	-14	12	
5059	723573.795	6189061.521	62.718	723573.794	6189061.506	62.730	0	-14	12	
5060	723583.611	6189044.887	62.703	723583.606	6189044.873	62.705	-5	-14	2	
5061	723593.834	6189028.715	62.865							disturbed / run over
5062	723604.119	6189010.199	62.804	723604.125	6189010.188	62.796	6	-11	-8	
5063	723614.767	6188993.684	62.792	723614.774	6188993.686	62.794	7	2	2	
5064	723624.919	6188976.554	62.834	723624.933	6188976.537	62.822	14	-17	-12	
5065	723634.854	6188960.420	62.748	723634.862	6188960.427	62.745	8	7	-3	
5066	723644.946	6188943.268	62.824	723644.956	6188943.269	62.828	10	1	4	
5067	723656.594	6188924.730	62.927	723656.605	6188924.727	62.928	11	-3	1	
5068	723666.680	6188910.996	62.967	723666.688	6188910.989	62.977	8	-7	10	
5073	723685.971	6188917.055	63.212	723685.978	6188917.057	63.220	7	2	8	
5074	723673.873	6188935.888	63.670	723673.873	6188935.892	63.669	0	4	-1	
5075	723667.984	6188953.135	62.833	723667.987	6188953.142	62.832	3	7	-1	
5076	723651.792	6188969.810	62.754	723651.788	6188969.803	62.735	-4	-7	-19	
5077	723642.332	6188988.410	62.685							underwater / mud
5078	723632.240	6189004.723	62.779	723632.230	6189004.716	62.766	-10	-7	-13	
5079	723622.023	6189021.998	62.754	723622.028	6189021.983	62.733	5	-15	-21	
5080	723611.272	6189038.610	62.788	723611.267	6189038.600	62.784	-5	-10	-4	
5081	723600.524	6189056.724	62.665							underwater / mud
5082	723590.141	6189072.871	62.735	723590.134	6189072.865	62.736	-7	-6	1	
5087	723609.356	6189082.376	62.772	723609.352	6189082.368	62.781	-4	-8	9	
5088	723618.808	6189066.335	62.877	723618.810	6189066.329	62.874	2	-6	-3	
5089	723627.394	6189049.378	62.769	723627.387	6189049.368	62.769	-7	-10	0	
5090	723637.922	6189031.995	62.863	723637.922	6189031.980	62.864	0	-14	1	
5091	723648.753	6189015.592	62.855	723648.750	6189015.577	62.856	-3	-15	1	
5092	723659.243	6188997.943	62.848	723659.239	6188997.931	62.851	-4	-12	4	
5093	723669.125	6188980.711	62.866	723669.126	6188980.707	62.862	2	-4	-4	
5094	723680.062	6188963.348	62.888	723680.058	6188963.339	62.882	-4	-9	-6	
5095	723690.043	6188944.416	63.269	723690.048	6188944.415	63.266	5	-1	-3	
5103	723699.619	6188975.110	62.992	723699.622	6188975.113	62.988	3	3	-4	
5104	723687.588	6188990.423	63.014	723687.588	6188990.427	63.005	0	4	-9	
5105	723678.001	6189006.526	62.944	723677.998	6189006.529	62.944	-3	3	1	
5106	723665.950	6189024.711	62.935	723665.944	6189024.703	62.931	-6	-8	-4	
5107	723655.558	6189044.201	62.791	723655.549	6189044.198	62.793	-9	-8	2	
5108	723646.939	6189061.414	62.819	723646.936	6189061.406	62.822	-3	-8	3	found, this survey
5109	723635.425	6189076.611	62.927	723635.414	6189076.610	62.930	-11	-1	3	
5110	723624.123	6189093.881	62.778	723624.119	6189093.879	62.779	-4	-2	1	

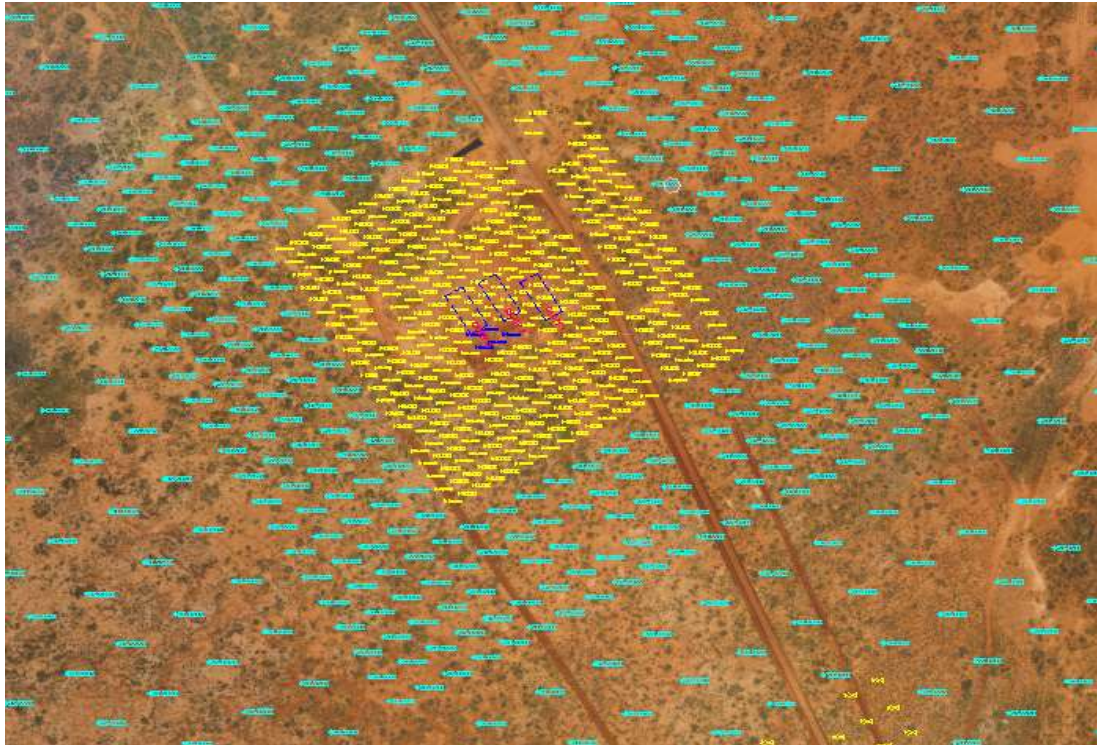
Iluka Resources - West Balranald Trial2 - Stope 4 - Survey Results (15 mths post-mining)										
POINT	PRE-MINING SURVEY - 18/8/16			POST-MINING SURVEY - 21/11/17			TOTAL MOVEMENT			COMMENTS
	E (MGA)	N (MGA)	Ht (AHD)	E (MGA)	N (MGA)	Ht (AHD)	dE (mm)	dN (mm)	dHt (mm)	
1001	723615.888	6188945.010	63.857	723615.896	6188945.008	63.852	8	-3	-5	Fixed prism
1002	723590.728	6188989.940	63.693	723590.740	6188989.927	63.686	12	-13	-7	Fixed prism
2001	723660.693	6188943.426	64.050	723660.692	6188943.424	64.046	-1	-2	-4	Fixed prism
2002	723653.197	6188955.426	63.882	723653.202	6188955.428	63.876	5	1	-7	Fixed prism
2003	723644.875	6188969.082	63.853	723644.879	6188969.074	63.835	4	-8	-18	Fixed prism
2004	723635.477	6188984.363	63.885	723635.481	6188984.358	63.874	4	-6	-11	Fixed prism
2005	723626.042	6188999.864	63.861	723626.041	6188999.850	63.846	-1	-14	-15	Fixed prism
2006	723612.443	6189021.818	63.846	723612.448	6189021.799	63.834	5	-20	-12	Fixed prism
2007	723603.927	6189035.514	63.869	723603.934	6189035.505	63.866	7	-9	-3	Fixed prism
2008	723595.595	6189049.219	63.658	723595.581	6189049.209	63.658	-14	-10	0	Fixed prism
3001	723673.515	6188979.840	63.823	723673.511	6188979.837	63.817	-3	-2	-6	Fixed prism
3002	723646.200	6189022.981	63.850	723646.199	6189022.976	63.844	-1	-5	-7	Fixed prism
5031	723539.266	6189041.326	62.649	723539.260	6189041.322	62.649	-6	-4	0	
5032	723549.264	6189024.349	62.684	723549.272	6189024.334	62.684	8	-15	0	
5033	723559.911	6189007.656	62.720	723559.918	6189007.644	62.723	7	-12	3	
5034	723570.241	6188990.737	62.744	723570.250	6188990.726	62.744	10	-11	0	
5035	723580.474	6188973.282	62.779	723580.482	6188973.275	62.764	8	-7	-15	
5036	723590.332	6188956.352	62.799							disturbed / run over
5037	723600.921	6188938.286	62.819	723600.928	6188938.282	62.800	7	-4	-19	
5038	723611.337	6188922.360	62.770	723611.354	6188922.357	62.762	17	-3	-8	
5039	723620.801	6188906.008	62.728	723620.816	6188906.001	62.729	15	-7	1	
5045	723649.183	6188897.383	62.928	723649.196	6188897.382	62.926	13	-1	-2	
5046	723639.124	6188914.477	62.885	723639.134	6188914.479	62.871	10	3	-14	
5047	723629.415	6188931.691	62.875	723629.419	6188931.684	62.871	5	-7	-4	
5048	723618.883	6188951.625	62.821	723618.897	6188951.629	62.822	14	4	1	
5049	723607.938	6188967.799	62.820	723607.934	6188967.789	62.796	-4	-10	-24	
5050	723597.478	6188983.475	62.781	723597.470	6188983.462	62.777	-8	-13	-4	disturbed?
5051	723587.135	6189001.770	62.753	723587.136	6189001.760	62.746	1	-10	-7	
5052	723576.781	6189017.743	62.782	723576.786	6189017.740	62.774	5	-3	-8	
5053	723566.597	6189034.976	62.762	723566.586	6189034.966	62.757	-11	-9	-5	
5054	723555.756	6189051.136	62.706	723555.757	6189051.123	62.711	1	-13	5	
5059	723573.795	6189061.521	62.718	723573.787	6189061.508	62.717	-7	-12	-1	
5060	723583.611	6189044.887	62.703	723583.606	6189044.867	62.696	-5	-20	-7	
5061	723593.834	6189028.715	62.865							disturbed / run over
5062	723604.119	6189010.199	62.804	723604.128	6189010.202	62.806	9	3	2	
5063	723614.767	6188993.684	62.792	723614.776	6188993.680	62.785	9	-4	-7	
5064	723624.919	6188976.554	62.834	723624.931	6188976.539	62.816	12	-15	-18	
5065	723634.854	6188960.420	62.748	723634.868	6188960.407	62.741	15	-13	-7	
5066	723644.946	6188943.268	62.824	723644.959	6188943.254	62.817	13	-14	-7	
5067	723656.594	6188924.730	62.927	723656.595	6188924.732	62.921	1	2	-6	
5068	723666.680	6188910.996	62.967	723666.683	6188910.991	62.988	3	-5	21	
5073	723685.971	6188917.055	63.212	723685.982	6188917.047	63.225	11	-8	13	
5074	723673.873	6188935.888	63.670	723673.875	6188935.887	63.660	2	-1	-10	
5075	723667.984	6188953.135	62.833	723667.979	6188953.142	62.834	-5	7	1	
5076	723651.792	6188969.810	62.754	723651.788	6188969.796	62.744	-4	-14	-10	
5077	723642.332	6188988.410	62.685							destroyed
5078	723632.240	6189004.723	62.779	723632.230	6189004.709	62.774	-10	-14	-5	
5079	723622.023	6189021.998	62.754	723622.021	6189021.980	62.736	-2	-18	-18	
5080	723611.272	6189038.610	62.788	723611.262	6189038.597	62.789	-10	-13	1	
5081	723600.524	6189056.724	62.665	723600.516	6189056.713	62.671	-8	-10	6	
5082	723590.141	6189072.871	62.735	723590.132	6189072.865	62.728	-9	-6	-7	
5087	723609.356	6189082.376	62.772	723609.354	6189082.366	62.758	-2	-10	-14	
5088	723618.808	6189066.335	62.877	723618.815	6189066.324	62.874	7	-11	-3	
5089	723627.394	6189049.378	62.769	723627.389	6189049.365	62.786	-5	-13	17	
5090	723637.922	6189031.995	62.863	723637.922	6189031.978	62.860	0	-16	-3	
5091	723648.753	6189015.592	62.855	723648.750	6189015.573	62.851	-3	-19	-4	
5092	723659.243	6188997.943	62.848	723659.241	6188997.940	62.858	-2	-3	11	
5093	723669.125	6188980.711	62.866	723669.122	6188980.702	62.859	-3	-9	-7	
5094	723680.062	6188963.348	62.888	723680.064	6188963.350	62.876	2	2	-12	
5095	723690.043	6188944.416	63.269	723690.050	6188944.412	63.266	7	-4	-3	
5103	723699.619	6188975.110	62.992	723699.621	6188975.113	62.987	2	3	-5	
5104	723687.588	6188990.423	63.014	723687.585	6188990.419	63.011	-3	-4	-3	
5105	723678.001	6189006.526	62.944	723677.998	6189006.534	62.945	-3	8	2	
5106	723665.950	6189024.711	62.935	723665.936	6189024.707	62.929	-14	-4	-6	
5107	723655.558	6189044.201	62.791	723655.554	6189044.197	62.798	-4	-4	7	
5108	723646.939	6189061.414	62.819	723646.932	6189061.415	62.832	-7	1	13	
5109	723635.425	6189076.611	62.927	723635.425	6189076.610	62.929	0	-1	2	
5110	723624.123	6189093.881	62.778	723624.108	6189093.878	62.791	-15	-3	13	

Iluka Resources - West Balranald Trial2 - Stope 4 - Survey Results (27 mths post-mining)										
POINT	PRE-MINING SURVEY - 18/8/16			POST-MINING SURVEY - 20/11/18			TOTAL MOVEMENT			COMMENTS
	E (MGA)	N (MGA)	Ht (AHD)	E (MGA)	N (MGA)	Ht (AHD)	dE (mm)	dN (mm)	dHt (mm)	
1001	723615.888	6188945.010	63.857	723615.896	6188945.010	63.853	8	-1	-4	Fixed prism
1002	723590.728	6188989.940	63.693	723590.739	6188989.926	63.686	11	-14	-8	Fixed prism
2001	723660.693	6188943.426	64.050	723660.692	6188943.426	64.047	0	0	-3	Fixed prism
2002	723653.197	6188955.426	63.882	723653.202	6188955.428	63.876	6	2	-6	Fixed prism
2003	723644.875	6188969.082	63.853	723644.878	6188969.076	63.837	3	-6	-16	Fixed prism
2004	723635.477	6188984.363	63.885	723635.482	6188984.359	63.874	5	-5	-11	Fixed prism
2005	723626.042	6188999.864	63.861	723626.041	6188999.850	63.845	-1	-14	-16	Fixed prism
2006	723612.443	6189021.818	63.846	723612.448	6189021.801	63.835	6	-18	-11	Fixed prism
2007	723603.927	6189035.514	63.869	723603.933	6189035.504	63.866	7	-10	-3	Fixed prism
2008	723595.595	6189049.219	63.658	723595.583	6189049.209	63.659	-12	-10	1	Fixed prism
3001	723673.515	6188979.840	63.823	723673.510	6188979.837	63.818	-4	-3	-5	Fixed prism
3002	723646.200	6189022.981	63.850	723646.198	6189022.977	63.844	-3	-4	-6	Fixed prism
POINT	PRE-MINING SURVEY - 18/8/16			POST-MINING SURVEY - 20/12/18			TOTAL MOVEMENT			COMMENTS
	E (MGA)	N (MGA)	Ht (AHD)	E (MGA)	N (MGA)	Ht (AHD)	dE (mm)	dN (mm)	dHt (mm)	
5031	723539.266	6189041.326	62.649	723539.275	6189041.317	62.636	9	-9	-13	
5032	723549.264	6189024.349	62.684	723549.283	6189024.336	62.681	19	-13	-3	
5033	723559.911	6189007.656	62.720	723559.927	6189007.655	62.701	16	-1	-19	
5034	723570.241	6188990.737	62.744	723570.247	6188990.728	62.729	7	-9	-15	
5035	723580.474	6188973.282	62.779	723580.487	6188973.286	62.769	13	4	-10	
5036	723590.332	6188956.352	62.799	723590.338	6188956.340	62.741				disturbed / run over
5037	723600.921	6188938.286	62.819	723600.931	6188938.282	62.801	10	-4	-18	
5038	723611.337	6188922.360	62.770	723611.354	6188922.361	62.747	17	1	-23	
5039	723620.801	6188906.008	62.728	723620.819	6188906.004	62.728	18	-4	0	
5045	723649.183	6188897.383	62.928							not able to be measured
5046	723639.124	6188914.477	62.885	723639.141	6188914.481	62.875	17	4	-10	
5047	723629.415	6188931.691	62.875	723629.413	6188931.676	62.863	-2	-15	-12	
5048	723618.883	6188951.625	62.821	723618.908	6188951.625	62.819	25	0	-2	
5049	723607.938	6188967.799	62.820	723607.944	6188967.784	62.811	6	-15	-9	
5050	723597.478	6188983.475	62.781	723597.487	6188983.467	62.768	9	-8	-13	disturbed?
5051	723587.135	6189001.770	62.753	723587.153	6189001.762	62.760	18	-8	7	
5052	723576.781	6189017.743	62.782	723576.793	6189017.733	62.793	12	-10	11	
5053	723566.597	6189034.976	62.762	723566.605	6189034.965	62.758	8	-10	-4	
5054	723555.756	6189051.136	62.706	723555.757	6189051.129	62.716	1	-7	10	
5059	723573.795	6189061.521	62.718	723573.792	6189061.519	62.731	-2	-1	13	
5060	723583.611	6189044.887	62.703	723583.613	6189044.877	62.701	2	-10	-2	
5061	723593.834	6189028.715	62.865	723593.841	6189028.720	62.808				disturbed / run over
5062	723604.119	6189010.199	62.804	723604.132	6189010.198	62.801	13	-1	-3	
5063	723614.767	6188993.684	62.792	723614.778	6188993.698	62.794	11	14	2	
5064	723624.919	6188976.554	62.834	723624.930	6188976.554	62.820	11	0	-14	
5065	723634.854	6188960.420	62.748	723634.869	6188960.432	62.741	15	12	-7	
5066	723644.946	6188943.268	62.824	723644.960	6188943.260	62.806	14	-8	-18	
5067	723656.594	6188924.730	62.927	723656.611	6188924.732	62.915	17	2	-12	
5068	723666.680	6188910.996	62.967	723666.694	6188911.005	62.969	14	9	2	
5073	723685.971	6188917.055	63.212	723685.986	6188917.053	63.210	15	-2	-2	
5074	723673.873	6188935.888	63.670	723673.865	6188935.882	63.659	-8	-6	-11	
5075	723667.984	6188953.135	62.833	723667.995	6188953.138	62.828	11	3	-5	
5076	723651.792	6188969.810	62.754	723651.789	6188969.813	62.735	-3	3	-19	
5077	723642.332	6188988.410	62.685							destroyed
5078	723632.240	6189004.723	62.779	723632.236	6189004.720	62.778	-4	-3	-1	
5079	723622.023	6189021.998	62.754							destroyed
5080	723611.272	6189038.610	62.788	723611.269	6189038.608	62.786	-3	-2	-2	
5081	723600.524	6189056.724	62.665	723600.524	6189056.721	62.684	0	-3	19	
5082	723590.141	6189072.871	62.735	723590.135	6189072.874	62.729	-6	3	-6	
5087	723609.356	6189082.376	62.772	723609.355	6189082.369	62.768	-1	-7	-4	
5088	723618.808	6189066.335	62.877	723618.812	6189066.338	62.875	4	3	-2	
5089	723627.394	6189049.378	62.769	723627.387	6189049.377	62.779	-7	-1	11	
5090	723637.922	6189031.995	62.863	723637.928	6189031.987	62.854	6	-8	-9	
5091	723648.753	6189015.592	62.855	723648.747	6189015.586	62.847	-6	-5	-9	
5092	723659.243	6188997.943	62.848	723659.244	6188997.951	62.850	1	8	3	
5093	723669.125	6188980.711	62.866	723669.120	6188980.716	62.861	-5	5	-5	
5094	723680.062	6188963.348	62.888	723680.063	6188963.352	62.885	1	4	-3	
5095	723690.043	6188944.416	63.269	723690.052	6188944.432	63.278	9	16	9	
5103	723699.619	6188975.110	62.992	723699.623	6188975.103	62.993	4	-7	1	
5104	723687.588	6188990.423	63.014	723687.585	6188990.414	63.006	-3	-9	-8	
5105	723678.001	6189006.526	62.944	723678.000	6189006.522	62.946	-1	-4	2	
5106	723665.950	6189024.711	62.935	723665.933	6189024.693	62.938	-17	-18	3	
5107	723655.558	6189044.201	62.791	723655.550	6189044.193	62.804	-8	-8	13	
5108	723646.939	6189061.414	62.819	723646.934	6189061.405	62.833	-5	-9	14	
5109	723635.425	6189076.611	62.927	723635.414	6189076.617	62.925	-11	6	-2	
5110	723624.123	6189093.881	62.778	723624.125	6189093.874	62.796	2	-7	18	

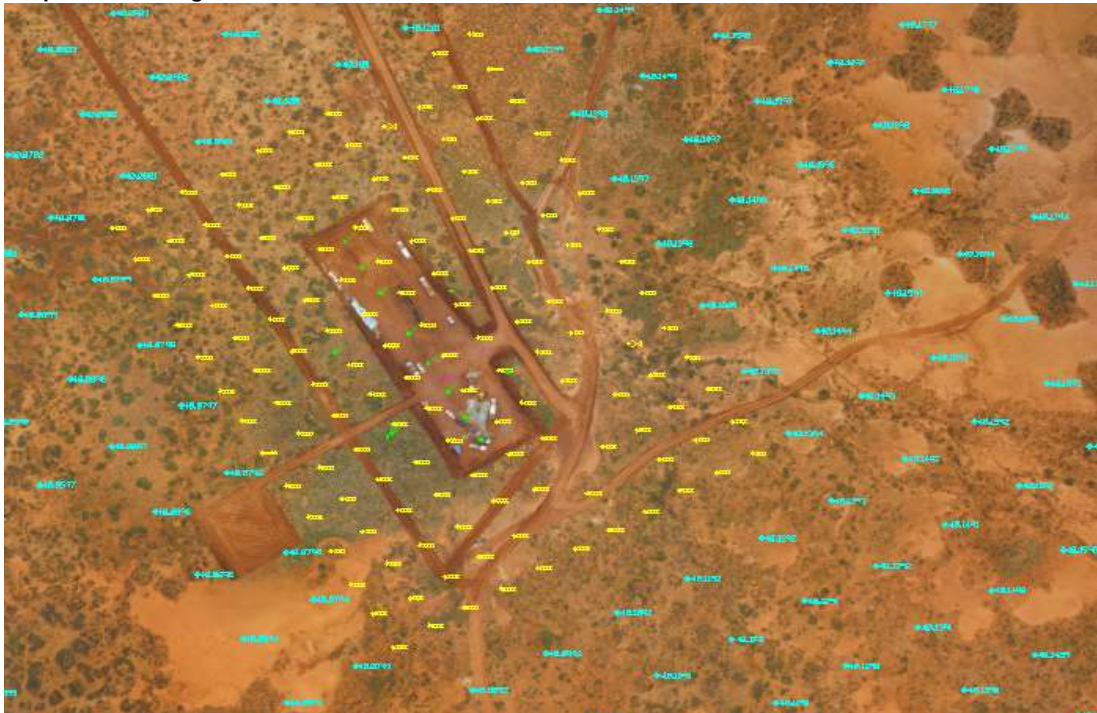
Iluka Resources - West Balranald Trial2 - Stope 4 - Survey Results (39 mths post-mining)										
POINT	PRE-MINING SURVEY - 18/8/16			POST-MINING SURVEY - 6/11/19			TOTAL MOVEMENT			COMMENTS
	E (MGA)	N (MGA)	Ht (AHD)	E (MGA)	N (MGA)	Ht (AHD)	dE (mm)	dN (mm)	dHt (mm)	
1001	723615.888	6188945.010	63.857	723615.896	6188945.010	63.853	8	-1	-4	Fixed prism
1002	723590.728	6188989.940	63.693	723590.739	6188989.926	63.686	11	-14	-8	Fixed prism
2001	723660.693	6188943.426	64.050	723660.692	6188943.426	64.047	0	0	-3	Fixed prism
2002	723653.197	6188955.426	63.882	723653.202	6188955.428	63.876	6	2	-6	Fixed prism
2003	723644.875	6188969.082	63.853	723644.878	6188969.076	63.837	3	-6	-16	Fixed prism
2004	723635.477	6188984.363	63.885	723635.482	6188984.354	63.874	5	-9	-11	Fixed prism
2005	723626.042	6188999.864	63.861	723626.041	6188999.850	63.845	-1	-14	-16	Fixed prism
2006	723612.443	6189021.818	63.846	723612.448	6189021.801	63.835	6	-18	-11	Fixed prism
2007	723603.927	6189035.514	63.869	723603.933	6189035.504	63.866	7	-10	-3	Fixed prism
2008	723595.595	6189049.219	63.658	723595.583	6189049.209	63.658	-12	-10	0	Fixed prism
3001	723673.515	6188979.840	63.823	723673.510	6188979.837	63.818	-4	-3	-5	Fixed prism
3002	723646.200	6189022.981	63.850	723646.198	6189022.977	63.844	-3	-4	-6	Fixed prism
5031	723539.266	6189041.326	62.649	723539.274	6189041.322	62.643	8	-5	-6	
5032	723549.264	6189024.349	62.684	723549.280	6189024.328	62.684	16	-21	0	
5033	723559.911	6189007.656	62.720	723559.924	6189007.654	62.695	12	-2	-26	
5034	723570.241	6188990.737	62.744	723570.245	6188990.723	62.731	5	-14	-13	
5035	723580.474	6188973.282	62.779	723580.486	6188973.279	62.769	12	-3	-10	
5036	723590.332	6188956.352	62.799	723590.339	6188956.335	62.745				disturbed / run over
5037	723600.921	6188938.286	62.819	723600.931	6188938.279	62.798	10	-8	-21	
5038	723611.337	6188922.360	62.770	723611.353	6188922.359	62.746	16	-1	-24	
5039	723620.801	6188906.008	62.728	723620.822	6188905.999	62.727	21	-10	-1	
5045	723649.183	6188897.383	62.928							not able to be measured
5046	723639.124	6188914.477	62.885	723639.143	6188914.474	62.874	19	-3	-11	
5047	723629.415	6188931.691	62.875	723629.409	6188931.679	62.873	-6	-12	-3	
5048	723618.883	6188951.625	62.821	723618.908	6188951.628	62.826	25	3	5	
5049	723607.938	6188967.799	62.820	723607.939	6188967.785	62.816	1	-14	-4	
5050	723597.478	6188983.475	62.781	723597.480	6188983.468	62.772	2	-7	-9	
5051	723587.135	6189001.770	62.753	723587.146	6189001.764	62.756	11	-7	3	
5052	723576.781	6189017.743	62.782	723576.788	6189017.733	62.784	7	-10	2	
5053	723566.597	6189034.976	62.762	723566.595	6189034.966	62.761	-2	-9	-1	
5054	723555.756	6189051.136	62.706	723555.756	6189051.122	62.716	0	-14	9	
5059	723573.795	6189061.521	62.718	723573.787	6189061.513	62.732	-8	-7	13	
5060	723583.611	6189044.887	62.703	723583.617	6189044.875	62.698	6	-12	-6	
5061	723593.834	6189028.715	62.865	723593.842	6189028.714	62.813				disturbed / run over
5062	723604.119	6189010.199	62.804	723604.130	6189010.191	62.798	10	-8	-6	
5063	723614.767	6188993.684	62.792	723614.777	6188993.693	62.797	10	9	5	
5064	723624.919	6188976.554	62.834	723624.936	6188976.547	62.826	17	-7	-8	
5065	723634.854	6188960.420	62.748	723634.873	6188960.425	62.741	19	4	-8	
5066	723644.946	6188943.268	62.824	723644.960	6188943.258	62.806	14	-10	-18	
5067	723656.594	6188924.730	62.927	723656.609	6188924.730	62.924	14	0	-4	
5068	723666.680	6188910.996	62.967	723666.695	6188910.997	62.968	14	1	1	
5073	723685.971	6188917.055	63.212							not found / destroyed
5074	723673.873	6188935.888	63.670	723673.873	6188935.884	63.665	0	-5	-6	
5075	723667.984	6188953.135	62.833	723667.992	6188953.136	62.825	7	0	-9	
5076	723651.792	6188969.810	62.754	723651.788	6188969.807	62.747	-4	-3	-7	
5077	723642.332	6188988.410	62.685							destroyed
5078	723632.240	6189004.723	62.779	723632.236	6189004.713	62.774	-4	-10	-6	
5079	723622.023	6189021.998	62.754							destroyed
5080	723611.272	6189038.610	62.788	723611.273	6189038.602	62.796	1	-9	8	
5081	723600.524	6189056.724	62.665	723600.528	6189056.711	62.689	4	-13	24	
5082	723590.141	6189072.871	62.735	723590.137	6189072.868	62.732	-4	-3	-4	
5087	723609.356	6189082.376	62.772	723609.356	6189082.367	62.768	0	-10	-4	
5088	723618.808	6189066.335	62.877	723618.810	6189066.329	62.872	1	-6	-5	
5089	723627.394	6189049.378	62.769	723627.390	6189049.372	62.776	-4	-6	7	
5090	723637.922	6189031.995	62.863	723637.918	6189031.981	62.855	-4	-14	-9	
5091	723648.753	6189015.592	62.855	723648.750	6189015.582	62.848	-4	-10	-7	
5092	723659.243	6188997.943	62.848	723659.242	6188997.946	62.849	-1	3	1	
5093	723669.125	6188980.711	62.866	723669.126	6188980.711	62.863	1	-1	-4	
5094	723680.062	6188963.348	62.888	723680.064	6188963.349	62.878	2	1	-10	
5095	723690.043	6188944.416	63.269	723690.056	6188944.426	63.278	13	10	9	
5103	723699.619	6188975.110	62.992	723699.631	6188975.108	62.990	11	-3	-2	
5104	723687.588	6188990.423	63.014	723687.590	6188990.416	63.009	2	-7	-5	
5105	723678.001	6189006.526	62.944	723678.009	6189006.523	62.947	7	-3	3	
5106	723665.950	6189024.711	62.935	723665.942	6189024.697	62.937	-9	-14	2	
5107	723655.558	6189044.201	62.791	723655.556	6189044.198	62.802	-2	-3	11	
5108	723646.939	6189061.414	62.819	723646.942	6189061.409	62.834	3	-5	15	
5109	723635.425	6189076.611	62.927	723635.420	6189076.609	62.924	-5	-3	-3	
5110	723624.123	6189093.881	62.778	723624.121	6189093.872	62.795	-2	-9	17	

## Appendix A: West Balranald Trial 2 Post-mining Subsidence Survey Monitoring Locations

### Stopes 1 - 3 Monitoring Network



### Stope 4 Monitoring Network



Appendix A: West Balranald Trial 2 Post-mining Subsidence Survey Results - Regional (May 2016 to November 2019)

Iluka Resources - West Balranald Trial2 - Far Field - Survey Results										
POINT	PRE-MINING SURVEY - 28/5/16			POST-MINING SURVEY - 24/05/17			TOTAL MOVEMENT			COMMENTS
	E (MGA)	N (MGA)	Ht (AHD)	E (MGA)	N (MGA)	Ht (AHD)	dE (mm)	dN (mm)	dHt (mm)	
STN4A	723646.618	6189409.990	63.713	723646.618	6189409.990	63.713	0	0	0	Control Point at Site
FF101	725964.853	6192554.472	58.593	725964.855	6192554.470	58.594	2	-2	1	
FF102	724063.505	6188033.288	65.176	724063.498	6188033.287	65.186	-7	-1	10	quite wet at this location
FF103	721547.241	6188708.611	65.213	721547.234	6188708.614	65.209	-7	3	-4	
FF104	724368.735	6190383.861	63.521	724368.741	6190383.864	63.525	6	3	4	
FF105	722766.207	6190655.622	62.998	722766.204	6190655.622	63.002	-3	0	4	
FF106	721363.685	6193089.244	65.736	721363.690	6193089.244	65.732	5	0	-4	

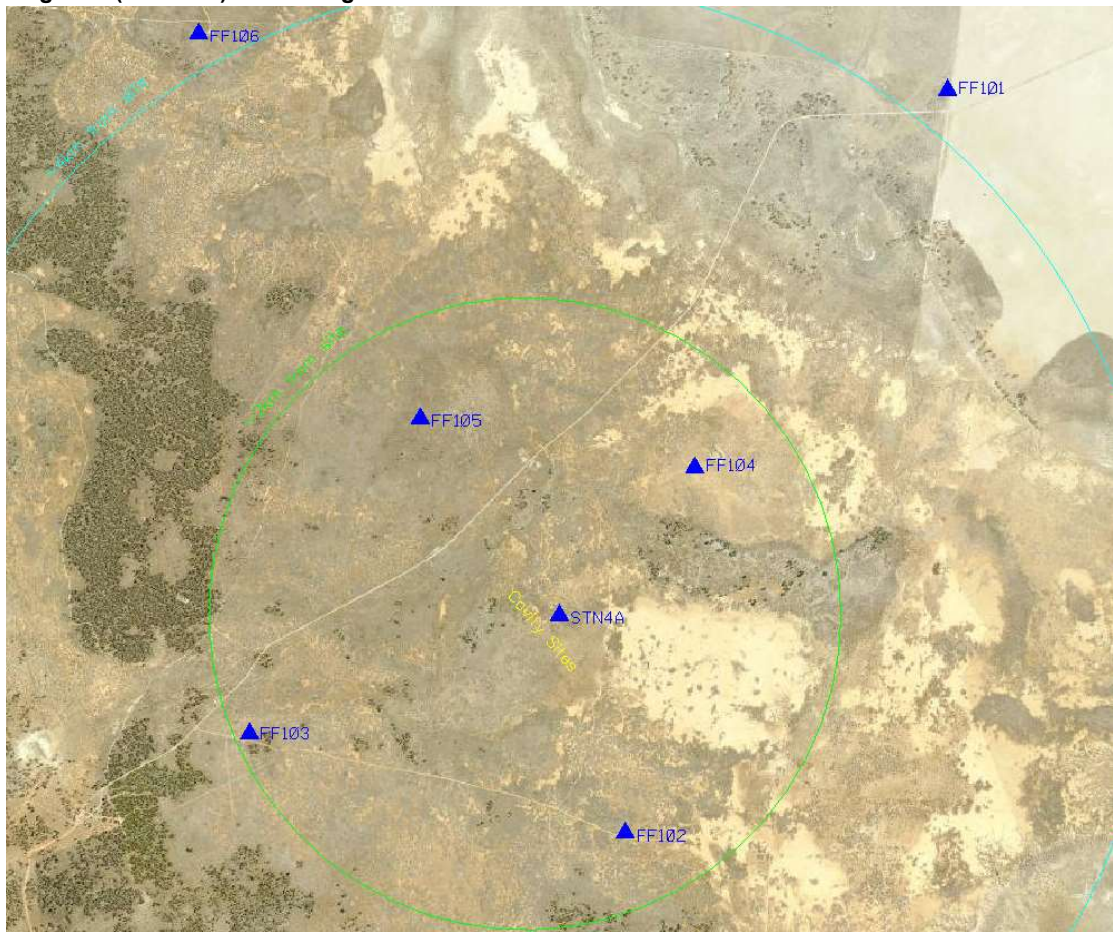
Iluka Resources - West Balranald Trial2 - Far Field - Survey Results										
POINT	PRE-MINING SURVEY - 28/5/16			POST-MINING SURVEY - 21-22/11/17			TOTAL MOVEMENT			COMMENTS
	E (MGA)	N (MGA)	Ht (AHD)	E (MGA)	N (MGA)	Ht (AHD)	dE (mm)	dN (mm)	dHt (mm)	
STN4A	723646.618	6189409.990	63.713	723646.618	6189409.990	63.713	0	0	0	Control Point at Site
FF101	725964.853	6192554.472	58.593	725964.851	6192554.477	58.596	-2	5	3	
FF102	724063.505	6188033.288	65.176	724063.510	6188033.284	65.180	5	-4	4	
FF103	721547.241	6188708.611	65.213	721547.242	6188708.608	65.210	1	-3	-3	
FF104	724368.735	6190383.861	63.521	724368.731	6190383.862	63.528	-4	1	7	
FF105	722766.207	6190655.622	62.998	722766.207	6190655.622	62.990	0	0	-8	
FF106	721363.685	6193089.244	65.736	721363.688	6193089.245	65.734	3	1	-2	

Iluka Resources - West Balranald Trial2 - Far Field - Survey Results										
POINT	PRE-MINING SURVEY - 28/5/16			POST-MINING SURVEY - 20/11/18			TOTAL MOVEMENT			COMMENTS
	E (MGA)	N (MGA)	Ht (AHD)	E (MGA)	N (MGA)	Ht (AHD)	dE (mm)	dN (mm)	dHt (mm)	
STN4A	723646.618	6189409.990	63.713	723646.618	6189409.990	63.713	0	0	0	Control Point at Site
FF101	725964.853	6192554.472	58.593	725964.853	6192554.475	58.597	0	3	4	
FF102	724063.505	6188033.288	65.176	724063.504	6188033.288	65.178	-1	0	2	
FF103	721547.241	6188708.611	65.213	721547.240	6188708.620	65.209	-1	9	-4	
FF104	724368.735	6190383.861	63.521	724368.739	6190383.857	63.520	4	-4	-1	
FF105	722766.207	6190655.622	62.998	722766.211	6190655.620	62.998	4	-2	0	
FF106	721363.685	6193089.244	65.736	721363.684	6193089.243	65.733	-1	-1	-3	

Iluka Resources - West Balranald Trial2 - Far Field - Survey Results										
POINT	PRE-MINING SURVEY - 28/5/16			POST-MINING SURVEY - 7/11/19			TOTAL MOVEMENT			COMMENTS
	E (MGA)	N (MGA)	Ht (AHD)	E (MGA)	N (MGA)	Ht (AHD)	dE (mm)	dN (mm)	dHt (mm)	
STN4A	723646.618	6189409.990	63.713	723646.618	6189409.990	63.713	0	0	0	Control Point at Site
FF101	725964.853	6192554.472	58.593	725964.856	6192554.471	58.590	3	-1	-3	
FF102	724063.505	6188033.288	65.176	724063.505	6188033.286	65.170	0	-2	-6	
FF103	721547.241	6188708.611	65.213	721547.239	6188708.612	65.192	-2	1	-21	
FF104	724368.735	6190383.861	63.521	724368.738	6190383.859	63.514	3	-2	-7	
FF105	722766.207	6190655.622	62.998	722766.214	6190655.629	62.991	7	7	-7	
FF106	721363.685	6193089.244	65.736	721363.688	6193089.239	65.730	3	-5	-6	

**Appendix A: West Balranald Trial 2 Post-mining Subsidence Survey Monitoring Locations**

**Regional (Far Field) Monitoring Network**



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**Appendix B: Baseline Groundwater Monitoring Results (July and December 2019)**

Field ID	Unit	Aluminium (Dissolved)	Antimony (Dissolved)	Arsenic (Dissolved)	Beryllium (Dissolved)	Bismuth (Dissolved)	Cadmium (Dissolved)	Chromium (Dissolved)	Chromium (III) (Dissolved)	Chromium (VI) (Dissolved)	Cobalt (Dissolved)	Copper (Dissolved)	Iron (Dissolved)	Iron (Ferric) (Dissolved)	Lead (Dissolved)	Lithium (Dissolved)	Manganese (Dissolved)	Mercury (Dissolved)	Molybdenum (Dissolved)	Nickel (Dissolved)	Selenium (Dissolved)	Silver (Dissolved)	Strontium (Dissolved)	Thorium (Dissolved)	Titanium (Dissolved)	Uranium (Dissolved)	Vanadium (Dissolved)	Zinc (Dissolved)	Zirconium (Dissolved)
mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
UGM-M15	28/11/2016	<0.02	<0.002	0.006	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	<0.002	<0.002	<0.1	<0.1	<0.002	0.063	0.07	-	0.028	0.003	<0.02	<0.002	23	<0.002	<0.02	0.021	<0.02	0.019	<0.05
UGM-M15	09/07/2017	<0.02	<0.002	0.008	<0.002	0.003	<0.002	<0.002	<0.01	<0.01	<0.002	<0.002	0.39	<0.1	<0.002	0.114	0.083	-	0.031	0.004	<0.02	0.009	19.1	<0.002	<0.02	0.023	<0.02	0.024	<0.05
UGM-M15	15/12/2017	<0.02	<0.002	0.007	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	<0.002	<0.002	0.33	<0.1	<0.002	0.023	0.021	-	0.032	0.003	<0.02	<0.002	15.7	<0.002	<0.02	0.021	<0.02	0.021	<0.05
UGM-M15	17/07/2018	0.03	<0.001	0.008	<0.001	<0.002	<0.002	<0.002	<0.01	<0.01	0.002	<0.002	0.3	<0.1	<0.002	0.044	0.104	<0.0001	0.036	0.006	<0.01	<0.002	16	<0.002	<0.02	0.018	<0.01	<0.01	<0.01
UGM-M15	13/12/2018	<0.02	<0.002	0.007	<0.002	0.017	<0.002	<0.002	<0.01	<0.01	<0.002	<0.002	0.55	0.25	<0.002	0.084	0.084	-	0.041	0.002	<0.02	0.013	20.7	<0.002	<0.02	0.022	<0.02	<0.01	<0.05
UGM-M15	30/07/2019	<0.02	<0.002	0.007	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	<0.002	<0.002	0.58	0.11	<0.002	0.087	0.083	-	0.044	0.012	<0.02	<0.002	18.6	<0.002	<0.02	0.019	<0.02	0.010	<0.05
UGM-M15	17/12/2019	<0.02	<0.002	0.007	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	<0.002	<0.002	0.58	<0.1	<0.002	0.084	0.083	-	0.042	0.002	<0.02	<0.002	18.4	<0.002	<0.02	0.019	<0.02	0.010	<0.05
UGM-M25	28/11/2016	<0.02	<0.002	0.019	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	<0.002	<0.002	1.22	<0.1	<0.002	0.013	0.117	-	<0.002	0.005	<0.02	<0.002	22.5	<0.002	<0.02	0.012	<0.02	0.025	<0.05
UGM-M25	09/07/2017	<0.02	<0.002	0.016	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	<0.002	<0.002	1.24	<0.1	<0.002	0.032	0.152	-	0.003	0.004	<0.02	<0.002	16.5	<0.002	<0.02	0.011	<0.02	0.027	<0.05
UGM-M25	22/11/2017	<0.02	<0.002	0.01	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	<0.002	<0.002	<0.05	<0.05	<0.002	0.055	0.248	-	0.002	0.006	<0.02	<0.002	16.1	<0.002	<0.02	0.008	<0.02	0.027	<0.05
UGM-M25	16/07/2018	<0.02	<0.002	0.009	<0.001	<0.002	<0.002	<0.002	<0.01	<0.01	<0.002	<0.002	1.42	<0.1	<0.002	0.158	0.184	<0.0001	0.007	0.004	<0.01	0.006	15.8	<0.002	<0.02	0.008	<0.02	0.027	<0.05
UGM-M25	16/12/2018	<0.02	<0.002	0.023	<0.001	<0.002	<0.002	<0.002	<0.01	<0.01	<0.002	<0.002	1.38	0.34	<0.002	0.125	0.479	-	0.011	0.01	<0.02	<0.002	14.5	<0.002	<0.02	<0.002	<0.02	0.021	<0.05
UGM-M25	30/07/2019	<0.02	<0.002	0.007	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	<0.002	0.007	0.25	0.25	<0.002	0.032	0.054	-	0.004	0.031	<0.02	<0.002	17	<0.002	<0.02	0.011	<0.02	0.083	<0.05
UGM-M25	11/12/2019	<0.02	<0.002	0.005	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	<0.002	0.006	0.3	0.3	<0.002	0.017	0.138	<0.0001	0.003	0.02	<0.02	<0.002	17.5	<0.002	<0.02	0.012	<0.02	0.016	<0.05
UGM-M55	29/11/2016	<0.02	<0.002	0.007	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	<0.002	<0.002	0.42	<0.1	<0.002	0.049	0.184	-	0.002	0.005	<0.02	<0.002	20.4	<0.002	<0.02	0.008	<0.02	0.041	<0.05
UGM-M55	09/07/2017	<0.02	<0.002	0.01	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	<0.002	<0.002	0.4	<0.1	<0.002	0.056	0.458	-	<0.002	0.004	<0.02	<0.002	15.4	<0.002	<0.02	0.005	<0.02	0.041	<0.05
UGM-M55	28/11/2017	<0.02	<0.002	0.01	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	<0.002	<0.002	4.33	<0.05	<0.002	0.071	0.425	-	<0.002	0.002	<0.02	<0.002	13.7	<0.002	<0.02	0.004	<0.02	0.054	<0.05
UGM-M55	17/07/2018	<0.02	<0.001	0.013	<0.001	<0.002	<0.002	<0.002	<0.01	<0.01	<0.002	<0.002	3.94	<0.1	<0.002	0.056	0.438	<0.0001	0.001	0.003	<0.01	<0.002	14.8	<0.002	<0.02	0.005	<0.01	<0.01	<0.01
UGM-M55	12/12/2018	<0.02	<0.002	0.013	<0.002	0.004	<0.002	<0.002	<0.01	<0.01	<0.002	<0.002	3.2	<0.05	<0.002	0.085	0.421	-	<0.002	0.003	<0.02	<0.002	16.1	<0.002	<0.02	0.005	<0.02	<0.01	<0.05
UGM-M55	30/07/2019	<0.02	<0.002	0.014	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	<0.002	<0.002	2.98	<0.10	<0.002	0.073	0.613	-	0.002	0.004	<0.02	<0.002	16.3	<0.002	<0.02	0.005	<0.02	0.014	<0.05
UGM-M55	10/12/2019	<0.02	<0.002	0.011	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	<0.002	<0.002	1.22	0.25	<0.002	0.025	0.22	<0.0001	0.005	0.002	<0.02	<0.002	18	<0.002	<0.02	0.008	<0.02	<0.01	<0.05
UGM-M65	04/12/2016	<0.02	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	<0.002	<0.002	<0.1	<0.1	<0.002	0.044	0.011	-	<0.002	0.01	<0.02	<0.002	19.4	<0.002	<0.02	0.014	<0.02	0.054	<0.01
UGM-M65	09/07/2017	<0.02	<0.002	<0.002	<0.002	<0.002	<0.002	0.006	<0.01	<0.01	<0.002	<0.002	<0.1	<0.1	<0.002	0.062	0.102	-	<0.002	0.007	<0.02	<0.002	18	<0.002	<0.02	0.018	<0.02	0.029	<0.05
UGM-M65	22/12/2017	<0.02	<0.002	0.013	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	<0.002	<0.002	0.21	<0.01	<0.002	0.084	0.053	-	<0.002	0.004	<0.02	<0.002	15.2	<0.002	<0.02	0.009	<0.02	0.044	<0.05
UGM-M65	17/07/2018	<0.02	<0.001	<0.002	<0.001	<0.002	<0.002	<0.002	<0.01	<0.01	<0.002	0.008	<0.1	<0.1	<0.002	0.057	0.395	<0.0001	0.001	0.004	<0.01	<0.002	15	<0.002	<0.02	0.01	<0.01	<0.01	<0.01
UGM-M65	30/01/2019	<0.02	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	<0.002	0.004	0.17	0.12	<0.002	0.073	0.375	-	<0.002	0.006	<0.02	<0.002	14.4	<0.002	<0.02	0.01	<0.02	0.014	<0.05
UGM-M65	31/07/2019	<0.02	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	<0.002	0.008	<0.10	<0.10	<0.002	0.085	0.379	-	0.003	0.012	<0.02	<0.002	16.2	<0.002	<0.02	0.01	<0.02	0.022	<0.05
UGM-M75	12/12/2016	<0.02	<0.002	0.013	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	<0.002	<0.002	0.62	<0.05	<0.002	0.062	0.329	<0.0001	0.004	0.008	<0.02	<0.002	15.7	<0.002	<0.02	0.009	<0.02	0.016	<0.05
UGM-M75	29/11/2016	<0.02	<0.002	0.013	<0.002	0.003	<0.002	<0.002	<0.01	<0.01	<0.002	<0.002	0.66	<0.1	<0.002	0.032	0.205	-	0.004	<0.002	<0.02	0.003	20.4	<0.002	<0.02	0.007	<0.02	0.019	<0.05
UGM-M75	09/07/2017	<0.02	<0.002	0.013	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	<0.002	<0.002	0.85	0.21	<0.002	0.046	0.243	-	0.005	0.002	<0.02	<0.002	18.1	<0.002	<0.02	0.01	<0.02	0.016	<0.05
UGM-M75	22/12/2017	<0.02	<0.002	0.009	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	<0.002	<0.002	<0.05	<0.05	<0.002	0.037	0.242	-	0.005	<0.002	<0.02	<0.002	15.6	<0.002	<0.02	0.008	<0.02	0.014	<0.05
UGM-M75	17/12/2018	<0.02	<0.002	0.012	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	<0.002	<0.002	0.8	<0.1	<0.002	0.029	0.328	<0.0001	0.004	0.008	<0.02	<0.002	13.3	<0.002	<0.02	0.008	<0.02	0.016	<0.05
UGM-M75	12/12/2018	<0.02	<0.002	0.012	<0.002	0.018	&lt																						

Analyte	Aluminium (Dissolved)	Antimony (Dissolved)	Arsenic (Dissolved)	Beryllium (Dissolved)	Bismuth (Dissolved)	Cadmium (Dissolved)	Chromium (Dissolved)	Chromium (III) (Dissolved)	Chromium (VI) (Dissolved)	Cobalt (Dissolved)	Copper (Dissolved)	Iron (Dissolved)	Iron (Ferric) (Dissolved)	Lead (Dissolved)	Lithium (Dissolved)	Manganese (Dissolved)	Mercury (Dissolved)	Molybdenum (Dissolved)	Nickel (Dissolved)	Selenium (Dissolved)	Silver (Dissolved)	Strontium (Dissolved)	Thorium (Dissolved)	Titanium (Dissolved)	Uranium (Dissolved)	Vanadium (Dissolved)	Zinc (Dissolved)	Zirconium (Dissolved)				
Unit	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L				
LOD	0.01	0.001	0.001	0.001	0.001	0.0001	0.001	0.01	0.01	0.001	0.001	0.05	0.05	0.001	0.001	0.001	0.0001	0.001	0.001	0.01	0.001	0.001	0.001	0.01	0.001	0.01	0.005	0.005				
Field ID	Date																															
GW036673 (1)	27/10/2016	<0.02		0.015			0.0002	<0.002	-			0.013	5.08					4.67		0.022			<0.002		<0.002	<0.002		0.084	<0.01			
GW036673 (1)	20/07/2018	<0.02	<0.002	0.004	<0.002	<0.002	<0.0002	<0.002	-	<0.01	0.004	0.03	1.36	0.76				3.98		0.028	<0.02	<0.002	16.3	<0.002	<0.02	<0.002	<0.02	0.081	<0.005			
GW036673 (1)	18/12/2018	<0.01	<0.001	0.001	<0.001	<0.001	0.0001	<0.001	-	<0.01	0.004	0.057	0.35	0.35				4.02		0.02	0.028	<0.01	0.001	20	<0.001	<0.01	<0.001	0.123	<0.005			
GW036673 (1)	03/08/2019	<0.02	<0.002	<0.002	<0.002	<0.002	<0.0002	<0.002	-	<0.01	0.003	0.026	<0.10	<0.10				<0.002	0.114	4.66		<0.002	0.022	<0.02	<0.002	21.1	<0.002	<0.02	<0.02	0.095	<0.005	
GW036673 (1)	07/12/2019	<0.02	<0.002	0.013	<0.002	<0.002	<0.0002	<0.002	-	<0.01	0.006	<0.002	2.62	0.7				<0.002	0.102	4.88		<0.002	0.031	<0.02	<0.002	21.3	<0.002	<0.02	<0.02	0.077	<0.005	
GW036673 (1)	26/10/2019	<0.01		0.001			<0.0001	<0.001	-			0.002	1.45					<0.001		0.253		<0.001			<0.001	0.001			0.021	<0.005		
GW036686 (1)	13/07/2018	<0.02	<0.001	0.002	<0.001	0.003	<0.0001	<0.001	-	<0.01	<0.001	0.012	1.56	<0.05				<0.001	0.064	0.205		0.005	0.002	<0.01	<0.001	8.69	<0.001	<0.01	0.002	0.011	<0.005	
GW036686 (1)	31/01/2019	<0.02	<0.002	<0.002	<0.002	<0.002	<0.0002	<0.002	-	<0.01	<0.002	<0.002	<0.1	<0.1				<0.002	0.069	0.11		0.004	0.002	<0.02	<0.002	8.68	<0.002	<0.02	<0.02	0.027	<0.005	
GW036686 (1)	30/07/2019	<0.02	<0.002	<0.002	<0.002	<0.002	<0.0002	<0.002	-	<0.01	<0.002	0.022	0.42	0.32				<0.002	0.083	0.212		0.005	<0.002	<0.02	<0.002	9.39	<0.002	<0.02	<0.02	0.03	<0.005	
GW036686 (1)	07/12/2019	<0.01	<0.001	0.00	<0.001	0.002	<0.0001	<0.001	-	<0.01	<0.001	0.004	1.18	0.05				<0.001	0.08	0.272		0.005	0.002	<0.01	0.001	10.2	<0.001	<0.01	0.002	<0.01	0.012	<0.005
SH0803	28/12/2016	<0.02	<0.002	<0.002	<0.002	<0.002	<0.0002	<0.002	<0.01	<0.01	0.013	0.022	1.72	0.17				0.09	0.023			<0.002	0.005	<0.02	<0.002	17.2	<0.002	<0.02	<0.02	0.047	<0.005	
SH0803	05/07/2017	<0.02	<0.002	0.002	<0.002	<0.002	<0.0002	<0.002	<0.01	<0.01	0.014	0.011	2.64	<0.1				<0.002	0.134	0.692		<0.002	0.019	<0.02	<0.002	16.7	<0.002	<0.02	0.002	<0.02	0.018	<0.005
SH0803	26/11/2017	<0.02	<0.002	0.003	<0.002	<0.002	<0.0002	<0.002	<0.01	<0.01	0.012	0.019	2.64	<0.05				<0.002	0.106	0.705		<0.002	0.006	<0.02	<0.002	14.1	<0.002	<0.02	<0.02	0.014	<0.005	
SH0803	20/07/2018	<0.02	<0.002	0.003	<0.002	<0.002	<0.0002	<0.002	-	<0.01	0.014	0.02	3.14	0.15				<0.002	0.108	0.64		<0.002	0.006	<0.02	<0.002	14.7	<0.002	<0.02	<0.02	0.025	<0.005	
SH0803	02/08/2019	<0.02	<0.002	0.003	<0.002	<0.002	<0.0002	<0.002	-	<0.01	0.014	0.008	3.09	<0.1				<0.002	0.118	0.667		<0.002	0.006	<0.02	<0.002	15	<0.002	<0.02	<0.02	0.028	<0.005	
SH0803	02/08/2019	<0.02	<0.002	0.004	<0.002	<0.002	<0.0002	<0.002	-	<0.01	0.013	0.009	3.03	<0.10				<0.002	0.149	0.688		<0.002	0.004	<0.02	<0.002	17.3	<0.002	<0.02	0.002	<0.02	0.023	<0.005
SH0803	05/12/2019	<0.02	<0.002	0.004	<0.002	<0.002	<0.0002	<0.002	-	<0.01	0.013	0.022	3.1	<0.10				<0.002	0.142	0.702		<0.002	0.012	<0.02	<0.002	17.7	<0.002	<0.02	<0.02	0.045	<0.005	
SH0804	28/11/2016	<0.02	<0.002	<0.002	<0.002	<0.002	0.0003	0.004	<0.01	<0.01	<0.002	<0.002	<0.1	<0.1				<0.002	0.05	<0.002		<0.012	0.002	<0.02	<0.002	18.3	<0.002	<0.02	0.048	<0.02	0.029	<0.005
SH0804	04/07/2017	<0.02	<0.002	<0.002	<0.002	<0.002	<0.0002	0.004	<0.01	<0.01	<0.002	<0.002	<0.1	<0.1				<0.002	0.085	<0.002		0.013	0.025	<0.02	<0.002	17.5	<0.002	<0.02	0.008	<0.02	0.033	<0.005
SH0804	26/11/2017	<0.02	<0.002	<0.002	<0.002	<0.002	0.004	<0.01	<0.01	<0.01	<0.002	0.008	<0.05	<0.05				<0.002	0.07	0.003		<0.014	0.014	<0.02	<0.002	14.4	<0.002	<0.02	0.06	<0.02	0.024	<0.005
SH0804	21/07/2018	<0.02	<0.002	<0.002	<0.002	<0.002	<0.0002	0.005	-	<0.02	<0.002	0.051	<0.1	<0.1				<0.002	0.07	<0.002		<0.014	0.011	<0.02	<0.002	15.3	<0.002	<0.02	0.063	<0.02	0.035	<0.005
SH0804	31/01/2019	<0.02	<0.002	<0.002	<0.002	<0.002	0.004	-	<0.02	<0.002	0.006	0.31	<0.1	<0.002	0.089	0.003		<0.012	0.005	<0.02		<0.002	0.002	<0.02	<0.002	15	0.002	<0.02	0.058	<0.02	0.028	<0.005
SH0804	02/08/2019	<0.02	<0.002	<0.002	<0.002	<0.002	<0.0002	0.004	-	<0.01	<0.002	0.01	<0.10	<0.10				<0.002	0.093	<0.002		<0.015	0.002	<0.02	<0.002	18.3	<0.002	<0.02	0.008	<0.02	0.014	<0.005
SH0804	07/12/2019	<0.02	<0.002	<0.002	<0.002	<0.002	0.005	-	<0.01	<0.002	0.006	<0.10	<0.10	<0.002	0.103	<0.002	-	<0.012	0.003	<0.02		0.003	17.3	<0.002	<0.02	<0.002	0.002	0.012	<0.002	0.012	<0.005	
WB1	27/10/2016	<0.01		0.055			<0.0001	<0.001	-			<0.001	4.76					<0.001	<0.001	0.145		0.004			<0.001		0.001		0.029	<0.005		
WB1	21/07/2018	<0.01	<0.001	0.057	<0.001	<0.001	<0.0001	<0.001	-	<0.01	0.012	<0.001	5.22	<0.05				<0.001	0.062	0.154		0.002	0.006	<0.01	<0.001	8.47	<0.001	<0.01	0.001	<0.01	0.026	<0.005
WB1	17/12/2018	<0.02	<0.002	0.058	<0.002	<0.002	<0.0002	<0.001	-	<0.01	0.012	0.003	5.31	0.06				<0.002	0.075	0.159		<0.002	0.008	<0.02	<0.002	9.49	<0.002	<0.02	0.054	<0.02	0.054	<0.005
WB1	03/08/2019	<0.01	<0.001	0.065	<0.001	<0.001	<0.0001	<0.001	-	<0.01	0.007	0.007	5.42	0.54				<0.002	0.093	0.16		<0.002	0.005	<0.01	<0.001	10.2	<0.001	<0.01	0.001	<0.01	0.015	<0.005
WB1	05/12/2019	<0.01	<0.001	0.064	<0.001	<0.001	<0.0001	<0.001	-	<0.01	0.012	<0.001	5.39	0.07				<0.002	0.063	0.157		0.002	0.008	<0.01	<0.001	10.5	<0.001	<0.01	0.001	<0.01	0.018	<0.005
WB42	25/10/2016	<0.02		0.004			<0.0002	<0.002	-			<0.002	1.46					<0.002	1.46			0.003			<0.002		0.004		0.028	<0.01		
WB42	04/12/2016	<0.02	<0.002	0.004	<0.002	<0.002	<0.0002	<0.002	<0.01	<0.01	<0.002	<0.002	1.39	0.11				<0.002	0.086	0.4		<0.002	0.007	<0.02	<0.002	19.1	<0.002	<0.02	0.004	<0.02	0.039	<0.01
WB42	09/07/2017	<0.02	<0.002	0.004	<0.002	<0.002	<0.0002	<0.002	<0.01	<0.01	<0.002	<0.002	1.48	<0.1				<0.002	0.1	0.448		<0.002	0.002	<0.02	<0.002	16.6	<0.002	<0.02	0.005	<0.02	<0.01	<0.005
WB42	26/11/2017	<0.01	<0.001																													

Analyte	Aluminium (Total)	Arsenic (Total)	Chromium (Total)	Iron(Ferrous) (Total)	Iron (Total)	Manganese (Total)	Uranium (Total)	pH	TDS	Electrical Conductivity	Carbonate Hardness as CaCO3	Non-carbonate Hardness as CaCO3	Acidity as CaCO3	BOD	COD	Reactive Silica	Silicon (Dissolved)	Silicon (Dissolved) as SiO2	Alkalinity (Carbonate as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide as CaCO3)	Alkalinity (Total as CaCO3)
Field ID	Date																					
UGM-M15	28/11/2016	0.05	0.007	<0.002	<0.05	0.39	0.07	0.027	7.66	47800	66300	163	7180	-	<2	<100	17	8.33	-	<1	163	163
UGM-M15	09/07/2017	0.03	0.009	<0.002	0.38	0.43	0.084	0.023	7.75	38600	68000	162	7870	-	<2	<100	17.4	-	<1	162	162	
UGM-M15	28/11/2017	0.32	0.009	<0.003	0.28	0.24	0.11	0.02	7.25	46600	69200	123	8290	-	<2	<100	12.1	-	<1	123	123	
UGM-M15	17/07/2018	-	-	-	0.22	0.74	-	-	7.68	41800	64300	-	-	-	-	-	-	-	<1	132	132	
UGM-M15	13/12/2018	-	-	-	0.3	-	-	-	7.68	41100	63300	-	-	-	-	-	-	-	<1	145	145	
UGM-M15	30/07/2019	-	-	-	0.47	-	-	-	7.65	42500	65400	-	-	-	-	-	-	-	<1	147	147	
UGM-M15	07/12/2019	-	-	-	0.5	-	-	-	7.52	43200	66200	-	-	-	-	-	-	-	<1	153	153	
UGM-M25	28/11/2016	0.31	0.018	0.002	1.19	1.91	0.124	0.015	7.43	42800	58900	326	7260	-	<2	<100	62.8	33.5	-	<1	326	
UGM-M25	09/07/2017	0.14	0.017	0.002	1.23	1.29	0.162	0.012	7.46	31400	58800	391	7430	-	<2	<100	63.9	-	71	<1	391	
UGM-M25	22/11/2017	0.13	0.016	<0.002	<0.05	1.26	0.256	0.008	7.51	35000	55500	396	6800	-	<2	<100	49.2	-	53.8	<1	396	
UGM-M25	16/07/2018	-	-	-	1.38	-	-	-	7.25	38600	59400	-	-	-	-	-	-	-	<1	342	342	
UGM-M25	16/11/2018	-	-	-	1.64	-	-	-	7.47	31300	48100	-	-	-	-	-	-	-	<1	457	457	
UGM-M25	30/07/2019	-	-	-	<0.05	-	-	-	7.31	36700	56500	-	-	-	-	-	-	-	<1	337	337	
UGM-M25	11/12/2019	-	-	-	<0.05	-	-	-	7.28	38600	-	-	-	-	-	-	-	-	<1	318	318	
UGM-M55	29/11/2016	0.06	0.006	<0.002	0.38	0.46	0.167	0.008	7.26	41200	58800	360	6030	-	4	<100	31	14.9	-	<1	360	
UGM-M55	09/07/2017	<0.02	0.012	<0.002	4.55	4.12	0.433	0.005	7.27	33600	54700	420	6810	-	<2	<100	23.8	-	-	<1	420	
UGM-M55	28/11/2017	0.12	0.012	<0.002	4.85	4.89	0.429	0.005	7.37	31400	53800	409	6430	-	<2	<100	19.2	-	15.4	<1	409	
UGM-M55	17/07/2018	-	-	-	4.3	-	-	-	7.22	36300	53800	-	-	-	-	-	-	-	<1	425	425	
UGM-M55	12/12/2018	-	-	-	4.32	-	-	-	7.72	34000	52300	-	-	-	-	-	-	-	<1	402	402	
UGM-M55	30/07/2019	-	-	-	3.04	-	-	-	7.32	36200	55700	-	-	-	-	-	-	-	<1	409	409	
UGM-M55	10/12/2019	-	-	-	0.97	-	-	-	7.93	37300	-	-	-	-	-	-	-	-	<1	373	373	
UGM-M65	04/12/2016	0.06	<0.002	0.006	<0.05	<0.1	0.013	0.018	7.2	50500	63900	287	6880	-	6	3830	40.4	16.6	-	<1	287	
UGM-M65	09/07/2017	0.03	<0.002	0.007	<0.05	<0.1	0.012	0.019	7.08	35200	64300	301	7920	-	3	<100	46.1	-	50.4	<1	301	
UGM-M65	22/11/2017	0.04	<0.002	0.002	<0.05	0.06	0.008	0.014	7.13	33100	61900	307	6510	-	<2	<100	20.5	-	21.4	<1	406	
UGM-M65	17/07/2018	-	-	-	<0.05	-	-	-	7.21	35700	54900	-	-	-	-	-	-	-	<1	423	423	
UGM-M65	30/01/2019	-	-	-	0.05	-	-	-	7.08	33500	51500	-	-	-	-	-	-	-	<1	395	395	
UGM-M65	31/07/2019	-	-	-	<0.05	-	-	-	7.27	35300	54300	-	-	-	-	-	-	-	<1	420	420	
UGM-M65	12/12/2019	-	-	-	<0.05	-	-	-	7.83	33400	-	-	-	-	-	-	-	-	<1	419	419	
UGM-M75	29/11/2016	0.26	0.014	<0.002	0.58	0.85	0.206	0.009	7.64	40000	58100	359	7230	-	4	<100	22.2	10.7	-	<1	359	
UGM-M75	09/07/2017	0.15	0.014	<0.002	0.64	1.1	0.247	0.01	7.77	33800	58800	370	8170	-	<2	<100	27.1	-	23	<1	370	
UGM-M75	22/11/2017	0.06	0.015	<0.002	<0.05	1.21	0.264	0.01	7.67	41100	59300	343	8790	-	<2	<100	22.8	-	23.8	<1	343	
UGM-M75	17/07/2018	-	-	-	0.95	-	-	-	7.64	39100	60200	-	-	-	-	-	-	-	<1	373	373	
UGM-M75	12/12/2018	-	-	-	1.04	-	-	-	7.75	36100	55600	-	-	-	-	-	-	-	<1	343	343	
UGM-M75	31/07/2019	-	-	-	1.15	-	-	-	7.6	38700	59600	-	-	-	-	-	-	-	<1	368	368	
UGM-M75	09/12/2019	-	-	-	3.06	-	-	-	7.65	34400	-	-	-	-	-	-	-	-	<1	405	405	
UGM-M85	28/11/2016	0.27	0.004	0.002	4.28	7.38	0.083	0.01	7.36	44900	61000	260	7770	-	<2	<100	35.1	18.1	-	<1	260	
UGM-M85	09/07/2017	0.03	0.005	<0.002	0.25	0.33	0.139	0.01	7.08	38100	62400	277	8780	-	<2	<100	38.5	-	41.1	<1	277	
UGM-M85	28/11/2017	0.05	0.007	<0.002	0.28	0.5	0.181	0.011	7.29	40500	61100	269	8270	-	<2	<100	9.69	-	29.2	<1	269	
UGM-M85	16/07/2018	-	-	-	0.28	-	-	-	7.13	41800	64300	-	-	-	-	-	-	-	<1	263	263	
UGM-M85	12/12/2018	-	-	-	0.15	-	-	-	7.61	38200	58700	-	-	-	-	-	-	-	<1	251	251	
UGM-M85	01/08/2019	-	-	-	0.23	-	-	-	6.83	40300	61500	-	-	-	-	-	-	-	<1	272	272	
UGM-M85	01/08/2019	-	-	-	0.15	-	-	-	7.64	39000	-	-	-	-	-	-	-	-	<1	272	272	
UGM-M105	29/11/2016	0.07	0.012	<0.002	3.46	3.52	0.445	0.003	7.36	37800	52600	419	6050	-	5	<100	18.3	8.82	-	<1	419	
UGM-M105	09/07/2017	0.08	0.011	<0.002	<0.05	4.1	0.501	<0.002	7.3	38000	63800	430	6880	-	<2	<100	19.9	-	19.6	<1	430	
UGM-M105	22/11/2017	0.06	0.012	<0.002	<0.05	4.03	0.52	<0.002	7.27	35400	54300	416	6430	-	<2	<100	16	-	15.7	<1	416	
UGM-M105	22/07/2018	-	-	-	3.4	-	-	-	7.29	37500	57700	-	-	-	-	-	-	-	<1	466	466	
UGM-M105	30/01/2019	-	-	-	3.5	-	-	-	7.18	33700	51800	-	-	-	-	-	-	-	<1	423	423	
UGM-M105	01/02/2019	-	-	-	1.59	-	-	-	7.19	33400	51400	-	-	-	-	-	-	-	<1	397	397	
UGM-M105	31/07/2019	-	-	-	2.47	-	-	-	7.16	35400	54600	-	-	-	-	-	-	-	<1	443	443	
UGM-M105	09/12/2019	-	-	-	3.2	-	-	-	7.57	33300	-	-	-	-	-	-	-	-	<1	424	424	
UGM-M115	30/11/2016	2.44	0.018	0.01	0.45	4.45	0.324	0.068	7.59	45800	63400	372	7280	-	<2	280	16.7	8.74	-	<1	372	
UGM-M115	09/07/2017	3.6	0.019	0.011	1.19	8.12	0.189	0.074	7.54	39600	68900	382	7700	-	<2	<100	22.4	-	17.5	<1	382	
UGM-M115	22/11/2017	8.05	0.028	0.093	0.58	45.4	0.188	0.074	7.44	41300	67900	363	7540	-	<2	<100	17.4	-	<10	<1	363	
UGM-M115	17/07/2018	-	-	-	1.09	-	-	-	7.47	45400	69900	-	-	-	-	-	-	-	<1	379	379	
UGM-M115	30/01/2019	-	-	-	1.27	-	-	-	7.38	43000	66100	-	-	-	-	-	-	-	<1	368	368	
UGM-M115	04/08/2019	-	-	-	0.25	-	-	-	7.36	44300	68100	-	-	-	-	-	-	-	<1	407	407	
UGM-M115	08/12/2019	-	-	-	0.34	-	-	-	7.38	45500	70000	-	-	-	-	-	-	-	<1	386	386	
UGM-M125	30/11/2016	6.7	0.004	0.006	<0.05	1.82	0.087	0.06	7.88	46800	65300	182	7050	-	<2	<100	7.5	4.51	-			



Analyte	Anions	Cations	Ionic Balance	Calcium (Dissolved)	Chloride	Fluoride	Magnesium (Dissolved)	Potassium (Dissolved)	Sodium (Dissolved)	Sulfate (Dissolved)	Sulfate (Total)	Sulfide as S	Nitrate & Nitrite		Ammonia as N	Kjeldahl Nitrogen as N	Nitrate as N		Nitrite as N	Nitrogen as N (Total)	Carbon (Total)	DOC	TOC
													mg/L	%			mg/L	mg/L					
Unit	mg/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Field ID	Date																						
UGM-M15	28/11/2016	930	804	7.28	977	29100	0.5	1190	27	15100	5110	-	<0.1	0.07	0.06	1190	<0.2	0.07	<0.02	<0.2	41	6	6
UGM-M15	09/07/2017	886	826	3.49	1120	27800	0.3	1270	17	15300	4740	-	<0.1	<0.05	0.47	1	0.03	<0.02	<0.02	1	36	6	6
UGM-M15	29/07/2017	909	869	2.2	1260	28500	0.4	1260	43	16100	4910	-	<0.1	0.15	0.12	<0.2	0.15	<0.02	<0.02	<0.2	32	5	5
UGM-M15	17/07/2018	787	798	0.68	1100	24700	-	1400	45	14400	4200	3600	<0.01	-	-	-	-	-	-	-	-	-	-
UGM-M15	13/12/2018	879	783	5.82	1060	27500	-	1350	42	14200	4800	-	<0.01	-	-	-	-	-	-	-	-	-	-
UGM-M15	30/07/2019	753	772	1.27	1090	23600	-	1370	45	13900	4050	4620	-	-	-	-	-	-	-	-	-	-	-
UGM-M15	10/11/2019	885	799	2.51	1060	217000	0.4	1380	40	13800	4700	-	<0.1	0.06	0.06	1380	<0.2	0.06	<0.02	<0.2	41	6	6
UGM-M25	28/11/2016	826	704	7.98	630	25300	0.3	1460	16	12700	5110	-	0.2	<0.05	0.13	<0.2	<0.02	<0.02	<0.2	76	5	5	
UGM-M25	09/07/2017	687	687	0.02	656	20300	0.3	1500	<10	12200	5100	-	<0.1	<0.05	0.31	0.50	<0.04	<0.02	<0.02	0.5	90	7	10
UGM-M25	22/11/2017	700	614	6.56	604	21300	0.4	1380	34	10800	4410	-	<0.1	<0.05	0.16	0.4	<0.02	<0.02	0.4	104	<5	<5	
UGM-M25	16/07/2018	691	791	6.72	742	21400	-	1950	47	13500	3990	-	<0.01	-	-	-	-	-	-	-	-	-	-
UGM-M25	16/12/2018	640	628	0.91	548	19200	-	1530	45	10900	4030	-	<0.1	-	-	-	-	-	-	-	-	-	-
UGM-M25	30/07/2019	647	663	1.22	682	19200	-	1600	41	13400	4720	4680	-	-	-	-	-	-	-	-	-	-	-
UGM-M25	11/12/2019	694	633	4.59	546	20900	0.3	1430	36	11200	4710	-	-	-	-	-	-	-	-	-	-	-	-
UGM-M55	29/11/2016	691	692	0.07	553	20900	0.3	1410	19	14600	4540	-	<0.1	0.06	0.17	<0.5	0.06	<0.02	<0.02	<0.5	78	3	3
UGM-M55	09/07/2017	627	645	1.43	554	19000	0.4	1420	12	15500	3950	-	<0.1	<0.05	0.28	0.5	0.02	<0.02	0.5	90	5	4	
UGM-M55	28/11/2017	702	616	6.54	514	21400	0.4	1350	15	11000	4320	-	<0.1	<0.05	0.28	0.3	<0.02	<0.02	0.3	114	5	18	
UGM-M55	12/07/2018	636	712	5.67	619	19800	-	1760	48	12300	3290	3380	<0.01	-	-	-	-	-	-	-	-	-	-
UGM-M55	13/12/2018	660	600	4.76	534	20100	-	1460	44	10400	3990	-	<0.01	-	-	-	-	-	-	-	-	-	-
UGM-M55	30/07/2019	639	636	0.6	594	19800	-	1540	49	11900	4320	4130	-	-	-	-	-	-	-	-	-	-	-
UGM-M55	10/12/2019	686	667	1.4	594	20700	0.3	1550	38	11700	4550	-	-	-	-	-	-	-	-	-	-	-	-
UGM-M65	04/12/2016	845	779	4.08	560	26400	0.3	1400	37	14600	4560	-	<0.1	0.07	0.06	0.7	0.07	<0.02	0.8	60	2	2	
UGM-M65	09/07/2017	863	778	5.2	672	26900	0.3	1550	<10	14100	4720	-	<0.1	<0.05	0.03	0.4	0.05	<0.02	0.4	62	2	2	
UGM-M65	22/11/2017	676	596	6.81	538	20700	0.4	1340	35	10700	4040	-	<0.1	<0.05	0.16	0.7	<0.02	<0.02	0.7	108	<1	<1	
UGM-M65	17/07/2018	636	705	5.18	601	19800	-	1740	49	12200	3300	1530	<0.01	-	-	-	-	-	-	-	-	-	-
UGM-M65	30/01/2019	692	594	7.6	512	20800	-	1400	46	10400	4370	-	<0.01	-	-	-	-	-	-	-	-	-	-
UGM-M65	31/07/2019	574	628	4.46	584	17000	-	1500	50	10900	4150	4150	-	-	-	-	-	-	-	-	-	-	-
UGM-M65	12/01/2019	621	609	1	609	1	0.3	1400	40	11800	4140	-	<0.1	<0.05	0.14	0.5	<0.02	<0.02	0.5	92	<1	1	
UGM-M75	29/11/2016	703	700	0.23	632	21300	0.4	1460	17	12600	4580	-	<0.1	<0.05	0.13	<0.2	0.02	<0.02	<0.2	87	11	11	
UGM-M75	09/07/2017	692	732	2.77	715	20900	0.3	1640	<10	12900	4580	-	<0.1	<0.05	0.13	0.60	<0.02	<0.02	0.5	82	9	8	
UGM-M75	22/11/2017	925	771	9.13	705	29200	0.4	1790	36	13500	4550	-	<0.1	<0.05	0.14	0.5	<0.02	<0.02	0.5	92	<1	1	
UGM-M75	12/07/2018	695	738	3.19	695	21500	-	1860	41	12500	3780	-	<0.01	-	-	-	-	-	-	-	-	-	-
UGM-M75	13/12/2018	720	585	10.3	586	22000	-	1350	40	10200	4440	-	<0.01	-	-	-	-	-	-	-	-	-	-
UGM-M75	31/07/2019	631	718	6.44	744	18700	-	1760	44	12300	4630	4450	-	-	-	-	-	-	-	-	-	-	-
UGM-M75	09/07/2019	628	607	1.66	475	18800	0.3	1370	40	10800	4290	-	-	-	-	-	-	-	-	-	-	-	-
UGM-M85	29/11/2016	645	727	6.45	645	21500	0.2	1560	40	13000	4170	-	<0.1	<0.05	0.02	<0.2	<0.02	<0.02	<0.2	58	2	2	
UGM-M85	09/07/2017	832	768	3.98	744	25800	0.2	1750	<10	13500	4740	-	<0.1	<0.05	0.03	0.4	<0.02	<0.02	0.4	56	2	2	
UGM-M85	28/11/2017	822	723	6.4	697	25100	0.3	1650	14	12700	5230	-	<0.1	<0.05	0.05	<0.2	<0.02	<0.02	<0.2	74	<5	18	
UGM-M85	16/07/2018	790	774	1.04	745	24800	-	1960	42	13200	4090	4170	<0.01	-	-	-	-	-	-	-	-	-	-
UGM-M85	13/12/2018	820	738	5.26	682	23200	-	1780	40	12800	4730	-	<0.01	-	-	-	-	-	-	-	-	-	-
UGM-M85	01/08/2019	716	798	2.81	783	21500	-	1900	45	13900	5010	4720	<0.01	-	-	-	-	-	-	-	-	-	-
UGM-M85	01/08/2019	750	697	3.63	614	22800	0.2	1640	40	12200	4860	-	-	-	-	-	-	-	-	-	-	-	-
UGM-M105	29/11/2016	631	626	0.43	480	19000	0.4	1280	24	11400	4170	-	<0.1	1.3	0.36	0.4	1.3	<0.02	1.7	94	4	3	
UGM-M105	09/07/2017	613	651	1	552	18700	0.4	1480	16	14600	3700	-	<0.1	<0.05	0.39	0.5	0.04	<0.02	0.5	93	3	2	
UGM-M105	22/11/2017	692	590	7.96	531	21100	0.4	1340	38	10400	4260	-	<0.1	<0.05	0.41	0.7	<0.02	<0.02	0.7	111	<1	<5	
UGM-M105	22/07/2018	612	605	0.57	555	18400	-	1500	52	10400	4010	4260	0.137	-	-	-	-	-	-	-	-	-	-
UGM-M105	30/01/2019	693	585	8.43	502	20900	-	1400	47	10200	4210	-	0.014	-	-	-	-	-	-	-	-	-	-
UGM-M105	01/02/2019	614	597	1.37	446	18800	-	1420	44	10500	3990	-	0.231	-	-	-	-	-	-	-	-	-	-
UGM-M105	01/02/2019	611	611	3.21	572	17000	-	1460	40	10600	4000	3950	-	-	-	-	-	-	-	-	-	-	-
UGM-M105	09/12/2019	602	619	1.4	479	18000	0.3	1400	50	11000	4010	-	-	-	-	-	-	-	-	-	-	-	-
UGM-M115	30/11/2016	815	841	1.56	556	25100	1.5	1520	20	15800	4770	-	<0.1	9.5	0.03	0.4	9.4	<0.02	9.9	111	33	30	
UGM-M115	09/07/2017	892	831	3.5	612	27700	1.1	1590	<10	15400	4930	-	<0.1	<0.05	0.04	<0.2	<0.02	<0.02	<0.2	86	8	6	
UGM-M115	12/07/2018	888	803	5.03	625	21700	1.3	1540	60	14800	4790	-	<0.1	<0.05	0.04	<0.2	<0.02	<0.02	<0.2	90	4	4	
UGM-M115	17/07/2018	949	902	2.55	687	30400	-	1920	35	16300	4050	4230	0.016	-	-	-	-	-	-	-	-	-	-
UGM-M115	30/01/2019	946	769	10.3	607	29200	-	1620	35	13900	5520	-	0.013	-	-	-	-	-	-	-	-	-	-
UGM-M115	04/08/2019	907	862	2.56	730	28000	-	1830	34	15500	5260	4800	<1.0	-	-	-	-	-	-	-	-	-	-
UGM-M115	18/12/2019	858	826	2.89	590	26400	1.4	1280	39	14800	5050	-	-	-	-	-	-	-	-	-	-	-	-
UGM-M125	30/11/2016	816	806	0.57	851	25100	0.6	1240	26	15200	4990	-	<0.1	0.15	0.7	0.8	0.15	<0.02	0.95	41	4	3	
UGM-M125	09/07/2017	887	765	7.38	680	27600	0.7	1380	<10	14200	4970	-	<0.1	0.13	0.14	0.2	0.13	<0.02	0.3	49	3	2	
UGM-M125	27/11/2017	879	773	6.43	663	27300	0.8	1470	36	14200	4990	-	<0.1										

Analyte	Anions	Cations	Ionic Balance	Calcium (Dissolved)	Chloride	Fluoride	Magnesium (Dissolved)	Potassium (Dissolved)	Sodium (Dissolved)	Sulfate (Dissolved)	Sulfate (Total)	Sulfide as S	Nitrate & Nitrite as N	Ammonia as N	Kjeldahl Nitrogen as N	Nitrate as N	Nitrite as N	Nitrogen as N (Total)	Carbon (Total)	DOC	TOC		
Unit	mg/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L		
LOR	0.01	0.01	0.01	1	1	0.1	1	1	1	1	0.1	0.1	0.01	0.01	0.1	0.01	0.01	0.1	1	1	1		
Field ID	Date																						
GW036673 (1)	27/10/2016	-	-	-	-	-	-	-	-	4580	-	-	-	-	-	-	-	-	-	-	-		
GW036673 (1)	20/07/2018	778	848	6.88	754	27500	-	1950	62	14900	4780	4740	<0.01	-	-	-	-	-	-	-	-		
GW036673 (1)	18/12/2018	771	732	2.62	637	23800	-	1620	61	13000	3950	-	<0.01	-	-	-	-	-	-	-	-		
GW036673 (1)	03/08/2019	805	766	2.47	702	24700	-	1730	54	13500	4990	4110	<0.1	-	-	-	-	-	-	-	-		
GW036673 (1)	07/12/2019	706	786	5.34	630	24500	0.2	1800	69	13900	4610	-	-	-	-	-	-	-	-	-	-		
GW036666 (1)	26/10/2016	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
GW036666 (1)	19/07/2018	390	431	4.99	421	12000	-	884	25	7730	2070	-	-	-	-	-	-	-	-	-	-		
GW036666 (1)	31/01/2019	396	368	3.71	303	12000	-	691	24	6780	2030	-	-	-	-	-	-	-	-	-	-		
GW036666 (1)	30/07/2019	398	386	1.43	374	12200	-	768	26	6990	2180	2240	-	-	-	-	-	-	-	-	-		
GW036666 (1)	07/12/2019	395	420	3.02	398	12200	0.5	849	32	7570	2050	-	-	-	-	-	-	-	-	-	-		
SH0803	28/11/2016	636	595	3.35	486	19600	0.4	1320	26	10600	3670	-	<0.1	<0.05	0.35	0.4	<0.02	<0.02	0.4	81	3	2	
SH0803	05/07/2017	612	560	4.44	470	18500	0.3	1520	33	9450	4010	-	<0.1	<0.05	0.46	0.5	<0.02	<0.02	0.5	76	2	2	
SH0803	26/11/2017	686	603	6.46	579	21100	0.4	1360	42	10600	4040	-	<0.1	0.09	0.43	0.4	0.04	0.05	0.5	87	<5	<5	
SH0803	20/07/2018	570	598	2.46	601	17000	-	1620	58	9970	3960	3960	<0.05	-	-	-	-	-	-	-	-	-	
SH0803	01/02/2019	665	554	9.89	598	20100	-	1420	49	9420	4110	-	<0.05	-	-	-	-	-	-	-	-	-	
SH0803	02/08/2019	589	604	1.23	612	17700	-	1610	51	10100	3840	3830	<0.1	-	-	-	-	-	-	-	-	-	
SH0803	05/12/2019	558	666	8.81	586	16700	0.4	1800	76	11200	3850	-	-	-	-	-	-	-	-	-	-	-	
SH0804	28/10/2016	957	856	5.54	537	29700	1.6	1570	10	16100	5410	-	<0.1	0.16	<0.01	<0.2	0.16	<0.02	0.2	78	2	2	
SH0804	04/07/2017	932	867	3.12	577	28600	1.5	1670	24	16100	5260	-	<0.1	0.14	<0.01	0.5	0.14	<0.02	0.6	68	2	1	
SH0804	26/11/2017	919	832	4.98	630	28600	1.5	1580	31	15400	5110	-	<0.1	0.23	<0.01	<0.2	0.23	<0.02	0.2	75	<5	<1	
SH0804	21/07/2018	807	822	0.89	610	24400	-	1830	54	14700	5370	5230	<0.01	-	-	-	-	-	-	-	-	-	
SH0804	31/01/2019	1000	809	10.5	536	31100	-	1680	28	14800	5460	-	<0.01	-	-	-	-	-	-	-	-	-	
SH0804	02/08/2019	859	830	1.61	633	25500	-	1820	32	14900	5000	4540	<0.1	-	-	-	-	-	-	-	-	-	
SH0804	07/12/2019	913	759	9.21	564	28200	1.6	1680	35	13600	5110	-	-	-	-	-	-	-	-	-	-	-	
WB1	27/10/2016	-	-	-	-	-	-	-	-	1870	-	-	-	-	-	-	-	-	-	-	-	-	
WB1	21/07/2018	410	422	1.54	494	13000	-	982	43	7260	1640	1700	0.013	-	-	-	-	-	-	-	-	-	
WB1	17/12/2018	409	404	0.59	416	13000	-	878	44	7130	1590	-	<0.01	-	-	-	-	-	-	-	-	-	
WB1	03/08/2019	401	392	1.22	434	12600	-	891	38	6800	1810	1760	<0.1	-	-	-	-	-	-	-	-	-	
WB1	05/12/2019	388	410	2.82	394	12200	0.3	954	52	7140	1700	-	-	-	-	-	-	-	-	-	-	-	
WB42	25/10/2016	-	-	-	-	-	-	-	-	3770	-	-	-	-	-	-	-	-	-	-	-	-	
WB42	04/12/2016	591	624	2.72	575	18000	0.8	1300	29	11200	3680	-	<0.1	0.05	0.53	0.6	0.05	<0.02	0.7	78	4	4	
WB42	05/07/2017	622	564	4.82	554	18900	0.6	1430	24	9620	3910	-	<0.1	<0.05	0.6	1430	0.6	0.05	<0.02	0.7	76	4	3
WB42	26/11/2017	638	643	0.36	698	19600	0.7	1350	32	11400	3760	-	<0.1	<0.05	0.95	0.91	<0.02	<0.02	0.91	85	6	9	
WB42	19/07/2018	590	674	6.71	766	17900	-	1690	45	11400	3690	3370	<0.01	-	-	-	-	-	-	-	-	-	
WB42	31/01/2019	650	545	8.77	576	19800	-	1310	36	9370	3880	-	<0.01	-	-	-	-	-	-	-	-	-	
WB42	03/08/2019	568	612	3.69	696	17100	-	1500	43	10400	3750	3550	<0.1	-	-	-	-	-	-	-	-	-	
WB42	05/12/2019	565	585	1.72	661	17000	0.7	1440	46	9930	3740	-	-	-	-	-	-	-	-	-	-	-	
WBGT4	28/11/2016	766	653	7.96	441	23900	0.3	1320	22	12000	4040	-	<0.1	<0.05	0.74	1.7	<0.02	<0.02	1.7	93	4	4	
WBGT4	05/07/2017	688	642	3.49	422	21200	0.2	1560	30	11800	3940	-	<0.1	0.44	0.79	0.9	0.44	<0.02	1.3	87	3	3	
WBGT4	26/11/2017	773	670	7.12	517	24000	0.3	1370	40	12200	4240	-	<0.1	<0.05	0.91	0.9	<0.02	<0.02	0.9	99	<1	<1	
WBGT4	21/07/2018	686	748	4.28	589	20800	-	1840	61	13000	4370	4210	<0.01	-	-	-	-	-	-	-	-	-	
WBGT4	31/01/2019	657	596	4.89	437	19600	-	1410	48	10500	4110	-	<0.01	-	-	-	-	-	-	-	-	-	
WBGT4	02/08/2019	664	664	0.05	538	20200	-	1600	47	11600	4100	3700	<0.1	-	-	-	-	-	-	-	-	-	
WBGT4	07/12/2019	648	636	0.94	493	19600	0.3	1540	53	11100	4150	-	-	-	-	-	-	-	-	-	-	-	

Bairanal - Shepparton yellow trigger level	-	-	7	1112	42672	1	3219	141	23586	-	-	-	5	5	5	5	5	5	-	-	-
Bairanal - Shepparton red trigger level	-	-	-	1855	51206	2	3863	169	28203	-	-	-	25	25	25	25	25	25	-	-	-
ANZECC 2000 irrigation long-term trigger values	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	5	-	-	-
ANZECC 2000 irrigation short-term trigger values	-	-	-	-	-	2	-	-	-	-	-	-	-	-	5	5	5	5	-	-	-
ANZECC (2000) stock water guidelines	-	-	-	1000	-	-	2000	-	-	1000	1000	-	-	-	-	-	4.43	3.29	-	-	-



Analyte	Sulphate reducing bacteria population	Iron related bacteria population	Slime producing bacteria population	
Unit	pac/ml	pac/ml	pac/ml	
RDR	20	25	1	
Field ID	Date			
<b>Shepparton Bore</b>				
SHO803	28/11/2016	<20	2200	Background
SHO804	28/11/2016	<20	2200	Background
UGM-M15	28/11/2016	1400	2200	Background
UGM-M25	28/11/2016	6000	2200	Moderate
UGM-M55	29/11/2016	6000	9000	<500
UGM-M65	04/12/2016	20	9000	<500
UGM-M75	29/11/2016	6000	9000	12000
UGM-M85	28/11/2016	220	500	Background
UGM-M105	29/11/2016	27000	9000	12000
UGM-M115	30/11/2016	120000	35000	66000
UGM-M125	30/11/2016	<20	35000	<500
UGM-M135	30/11/2016	<20	9000	<500
UGM-M145	30/11/2016	120000	9000	<500
UGM-M155	28/11/2016	<20	2200	Background
WB42	04/12/2016	<20	500	<500
WB574	28/11/2016	75	2200	Background
<b>LPS Bore</b>				
LPSB03	28/11/2016	6000	2200	Background
LPSB04	28/11/2016	6000	2200	Moderate
UGM-M1D	28/11/2016	120000	2200	Moderate
UGM-M1D	03/07/2017	320	2200	500
UGM-M1D	26/11/2017	<20	35000	500
UGM-M2D	28/11/2016	1400	2200	Moderate
UGM-M4D	28/11/2016	6000	2200	Moderate
UGM-M5D	29/11/2016	27000	9000	500
UGM-M5D	04/07/2017	320	2200	500
UGM-M5D	28/11/2017	1400	High	2500
UGM-M6D	04/12/2016	320	500	500
UGM-M7D	29/11/2016	6000	9000	<500
UGM-M8D	28/11/2016	6000	2200	Moderate
UGM-M10D	29/11/2016	27000	9000	500
UGM-M10D	03/07/2017	75	2200	2500
UGM-M10D	22/11/2017	1400	9000	13000
UGM-M11D	30/11/2016	75	35000	66000
UGM-M12D	30/11/2016	27000	35000	66000
UGM-M12D	04/07/2017	75	9000	500
UGM-M12D	27/11/2017	75	2200	500
UGM-M13D	30/11/2016	1400	35000	7000
UGM-M14D	30/11/2016	120000	9000	66000
UGM-M15D	28/11/2016	120000	2200	Significant
UGM-M15D	04/07/2017	75	2200	500
UGM-M15D	26/11/2017	1400	High	500
WB41	04/12/2016	<20	9000	<500
WB41	05/07/2017	<20	9000	<20
WB41	28/11/2017	1400	High	2500
WB573	04/12/2016	1400	9000	500
<b>Remark Bore</b>				
DUP1	04/12/2016	1400	500	<500
DUP2	04/12/2016	<20	9000	<500
DUP3	05/07/2017	<20	9000	<20
DUP3	27/11/2017	75	2200	500
HD1	28/11/2016	6000	2200	Background
KarratHomestead	04/12/2016	500000	140000	12000

Bakranald - Shepparton yellow trigger level	-	-	-	-	-
Bakranald - Shepparton red trigger level	-	-	-	-	-
ANZECC 2000 irrigation long-term trigger values	-	-	-	-	-
ANZECC 2000 irrigation short-term trigger values	-	-	-	-	-
ANZECC (2000) stock water guidelines	-	-	-	-	-



Analyte	Aluminium (Dissolved)	Antimony (Dissolved)	Arsenic (Dissolved)	Beryllium (Dissolved)	Bismuth (Dissolved)	Cadmium (Dissolved)	Chromium (Dissolved)	Chromium (III) (Dissolved)	Chromium (VI) (Dissolved)	Cobalt (Dissolved)	Copper (Dissolved)	Iron (Dissolved)	Iron (Ferric) (Dissolved)	Lead (Dissolved)	Lithium (Dissolved)	Manganese (Dissolved)	Mercury (Dissolved)	Molybdenum (Dissolved)	Nickel (Dissolved)	Selenium (Dissolved)	Silver (Dissolved)	Strontium (Dissolved)	Thorium (Dissolved)	Titanium (Dissolved)	Uranium (Dissolved)	Vanadium (Dissolved)	Zinc (Dissolved)	Zirconium (Dissolved)	
Unit	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	
LOD	0.01	0.001	0.001	0.001	0.001	0.0001	0.001	0.01	0.01	0.001	0.001	0.05	0.05	0.001	0.001	0.001	0.0001	0.001	0.001	0.01	0.001	0.001	0.001	0.01	0.001	0.01	0.005	0.005	
Field ID	Date																												
UGM-M150	28/11/2016	<0.02	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	<0.002	<0.002	3.25	<0.1	<0.002	0.075	0.798	-	<0.002	<0.002	<0.02	<0.002	14.4	<0.002	<0.02	0.003	<0.02	0.011	<0.05	
UGM-M150	04/07/2017	<0.02	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	<0.002	<0.002	6.86	0.84	<0.002	0.152	0.72	-	<0.002	<0.002	<0.02	<0.002	12.9	<0.002	<0.02	0.003	<0.02	<0.01	<0.05	
UGM-M150	26/12/2017	<0.02	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	<0.002	<0.002	6.86	1.32	<0.002	0.148	0.702	-	<0.002	<0.002	<0.02	<0.002	10.4	<0.002	<0.02	0.003	<0.02	<0.01	<0.05	
UGM-M150	22/07/2018	<0.02	<0.002	<0.002	<0.002	<0.002	<0.002	-	<0.01	<0.002	<0.002	5.48	0.3	<0.002	0.116	0.613	-	<0.002	<0.002	<0.02	<0.002	11.3	<0.002	<0.02	0.003	<0.02	0.013	<0.05	
UGM-M150	01/02/2019	<0.02	<0.002	<0.002	<0.002	<0.002	<0.002	-	<0.01	<0.002	<0.002	5.66	0.21	<0.002	0.127	0.601	-	<0.002	<0.002	<0.02	<0.002	12.1	<0.002	<0.02	0.002	<0.02	0.02	<0.05	
UGM-M150	02/08/2019	0.05	<0.002	<0.002	<0.002	<0.002	<0.002	-	<0.01	<0.002	<0.002	4.96	<0.1	<0.002	0.188	0.854	-	<0.002	<0.002	<0.02	<0.002	13.2	<0.002	<0.02	0.003	<0.02	<0.010	<0.05	
UGM-M150	02/08/2019	0.02	<0.002	<0.002	<0.002	<0.002	<0.002	-	<0.01	<0.002	<0.002	3.98	0.06	<0.002	0.127	0.598	-	<0.002	<0.002	<0.02	<0.002	12.9	<0.002	<0.02	0.003	<0.02	<0.010	<0.05	
GW038866 (2)	26/10/2016	<0.01	<0.001	<0.001	-	-	<0.001	<0.01	-	-	<0.001	0.38	-	<0.01	-	0.222	-	-	0.002	-	-	-	<0.001	-	<0.01	-	0.015	<0.05	
GW038866 (2)	19/07/2018	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.01	<0.001	0.005	<0.05	<0.05	<0.01	0.052	0.226	-	0.001	0.001	<0.01	<0.001	4.7	<0.001	<0.01	<0.001	<0.01	<0.01	0.019	<0.05
GW038866 (2)	31/01/2019	<0.02	<0.002	<0.002	<0.002	<0.002	<0.002	-	<0.01	<0.002	<0.002	<0.1	<0.1	<0.002	0.06	0.26	-	<0.002	<0.002	<0.02	<0.002	7	<0.002	<0.02	<0.002	<0.02	0.025	<0.05	
GW038866 (2)	21/07/2019	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.01	<0.001	<0.001	<0.05	<0.05	<0.01	0.05	0.265	-	0.001	0.002	<0.01	<0.001	5.38	<0.001	<0.01	<0.001	<0.01	0.017	<0.05	
GW038866 (2)	07/12/2019	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.01	<0.001	0.003	<0.05	<0.05	<0.01	0.063	0.25	-	<0.001	0.003	<0.01	<0.001	5.61	<0.001	<0.01	<0.001	<0.01	0.014	<0.05	
LPSR03	28/11/2016	<0.02	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	<0.002	<0.002	1.17	<0.1	<0.002	0.093	0.425	-	<0.002	<0.002	<0.02	<0.002	14.1	<0.002	<0.02	<0.002	<0.02	0.031	<0.05	
LPSR03	05/07/2017	<0.02	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	<0.002	<0.002	1.39	<0.1	<0.002	0.125	0.439	-	<0.002	<0.002	<0.02	0.004	13.9	<0.002	<0.02	<0.002	<0.02	0.011	<0.05	
LPSR03	26/12/2017	<0.02	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	<0.002	<0.002	1.34	<0.05	<0.002	0.098	0.429	-	<0.002	<0.002	<0.02	<0.002	11	<0.002	<0.02	<0.002	<0.02	<0.01	<0.05	
LPSR03	20/07/2018	<0.02	<0.002	<0.002	<0.002	<0.002	<0.002	-	<0.01	<0.002	0.014	1.47	<0.1	<0.002	0.105	0.414	-	<0.002	<0.002	<0.02	<0.002	11.6	<0.002	<0.02	<0.002	<0.02	0.026	<0.05	
LPSR03	01/02/2019	<0.02	<0.002	<0.002	<0.002	0.004	<0.002	<0.002	-	<0.01	<0.002	1.45	<0.1	<0.002	0.132	0.418	-	<0.002	<0.002	<0.02	<0.002	11.9	<0.002	<0.02	<0.002	<0.02	0.021	<0.05	
LPSR03	02/08/2019	0.02	<0.002	<0.002	<0.002	<0.002	<0.002	-	<0.01	<0.002	<0.002	1.39	0.1	<0.002	0.14	0.441	-	<0.002	<0.002	<0.02	<0.002	14.3	<0.002	<0.02	<0.002	<0.02	0.031	<0.05	
LPSR03	05/12/2019	<0.02	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	<0.002	<0.002	1.34	<0.10	<0.002	0.107	0.442	-	<0.002	0.007	<0.02	<0.002	14.5	<0.002	<0.02	<0.002	<0.02	0.02	<0.05	
LPSR04	28/11/2016	<0.02	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	<0.002	<0.002	0.71	<0.1	<0.002	0.076	0.544	-	<0.002	<0.002	<0.02	<0.002	14.7	<0.002	<0.02	<0.002	<0.02	0.027	<0.05	
LPSR04	05/07/2017	<0.02	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	<0.002	<0.002	1.88	<0.1	<0.002	0.119	0.58	-	<0.002	<0.002	<0.02	<0.002	14.7	<0.002	<0.02	<0.002	<0.02	0.021	<0.05	
LPSR04	26/12/2017	<0.02	<0.002	0.002	<0.002	<0.002	<0.002	<0.01	<0.01	<0.002	<0.002	1.87	<0.05	<0.002	0.108	0.597	-	<0.002	0.002	<0.02	<0.002	11.9	<0.002	<0.02	<0.002	<0.02	0.013	<0.05	
LPSR04	20/07/2018	<0.02	<0.002	<0.002	<0.002	<0.002	<0.002	-	<0.01	<0.002	<0.002	1.24	<0.1	<0.002	0.107	0.521	-	<0.002	<0.002	<0.02	<0.002	12.2	<0.002	<0.02	<0.002	<0.02	0.021	<0.05	
LPSR04	31/01/2019	<0.02	<0.002	<0.002	<0.002	0.005	<0.002	<0.002	-	<0.01	<0.002	<0.002	1.73	0.12	<0.002	0.126	0.555	-	<0.002	<0.002	<0.02	0.004	13.6	<0.002	<0.02	<0.002	<0.02	0.024	<0.05
LPSR04	02/08/2019	<0.02	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	-	<0.01	<0.002	<0.002	1.58	0.11	<0.002	0.134	0.572	-	<0.002	<0.002	<0.02	<0.002	16.3	<0.002	<0.02	<0.002	<0.02	<0.010	<0.05
LPSR04	07/12/2019	<0.02	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	-	<0.01	<0.002	<0.002	1.84	<0.10	<0.002	0.14	0.573	-	<0.002	0.003	<0.02	<0.002	15.6	<0.002	<0.02	<0.002	<0.02	0.01	<0.05
WB1	21/07/2018	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.01	<0.001	<0.05	<0.05	<0.01	0.064	0.064	-	<0.001	0.001	<0.01	<0.001	6.01	<0.001	<0.01	<0.001	<0.01	0.017	<0.05	
WB2	21/07/2018	<0.01	<0.001	<0.001	<0.001	0.005	<0.002	<0.001	-	<0.01	<0.001	<0.001	<0.05	<0.05	<0.001	0.082	0.059	-	<0.001	<0.001	5.67	<0.001	<0.01	<0.001	<0.001	<0.01	<0.005	<0.05	
WB2	17/12/2018	<0.02	<0.002	<0.002	<0.002	0.005	<0.002	<0.001	-	<0.01	<0.002	0.002	0.05	0.05	<0.002	0.093	0.061	-	<0.002	<0.002	<0.02	0.015	6.5	<0.002	<0.02	<0.002	<0.02	0.001	<0.05
WB2	03/08/2019	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.01	<0.001	0.006	<0.05	<0.05	<0.001	0.117	0.057	-	<0.001	<0.001	<0.01	<0.001	6.76	<0.001	<0.01	<0.001	<0.01	0.008	<0.05
WB2	05/12/2019	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.01	<0.001	<0.001	<0.05	<0.05	<0.001	0.08	0.055	-	<0.001	0.003	<0.01	<0.001	7.01	<0.001	<0.01	<0.001	<0.01	0.011	<0.05
WB4	25/10/2016	<0.02	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	-	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	0.402	-	-	0.002	-	-	-	<0.002	-	<0.002	-	0.028	<0.01	
WB4	04/12/2016	<0.02	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	<0.002	<0.002	1.22	<0.1	<0.00															

Analyte	Aluminium (Total) mg/L	Arsenic (Total) mg/L	Chromium (Total) mg/L	Iron(Ferrous) (Total) mg/L	Iron (Total) mg/L	Manganese (Total) mg/L	Uranium (Total) mg/L	pH unit pH	TDS mg/L	Electrical Conductivity µS/cm	Carbonate Hardness as CaCO3 mg/L	Non-carbonate Hardness as CaCO3 mg/L	Acidity as CaCO3 mg/L	BOD mg/L	COD mg/L	Reactive Silica mg/L	Silicon (Dissolved) mg/L	Silicon (Dissolved) as SiO2 mg/L	Alkalinity (Carbonate as CaCO3) mg/L	Alkalinity (Bicarbonate as CaCO3) mg/L	Alkalinity (Hydroxide as CaCO3) mg/L	Alkalinity (Total as CaCO3) mg/L
Date	0.01	0.001	0.001	0.001	0.001	0.001	0.001	0.01	10	150	1	1	1	2	10	0.05	0.05	0.05	1	1	1	1
UGM-M1D 28/11/2016	0.12	<0.002	<0.002	1.51	2.63	0.574	<0.002	7.46	37200	53800	384	6340	35	<2	<100	13.5	7.02	-	<1	384	<1	384
UGM-M1D 03/07/2017	0.14	<0.002	<0.002	2.52	2.62	0.558	<0.002	7.28	31800	56100	378	6880	-	2	<10	14.2	-	-	<1	378	<1	378
UGM-M1D 04/07/2017	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UGM-M1D 26/11/2017	0.08	<0.002	<0.002	4.77	0.7	0.854	0.002	7.59	35400	54400	296	6560	0.002	-	<100	18	-	20.5	<1	296	<1	296
UGM-M1D 03/07/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UGM-M1D 16/12/2018	-	-	-	0.86	-	-	-	7.52	34900	53700	47	-	-	-	-	-	-	-	<1	321	<1	321
UGM-M1D 13/12/2018	-	-	-	1.43	-	-	-	7.81	31700	53600	54	-	-	-	-	-	-	-	<1	318	<1	318
UGM-M1D 30/07/2019	-	-	-	1.32	-	-	-	7.52	34900	53700	61	-	-	-	-	-	-	-	<1	371	<1	371
UGM-M1D 07/12/2019	-	-	-	1.63	-	-	-	6.52	35200	54100	49	-	-	-	-	-	-	-	<1	314	<1	314
UGM-M2D 28/11/2016	0.06	0.01	<0.002	3.68	4.74	0.486	<0.002	7.47	38300	53800	403	6270	27	<2	<100	13.8	7.01	-	<1	403	<1	403
UGM-M2D 03/07/2017	0.1	0.009	<0.002	4.96	5.91	0.531	<0.002	7.36	33000	56300	397	6960	-	-	<2	<10	14.8	-	<1	397	<1	397
UGM-M2D 22/11/2017	0.87	0.01	0.004	<0.05	6.57	0.541	<0.002	7.35	36500	56000	372	7700	-	-	<2	<100	12.8	-	<1	372	<1	372
UGM-M2D 16/07/2018	-	-	-	4.18	-	-	-	7.3	36800	56700	-	-	100	-	-	-	-	-	<1	409	<1	409
UGM-M2D 16/12/2018	-	-	-	0.19	-	-	-	7.4	35000	54700	-	-	75	-	-	-	-	-	<1	308	<1	308
UGM-M2D 30/07/2019	-	-	-	3.48	-	-	-	7.24	35900	53900	-	-	86	-	-	-	-	-	<1	415	<1	415
UGM-M2D 07/12/2019	-	-	-	3.7	-	-	-	7.85	34500	-	-	-	73	-	-	-	-	-	<1	419	<1	419
UGM-M4D 28/11/2016	<0.02	0.003	<0.002	1.21	1.71	0.465	<0.002	7.47	38300	54100	387	6710	25	<2	<100	11.9	6.32	-	<1	387	<1	387
UGM-M4D 03/07/2017	0.02	0.004	<0.002	1.96	2.01	0.499	<0.002	7.39	34100	56600	386	7090	-	-	<2	<10	13.8	-	<1	386	<1	386
UGM-M4D 22/11/2017	0.02	0.004	<0.002	<0.05	3.95	0.511	<0.002	7.37	34100	56000	368	6850	-	-	<2	<100	11.9	-	<1	368	<1	368
UGM-M4D 16/07/2018	-	-	-	1.93	-	-	-	7.28	37100	57100	-	-	93	-	-	-	-	-	<1	391	<1	391
UGM-M4D 29/01/2019	-	-	-	1.85	-	-	-	7.19	33700	51800	-	-	61	-	-	-	-	-	<1	375	<1	375
UGM-M4D 01/08/2019	-	-	-	1.75	-	-	-	7.07	36300	55800	-	-	112	-	-	-	-	-	<1	408	<1	408
UGM-M4D 07/12/2019	-	-	-	1.23	-	-	-	6.97	35600	54800	-	-	66	-	-	-	-	-	<1	403	<1	403
UGM-M5D 29/11/2016	0.18	0.003	<0.002	1.56	1.82	0.466	<0.002	7.36	40800	55800	398	6160	5	<100	13.1	6.29	46	-	<1	398	<1	398
UGM-M5D 04/07/2017	0.03	0.003	<0.002	2.01	2.07	0.559	<0.002	7.19	35900	57200	394	7190	-	-	<2	<100	14.4	-	<1	394	<1	394
UGM-M5D 28/11/2017	<0.02	0.003	<0.002	1.66	1.92	0.525	<0.002	7.47	32300	55900	391	6730	-	-	<2	<100	12.3	-	<1	391	<1	391
UGM-M5D 13/07/2018	-	-	-	1.75	-	-	-	7.29	37100	57400	-	-	80	-	-	-	-	-	<1	417	<1	417
UGM-M5D 12/12/2018	-	-	-	1.95	-	-	-	7.14	35200	54500	-	-	79	-	-	-	-	-	<1	402	<1	402
UGM-M5D 30/07/2019	-	-	-	1.69	-	-	-	7.21	36500	56200	-	-	77	-	-	-	-	-	<1	415	<1	415
UGM-M5D 10/12/2019	-	-	-	<0.05	-	-	-	7.91	32200	-	-	-	81	-	-	-	-	-	<1	477	<1	477
UGM-M6D 04/12/2016	0.04	0.003	<0.002	1.77	1.76	0.381	<0.002	7.31	39200	55300	405	6560	102	7	<100	13.1	<5	-	<1	405	<1	405
UGM-M6D 03/07/2017	<0.02	0.003	<0.002	1.23	1.21	0.437	<0.002	7.15	38400	57800	415	7160	-	-	<2	<10	14.2	-	<1	415	<1	415
UGM-M6D 22/11/2017	<0.02	0.004	<0.002	<0.05	2.24	0.492	<0.002	7.32	35900	54700	406	6220	-	-	<2	<100	12	-	<1	397	<1	397
UGM-M6D 17/07/2018	-	-	-	2.84	-	-	-	7.25	36000	55400	-	-	90	-	-	-	-	-	<1	424	<1	424
UGM-M6D 30/01/2019	-	-	-	2.52	-	-	-	7.18	35000	53900	-	-	62	-	-	-	-	-	<1	402	<1	402
UGM-M6D 12/07/2019	-	-	-	1.96	-	-	-	7.23	36700	56400	-	-	82	-	-	-	-	-	<1	428	<1	428
UGM-M6D 16/12/2019	-	-	-	1.4	-	-	-	7.78	32700	-	-	-	79	-	-	-	-	-	<1	436	<1	436
UGM-M7D 29/11/2016	0.02	<0.002	<0.002	1.09	1.23	0.448	<0.002	7.55	33300	56900	407	6570	55	4	<100	12.1	5.83	-	<1	407	<1	407
UGM-M7D 04/07/2017	<0.02	<0.002	<0.002	1.31	1.26	0.526	<0.002	7.14	36100	60400	402	7630	-	-	6	<10	13.6	-	<1	402	<1	402
UGM-M7D 22/11/2017	<0.02	<0.002	<0.002	1.46	1.36	0.56	<0.002	7.32	35200	59200	391	8620	-	-	<2	<100	11.3	-	<1	391	<1	391
UGM-M7D 13/07/2018	-	-	-	1.03	-	-	-	7.33	39200	60300	-	-	90	-	-	-	-	-	<1	416	<1	416
UGM-M7D 12/12/2018	-	-	-	1.16	-	-	-	7.6	35900	55300	-	-	85	-	-	-	-	-	<1	390	<1	390
UGM-M7D 13/07/2019	-	-	-	0.75	-	-	-	7.2	37600	57800	-	-	77	-	-	-	-	-	<1	414	<1	414
UGM-M7D 09/12/2019	-	-	-	1.58	-	-	-	7.11	33800	53800	-	-	80	-	-	-	-	-	<1	415	<1	415
UGM-M8D 28/11/2016	0.14	<0.002	0.003	3.01	3.75	0.462	<0.002	7.46	39600	55500	410	6100	39	<2	<100	13.9	6.78	-	<1	410	<1	410
UGM-M8D 03/07/2017	0.06	<0.002	<0.002	4.2	4.18	0.498	<0.002	7.38	37500	56300	404	6920	-	-	<2	<10	14.4	-	<1	404	<1	404
UGM-M8D 28/11/2017	0.07	<0.002	<0.002	3.95	4.06	0.494	<0.002	7.45	35300	55200	386	6460	-	-	<2	<100	12.2	-	<1	386	<1	386
UGM-M8D 16/07/2018	-	-	-	3.66	-	-	-	7.28	37200	57100	-	-	80	-	-	-	-	-	<1	411	<1	411
UGM-M8D 13/12/2018	-	-	-	3.87	-	-	-	7.69	34300	53600	-	-	74	-	-	-	-	-	<1	386	<1	386
UGM-M8D 01/08/2019	-	-	-	3.31	-	-	-	7.07	35800	55100	-	-	95	-	-	-	-	-	<1	423	<1	423
UGM-M8D 10/12/2019	-	-	-	3.1	-	-	-	7.77	34600	-	-	-	74	-	-	-	-	-	<1	412	<1	412
UGM-M9D 29/11/2016	0.04	0.003	<0.002	1.56	1.64	0.373	<0.002	7.35	39600	55200	398	6210	4	4	<200	12.2	5.94	-	<1	398	<1	398
UGM-M9D 03/07/2017	<0.02	0.003	<0.002	1.94	2.01	0.419	<0.002	7.39	32400	56800	396	6890	-	-	3	<10	13.7	-	<1	396	<1	396
UGM-M10D 22/11/2017	<0.02	0.003	<0.002	<0.05	1.89	0.455	<0.002	7.31	37800	56100	383	7540	-	-	<2	<100	11.6	-	<1	383	<1	383
UGM-M10D 22/07/2018	-	-	-	1.85	-	-	-	7.15	38300	58900	-	-	-	-	-	-	-	-	<1</			

Analyte	Aluminium	Arsenic (Total)	Chromium	Iron (Ferrous)	Iron (Total)	Manganese	Uranium	pH	TDS	Electrical Conductivity	Carbonate Hardness as CaCO3	Non-carbonate Hardness as CaCO3	Acidity as CaCO3	BOD	COD	Reactive Silica	Silicon (Dissolved)	Silicon (Dissolved) as SiO2	Alkalinity (Carbonate as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide as CaCO3)	Alkalinity (Total as CaCO3)	
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	pH unit	mg/L	µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	
LR	0.01	0.001	0.001	0.001	0.001	0.001	0.001	0.01	10	1	1	1	1	2	10	0.05	0.05	0.05	1	1	1	1	
Field ID	Date																						
UGM-M15D	28/11/2016	0.1	<0.002	<0.002	3.32	3.71	0.854	0.004	7.37	38100	55100	428	6050	35	<2	<100	15.8	8.31	-	<1	428	<1	428
UGM-M15D	04/07/2017	<0.02	<0.002	<0.002	6.42	7.15	0.758	0.004	7.27	39300	59100	416	6990	8	<10	17.2	-	-	17.6	<1	416	<1	416
UGM-M15D	26/11/2017	0.111	<0.002	<0.002	6.42	5.30	0.737	0.003	7.34	34600	57300	406	5330	<2	<100	14.8	-	17.2	<1	406	<1	406	
UGM-M15D	22/07/2018	-	-	-	5.18	-	-	-	7.25	39600	60900	-	-	<1	-	-	-	-	<1	448	<1	448	
UGM-M15D	01/02/2019	-	-	-	5.45	-	-	-	7.18	36500	56200	-	-	59	-	-	-	-	<1	402	<1	402	
UGM-M15D	02/08/2019	-	-	-	4.91	-	-	-	7.5	37200	57200	-	-	43	-	-	-	-	<1	468	<1	468	
UGM-M15D	08/12/2019	-	-	-	<0.05	-	-	-	7.12	39300	55300	-	-	63	-	-	-	-	<1	459	<1	459	
GW036866 (2)	26/10/2016	-	-	-	-	-	-	-	7.62	13500	-	-	-	58	-	-	-	-	-	-	-	-	
GW036866 (2)	19/07/2018	-	-	-	<0.05	-	-	-	7.43	15100	23200	-	-	41	-	-	-	-	<1	502	<1	502	
GW036866 (2)	31/01/2019	-	-	-	0.11	-	-	-	7.45	13800	21200	-	-	29	-	-	-	-	<1	452	<1	452	
GW036866 (2)	23/07/2019	-	-	-	<0.05	-	-	-	7.62	14400	22100	-	-	54	-	-	-	-	<1	491	<1	491	
GW036866 (2)	07/12/2019	-	-	-	<0.05	-	-	-	7.19	14400	22100	-	-	38	-	-	-	-	<1	468	<1	468	
LPSB03	28/11/2016	<0.02	<0.002	<0.002	1.17	1.48	0.404	<0.002	7.31	36200	52100	425	5400	39	<2	<100	17.7	9.18	<1	425	<1	425	
LPSB03	05/07/2017	<0.02	<0.002	<0.002	1.39	1.54	0.462	<0.002	7.38	32100	51900	423	6150	2	<100	19.3	-	19.8	<1	423	<1	423	
LPSB03	26/11/2017	<0.02	<0.002	<0.002	1.32	1.52	0.448	<0.002	7.26	30300	52300	409	5960	<2	<100	16.3	-	19.1	<1	409	<1	409	
LPSB03	20/07/2018	-	-	-	1.41	-	-	-	7.15	35700	54900	-	-	<1	-	-	-	-	<1	460	<1	460	
LPSB03	01/02/2019	-	-	-	1.39	-	-	-	7.15	31600	48700	-	-	62	-	-	-	-	<1	414	<1	414	
LPSB03	02/08/2019	-	-	-	1.29	-	-	-	7.03	33600	51700	-	-	52	-	-	-	-	<1	449	<1	449	
LPSB03	05/12/2019	-	-	-	1.38	-	-	-	7.16	34100	52400	-	-	94	-	-	-	-	<1	436	<1	436	
LPSB04	28/11/2016	<0.02	<0.002	<0.002	0.71	1.62	0.554	<0.002	7.32	39600	55800	422	6280	35	<2	<100	14.2	6.97	<1	422	<1	422	
LPSB04	05/07/2017	<0.02	<0.002	<0.002	2.1	1.98	0.6	<0.002	7.42	30600	57000	419	6650	5	<100	14.4	-	14.2	<1	419	<1	419	
LPSB04	26/11/2017	<0.02	<0.002	<0.002	2.01	2.09	0.617	<0.002	7.21	38300	57300	406	6970	<2	<100	12.4	-	14.3	<1	406	<1	406	
LPSB04	21/07/2018	-	-	-	2.2	-	-	-	7.25	39300	60500	-	-	<1	-	-	-	-	<1	450	<1	450	
LPSB04	31/01/2019	-	-	-	1.61	-	-	-	7.16	33100	50900	-	-	63	-	-	-	-	<1	422	<1	422	
LPSB04	02/08/2019	-	-	-	1.47	-	-	-	7.06	35200	54100	-	-	53	-	-	-	-	<1	448	<1	448	
LPSB04	07/12/2019	-	-	-	1.59	-	-	-	6.93	35200	54100	-	-	62	-	-	-	-	<1	437	<1	437	
WB2	27/10/2016	0.03	<0.001	<0.001	-	0.07	0.064	<0.001	7.33	18600	31600	-	-	31	-	-	-	-	<1	360	<1	360	
WB2	21/07/2018	-	-	-	<0.05	-	-	-	7.25	29500	31600	-	-	<1	-	-	-	-	<1	486	<1	486	
WB2	17/12/2018	-	-	-	<0.05	-	-	-	7.75	17700	27200	-	-	63	-	-	-	-	<1	438	<1	438	
WB2	03/08/2019	-	-	-	<0.05	-	-	-	7.15	19100	29400	-	-	93	-	-	-	-	<1	480	<1	480	
WB2	05/12/2019	-	-	-	0.07	-	-	-	7.17	20200	31000	-	-	79	-	-	-	-	<1	457	<1	457	
WB41	28/10/2016	-	-	-	-	-	-	-	7.49	33400	-	-	-	94	-	-	-	-	<1	362	<1	362	
WB41	04/12/2016	<0.02	<0.002	<0.002	1.18	1.03	0.401	<0.002	7.66	33800	47600	362	5970	8	<100	12.6	<5	-	<1	362	<1	362	
WB41	05/07/2017	<0.02	<0.002	<0.002	1.32	1.49	0.469	<0.002	7.49	32600	49900	381	6840	<2	<100	13.1	-	12.2	<1	381	<1	381	
WB41	26/11/2017	<0.01	0.001	<0.001	1.12	1.28	0.446	<0.001	7.41	31800	51100	360	6960	<2	<100	10.9	-	13	<1	360	<1	360	
WB41	28/12/2017	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	351	<1	351	
WB41	19/07/2018	-	-	-	1.65	-	-	-	7.38	31900	49100	-	-	<1	-	-	-	-	<1	394	<1	394	
WB41	31/01/2019	-	-	-	1.61	-	-	-	7.3	27300	42000	-	-	50	-	-	-	-	<1	351	<1	351	
WB41	03/08/2019	-	-	-	1.29	-	-	-	7.23	30900	47500	-	-	63	-	-	-	-	<1	386	<1	386	
WB41	05/12/2019	-	-	-	<0.05	-	-	-	7.52	30500	47100	-	-	60	-	-	-	-	<1	370	<1	370	
WB5	27/10/2016	0.02	<0.001	<0.001	-	0.6	0.22	<0.001	7.32	21800	-	-	-	35	-	-	-	-	<1	386	<1	386	
WB5	21/07/2018	-	-	-	0.56	-	-	-	7.2	23600	36300	-	-	<1	-	-	-	-	<1	485	<1	485	
WB5	17/12/2018	-	-	-	0.46	-	-	-	7.92	18700	28800	-	-	72	-	-	-	-	<1	440	<1	440	
WB5	03/08/2019	-	-	-	0.42	-	-	-	7.08	21500	33200	-	-	72	-	-	-	-	<1	463	<1	463	
WB5	05/12/2019	-	-	-	0.55	-	-	-	7.18	23200	35700	-	-	84	-	-	-	-	<1	444	<1	444	
WB7	27/10/2016	0.03	0.008	<0.002	-	1.4	1.13	0.012	6.78	44000	-	-	-	56	-	-	-	-	<1	277	<1	277	
WB7	21/07/2018	-	-	-	1.64	-	-	-	6.55	40600	62400	-	-	8	-	-	-	-	<1	277	<1	277	
WB7	17/12/2018	-	-	-	1	-	-	-	7.36	34700	53400	-	-	117	-	-	-	-	<1	251	<1	251	
WB7	03/08/2019	-	-	-	0.94	-	-	-	6.38	38600	59400	-	-	126	-	-	-	-	<1	266	<1	266	
WB7	05/12/2019	-	-	-	0.93	-	-	-	6.56	38700	59600	-	-	152	-	-	-	-	<1	263	<1	263	
WBGT3	04/12/2016	0.2	0.002	0.002	0.93	1.77	0.439	<0.002	7.34	44100	58300	461	6600	113	10	<100	15.8	<5	<1	461	<1	461	
WBGT3	05/07/2017	1.25	0.005	0.007	0.31	2.6	0.488	<0.002	7.5	37600	60500	463	7040	2	<100	17.1	-	15	<1	463	<1	463	
WBGT3	26/11/2017	0.43	0.198	0.154	0.35	0.6	0.695	0.005	7.33	37400	61700	434	6960	<2	<100	15	-	17.6	<1	434	<1	434	
WBGT3	20/07/2018	-	-	-	1.24	-	-	-	7.21	40600	62500	-	-	<1	-	-	-	-	<1	484	<1	484	
WBGT3	01/02/2019	-	-	-	1.38	-	-	-	7.2	36900	56800	-	-	65	-	-	-	-	<1	438	<1	438	
WBGT3	02/08/2019	-	-	-	1.51	-	-	-	7.1	39000	60000	-	-	56	-	-	-	-	<1	456	<1	456	
WBGT3																							

Analyte	Anions		Cations		Ionic Balance	Calcium (Dissolved)		Chloride (mg/L)	Fluoride (mg/L)	Magnesium (Dissolved)	Potassium (Dissolved)	Sodium (Dissolved)	Sulfate (Dissolved)	Sulfate (Total)	Nitrate & Nitrite as N		Ammonia as N	Kjeldahl Nitrogen as N		Nitrate as N		Nitrite as N	Nitrogen as N (Total)		Carbon (Total)	DOC	TOC		
	mg/L	mg/L	mg/L	mg/L		mg/L	mg/L								mg/L	mg/L		mg/L	mg/L	mg/L	mg/L		mg/L	mg/L				mg/L	mg/L
Field ID	Date																												
UGM-M1D	28/11/2016	721	644	5.67	514	22300	0.3	1320	23	11700	4060	-	0.1	<0.05	0.83	2.2	<0.02	<0.02	2.2	91	6	6	-	-	-	-	-	-	-
UGM-M1D	03/07/2017	646	629	1.37	531	19600	0.2	1440	35	11100	4120	-	<0.1	0.07	0.85	0.9	-	<0.02	1	84	6	6	-	-	-	-	-	-	-
UGM-M1D	04/07/2017	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UGM-M1D	26/11/2017	662	656	0.42	786	20500	0.3	1190	50	11900	3720	-	<0.1	<0.05	1.1	1.1	-	<0.02	1.1	82	6	6	-	-	-	-	-	-	-
UGM-M1D	03/07/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UGM-M1D	16/12/2018	625	645	1.6	711	19700	-	1420	56	11400	3020	3080	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UGM-M1D	13/12/2018	651	688	5.86	645	20000	-	1300	54	10300	3880	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UGM-M1D	30/07/2019	565	607	3.63	630	17000	-	1380	52	10600	3740	3950	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UGM-M1D	07/12/2019	616	607	0.75	602	18700	0.3	1440	55	10500	3840	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UGM-M2D	28/11/2016	742	647	6.81	481	21000	0.3	1330	21	11800	4190	-	0.2	<0.05	0.84	0.9	-	<0.02	<0.02	0.9	94	4	4	-	-	-	-	-	-
UGM-M2D	02/07/2017	660	648	0.91	595	20200	0.2	1480	33	11500	4220	-	<0.1	<0.05	0.77	0.9	-	0.03	<0.02	0.9	87	4	4	-	-	-	-	-	-
UGM-M2D	22/11/2017	702	698	0.31	628	21600	0.3	1580	45	12300	4090	-	<0.1	<0.05	1.1	1.3	-	0.03	<0.02	1.3	100	<5	<5	-	-	-	-	-	-
UGM-M2D	16/07/2018	648	721	5.37	595	20200	-	1780	51	12500	3350	3570	0.084	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UGM-M2D	16/12/2018	691	687	0.28	640	20900	-	1610	37	12000	4590	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UGM-M2D	30/07/2019	622	627	0.39	557	19800	-	1510	48	10900	4030	3990	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UGM-M2D	07/12/2019	598	615	1.44	454	19800	0.3	1370	42	11000	4180	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UGM-M4D	28/11/2016	663	879	14.8	638	19900	0.3	1880	42	15900	4040	-	<0.1	<0.05	0.85	0.9	-	0.04	<0.02	0.9	91	4	4	-	-	-	-	-	-
UGM-M4D	03/07/2017	692	659	2.43	506	21200	0.2	1510	34	11700	4150	-	<0.1	<0.05	0.78	0.9	-	<0.02	<0.02	0.9	83	4	4	-	-	-	-	-	-
UGM-M4D	22/11/2017	710	628	6.1	550	21800	0.3	1420	40	11100	4290	-	<0.1	<0.05	0.97	1.1	-	<0.02	<0.02	1.1	98	<1	<5	-	-	-	-	-	-
UGM-M4D	16/07/2018	656	674	1.33	549	20100	-	1660	47	11700	3920	3360	<0.03	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UGM-M4D	29/01/2019	712	594	9.09	483	21600	-	1410	44	10400	4590	-	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UGM-M4D	01/08/2019	629	705	5.68	632	19000	-	1720	54	12200	4090	3620	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UGM-M4D	07/12/2019	609	612	0.98	533	18000	0.3	1500	51	10600	4100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UGM-M5D	29/11/2016	607	645	1.69	433	20400	0.3	1330	21	11800	4020	-	<0.1	<0.05	0.8	1.1	-	<0.02	<0.02	1.1	90	4	4	-	-	-	-	-	-
UGM-M5D	04/07/2017	663	646	2.45	530	20300	0.3	1520	38	12500	3960	-	<0.1	<0.05	0.68	0.8	-	<0.02	<0.02	0.9	85	4	4	-	-	-	-	-	-
UGM-M5D	28/11/2017	728	660	4.86	477	22500	0.4	1440	17	11900	4100	-	<0.1	<0.05	0.93	0.9	-	<0.02	<0.02	0.9	106	15	<5	-	-	-	-	-	-
UGM-M5D	17/07/2018	655	669	2.52	522	20700	-	1700	48	12000	4030	3480	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UGM-M5D	12/12/2018	674	649	2.56	470	20700	-	1510	45	11300	3720	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UGM-M5D	30/07/2019	635	648	0.98	529	19200	-	1560	50	11300	4090	3890	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UGM-M5D	10/12/2019	632	699	5.01	511	19300	0.3	1610	53	12400	3750	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UGM-M6D	04/12/2016	635	688	3.99	463	19300	0.3	1410	37	12600	3980	-	<0.1	<0.05	0.63	0.9	-	<0.02	<0.02	0.9	89	4	4	-	-	-	-	-	-
UGM-M6D	03/07/2017	626	665	4.74	295	17000	0.3	1700	35	15500	4100	-	<0.1	<0.05	0.67	0.8	-	<0.02	<0.02	0.8	88	4	4	-	-	-	-	-	-
UGM-M6D	22/11/2017	703	616	6.58	460	21700	0.3	1330	27	11100	3970	-	<0.1	<0.05	0.94	1.2	-	<0.02	<0.02	1.2	104	<1	<5	-	-	-	-	-	-
UGM-M6D	17/07/2018	649	684	2.59	516	20300	-	1690	47	11900	3770	3140	<0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UGM-M6D	30/07/2019	716	699	1.21	529	21800	-	1660	52	12300	4490	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UGM-M6D	15/07/2019	624	650	2.04	524	19800	0.3	1590	50	11200	3790	3780	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UGM-M6D	10/12/2019	623	596	2.26	401	18900	0.3	1330	42	10700	3920	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UGM-M7D	29/11/2016	686	679	0.51	468	21000	0.3	1410	23	12400	4260	-	<0.1	<0.05	0.88	0.9	-	<0.02	<0.02	0.9	94	5	5	-	-	-	-	-	-
UGM-M7D	04/07/2017	712	727	1.07	577	21800	0.2	1600	44	13000	4260	-	<0.1	<0.05	0.81	1.1	-	<0.02	<0.02	1.1	90	5	4	-	-	-	-	-	-
UGM-M7D	22/11/2017	788	799	7.88	576	21800	0.3	1840	48	14300	4280	-	<0.1	<0.05	1	1.6	-	<0.02	<0.02	1.6	105	<1	<1	-	-	-	-	-	-
UGM-M7D	17/07/2018	673	784	7.6	610	21600	-	1950	57	13600	2670	3310	<0.03	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UGM-M7D	12/12/2018	758	670	6.19	506	23500	-	1580	48	11800	4080	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UGM-M7D	13/12/2018	631	673	3.2	557	18800	-	1640	53	11700	4450	4190	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UGM-M7D	09/12/2019	653	671	1.36	457	19200	0.3	1520	48	11200	4120	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
UGM-M8D	28/11/2016	753	635	8.47	445	23500	0.3	1310	24	11600	3920	-	<0.1	<0.05	0.83	0.8	-	<0.02	<0.02	0.8	97	4	4	-	-	-	-	-	-
UGM-M8D	03/07/2017	692	647	3.35	474	21300	0.2	1490	32	11500	4000	-	<0.1	<0.05	0.79	0.9	-	<0.02	<0.02	0.9	87	4	4	-	-	-	-	-	-
UGM-M8D	28/11/2017	739	629	8.06	466	22800	0.4	1380	16																				

Analyte	Anions	Cations	Ionic Balance	Calcium (Dissolved)	Chloride	Fluoride	Magnesium (Dissolved)	Potassium (Dissolved)	Sodium (Dissolved)	Sulfate (Dissolved)	Sulfate (Total)	Sulfide as S	Nitrate & Nitrite as N	Ammonia as N	Kjeldahl Nitrogen as N	Nitrate as N	Nitrite as N	Nitrogen as N (Total)	Carbon (Total)	DOC	TOC	
Unit	mg/L	meq/L	%	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	
Limit	0.01	0.01	0.01	1	1	1	1	1	1	1	0.1	0.1	0.01	0.01	0.1	0.01	0.01	0.1	1	1	1	
Field ID	Date																					
UGM-M15D	28/11/2016	727	652	5.48	416	22800	0.3	1320	21	12000	3640	-	2.4	<0.05	0.47	0.7	0.03	<0.02	0.7	137	35	36
UGM-M15D	04/07/2017	690	693	0.17	495	21400	0.3	1500	36	12500	3770	-	0.5	<0.05	0.76	0.7	<0.02	<0.02	0.9	98	12	12
UGM-M15D	26/12/2017	769	735	2.27	547	24200	0.3	1500	42	13400	3750	-	0.7	<0.05	0.98	0.9	<0.02	<0.02	0.9	116	8	7
UGM-M15D	22/07/2018	656	724	4.93	550	20300	-	1790	54	12600	3580	3890	0.028	-	-	-	-	-	-	-	-	-
UGM-M15D	01/02/2019	664	626	2.92	436	20400	-	1460	46	11100	3850	-	<0.01	-	-	-	-	-	-	-	-	-
UGM-M15D	02/08/2019	652	730	5.7	563	20100	-	1750	52	12900	3610	3450	0.2	-	-	-	-	-	-	-	-	-
UGM-M15D	08/12/2019	636	608	1.46	451	19200	0.4	1450	51	10700	3640	-	-	-	-	-	-	-	-	-	-	-
GW038866 (2)	26/10/2016	-	-	-	-	-	-	-	-	-	1250	-	-	-	-	-	-	-	-	-	-	-
GW038866 (2)	19/07/2018	227	273	9.26	250	6810	-	527	30	4980	1190	1170	0.011	-	-	-	-	-	-	-	-	-
GW038866 (2)	31/01/2019	264	207	11.9	159	8280	-	362	22	3890	1010	-	<0.01	-	-	-	-	-	-	-	-	-
GW038866 (2)	23/07/2019	214	220	3.59	211	6290	-	429	25	4210	1270	-	1260	-	-	-	-	-	-	-	-	-
GW038866 (2)	07/12/2019	240	221	4.19	201	7260	0.5	416	26	4040	1240	-	-	-	-	-	-	-	-	-	-	-
LPSF803	28/11/2016	710	587	9.53	435	22200	0.4	1150	22	10800	3630	-	<0.1	<0.05	0.61	0.8	<0.02	<0.02	0.8	97	3	3
LPSF803	05/07/2017	611	557	4.63	423	18800	0.3	1340	30	9770	3480	-	<0.1	<0.05	0.61	0.7	0.02	<0.02	0.7	90	3	2
LPSF803	26/12/2017	703	598	8.07	524	21200	0.4	1230	39	10800	3440	-	<0.1	<0.05	0.73	0.7	<0.02	<0.02	0.7	101	<5	<5
LPSF803	20/07/2018	571	558	1.13	523	17400	-	1370	54	9610	3410	3470	0.011	-	-	-	-	-	-	-	-	-
LPSF803	01/02/2019	585	552	2.88	463	18000	-	1280	46	9710	3300	-	<0.01	-	-	-	-	-	-	-	-	-
LPSF803	02/08/2019	594	600	0.53	557	18200	-	1440	47	10400	3420	3050	<0.1	-	-	-	-	-	-	-	-	-
LPSF803	05/12/2019	573	633	5.03	512	17500	0.4	1550	67	11000	3380	-	-	-	-	-	-	-	-	-	-	-
LPSF804	28/11/2016	766	652	8	457	23600	0.4	1350	24	11900	4390	-	<0.1	0.06	0.61	1.6	0.06	<0.02	1.7	100	4	3
LPSF804	05/07/2017	686	594	7.15	409	21000	0.3	1470	30	10400	4100	-	<0.1	-	-	-	-	-	-	90	3	3
LPSF804	26/12/2017	756	697	4.12	564	23500	0.4	1450	44	12600	4110	-	<0.1	<0.05	0.74	1.8	<0.02	<0.02	1.8	101	<5	<1
LPSF804	21/07/2018	685	705	1.45	576	20900	-	1750	59	12200	4180	4240	0.01	-	-	-	-	-	-	-	-	-
LPSF804	31/01/2019	698	591	8.28	484	21100	-	1430	50	10300	4220	-	<0.01	-	-	-	-	-	-	-	-	-
LPSF804	02/08/2019	630	691	4.58	626	18800	-	1710	56	11900	4380	3830	<0.1	-	-	-	-	-	-	-	-	-
LPSF804	07/12/2019	622	615	358	540	18600	0.4	1530	57	10600	4280	-	-	-	-	-	-	-	-	-	-	-
WB2	27/10/2016	-	-	-	-	-	-	-	-	-	929	-	-	-	-	-	-	-	-	-	-	-
WB2	21/07/2018	299	340	6.44	324	9580	-	715	46	6070	916	853	0.24	-	-	-	-	-	-	-	-	-
WB2	17/12/2018	327	281	7.46	233	10600	-	532	30	5180	869	-	0.335	-	-	-	-	-	-	-	-	-
WB2	03/08/2019	325	294	4.92	289	10500	-	606	34	5270	915	936	0.5	-	-	-	-	-	-	-	-	-
WB2	05/12/2019	309	334	3.84	284	10000	0.3	707	49	5980	857	-	-	-	-	-	-	-	-	-	-	-
WB41	25/10/2016	-	-	-	-	-	-	-	-	-	3660	-	-	-	-	-	-	-	-	-	-	-
WB41	04/12/2016	566	580	1.22	539	17900	0.5	1210	29	10400	3380	-	<0.1	<0.05	0.67	0.7	<0.02	<0.02	0.7	79	4	4
WB41	05/07/2017	641	553	7.33	551	19700	0.4	1420	26	9390	3730	-	<0.1	<0.05	0.77	0.9	<0.02	<0.02	0.9	81	4	4
WB41	26/12/2017	603	621	1.46	704	18500	0.5	1350	35	10900	3970	-	<0.1	<0.05	0.76	0.73	<0.02	<0.02	0.73	90	<5	6
WB41	28/12/2017	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WB41	19/07/2018	528	545	1.63	645	16000	-	1400	42	9120	3290	3590	<0.01	-	-	-	-	-	-	-	-	-
WB41	31/01/2019	594	506	8	567	18100	-	1250	39	8590	3340	-	0.026	-	-	-	-	-	-	-	-	-
WB41	03/08/2019	525	567	3.88	674	15800	-	1430	46	9540	3440	3000	<0.1	-	-	-	-	-	-	-	-	-
WB41	05/12/2019	515	536	2.01	524	15600	0.4	1390	55	9010	3230	-	-	-	-	-	-	-	-	-	-	-
WB5	27/10/2016	-	-	-	-	-	-	-	-	-	1180	-	-	-	-	-	-	-	-	-	-	-
WB5	21/07/2018	347	343	0.59	314	11100	-	745	40	6090	1160	1080	0.032	-	-	-	-	-	-	-	-	-
WB5	17/12/2018	369	359	1.33	284	11900	-	715	38	6560	1070	-	<0.01	-	-	-	-	-	-	-	-	-
WB5	03/08/2019	354	351	1.82	318	11700	-	744	39	6170	1180	1040	0.1	-	-	-	-	-	-	-	-	-
WB5	05/12/2019	356	394	5.17	313	11500	0.3	858	56	7050	1070	-	-	-	-	-	-	-	-	-	-	-
WB7	27/10/2016	-	-	-	-	-	-	-	-	-	4300	-	-	-	-	-	-	-	-	-	-	-
WB7	21/07/2018	705	713	0.59	709	21600	-	1980	62	11800	4320	4660	0.034	-	-	-	-	-	-	-	-	-
WB7	17/12/2018	695	670	1.83	679	21200	-	1790	61	11200	4480	-	<0.01	-	-	-	-	-	-	-	-	-
WB7	03/08/2019	703	713	0.74	759	21200	-	1950	57	11800	4770	4020	<0.1	-	-	-	-	-	-	-	-	-
WB7	05/12/2019	676	673	0.28	617	20400	0.4	1860	67	11200	4600	-	-	-	-	-	-	-	-	-	-	-
WBGT3	04/12/2016	700	738	2.63	454	21700	0.3	1440	38	13700	3790	-	6.1	<0.05	2.6	4.2	<0.02	<0.02	4.2	113	5	4
WBGT3	05/07/2017	837	694	9.3	415	26300	0.2	1570	36	12500	4120	-	0.1	<0.05	2.1	2.3	0.02	<0.02	2.3	105	5	4
WBGT3	26/12/2017	817	736	5.21	524	25600	0.3	1470	46	13500	4140	-	0.1	<0.05	1.4	1.4	<0.02	<0.02	1.4	112	<5	<5
WBGT3	20/07/2018	705	729	1.67	580	21700	-	1760	95	12700	3980	3910	<0.01	-	-	-	-	-	-	-	-	-
WBGT3	01/02/2019	682	660	1.69	449	21100	-	1490	50	11800	3760	-	<0.01	-	-	-	-	-	-	-	-	-
WBGT3	02/08/2019	686	791	7.05	595	21100	-	1830	58	14000	3950	3680	<0.1	-	-	-	-	-	-	-	-	-
WBGT3	05/12/2019	685	683	0.16	441	21100	0.3	1620	64	12100	3900	-	-	-	-	-	-	-	-	-	-	-
Balanad - LPS yellow trigger level	-	-	-	7	1220	41875	1	3324	105	24381	9642	9642	-	5	5	5	5	5	5	-	-	-
Balanad - LPS red trigger level	-	-	-	1464	50250	2	3989	126	29258	11570	11570	-	25	25	25	25	25	25	25	-	-	-
ANZECC 2000 irrigation long-term trigger values	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	5	-	-	-
ANZECC 2000 irrigation short-term trigger values	-	-	-	-	-	-	2	-	-	-	-	-	-	5	5	5	5	5	5	-	-	-
ANZECC (2000) stock water guidelines	-	-	-	1000	-	-	2000	-	-	1000	1000	-	-	-	-	4.43	3.29	-	-	-	-	-







Analyte	Anions	Cations	Ionic Balance	Calcium (Dissolved)	Chloride	Fluoride	Magnesium (Dissolved)	Potassium (Dissolved)	Sodium (Dissolved)	Sulfate (Dissolved)	Sulfate (Total)	Sulfide as S	Nitrate & Nitrite as N	Ammonia as N	Kjeldahl Nitrogen as N	Nitrate as N	Nitrite as N	Nitrogen as N (Total)	Carbon (Total)	DOC	TOC
limit	mg/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
LOD	0.01	0.01	0.01	1	1	0.1	3	3	3	1	0.1	0.1	0.01	0.01	0.1	0.1	0.01	0.1	5	1	1
field id																					
date																					
HD1	25/10/2016	-	-	-	-	-	-	-	-	<1	-	-	-	-	-	-	-	-	-	-	-
HD1	28/10/2016	69.9	60.9	6.92	29	2160	0.4	44	22	1270	<1	-	<0.1	<0.05	1.4	2.3	<0.02	<0.02	2.3	112	6
HD1	05/07/2017	68	58	7.94	23	2090	0.4	45	21	1210	1	-	<0.1	<0.05	1.5	1.6	0.02	<0.02	1.6	103	5
HD1	26/11/2017	68.4	62.2	4.74	32	2120	0.4	47	25	1290	<1	-	<0.1	<0.05	1.7	1.7	<0.02	<0.02	1.7	109	<5
HD1	20/07/2018	64.8	58	5.5	40	1950	-	59	28	1160	<1	2.19	<0.01	-	-	-	-	-	-	-	-
HD1	17/12/2018	61.2	66.8	2.76	42	1940	-	52	136	1320	<1	-	<0.01	-	-	-	-	-	-	-	-
HD1	01/08/2019	64.2	63.2	0.84	46	1940	-	64	31	1260	<1	0.162	<0.1	-	-	-	-	-	-	-	-
HD1	06/12/2019	64.2	66.8	1.97	40	1950	0.4	67	39	1340	<1	-	-	-	-	-	-	-	-	-	-
Karrahomestead	25/10/2016	-	-	-	-	-	-	-	-	<1	-	-	-	-	-	-	-	-	-	-	-
Karrahomestead	04/12/2016	91.3	84	5.22	40	2990	0.2	64	26	1750	1	-	<0.1	<0.05	1.3	2.4	<0.02	<0.02	2.4	102	6
Karrahomestead	09/07/2017	91.1	82.9	5.29	52	2950	0.2	87	33	1650	<1	-	<0.1	<0.05	1.9	2	<0.02	<0.02	2	99	8
Karrahomestead	26/11/2017	103	84.7	9.62	55	3140	0.2	77	30	1720	<1	-	<0.1	<0.05	1.8	1.8	<0.02	<0.02	1.8	107	<5
Karrahomestead	19/07/2018	86.2	77.3	5.46	62	2720	-	88	33	1520	<1	0.344	<0.01	-	-	-	-	-	-	-	-
Karrahomestead	11/12/2018	91.4	74.7	10.1	44	2940	-	73	32	1510	<1	-	0.012	-	-	-	-	-	-	-	-
Karrahomestead	01/08/2019	94	79.9	8.09	67	3000	-	90	34	1570	<1	-	-	-	-	-	-	-	-	-	-
Karrahomestead	06/12/2019	91.3	77.5	8.18	54	2920	0.2	88	40	1530	<1	-	-	-	-	-	-	-	-	-	-
T01	25/10/2016	-	-	-	-	-	-	-	-	<1	-	-	-	-	-	-	-	-	-	-	-
T01	26/11/2017	90.7	75.6	9.12	48	2930	0.4	57	25	1560	3	-	<0.1	<0.05	1.9	1.9	<0.02	<0.02	1.9	103	<5
T01	19/07/2018	79.1	70.6	5.66	56	2480	-	70	28	1410	<1	0.514	<0.01	-	-	-	-	-	-	-	-
T01	11/12/2018	84	69.2	9.66	42	2690	-	57	27	1420	<5	-	<0.01	-	-	-	-	-	-	-	-
T01	01/08/2019	56.4	53.5	2.58	56	1690	-	52	30	1050	8	0.221	<0.1	-	-	-	-	-	-	-	-
T01	06/12/2019	81.7	77.5	2.61	53	2590	0.4	74	37	1560	<1	-	-	-	-	-	-	-	-	-	-
T02	25/10/2016	-	-	-	-	-	-	-	-	<1	-	-	-	-	-	-	-	-	-	-	-
T02	26/11/2017	65.3	59.8	4.39	29	2040	0.3	42	20	1250	1	-	<0.1	<0.05	1.4	1.4	<0.02	<0.02	1.4	99	<5
T02	19/07/2018	62	67.6	4.35	47	1890	-	66	27	1360	1	0.849	0.022	-	-	-	-	-	-	-	-
T02	11/12/2018	61.7	57.2	3.83	26	1910	-	43	22	1190	<5	-	0.016	-	-	-	-	-	-	-	-
T02	01/08/2019	59.8	59.8	0.04	44	1820	-	58	25	1200	<1	1.75	<0.1	-	-	-	-	-	-	-	-
T02	06/12/2019	-	-	-	37	1870	0.3	60	30	1260	<1	-	-	-	-	-	-	-	-	-	-
T03	25/10/2016	-	-	-	-	-	-	-	-	<1	-	-	-	-	-	-	-	-	-	-	-
T03	26/11/2017	58	56.2	1.6	29	1780	0.4	39	26	1170	<1	-	<0.1	<0.05	1.8	1.8	<0.02	<0.02	1.8	103	6
T03	19/07/2018	52.4	65.1	10.9	48	1540	-	64	36	1300	<1	0.192	<0.01	-	-	-	-	-	-	-	-
T03	11/12/2018	54	46.4	4.41	22	1630	-	35	26	1030	<2	-	<0.08	-	-	-	-	-	-	-	-
T03	01/08/2019	89.2	74.1	9.28	59	2850	-	68	28	1490	<1	0.233	<0.1	-	-	-	-	-	-	-	-
T03	06/12/2019	-	-	-	34	1630	0.5	52	35	1080	6	-	-	-	-	-	-	-	-	-	-

Balanald - Renmark yellow trigger level	-	-	5	101	4556	1	130	47	2880	4	4	-	-	5	5	5	5	5	5	-	-
Balanald - Renmark red trigger level	-	-	-	121	5468	2	156	56	3456	5	5	-	-	25	25	25	25	25	25	-	-
ANZECC 2000 irrigation long-term trigger values	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	5	-	-	-
ANZECC 2000 irrigation short-term trigger values	-	-	-	-	-	2	-	-	-	-	-	-	-	5	5	5	5	5	-	-	-
ANZECC (2000) stock water guidelines	-	-	-	1000	-	-	2000	-	-	1000	1000	-	-	-	-	4.43	3.29	-	-	-	-

Analyte	TRH C6-C9	TRH C10-C14	TRH C15-C28	TRH C29-C36	TRH C6-C10	TRH C10-C16	TRH C16-C34	TRH C10-C36 (sum)	TRH C10-C40 (sum)	TRH C34-C40	TRH C6-C10 minus BTEX (F1)	TRH+C10-C16 less Naphthalene (F2)	Naphthalene	Toluene	Ethylbenzene	Xylenes (Total)	ortho-Xylene	meta- $\beta$ -para-Xylene	Benzene	Sum of BTEX	Radium-226 (Total)	Radium-228 (Total)	
Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	Bq/L	Bq/L	
SDR	20	50	100	50	20	100	100	50	100	100	20	100	5	2	2	2	2	2	1	1	0.05	0.08	
Field ID	Date																						
HD1	28/11/2016	40	<50	<100	<50	50	<100	<100	<100	<100	<20	-	<5	20	<2	13	3	10	1	34	0.04	0.122	
HD1	05/07/2017	<20	<50	<100	<50	<20	<100	<100	<100	<100	<20	<100	<5	<2	<2	<2	<2	<2	<2	<1	<1	0.062	0.12
HD1	26/11/2017	-	-	-	-	-	<100	<100	<100	<100	-	<100	<5	<2	<2	<2	<2	<2	<2	<1	<1	0.075	0.187
Karratomestead	04/12/2016	<20	<50	<100	<50	<20	<100	<100	<100	<100	<20	<100	<5	<2	<2	<2	<2	<2	<2	<1	<1	0.117	0.163
Karratomestead	09/07/2017	<20	<50	<100	<50	<20	<100	<100	<100	<100	<20	<100	<5	<2	<2	<2	<2	<2	<2	<1	<1	0.094	0.134
Karratomestead	26/11/2017	-	-	-	-	-	<100	<100	<100	<100	-	<100	<5	<2	<2	<2	<2	<2	<2	<1	<1	0.083	0.134
T01	26/11/2017	-	-	-	-	-	<100	<100	-	<100	-	<100	<5	<2	<2	<2	<2	<2	<2	<1	<1	0.116	0.177
T02	26/11/2017	-	-	-	-	-	<100	<100	-	<100	-	<100	<5	<2	<2	<2	<2	<2	<2	<1	<1	0.033	0.077
T03	26/11/2017	-	-	-	-	-	<100	<100	-	<100	-	<100	<5	<2	<2	<2	<2	<2	<2	<1	<1	0.073	0.149

Balkanald - Renmark yellow trigger level	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Balkanald - Renmark red trigger level	-	-	-	-	-	-	-	300	-	-	-	-	-	-	-	-	-	-	-	-	5	2
ANZECC 2000 irrigation long-term trigger values	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ANZECC 2000 irrigation short-term trigger values	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ANZECC (2000) stock water guidelines	-	-	-	-	-	-	-	-	-	-	-	-	300	-	-	600	-	-	-	-	5	2

**Balranald Project - Groundwater levels and assessment against Hydraulic SSTLs (mbTOC)**

Well ID	Formation	Dec-16	Jul-17	Nov-17	Jul-18	Dec-18	Jul-19	Dec-19
UGM – 1D	LPS	13.86	13.89	13.87	13.95	13.92	13.94	13.94
UGM – 2D	LPS	14.59	14.61	14.60	14.66	14.67	14.71	14.72
UGM – 4D	LPS	14.63	14.66	14.66	14.70	14.73	14.78	14.78
UGM – 5D	LPS	13.84	13.88	13.90	13.93	13.95	13.98	13.25
UGM – 6D	LPS	13.27	13.30	13.31	13.36	13.38	13.43	13.43
UGM – 7D	LPS	14.07	14.12	14.12	14.18	14.20	14.24	13.99
UGM – 8D	LPS	14.06	14.09	14.10	14.14	14.16	14.20	14.21
UGM – 10D	LPS	12.90	12.92	12.95	13.02	13.01	13.06	13.07
UGM – 11D	LPS	13.49	13.54	13.54	13.59	13.63	13.68	13.69
UGM – 12D	LPS	13.70	13.78	13.74	13.82	13.83	13.88	13.89
UGM – 13D	LPS	13.38	13.46	13.41	13.53	13.55	13.60	13.62
UGM – 14D	LPS	13.70	13.75	13.74	13.82	13.84	13.86	13.88
UGM – 15D	LPS	13.68	13.72	13.71	13.79	13.82	13.85	13.85
GW036866 (2)	LPS	-	-	-	11.30	11.04	11.36	11.47 (TOC)
LPSPB03	LPS	12.55	12.60	12.62	12.67	12.72	12.75	12.75
LPSPB04	LPS	13.35	13.40	13.38	13.45	13.47	13.50	13.50
WB2	LPS	-	-	-	17.91	17.91	17.99	18.04
WB41	LPS	14.73	15.35	15.36	15.30	15.32	15.36	15.37 (TOC)
WB5	LPS	-	-	-	17.30	17.31	17.37	17.44
WB7	LPS	-	-	-	12.75	12.54	12.76	12.60
WBG3	LPS	13.14	13.20	13.19	13.28	13.30	13.34	13.34
UGM – 1S	SFM	13.69	13.70	13.72	13.74	13.77	13.79	13.80
UGM – 2S	SFM	14.20	14.32	14.22	14.29	14.31	14.35	14.39
UGM – 5S	SFM	13.49	13.52	13.51	13.55	13.58	13.60	13.88
UGM – 6S	SFM	13.10	13.15	13.11	13.14	13.15	13.19	13.21
UGM – 7S	SFM	13.75	13.79	13.78	13.82	13.94	13.87	13.62
UGM – 8S	SFM	13.77	13.81	13.81	13.82	13.83	13.86	13.86
UGM – 10S	SFM	12.74	13.00	12.65	12.72	12.73	12.79	12.82
UGM – 11S	SFM	13.40	13.45	13.47	13.47	13.53	13.54	13.55
UGM – 12S	SFM	13.43	13.47	13.46	13.49	13.50	13.52	13.53
UGM – 13S	SFM	13.28	13.33	13.33	13.36	13.37	13.40	13.40
UGM – 14S	SFM	13.45	13.48	13.47	13.49	13.53	13.54	13.56
UGM – 15S	SFM	13.25	13.30	13.30	13.33	13.36	13.37	13.39
GW036673(1)	SFM	-	-	-	14.89	14.90	14.92	14.94 (TOC)
GW036866(1)	SFM	-	-	-	11.69	11.55	11.75	11.80 (TOC)
SHOB03	SFM	13.23	13.27	13.26	13.48	13.34	13.39	13.39
SHOB04	SFM	14.27	14.31	14.30	13.31	14.33	14.33	14.34
WB1	SFM	-	-	-	19.10	19.02	19.06	19.11
WB42	SFM	15.02	15.49	15.47	15.48	15.51	15.53	15.54 (TOC)
WBG4	SFM	13.80	13.85	13.83	13.91	13.92	13.95	13.96

LPS: Loxton-Parrilla Sands Aquifer

SFM: Shepparton Formation Aquifer