25 May 2021
Project Number 2017002
RGS Technical Memorandum - Rev A

Magnetic South Pty Ltd

MINE WASTE AND WATER MANAGEMENT

Attention: Mr James Xu – General Manager

Subject: Geochemical Assessment of Mining Waste Materials

1 Introduction

This technical memorandum is provided to Magnetic South Pty Ltd (MRL) by RGS Environmental Pty Ltd (RGS) to assist with a response to a request for information received from the Queensland Department of Environment and Science (DES) regarding an application for an Environmental Authority (EA) for the Gemini Coal Project (the 'Project'). The Project is located on EPC 881 in the Bowen Basin, approximately 20 km east of Bluff and 6 km west of Dingo, and the tenement straddles the Capricorn Highway and the Blackwater-Gladstone rail network (**Figure A1, Attachment A)**).

2 Responses to Information Requests

This technical memorandum provides responses to specific information requested by DES related to the geochemical assessment of mining waste materials (spoil and coal reject) at the Project, which are summarised in this section and detailed in **Attachment C**. A geochemical assessment of mining waste materials at the Project has previously been completed[1,2] and this information was included in the EA application provided to DES.

2.1 Target Coal Seams and Sample Depth

Recoverable coal from the Project will come from the Rangal Coal Measures and specifically the Aries, Castor and Pollox coal seams as illustrated in **Figure A2** (**Attachment A**). Section 2.1 of Reference 1 is incorrect and coal seams in the Upper Burngrove Formation will not be mined. Therefore, the sample depth intervals used in the geochemical assessment program (described in Table 3-1 of Reference 1) are representative of the geochemical characteristics of the materials that will be mined.

2.2 Location of Drill Holes

The three drill holes used to collect representative samples of mining waste (spoil) materials were taken in 2017 from an open pit area that was within the initial mine plan at that time. The mine plan was subsequently updated and optimised as additional information regarding coal resources was obtained. The current location of the open pits and the three drill holes is provided in **Figure A3** (**Attachment A**).

While it is acknowledged that the three drill holes are located outside the planned open pit areas, the sedimentary stratigraphic profile and materials encountered at these drill holes are very similar to those of the planned open pit areas (soil, clay, sandstone and siltstone). It should be noted that the Rangal Coal Measures are mined at a number of locations in the Bowen Basin and mine spoil is typically very low sulfur, has excess acid neutralising capacity (ANC) and is classified as Non-Acid Forming (NAF)[3].

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[1] RGS (2019). *Geochemical Assessment of Mining Waste Materials*. Report prepared by RGS Environmental Pty Ltd for Magnetic South Pty Ltd. 20 September.
[2] RGS (2020). *Geochemical Assessment of Coal Reject Materials. Gemini Cola Project*. Report prepared by RGS Environmental Pty Ltd for Magnetic South Pty Ltd. 15 March.
[3] Robertson A., Maddocks G. and Swane I. (2015). *Understanding Mine Waste Geochemistry in the Bowen Basin: From Exploration to Mine Closure*. Paper presented at the Bowen Basin Symposium, Brisbane 6 – 9 October.

Whilst overburden and interburden materials generated at some coal mines in the Bowen Basin can occasionally present a risk of AMD at spoil storage areas, this is unusual and typically localised. Most of the geochemical action in terms of presence of reactive sulfur (as a sulfide) is either within or close to particular coal seams and is therefore more closely associated with some coal and coal reject materials. In simplistic terms, a coal seam (including highly carbonaceous non-coal units) can be thought of as a 'geochemical sponge' with some potential for elevated sulfur content and possibly Acid and Metalliferous Drainage (AMD) in the absence of significant inherent ANC.

Sulfur in coal is derived from two sources that include the plant materials and ambient fluids in the coal forming environment. Abundance of sulfur in coal is controlled by depositional environment and the diagenesis of the coal seams and overlying strata. Typical low sulfur coal seams were deposited in an alluvial (deltaic) environment and the peat was not influenced by seawater. The sulfur in these low-sulfur coals is derived mostly from its parent plant materials. This is the case for the Rangal Coal Measures, which conformably overlie the Burngrove Formation and consist primarily of siltstones, sandstones and coal seams. The sediments and coal seams are laterally continuous, consistent with a deltaic depositional environment related to episodes of delta abandonment.

By contrast, high sulfur coal seams are generally associated with marine strata where sulfate in the seawater diffuses into the peat and is reduced by micro-organisms to hydrogen sulfide, elemental sulfur and polysulfides. During early diagenesis in a reducing environment, ferric iron is reduced to ferrous iron, which reacts with hydrogen sulfide to form iron monosulfide. Iron monosulfide is later transformed by reaction with elemental sulfur into minerals such as pyrite or marcasite.

The potential for AMD at coal mine sites in the Bowen Basin will therefore depend upon the specific coal measures being mined and the genesis and history of the coal seams. In general overburden and interburden materials, which report as spoil at coal mines in the Bowen Basin, have very little potential for AMD (as a bulk material) and many of these materials have excess acid neutralising characteristics. The volume of PAF coal reject materials is generally quite small compared to the volume of spoil material typically represent less than a few percent of the total mining waste materials generated at a particular mining operation and the risk of AMD is low and manageable.

At the Gemini Project, the Rangal Coal Measures that will be mined and the spoil generated from overburden and interburden materials will be very low in sulfur with excess ANC and be classified as NAF. The sedimentary rocks and coal seams are laterally continuous consistent with their depositional environment. These characteristics are typical of spoil characteristics at proposed and actual coal mines in close proximity to the Project such as the Walton Coal Project[4], Baralaba[5], Jellinbah and Yarrabee[6] mines.

The Rangal Coal Measures are Late Permian and termed Group IV coals as they resulted from the final phase of coal deposition in the Bowen Basin, are known to produce coals with good coking properties. The coals in this group are the most diverse in terms of quality, and also the most widely distributed within the Bowen Basin. They are characterised by comparatively low reactive content and low sulfur (Rio Doce Australia, 2007)[7].

[4] RGS (2018). Walton Coal Project. Geochemical Assessment of Mining Waste Materials. Report prepared by RGS Environmental Pty Ltd for Aquila Resources Pty Ltd. 15 October.

[5] RGS (2012). Geochemical Assessment of Spoil and Potential Coal Reject Materials: Baralaba North Project. Report prepared by RGS Environmental Pty Ltd for Cockatoo Coal Ltd. February

[6] RGS (2010). Geochemical Assessment of Overburden and Spoil Materials: Yarrabee Coal Project. Report prepared by RGS Environmental Pty Ltd for Yarrabee Coal Company Pty Ltd. 15 October.

[7] Rio Doce Australia. *Belvedere Coal Project Exploration Study Report. Section 7, Geology and Resources.* April 2007.

2.3 Location of Coal Reject Materials

The position of coal reject materials stored in the out-of-pit and in-pit spoil emplacement areas is shown conceptually in **Figures A4** and **A5**, respectively (**Attachment A**). Coal reject materials (and any other PAF mining waste materials encountered during mining) will be selectively handled and encapsulated within the spoil emplacement areas well away from the outside surface of rehabilitated landforms, where there is a low risk of connectivity to surface water or groundwater resources. The encapsulated materials will be covered with at least 10 m of NAF spoil material. At the out-of-pit emplacement areas, the coal reject materials will be positioned such that were the encapsulated materials to produce an acidic leachate, the leachate would not report outside the pit shell and would be neutralised by the much larger volume of encapsulating NAF spoil materials with excess ANC. When sufficient capacity is available, coal reject materials will be preferentially placed as backfill deep in the mining areas, and if practical, below the predicted level of the post-mining groundwater table.

The total volume of spoil materials that will be generated over the 22 year life of mine is over 1 billion tonnes and the corresponding total coal reject volume is less than 10 million tonnes. Therefore the coal reject materials make up a small fraction (< 1 %) of the total spoil materials and therefore there is more than sufficient capacity to accommodate the coal reject materials within the spoil materials at both the out-of-pit and in-pit spoil emplacement areas, as required[8].

2.4 Coal Reject: Spacial Variability

The location of the drill holes from which the 22 coal reject materials from 14 drill holes were acquired are shown in **Figure A3** (**Attachment A**) and the sample composition is provided in **Table B1** (**Attachment B**). The samples were prepared by the coal quality laboratory and supplied to represent coal reject samples from processing the target seams. The total sulfur content of the target seams obtained from all raw coal analysis averages 0.65 %S and the average value for the target coal seams typically ranges from 0.47 to 1.02 %S[9,10]. Total sulfur contours have been plotted for the main target seams and are provided in **Figures A6** to **A11** (**Attachment A**). The results indicate that the total sulfur content of the coal seams is relatively consistent across the open pit areas and therefore the average geochemical nature of bulk coal reject materials generated from processing the target coal seams is also likely to be relatively consistent (although natural variability will occur). It should be noted that while a proportion of the total sulfur present in the coal materials will be present as pyrite/marcasite and may have the potential to generate acidity in the absence of inherent ANC, a proportion will also be present as organic sulfur, which has no potential to generate acid.

2.5 Number of Drill Holes

While it is acknowledged that there is a greater number of drill holes used to generate coal reject samples from the larger AB pit compared to the smaller C pit, this was unavoidable due to the lack of sample mass available from the coal quality laboratory from remnant coal reject samples. This is also the reason why in some cases, coal reject material from more than one drill hole needed to be combined at the coal quality laboratory for a particular coal seam to provide sufficient mass for the range of geochemical test required in the geochemical assessment program.

Notwithstanding, the total sulfur isopach information provided in **Section 2.4** indicates that the average total sulfur content of the coal seams is relatively consistent across the open pit areas and therefore the average geochemical nature of the bulk coal reject materials generated from processing the target coal seams is also likely to be relatively consistent (although natural variability will occur).

While some of the 14 drill holes used to generate the coal reject samples is located outside the planned pit boundaries, this was unavoidable as the pit boundary and mine plan has been optimised since the time of sampling. Given that the average geochemical nature of the bulk coal reject materials is

[8] JT Boyd Company (2021). *Gemini Project Schedule* (Excel spreadsheet) provided to RGS Environmental Pty Ltd on 23 April 2021 and email advice provided on 11 May 2021.
[9] JT Boyd Company (2020). *Coal Resource Report - Gemini Project* . Report prepared for Magnetic South Pty Ltd. July 2021.
[10] Minserve (2021). *Magnetic South Gemini Project. Coal Quality and Processing Review.* Report prepared for Magnetic South Pty Ltd. January.

expected to be relatively consistent, the coal reject samples are expected to reflect the characteristics of the coal reject material at the Project.

3 Conclusion

RGS has reviewed the request for additional information from DES regarding the geochemical assessment of mining waste materials at the Project information.

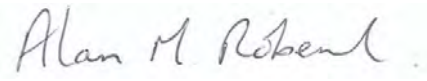
Based on the information presented in this technical memorandum, RGS holds the opinion that the geochemical characteristics of the mining waste (spoil and coal reject) materials at the Project are well understood and that these can be managed using the plans described in the EA Application.

4 Closing

If you have any questions regarding the information presented in this technical memorandum, please contact Alan Robertson on (+617) 3344 1222 or (+61) 431 620 623.

Yours sincerely,

RGS Environmental Pty Ltd



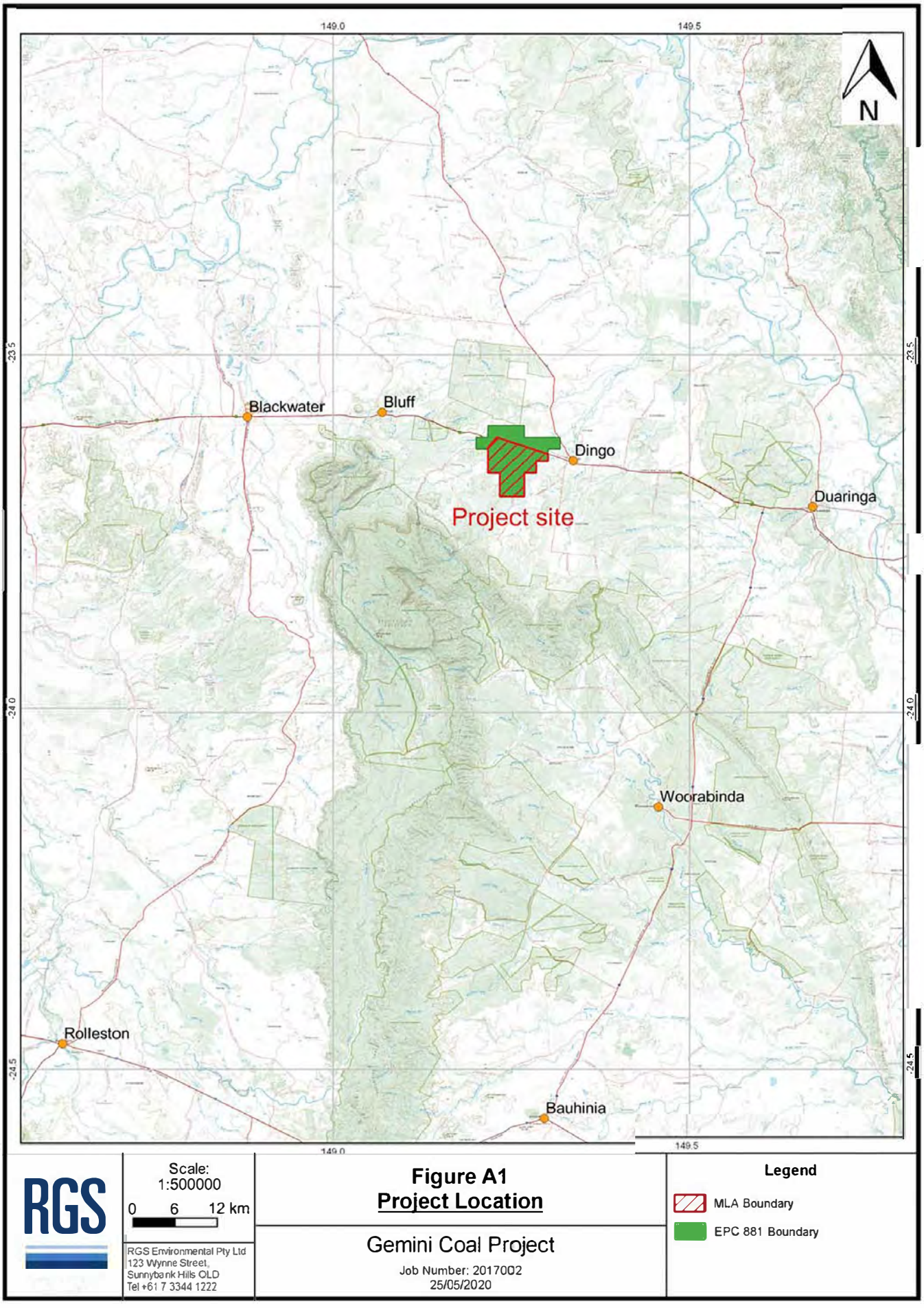
Dr. Alan M. Robertson
Principal Geochemist/Director

Attachments

Attachment A: Figures

Attachment B: Table B1

Attachment C: Information Request from DES


149.0
149.5
N
-23.5
-24.0
-24.5
Blackwater
Bluff
Dingo
Project site
Duaringa
Woorabinda
Rolleston
Bauhinia
Scale:
1:500000
0 6 12 km
RGS Environmental Pty Ltd
123 Wynne Street,
Sunnybank Hills QLD
Tel +61 7 3344 1222
Figure A1
Project Location
Gemini Coal Project
Job Number: 2017002
25/05/2020
Legend
MLA Boundary
EPC 881 Boundary

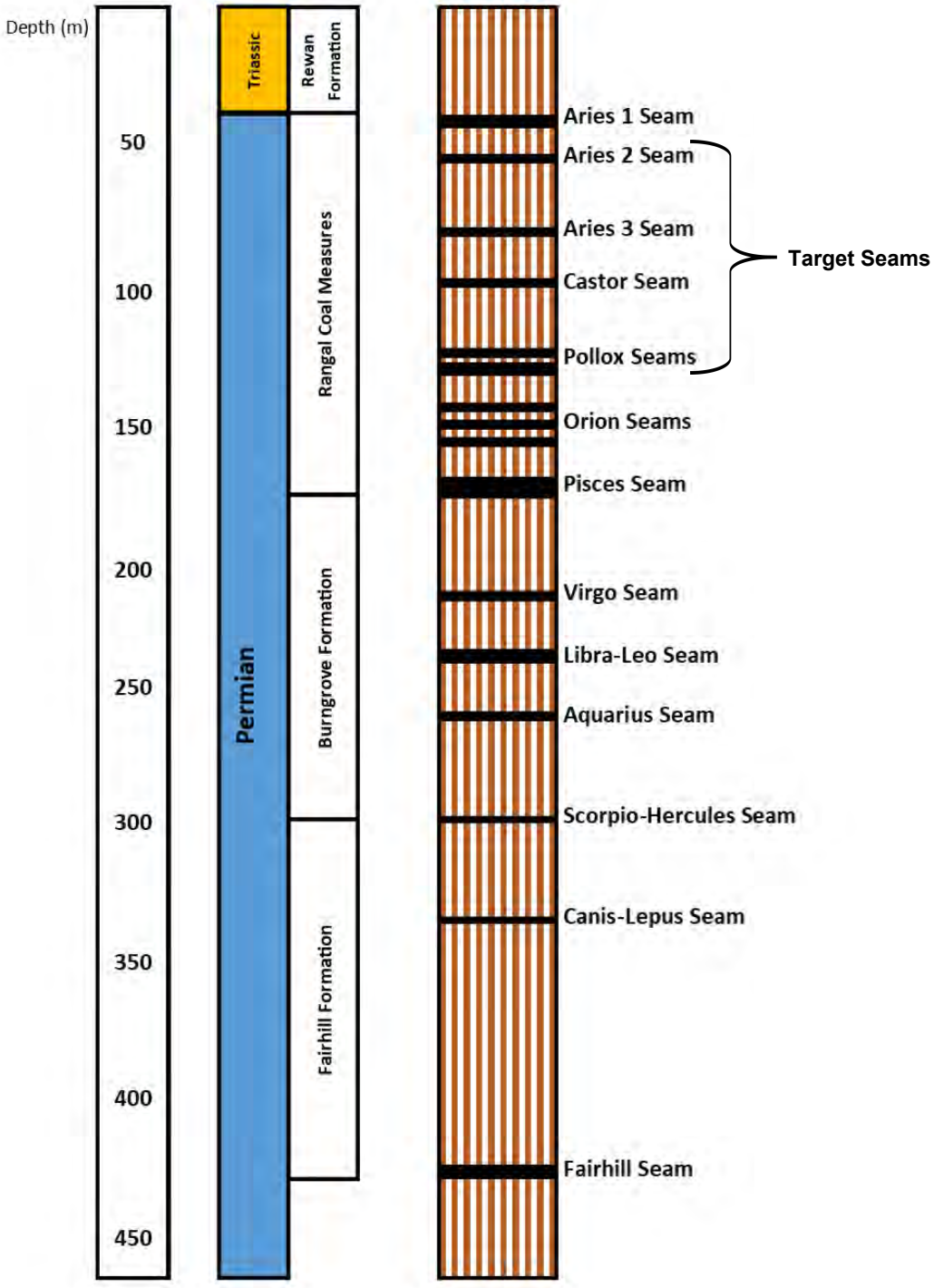


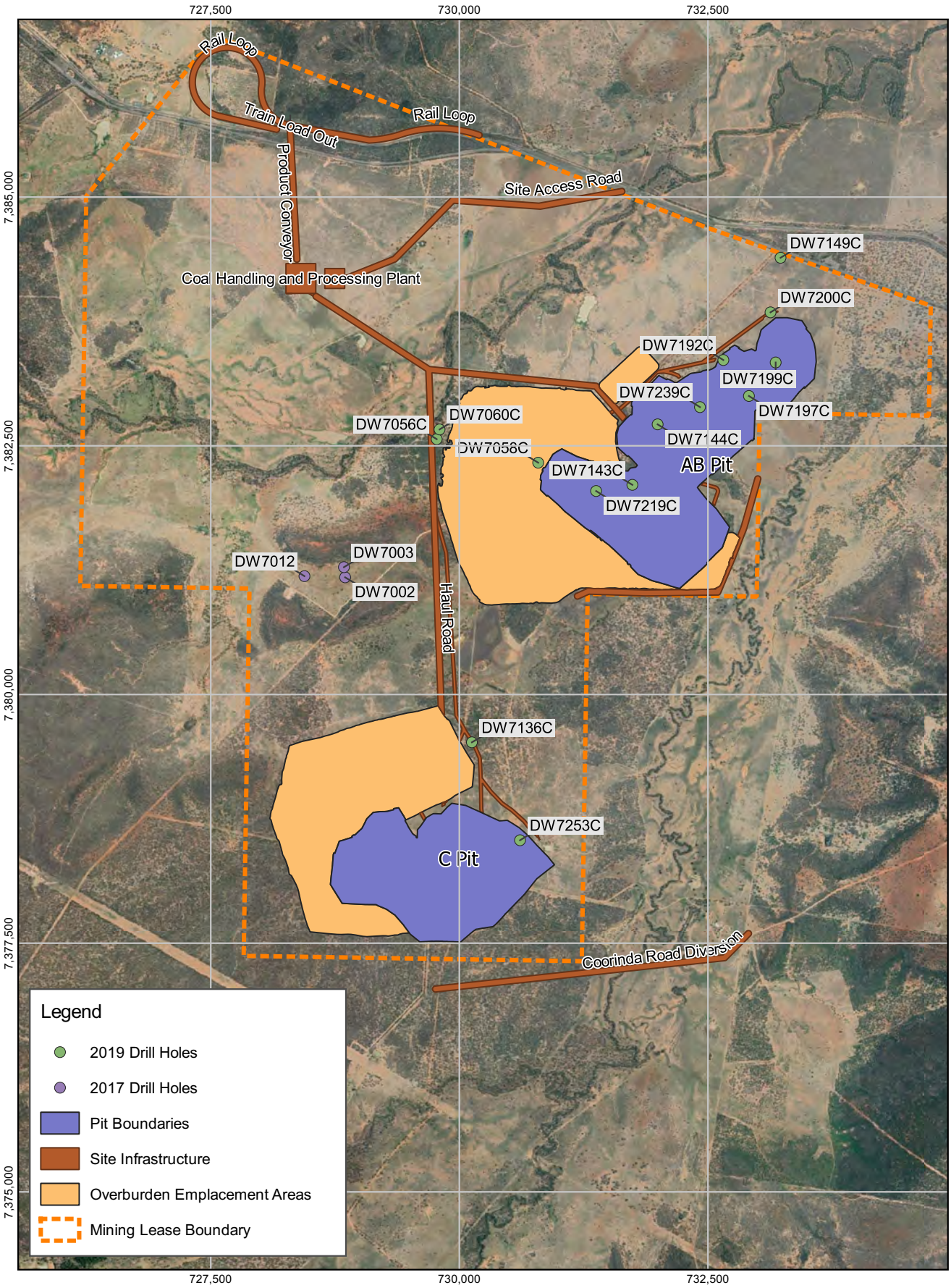
Figure A2

Representative Stratigraphic Column

RGS Environmental Pty Ltd
123 Wynne Street,
Sunnybank Hills QLD
Tel +61 7 3344 1222

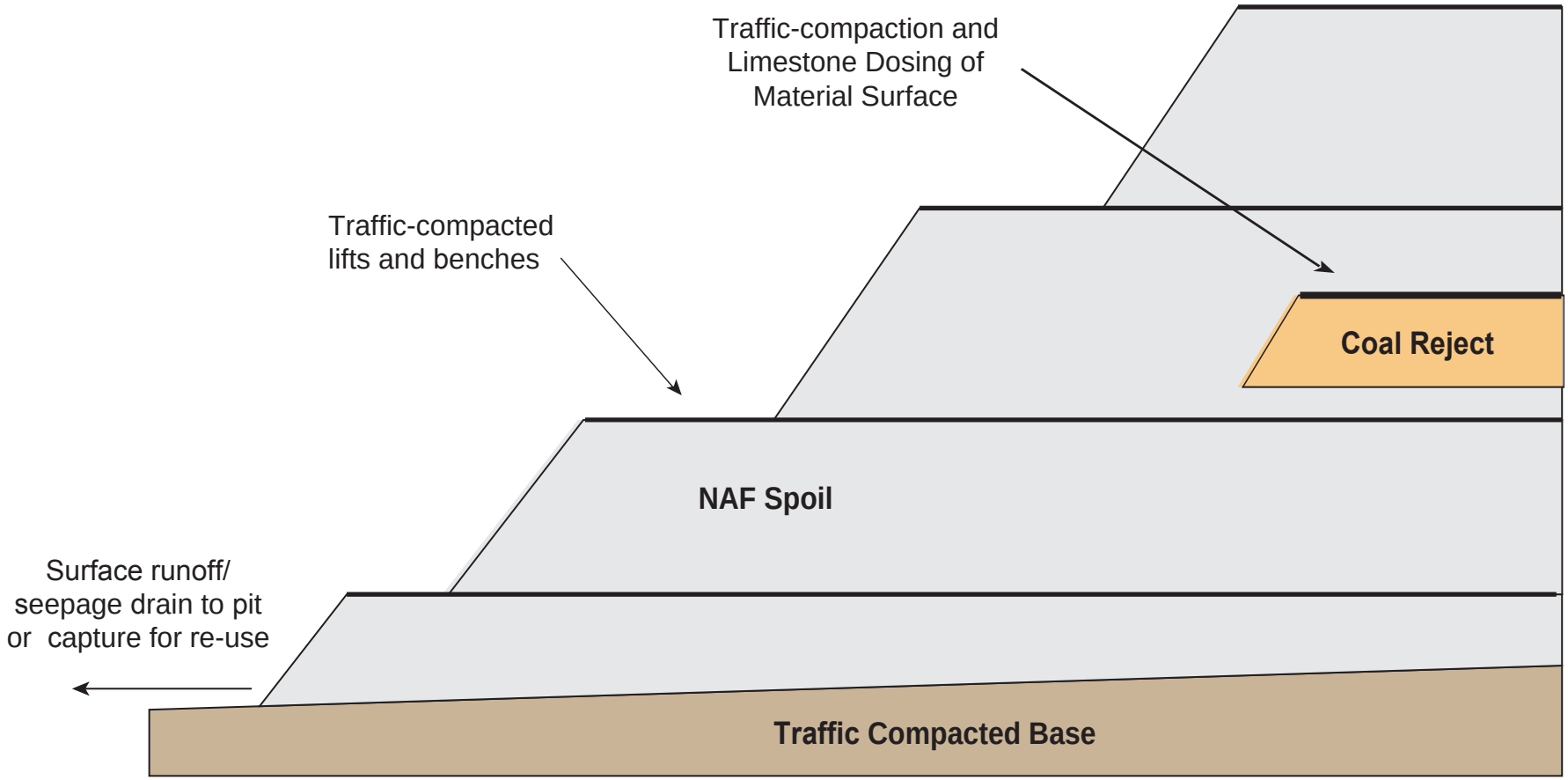
Gemini Coal Project

Job Number: 2017002
02/09/2019



Source: Magnetic South Pty Ltd; Google Satellite.

RGS	Scale 1:55,000 Datum:	Gemini Coal Project	0.5 0 0.5 1 1.5 2 km
	Dingo West Spatial Data_25052021.qgz; Project Layout	**Conceptual Project Layout**	Figure: A3 Job Number: 2017002 25/05/2021 N

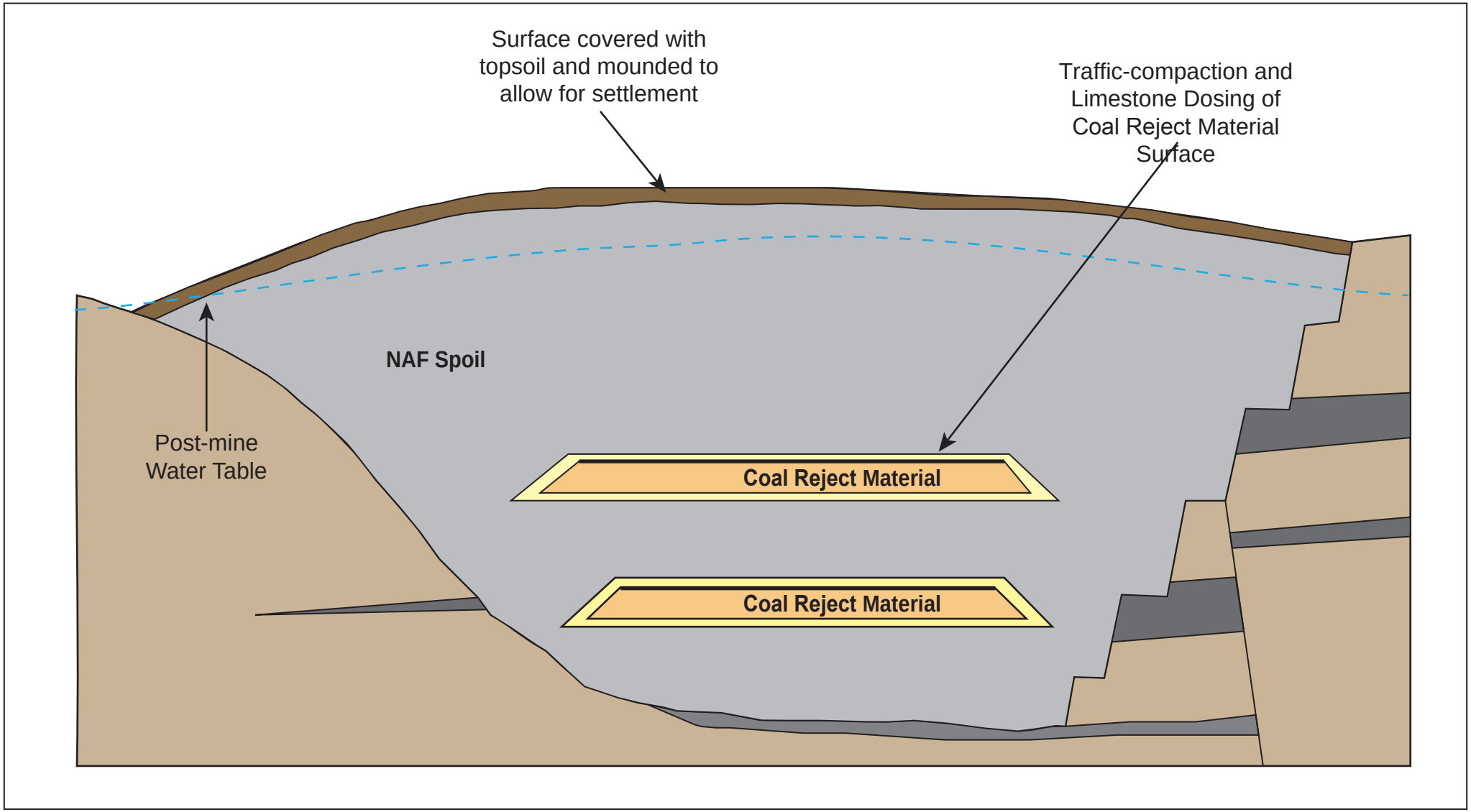


MAGNETIC SOUTH PTY LTD

GEMINI COAL PROJECT
Job Number: 2017002
Date: 25/05/2021

Figure: **A4**

Schematic cross-section of Above Ground Coal Reject Storage

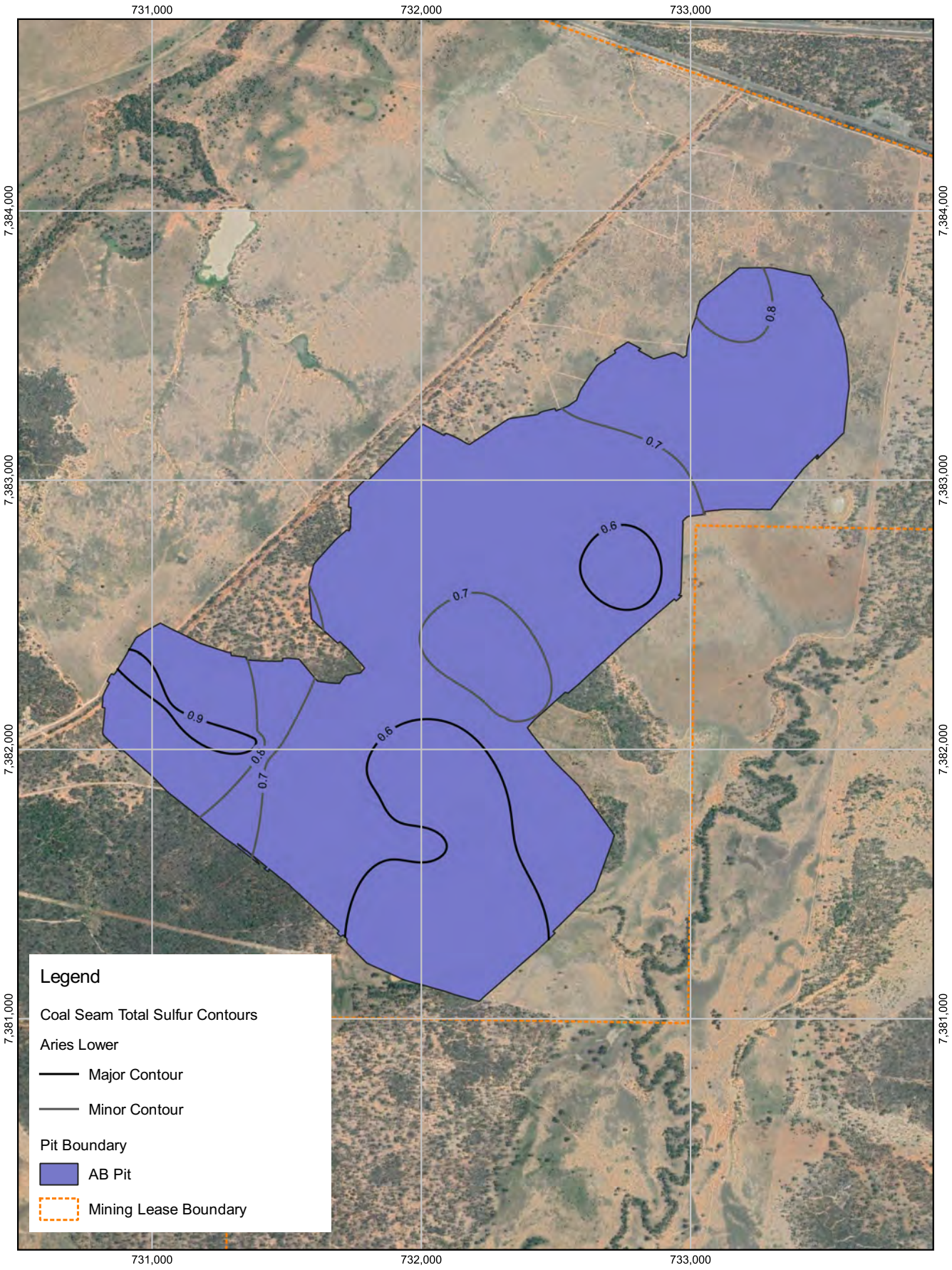


MAGNETIC SOUTH PTY LTD

GEMINI COAL PROJECT
Job Number: 2017002
Date: 25/05/2021

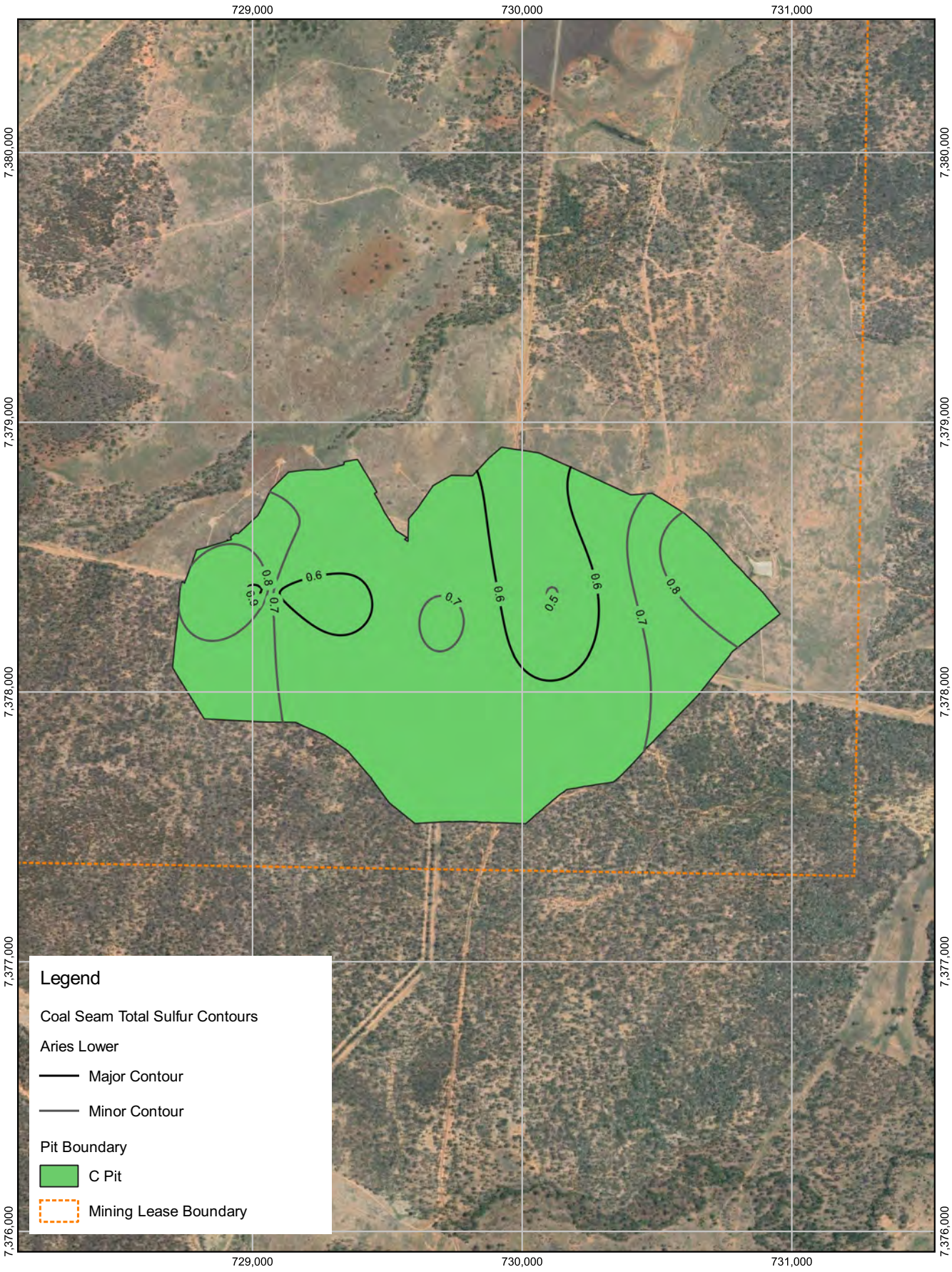
Figure: **A5**

Schematic cross-section of backfilled mine pits



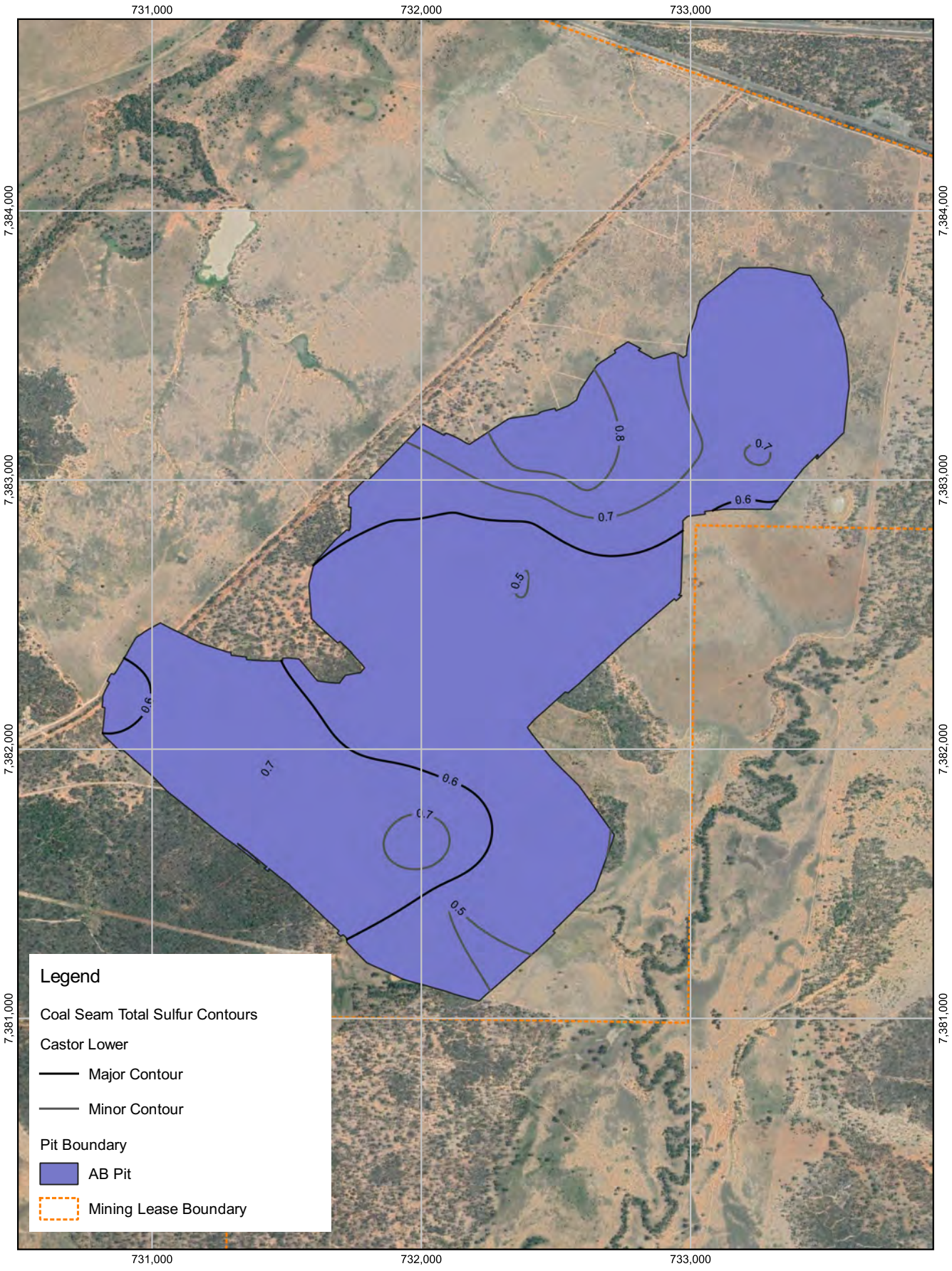
Source: Magnetic South Pty Ltd

RGS	Scale 1:20,000 Datum: GDA94 / MGA zone 55	Gemini Project Geochemical Assessment of Mining Waste Materials	200 0 200 400 600 m
	Dingo West Spatial Data_27042021.qgz; Coal Seam Sulfur Contours	**AB Pit - Aries 3 Seam Total Sulfur Concentrations**	Figure: A6 Job Number: 2017002 25/05/2021 N



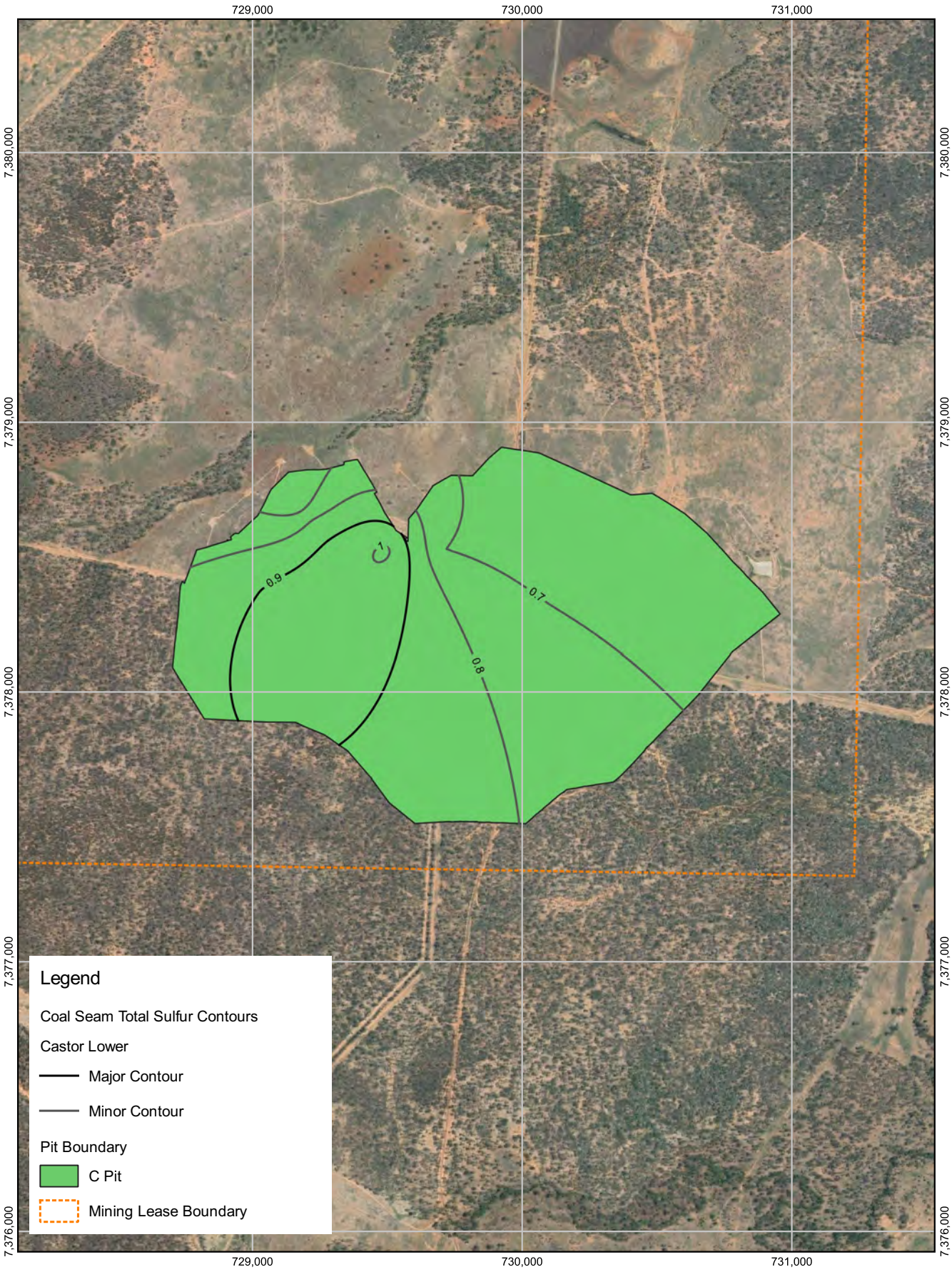
Source: Magnetic South Pty Ltd

RGS	Scale 1:20,000 Datum: GDA94 / MGA zone 55	Gemini Project Geochemical Assessment of Mining Waste Materials	200 0 200 400 600 m
	Dingo West Spatial Data_27042021.qgz; Coal Seam Sulfur Contours	**C Pit - Aries 3 Seam Total Sulfur Concentrations**	Figure: A7 Job Number: 2017002 25/05/2021 N



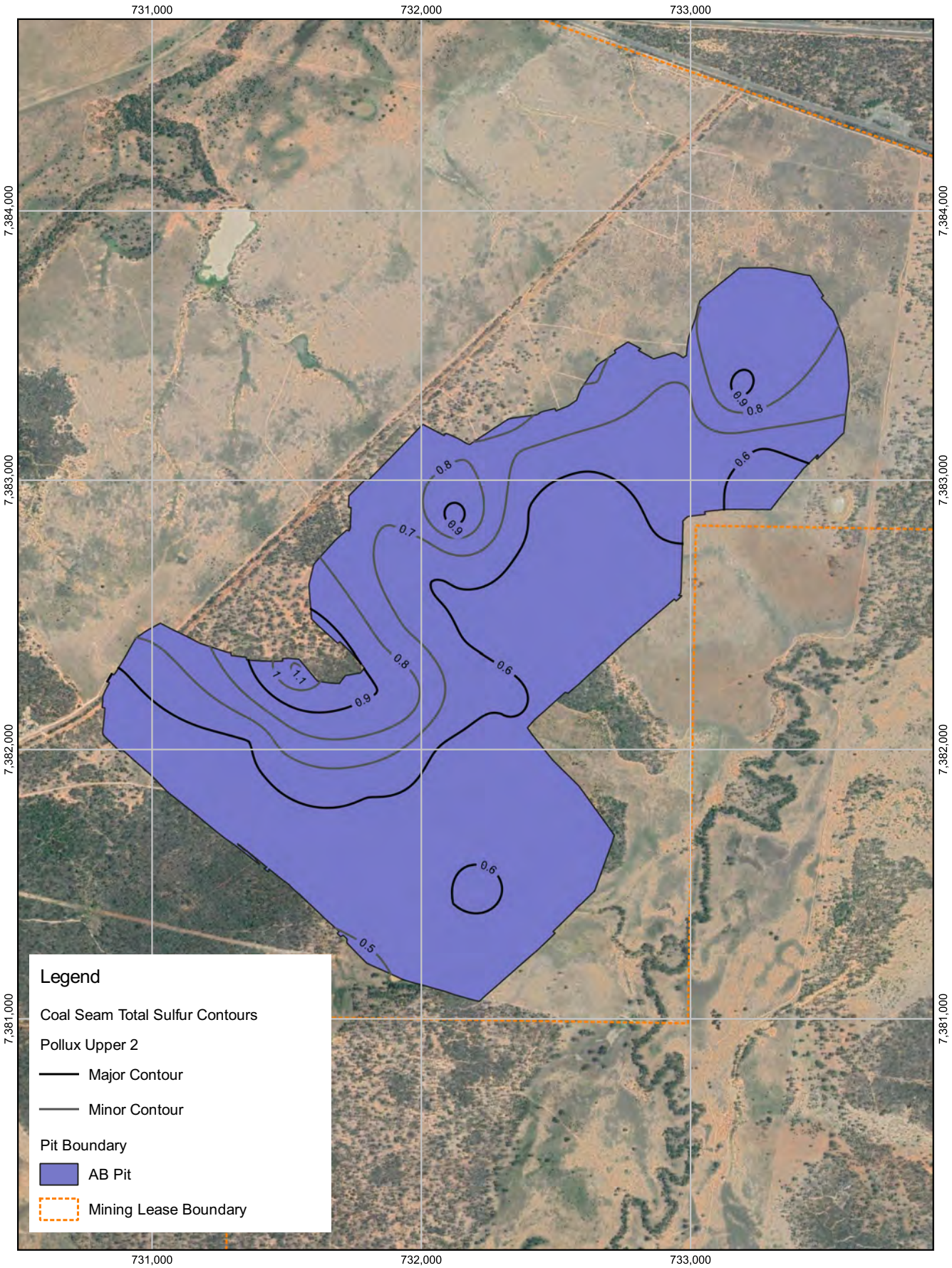
Source: Magnetic South Pty Ltd

RGS	Scale 1:20,000 Datum: GDA94 / MGA zone 55	Gemini Project Geochemical Assessment of Mining Waste Materials	200 0 200 400 600 m
	Dingo West Spatial Data_27042021.qgz; Coal Seam Sulfur Contours	**AB Pit - Castor Seam Total Sulfur Concentrations**	Figure: A8 Job Number: 2017002 25/05/2021 N



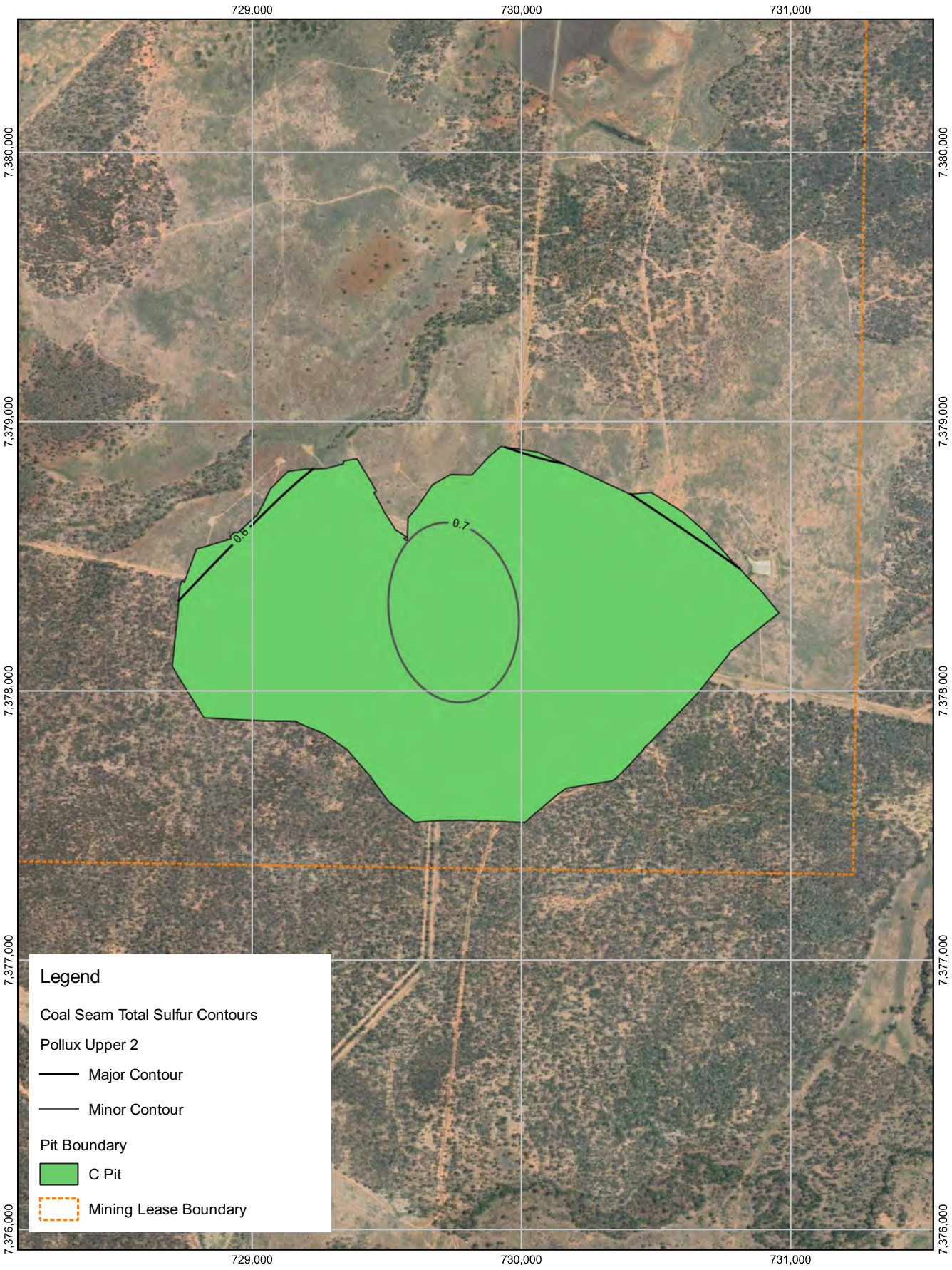
Source: Magnetic South Pty Ltd

RGS	Scale 1:20,000 Datum: GDA94 / MGA zone 55	Gemini Project Geochemical Assessment of Mining Waste Materials	200 0 200 400 600 m
	Dingo West Spatial Data_27042021.qgz; Coal Seam Sulfur Contours	**C Pit - Castor Seam Total Sulfur Concentrations**	Figure: A9 Job Number: 2017002 25/05/2021 N



Source: Magnetic South Pty Ltd

RGS	Scale 1:20,000 Datum: GDA94 / MGA zone 55	Gemini Project Geochemical Assessment of Mining Waste Materials	200 0 200 400 600 m
	Dingo West Spatial Data_27042021.qgz; Coal Seam Sulfur Contours	**AB Pit - Pollux Seam Total Sulfur Concentrations**	Figure: A10 Job Number: 2017002 25/05/2021 N



Source: Magnetic South Pty Ltd

RGS	Scale 1:20,000 Datum: GDA94 / MGA zone 55	Gemini Project Geochemical Assessment of Mining Waste Materials	200 0 200 400 600 m
	Dingo West Spatial Data_27042021.qgz; Coal Seam Sulfur Contours	**C Pit - Pollux Seam Total Sulfur Concentrations**	Figure: A11 Job Number: 2017002 25/05/2021 N

Attachment B Table B1: Coarse and Fine Reject Samples Selected for Geochemical Assessment

ALS Sample Number	Drill Hole Number	Coal Seam Name	Depth From (m)	Depth To (m)	Size From (cm)	Size To (cm)	Reject Type	RGS Composite Number
339	DW7056C	AR2	65.50	66.55	16.00	1.40	Coarse	1
479	DW7058C	AR2	85.35	86.80	16.00	1.40	Coarse	
619	DW7060C	AR3	60.74	63.02	16.00	1.40	Coarse	2
617	DW7060C	AR3	60.74	63.02	16.00	1.40	Coarse	
133	DW7149C	AR3	99.23	101.24	16.00	1.40	Coarse	3
129	DW7149C	AR3	99.23	101.24	16.00	1.40	Coarse	
69	DW7200C	AR3	63.93	66.10	16.00	1.40	Coarse	
1363	DW7136C	CAS	75.41	79.80	16.00	1.40	Coarse	4
2133	DW7144C	CAS	94.81	97.49	16.00	1.40	Coarse	
2132	DW7144C	CAS	94.81	97.49	16.00	1.40	Coarse	
207	DW7197C	CAS	97.70	99.35	16.00	1.40	Coarse	
146	DW7199C	CAS	59.92	62.36	16.00	1.40	Coarse	5
145	DW7199C	CAS	59.92	62.36	16.00	1.40	Coarse	
144	DW7199C	CAS	59.92	62.36	16.00	1.40	Coarse	
378	DW7239C	CAS	109.00	111.50	16.00	1.40	Coarse	6
377	DW7239C	CAS	109.00	111.50	16.00	1.40	Coarse	
374	DW7239C	CAS	109.00	111.50	16.00	1.40	Coarse	
228	DW7253C	CAS	94.84	99.15	16.00	1.40	Coarse	7
227	DW7253C	CAS	94.84	99.15	16.00	1.40	Coarse	
226	DW7253C	CAS	94.84	99.15	16.00	1.40	Coarse	
225	DW7253C	CAS	94.84	99.15	16.00	1.40	Coarse	
224	DW7253C	CAS	94.84	99.15	16.00	1.40	Coarse	
829	DW7060C	PLU1	102.37	103.65	16.00	1.40	Coarse	8
828	DW7060C	PLU1	102.37	103.65	16.00	1.40	Coarse	
827	DW7060C	PLU1	102.37	103.65	16.00	1.40	Coarse	
826	DW7060C	PLU1	102.37	103.65	16.00	1.40	Coarse	
825	DW7060C	PLU1	102.37	103.65	16.00	1.40	Coarse	
1923	DW7143C	PLU1	67.04	68.08	16.00	1.40	Coarse	9
1922	DW7143C	PLU1	67.04	68.08	16.00	1.40	Coarse	
1921	DW7143C	PLU1	67.04	68.08	16.00	1.40	Coarse	
1920	DW7143C	PLU1	67.04	68.08	16.00	1.40	Coarse	
1919	DW7143C	PLU1	67.04	68.08	16.00	1.40	Coarse	
119	DW7192C	PLU1	71.30	72.41	16.00	1.40	Coarse	10
117	DW7192C	PLU1	71.30	72.41	16.00	1.40	Coarse	
216	DW7199C	PLU1	98.65	100.01	16.00	1.40	Coarse	
239	DW7219C	PLU1	95.40	96.56	16.00	1.40	Coarse	11
238	DW7219C	PLU1	95.40	96.56	16.00	1.40	Coarse	
237	DW7219C	PLU1	95.40	96.56	16.00	1.40	Coarse	
235	DW7219C	PLU1	95.40	96.56	16.00	1.40	Coarse	
448	DW7239C	PLU1	130.17	131.61	16.00	1.40	Coarse	12
447	DW7239C	PLU1	130.17	131.61	16.00	1.40	Coarse	
446	DW7239C	PLU1	130.17	131.61	16.00	1.40	Coarse	
445	DW7239C	PLU1	130.17	131.61	16.00	1.40	Coarse	
444	DW7239C	PLU1	130.17	131.61	16.00	1.40	Coarse	
1993	DW7143C	PLU2	84.76	86.35	16.00	1.40	Coarse	13
1992	DW7143C	PLU2	84.76	86.35	16.00	1.40	Coarse	
1991	DW7143C	PLU2	84.76	86.35	16.00	1.40	Coarse	
1989	DW7143C	PLU2	84.76	86.35	16.00	1.40	Coarse	
2203	DW7144C	PLU2	124.58	126.35	16.00	1.40	Coarse	14
286	DW7199C	PLU2	100.10	102.68	16.00	1.40	Coarse	
284	DW7199C	PLU2	100.10	102.68	16.00	1.40	Coarse	
309	DW7219C	PLU2	112.60	114.17	16.00	1.40	Coarse	
353	DW7056C	AR2	65.50	66.55	1.40	0.25	Fine	15
493	DW7058C	AR2	85.35	86.80	1.40	0.25	Fine	
633	DW7060C	AR3	60.74	63.02	1.40	0.25	Fine	16
147	DW7149C	AR3	99.23	101.24	1.40	0.25	Fine	
83	DW7200C	AR3	63.93	66.10	1.40	0.25	Fine	
1377	DW7136C	CAS	75.41	79.80	1.40	0.25	Fine	17
2147	DW7144C	CAS	94.81	97.49	1.40	0.25	Fine	
221	DW7197C	CAS	97.70	99.35	1.40	0.25	Fine	
220	DW7197C	CAS	97.70	99.35	1.40	0.25	Fine	
160	DW7199C	CAS	59.92	62.36	1.40	0.25	Fine	18
159	DW7199C	CAS	59.92	62.36	1.40	0.25	Fine	
392	DW7239C	CAS	109.00	111.50	1.40	0.25	Fine	
242	DW7253C	CAS	94.84	99.15	1.40	0.25	Fine	
843	DW7060C	PLU1	102.37	103.65	1.40	0.25	Fine	19
842	DW7060C	PLU1	102.37	103.65	1.40	0.25	Fine	
841	DW7060C	PLU1	102.37	103.65	1.40	0.25	Fine	
839	DW7060C	PLU1	102.37	103.65	1.40	0.25	Fine	
1937	DW7143C	PLU1	67.04	68.08	1.40	0.25	Fine	20
133	DW7192C	PLU1	71.30	72.41	1.40	0.25	Fine	
230	DW7199C	PLU1	98.65	100.01	1.40	0.25	Fine	
253	DW7219C	PLU1	95.40	96.56	1.40	0.25	Fine	
462	DW7239C	PLU1	130.17	131.61	1.40	0.25	Fine	
2007	DW7143C	PLU2	84.76	86.35	1.40	0.25	Fine	21
2006	DW7143C	PLU2	84.76	86.35	1.40	0.25	Fine	
2005	DW7143C	PLU2	84.76	86.35	1.40	0.25	Fine	
2217	DW7144C	PLU2	124.58	126.35	1.40	0.25	Fine	22
300	DW7199C	PLU2	100.10	102.68	1.40	0.25	Fine	
323	DW7219C	PLU2	112.60	114.17	1.40	0.25	Fine	

Geochemical Assessment of Mining Waste Materials		
EA Application Information Request Response **Document Reference**	**Comment**	**Requirement**
Volume 3 / Appendix G: Geochemical Assessment of Mining Waste Materials / Section 2.1 and Section 3.1	In Section 2.1, it states, "recoverable coal will come from the Rangal coal seams but may also target the Upper Burngrove formation." Figure A2 in Attachment A indicates that the Upper Burngrove coals seams are found at depths of approximately 175 metres (m) to 250m. However, in section 3.1, Table 3-1 indicates the maximum sample depth was 158.00 metres. It is not clear how these samples are representative of the geochemical characteristics of the Upper Burngrove Formation.	Provide further explanation for the maximum sample depth, including justification that it is representative of geochemical characteristics and amount of potential mining waste materials expected to be encountered in the Upper Burngrove Formation given that Figure A2 identifies the coal seam presence at 175m to 250m, while the samples were taken at a shallower depth.

Volume 3 / Appendix G: Geochemical Assessment of Mining Waste Materials / Section 3.1 and Figure A3 in Attachment A	Table 3-1 in Section 3.1 presents the drill hole identification (ID) numbers from which samples were taken for geochemical assessments, that is DW7002, DW7003 and DW7012. The drill hole ID numbers correspond to locations provided in Figure A3 (Attachment A) of Appendix G. Figure A3 shows that the three (3) drill holes sample sites are in the centre of MLA 700056 tenure area, in an area that is not proposed to be disturbed by activities associated with the mining project. Neither Appendix G nor the Revised Supporting Information document provide discussion of the sufficiency of the geochemical sampling sites to be representative of the characteristics of the mining waste materials likely to be encountered. It is not clear how the drill hole samples sites are representative of mining waste materials likely to be encountered for Gemini Project when the samples have been taken from outside the proposed areas for Pit AB and Pit C.	Ensure a representative sampling regime is conducted for the assessment of geochemical properties of mining waste materials likely to be encountered. Provide a statement to justify that the chosen sampling regime sufficiently reflects the likely characteristics of mining waste materials encountered for Gemini Project, given the samples have been taken from outside the areas proposed to be disturbed by Pit AB and C.

Volume 1 / Revised Supporting Information / Section 12.4 / Table 68 Volume 1 / Revised Supporting Information / Section 13.4.1 & 13.4.4	Regarding the expected coal reject material disposal, the Revised Supporting Information document states in Section 12.3, Table 68: "Coal rejects will be disposed of within Pit AB and Pit C and out-of-pit waste rock emplacements." Further in Section 13.4.1 and 13.4.4, respectively, it is stated: "Coal reject material will be placed where there is a lower risk of connectivity to surface water or groundwater resources." "Coal reject materials and any potentially acid forming waste rock materials identified will be selectively handled and encapsulated within waste rock emplacements and well away from the outside surface of rehabilitated landforms, where there is a low risk of connectivity to surface water or groundwater resources." Appendix H and the Revised Supporting Information document do not give clear locations of where coal reject material will be disposed of other than, generally, within the waste rock or spoil emplacements and at a depth where there is a lower risk of connectivity to surface water or groundwater resources.	Provide a discussion of the likely position of disposed coal reject material within the out-of-pit and in-pit waste rock emplacements and demonstrate that there is sufficient capacity for proposed coal reject material disposal, including sufficient quantities of benign material to encapsulate potentially acid forming waste.

	Further information is required to ensure that there is sufficient capacity for the achievement of the proposed disposal requirements with respect the proposed final landform.	
Volume 3 / Appendix H: Geochemical Assessment of Coal Reject Material / Section 2.1 and Figure A3 in Attachment A	Table 2.1 in Section 2.1 assigns geochemical samples to a sample number according to the coal seam (AR2, AR3, CAS, PLU1, PLU2); however, it is unclear what consideration was given to spatial variability across the coal seams. It is noted that the samples are composite. It is not clear what influence this has on geochemical characteristics of the samples where quality may be variable across the coal seam.	Provide a list of the coal reject drillhole ID numbers for each generated composite coal reject sample detailed in Table 2.1 of section 2.1. Provide further information on how the geochemical characteristics across a coal seam is considered in the assessment of the quality of coal reject material from each coal seam or each composite sample.
Volume 3 / Appendix H: Geochemical Assessment of Coal Reject Material / Figure A3 in Attachment A	Figure A3 provides the locations of the drill hole sites from which samples were extracted for geochemical assessment of coal rejects material. Figure A3 shows that one (1) drill hole was taken from the proposed area of Pit C (drill hole ID number DW7253C), while eight (8) where taken from the proposed area of Pit AB. Neither Appendix H nor the Revised Supporting Information document provide discussion of the sufficiency of the geochemical sampling sites to be representative of the characteristics of the mining waste materials likely to be encountered. It is not clear how the drill hole samples sites are representative of mining waste materials likely to be encountered for Gemini Project when the samples have been taken from outside the proposed areas for Pit AB and Pit C.	Ensure a representative sampling regime is conducted for the assessment of geochemical properties of coal reject material likely to be produced. Provide a statement to justify that the chosen sampling regime sufficiently reflects the likely characteristics of coal reject material produced by the Gemini Project.

MINE WASTE AND
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