MULLER partnership

HYDRO ALUMINIUM KURRI KURRI CONTAINMENT CELL RESPONSE TO SUBMISSIONS REPORT ON LONG TERM MANAGEMENT BUDGETS

Newcastle :: Sydney :: Melbourne

8 JANUARY 2019

MULLER partnership
QUANTITY SURVEYORS

8 January 2019

Hydro Aluminium Kurri Kurri Pty Ltd
PO Box 1, Kurri Kurri NSW 2327, Australia
HART RD, LOXFORD VIA KURRI KURRI NSW 2327

ATTENTION: ANDREW WALKER

RE: HYDRO ALUMINIUM KURRI KURRI CONTAINMENT CELL RESPONSE TO SUBMISSIONS REPORT ON LONG TERM MANAGEMENT BUDGETS

As per your request dated 21st December 2018, Muller Partnership has updated the budgets for the Routine Inspections and Maintenance using a Whole of Life Model to determine the required Management Budgets for the Containment Cell once construction is complete.

This report is for the Routine Inspections and Maintenance for the new containment cell ONLY and does not include for any other areas.

Please take note of our Assumptions (Item 3.0) and Exclusions (Item 4.0) which have been based on the information provided.

Should you wish to discuss any of the above please do not hesitate to contact either *Harley Gleeson* or the undersigned.

Yours faithfully
MULLER PARTNERSHIP

C.R. Beard

CAMERON BEARD
DIRECTOR

CB:HG 18013 Hydro Aluminium, Kurri Kurri Containment Cell - Response to Submissions Report [2019-01-08]

Disclaimer

Muller Partnership have prepared this report in part on the basis of information supplied to it in the ordinary course of business by Andrew Walker of Hydro Aluminium Kurri Kurri Pty Ltd.

Whilst all reasonable professional care and skill have been exercised to validate its accuracy and authenticity, Muller Partnership is unable to provide any Guarantee in that regard, and will not be liable to any party for any loss arising as a result of any such information subsequently being found to be inaccurate, lacking authenticity or having been withheld.

This report is only intended for use by Hydro Aluminium Kurri Kurri Pty Ltd and Muller Partnership accepts no responsibility to other parties who use opinions or information contained herein. They do so at their own risk.

In acting as Quantity Surveyor for Hydro Aluminium Kurri Kurri Pty Ltd, Muller Partnership's liability is limited to the scope of services and value limit, as defined in their Professional indemnity insurance cover. A copy is available on request.

This report covers only the items as contained in this report. Should Hydro Aluminium Kurri Kurri Pty Ltd require additional items or areas of assessment, these should be specifically requested and will be actioned as agreed between the parties.

Document history & status

Revision	Date	Description	By	Review	Approved
1	15/03/2018	Response to Submissions Report	HG	CB	CB
2	23/04/2018	Response to Submissions Report On Long Term Management Budgets	HG	CB	CB
3	03/05/2018	Minor Updates	HG	CB	CB
4	21/05/2018	Discount Rate Change	HG	CB	CB
5	08/01/2019	Senversa Comments Incorporated	HG	CB	CB

CONTENTS

Glossary of Key Terms

Preliminaries & Margin	The Preliminaries and Margin Allowance is based on the industry standard allowance made for Civil Contractors. The allowance is for the builder's margin and their establishment and management of the site. This item will therefore include for items such as site fencing & amenities, site foreman, head office overheads, insurances, cranage, site cleaning, OH&S management, QA, etc.

1.0 EXECUTIVE SUMMARY

Project Description

The Hydro Aluminium, Kurri Kurri Containment Cell involves the construction of a containment cell as part of the larger site remediation within the existing Hydro Aluminium site, with a final capping area of approximately 47,000m2.

The purpose of this report is to inform the 'Long Term Management Plan' (LTMP) [developed by Rambol Environ dated 19/12/2017 Rev 5 – Draft] developed for the Containment Cell's ongoing management, post construction. Within the LTMP are a list of Routine Inspection and Monitoring tasks that have been identified to satisfy the requirements of the legislation and authorities.

To determine the budget for the Long Term Management of the Containment Cell the information provided in the LTMP has been quantified within a Whole of Life [WoL] model in order to determine the current Net Present Value. The results can be seen in the tables below outlining the certainty, duration and discounted rate to allow Hydro Aluminium to understand the potential budgets.

Whole of Life Model Result

A summary of the Whole of Life Model Results is as follows:

		Duration			
		25 Years	50 year	100 year	Perpetuity
Discounted Rate	2.3%	$1,896,838	$2,706,536	$3,412,367	$3,731,912

We note the attached models are for Maintenance costs only and do not allow for items such as property acquisition, finance costs, design & documentation, planning & authority fees & charges or Client Side Project Management. Please refer to the Qualification, Assumptions and Exclusions sections of this report for further details.

Cap Replacement

As part of our assessment we have included a cost for the complete cap replacement caused by a catastrophic event. The estimated replacement cost is **$10,223,000 *Excl GST***. This is assumed to be used to determine the insurance premiums excluding environmental clean-ups. An allowance for insurance premiums [Provided by Hydro] has been included within the Whole of Life models. Refer to assumptions for full scope of work.

2.0 SCHEDULE OF INFORMATION

Muller Partnership has used the following information in compiling the budgets/ models:

1. Ramboll Environ Long Term Management Plan titled 'Containment Cell – Long Term Management Plan [Draft]' Revision 5 dated 19 December 2017 and received 10 January 2018;

2. Workshop held at Muller Partnership's Office between Hydro Aluminium Kurri Kurri Pty Ltd, Muller Partnership, GHD and Ramboll Environ dated 16 January 2018;

3. Monitoring Fees prepared by Ramboll Environ received 19 January 2018;

4. Email and telephone correspondence with David Barrett of GHD Pty Ltd, Andrew Walker, Richard Brown and Leesa Jackson of Hydro Aluminium Kurri Kurri Pty Ltd and Fiona Robinson of Ramboll Environ in relation to scope (numerous);

5. GHD Pty Ltd's report titled 'Hydro Aluminium Kurri Kurri – Leachate Management – Options Assessment Report' dated September 2017, received 15 November 2017;

6. Discount rate of 2.3% above inflation has been adopted utilising guidance from Norsk Hydro's Corporate Finance and Treasury Operations and represents a conservative yield achievable by adopting a low risk investment strategy that considers government, bank and AAA and above, corporate instruments.

7. Email of consolidated report changes provided by Andrew Walker 21st December 2018;

All rates used within our budgets/models have been gathered from our in-house databases as well as being constructed from first principles namely labour, materials and waste to reflect current market and project specific value.

3.0 METHODOLOGY

The methodology used to develop the budgets for the Long Term Management of the Containment Cell can be separated into a few steps in order to determine a robust and logical budget. These steps include the determination of inspections and maintenance costs, development of the WoL model to consider the discounted rate, NPV and estimation of cap replacement costs for insurance purposes.

The Whole of Life model is based on the same routine management and inspections regime as listed in Table 4.1 of the LTMP. The results of the WoL model shows the results of a 2.3% discount rate on the Net Present Value [NPV] across a range of durations of 25 years, 50 years, 100 years and perpetuity.

Majority of the Whole of Life model items run in perpetuity, however, there are a few that are not expected to continue for very long. These items are included in the table below with a justification for why they stop/ change.

Table 1 - Whole of Life Model Changes

Item	Change Justification
Gas Monitoring	As advised by Ramboll Gas Monitoring would not be required past 10 years.
Leachate Removal	Rate of removal reduces to a small 7KL truck every 6 years based on the predicted volume.
Administrative Management	Administrative Management has been included for the first 5 years to ensure the cell is suitably established.
Insurance Costs	Insurance has been included as per advice from Hydro.

To assist Hydro Aluminium with the assessment of insurance we have developed an estimate of the cap replacement in a catastrophic event. This has been included in the WoL as a forecast insurance premium only.

Response Contingency

The budget for the long term model additionally includes a contingency response budget that is development from an evaluation of frequency and cost of contingent events. The contingent events were developed by considering the components of the cell, and the potential for events to occur that could damage these components to the extent that warrants an action, such as a repair, to be taken.

The identified contingent events are shown below in Table 2 which includes a description, cost and frequency. These costs are incorporated in the whole of life model.

Table 2 - Contingent Cost

Risk/ Cause	Response and Cost	Rate of Occurrence
Capping damage not covered by insurance – e.g. repairs due to soil erosion, burrowing animals, subsidence, instability (veneer or landslide), degradation past the design life	Assume progressive replacement of 25% of the cap (4.7 ha) every 200 years and a rate of $218/m2, per Muller (2018) price estimate. This equates to approximately $2.5M	1 in 200 years
Irrigation and re-vegetation costs due to bush fire, drought, life span of species. Separate to the 'slashing' costs included.	Irrigation, weeding, re-planting per Landscape Management Plan. Nominal allowance of $5,500	Per annum
Damage and degradation of gas venting infrastructure.	Replace, cost $10,000.	1 in 20 years
Independent review and auditing	Potential for independent auditing required, allow $10,000	Once in 5 years
General wear and tear to cell service road	The costs to replace the road surface every 100 years ($75,000), and patch minor areas every five years ($2,500). This equates to a nominal value of $1,250 per annum.	Various as shown

Risk assessment in the event of breach	Risk assessment to assess impacts in the event of cell performance reduction, allow $100,000	Once in 50 years

** not included above is the admin costs from Year 6 on of $10,000 p.a.

4.0 ASSUMPTIONS

We have made the following assumptions in the preparation of the budget:-

Generally

1. The cell design life is perpetuity, no allowance has been made for replacement of the cell or any element of the cell at any point in its life;
2. An event that is considered catastrophic would be assumed to be an insured event, our assessment only considers the immediate risks identified within the LTMP;
3. The construction of the containment cell is built in accordance with the design and specifications and meets the authority expectations;

Whole of Life Models

4. The Discount Rate of 2.3% has been included based on advice from Norsk Hydro's Corporate Finance and Treasury Operations at the direction of Hydro Aluminium;
5. Preliminaries, Margin and Management costs have been applied to each of the Whole of Life costs with the percentage ranging from 18% to 25% depending of the scale of the cost;
6. The Containment Cell Inspections have been assumed as being undertaken by adequately qualified professional(s) for 2 days/ period;
7. All inspection and monitoring costs are assumed to continue in perpetuity, except for gas monitoring. Gas monitoring is assumed to only be required for the first 10 years [As per advice from Ramboll dated 19/01/2018];
8. A provisional allowance of $40,000 *Excl GST* has been included for the Insurance Costs reducing to $20,000 *Excl GST* after 10 years;
9. The Effect on Financial Assurance of Senversa's Recommended Additional Contingency Actions has been included as a Response Contingency for the amount of $23,750 p.a. for the first 5 years and $33,750 p.a. after that;

Cap Replacement

10. It is assumed the top 1.3m of fill will be excavated and stockpiled for reuse, the same cap design would be installed over the existing and the fill material would be reused;
11. An allowance of 6% has been included for Design Consultants Costs;
12. An allowance of 5% has been included for Identified Risk Items;
13. An allowance of 10% has been included for Construction Contingency;

5.0 EXCLUSIONS

Within the following budgets the acronym 'EXCL' means work that has ***not*** been included in our assessment. We specifically note the following exclusions from the estimated budget:

1. GST;
2. Authority's fees and charges & legal fees;
3. Client Side Project Management;
4. Design Consultant costs;
5. Escalation and changes in market conditions;
6. Works outside the specified site area;
7. Finance costs;
8. Works outside normal hours;
9. Land Acquisition;
10. Staging/ Temporary works;
11. Treatment/ disposal of unsuitable material;
12. Dewatering [NB: Unless Otherwise Noted]
13. Capital Costs and Operating Costs are excluded;
14. Environmental clean-ups (including repairs to the cell caused by the event) and catastrophic events have been excluded from the WoL models, these are considered insurable events;
15. Management & monitoring of the capped waste stockpile area are excluded;
16. Management & monitoring for any area other than the containment cell are excluded;
17. Items listed in the "Effect on Financial Assurance of Senversa's Recommended Additional Contingency Actions" table with no cost allocated include:
    a. Unclogging of the leachate system;

b. Additional leachate volumes and one inspection/ event per year following significant rainfall events;

c. Leachate sample analysis;

APPENDIX A – WHOLE OF LIFE MODEL

Hydro Aluminium, Kurri Kurri

Whole of Life Review

Response to Submissions on Long Term Management Budgets

MULLER partnership

Year		Units	1	2	3	4	5	6	7
CAPITAL COSTS ($ 2018)									
All Capital Costs are excluded [Ongoing management only]		$							
TOTAL CAPITAL COSTS	-	$	-	-	-	-	-	-	-
OPERATING COSTS ($ 2018)									
Labour & other operating costs	Excl.	$							
TOTAL OPERATING COSTS		$	-	-	-	-	-	-	-
MAINTENANCE COSTS ($ 2018)									
Containment Cell Inspections	*Assumes 2 days [Monthly for yr 1, Quarterly for yr 2 & 3 and Anually from then on]*	$	$ 28,800	$ 9,600	$ 9,600	$ 2,400	$ 2,400	$ 2,400	$ 2,400
Leachate and Ground Water Monitoring	As per costing by Rambol [Monthly for yr 1, Quarterly from then on]	$	$ 36,552	$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184
Gas Monitoring	As per costing by Rambol [Quarterly for 10 years]	$	$ 11,484	$ 11,484	$ 11,484	$ 11,484	$ 11,484	$ 11,484	$ 11,484
Annual Reporting for Leachate, Ground water and Gas Monitoring	As per costing by Rambol [Annually for perpetuity]	$	$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880
Slashing	Assumes $1000/ event	$							
Leachate Removal	Leachate removal based on GHD modelling. After the intital drop in volumes the expected ongoing remove reduces to 1 x 7KL truck every 6 years.	$	$ 45,150	$ 6,750	$ 1,960				
Administrative Management	Assumes 1 x FTE part time	$	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000		
Insurance Costs	Cost as provided by Hydro	$	$ 40,000	$ 40,000	$ 40,000	$ 40,000	$ 40,000	$ 40,000	$ 40,000
Response Contingency	Cost as per agreed breakdown titled "Effect on Financial Assurance of Senversa's Recommended Additional Contingency Actions' [$23,750 yearly for first 5 years, $33,750 yearly for perpetuity]	$	$ 23,750	$ 23,750	$ 23,750	$ 23,750	$ 23,750	$ 33,750	$ 33,750
TOTAL MAINTENANCE COSTS		$	212,616	130,648	125,858	116,698	116,698	106,698	106,698
TOTAL MAINTENANCE PV 2.3%		$	212,616	127,643	120,135	108,830	106,327	94,979	92,795
LIFECYCLE COSTS		$	212,616	130,648	125,858	116,698	116,698	106,698	106,698
TOTAL PV 2.3%		$	$ 212,616	$ 127,643	$ 120,135	$ 108,830	$ 106,327	$ 94,979	$ 92,795

8	9	10	11	12	13	14	15	16	17	18	19	20
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-
$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400
$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184
$ 11,484	$ 11,484	$ 11,484										
$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880
	$ 1,960						$ 1,960					
$ 40,000	$ 40,000	$ 40,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000
$ 33,750	$ 33,750	$ 33,750	$ 33,750	$ 33,750	$ 33,750	$ 33,750	$ 33,750	$ 33,750	$ 33,750	$ 33,750	$ 33,750	$ 33,750
106,698	108,658	106,698	75,214	75,214	75,214	75,214	77,174	75,214	75,214	75,214	75,214	75,214
90,661	90,202	86,538	59,600	58,229	56,890	55,581	55,718	53,054	51,834	50,641	49,477	48,339
106,698	108,658	106,698	75,214	75,214	75,214	75,214	77,174	75,214	75,214	75,214	75,214	75,214
$ 90,661	**$ 90,202**	**$ 86,538**	**$ 59,600**	**$ 58,229**	**$ 56,890**	**$ 55,581**	**$ 55,718**	**$ 53,054**	**$ 51,834**	**$ 50,641**	**$ 49,477**	**$ 48,339**

21	22	23	24	25	26	27	28	29	30	31	32	33	34
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400
$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184
$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880
$ 1,960						$ 1,960						$ 1,960	
$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000
$ 33,750	$ 33,750	$ 33,750	$ 33,750	$ 33,750	$ 33,750	$ 33,750	$ 33,750	$ 33,750	$ 33,750	$ 33,750	$ 33,750	$ 33,750	$ 33,750
77,174	75,214	75,214	75,214	75,214	75,214	77,174	75,214	75,214	75,214	75,214	75,214	77,174	75,214
48,458	46,141	45,079	44,043	43,030	42,040	42,143	40,128	39,205	38,304	37,423	36,562	36,652	34,900
77,174	75,214	75,214	75,214	75,214	75,214	77,174	75,214	75,214	75,214	75,214	75,214	77,174	75,214
$ 48,458	**$ 46,141**	**$ 45,079**	**$ 44,043**	**$ 43,030**	**$ 42,040**	**$ 42,143**	**$ 40,128**	**$ 39,205**	**$ 38,304**	**$ 37,423**	**$ 36,562**	**$ 36,652**	**$ 34,900**

Hydro Aluminium, Kurri Kurri

Whole of Life Review

Response to Submissions on Long Term Management Budgets

MULLER partnership

35	36	37	38	39	40	41	42	43	44	45	46	47	48
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400
$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184
$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880
				$ 1,960						$ 1,960			
$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000
$ 33,750	$ 33,750	$ 33,750	$ 33,750	$ 33,750	$ 33,750	$ 33,750	$ 33,750	$ 33,750	$ 33,750	$ 33,750	$ 33,750	$ 33,750	$ 33,750
75,214	75,214	75,214	75,214	77,174	75,214	75,214	75,214	75,214	75,214	77,174	75,214	75,214	75,214
34,097	33,313	32,546	31,798	31,876	30,352	29,654	28,972	28,305	27,654	27,722	26,397	25,790	25,197
75,214	75,214	75,214	75,214	77,174	75,214	75,214	75,214	75,214	75,214	77,174	75,214	75,214	75,214
$ 34,097	**$ 33,313**	**$ 32,546**	**$ 31,798**	**$ 31,876**	**$ 30,352**	**$ 29,654**	**$ 28,972**	**$ 28,305**	**$ 27,654**	**$ 27,722**	**$ 26,397**	**$ 25,790**	**$ 25,197**

49	50	51	52	53	54	55	56	57	58	59	60	61	62
-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-
$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400
$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184
$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880
		$ 1,960						$ 1,960					
$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000
$ 33,750	$ 33,750	$ 33,750	$ 33,750	$ 33,750	$ 33,750	$ 33,750	$ 33,750	$ 33,750	$ 33,750	$ 33,750	$ 33,750	$ 33,750	$ 33,750
75,214	75,214	77,174	75,214	75,214	75,214	75,214	75,214	77,174	75,214	75,214	75,214	75,214	75,214
24,617	24,051	24,110	22,957	22,429	21,913	21,409	20,917	20,968	19,966	19,507	19,058	18,620	18,191
75,214	75,214	77,174	75,214	75,214	75,214	75,214	75,214	77,174	75,214	75,214	75,214	75,214	75,214
$ 24,617	**$ 24,051**	**$ 24,110**	**$ 22,957**	**$ 22,429**	**$ 21,913**	**$ 21,409**	**$ 20,917**	**$ 20,968**	**$ 19,966**	**$ 19,507**	**$ 19,058**	**$ 18,620**	**$ 18,191**

63	64	65	66	67	68	69	70	71	72	73	74	75	76	77
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400
$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184
$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880
$ 1,960						$ 1,960						$ 1,960		
$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000
$ 33,750	$ 33,750	$ 33,750	$ 33,750	$ 33,750	$ 33,750	$ 33,750	$ 33,750	$ 33,750	$ 33,750	$ 33,750	$ 33,750	$ 33,750	$ 33,750	$ 33,750
77,174	75,214	75,214	75,214	75,214	75,214	77,174	75,214	75,214	75,214	75,214	75,214	77,174	75,214	75,214
18,236	17,364	16,965	16,575	16,193	15,821	15,860	15,102	14,754	14,415	14,083	13,759	13,793	13,134	12,832
77,174	75,214	75,214	75,214	75,214	75,214	77,174	75,214	75,214	75,214	75,214	75,214	77,174	75,214	75,214
$ 18,236	**$ 17,364**	**$ 16,965**	**$ 16,575**	**$ 16,193**	**$ 15,821**	**$ 15,860**	**$ 15,102**	**$ 14,754**	**$ 14,415**	**$ 14,083**	**$ 13,759**	**$ 13,793**	**$ 13,134**	**$ 12,832**

78	79	80	81	82	83	84	85	86	87	88	89	90	91	92
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400
$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184
$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880
			$ 1,960						$ 1,960					
$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000
$ 33,750	$ 33,750	$ 33,750	$ 33,750	$ 33,750	$ 33,750	$ 33,750	$ 33,750	$ 33,750	$ 33,750	$ 33,750	$ 33,750	$ 33,750	$ 33,750	$ 33,750
75,214	75,214	75,214	77,174	75,214	75,214	75,214	75,214	75,214	77,174	75,214	75,214	75,214	75,214	75,214
12,537	12,248	11,967	11,996	11,422	11,160	10,903	10,652	10,407	10,433	9,934	9,706	9,482	9,264	9,051
75,214	75,214	75,214	77,174	75,214	75,214	75,214	75,214	75,214	77,174	75,214	75,214	75,214	75,214	75,214
$ 12,537	**$ 12,248**	**$ 11,967**	**$ 11,996**	**$ 11,422**	**$ 11,160**	**$ 10,903**	**$ 10,652**	**$ 10,407**	**$ 10,433**	**$ 9,934**	**$ 9,706**	**$ 9,482**	**$ 9,264**	**$ 9,051**

93	94	95	96	97	98	99	100
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400	$ 2,400
$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184	$ 12,184
$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880	$ 6,880
$ 1,960						$ 1,960	
$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000
$ 33,750	$ 33,750	$ 33,750	$ 33,750	$ 33,750	$ 33,750	$ 33,750	$ 33,750
77,174	75,214	75,214	75,214	75,214	75,214	77,174	75,214
9,073	8,640	8,441	8,247	8,057	7,872	7,891	7,514
77,174	75,214	75,214	75,214	75,214	75,214	77,174	75,214
$ 9,073	**$ 8,640**	**$ 8,441**	**$ 8,247**	**$ 8,057**	**$ 7,872**	**$ 7,891**	**$ 7,514**

APPENDIX B – CAP REPLACEMENT ESTIMATE

HYDRO ALUMINIUM KURRI KURRI
CONTAINMENT CELL
LTMP CAP REPLACEMENT
JANUARY 2018

ESTIMATE DETAILS

Ref	Description	Quantity	Unit	Rate	Amount
22.0 REPLACEMENT OF FINAL CAP FOR CONTAINMENT CELL					
	Site Preparation				
1	Allowance to strip vegetative layer and stockpile for reuse	47,000.00	m2	3.50	164,500.00
2	Allowance for bulk excavation of top 1000mm of cap material and stockpile for reuse	61,100.00	m3	15.00	916,500.00
3	Allowance to extend existing gas vent and associated infrastructure	1.00	Item	10,000.00	10,000.00
	Demolition				
4	Allowance to demolish existing barriers		Note		**EXCL**
	New Cap				
5	Allowance to excavate, load, transport, deliver and compact final capping material for existing site location [assuming 2 excavators, 4 dump trucks, 4 front end loaders and 1 compactor for 15 weeks]	105,700.00	m3	15.00	1,585,500.00
6	Supply and place drainage geotextile	47,000.00	m2	4.00	188,000.00
7	Supply and place geosynthetic clay liner [X1000]	47,000.00	m2	10.45	491,150.00
8	Allowance to place seal bearing layer comprising select fill from local stockpile	14,100.00	m3	12.00	169,200.00
9	Ditto LLDPE geomembrane	47,000.00	m2	12.76	599,720.00
10	Ditto protection geotextile	47,000.00	m2	8.03	377,410.00
11	Allowance to place 300mm drainage aggregate sourced from local stockpile	47,000.00	m2	30.00	1,410,000.00
12	Supply and place seperate geotextile	51,000.00	m2	4.40	224,400.00
13	Allowance to place 1.3m thick subsoil layer from stockpiled material	61,100.00	m3	12.00	733,200.00
14	Allowance for 100mm topsoil layer sources onsite and seeding for revegetation	47,000.00	m2	6.50	305,500.00
15	Allowance for QA Testing [Provisional]	1.00	Item	150,000.00	150,000.00
	Preliminaries and Margin				
16	Preliminaries and Margin [14%]	1.00	Item	1,025,002.00	1,025,002.00
	Design Consultants [6%]				
17	Design Consultants [6%]	1.00	Item	500,918.00	500,918.00
18	SUBTOTAL [EXCL GST]				*8,851,000.00*
	Identified Risk Items				
19	Allowance for specific Identified Risk Items [5%]	1.00	Item	443,000.00	443,000.00
	Construction Contingency				
20	Construction Contingency [10%]	1.00	Item	929,000.00	929,000.00
21	CONSTRUCTION SUBTOTAL [EXCL GST]				*10,223,000.00*
	Escalation				

HYDRO ALUMINIUM KURRI KURRI
CONTAINMENT CELL
LTMP CAP REPLACEMENT
JANUARY 2018

ESTIMATE DETAILS

Ref	Description	Quantity	Unit	Rate	Amount
22.0	**REPLACEMENT OF FINAL CAP FOR CONTAINMENT CELL**				*(Continued)*
22	Escalation [2.5% p.a.]		Note		**EXCL**
23	CONSTRUCTION SUBTOTAL [EXCL GST] including escalation				*10,223,000.00*
24					
25	Total Cap Area	47,000.00	m2		
26	Cost/m2	218.00	$/m2		
				Total :	***10,223,000.00***