REPORT

AQUENTA
A Jacobs Company

WEST NOWRA RECYCLING AND WASTE FACILITY

PROPOSED STAGE 4 LANDFILL EXTENSION

Concept Design Estimate Report – Environmental Impact Statement (EIS) Phase

March 2018

DOCUMENT TITLE: **WEST NOWRA RECYCLING AND WASTE FACILITY**

PROJECT REFERENCE: **PROPOSED STAGE 4 LANDFILL EXTENSION**

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ISSUE	DESCRIPTION OF AMENDMENT	AUTHOR	CHECKED	APPROVED	DATE
1	Concept level for EIS Purposes	IN	JS	DH	4/12/2017
2	Concept level for EIS Purposes	IN	JS	DH	5/12/2017
3	Concept level for EIS Purposes	IN	JS	DH	19/12/2017
4	Concept level for EIS Purposes	IN	JS	DH	30/1/2018
5	Concept level for EIS Purposes	IN	JS	DH	23/3/2018
6	Final Report	IN	IN	DH	22/3/2018

Previous issues of this document shall
be destroyed or marked SUPERSEDED.

CONTENTS

TABLES

1 Executive Summary

Aquenta Consulting were appointed by SLR Consulting Australia to compile and submit a concept design cost estimate for EIS purposes for the West Nowra Recycling and Waste Facility. Aquenta Consulting understand that the scope of works for this project are as detailed below:

The Proposal would provide landfill capacity to service the SCC LGA for up to 30 years and would commence operation from approximately 2026. While the Proposal seeks approval to operate for up to 30 years, landfill life expectancy modelling estimates that the landfill would provide capacity for a minimum of eight years (i.e. to end 2034 under a worst case scenario) and up to approximately 18 years (under a reduced waste disposal scenario) (SCC, 2017).

The EIS is based on assessments of the worst case scenario, whereby the RRP is assumed to not proceed, and the landfill extension is required to service the needs of LGA from 2026 onwards.

To extend and construct the existing landfilling operations within the proposed stage 4 land, the work will be constructed over an approximate 20-year period, each landfill cell stage is anticipated to be constructed over an approximate period of three (3) years. Each landfill cell stage will be excavated to an approximate level of RL42.5/43.5 and incorporate a 1.0m thick of Compacted Clay Layer (CCL) baseliner. A leachate drainage system, which will be connected to the existing leachate infrastructure, gas wells for the extraction of landfill gases, 10m, 6m and 20m of fire break buffers, sediment fencing, stormwater drainage bunds, drop structure and construction of new access and perimeter roads.

This report details the process by which Aquenta Consulting undertook the concept design estimate. It details the basis of the estimate, and all assumptions and exclusions made in pricing the scheme.

The total project estimate for the proposed landfill *extension* (based on 6 *landfill* sub-cells) at P50 confidence level is as follows:

Table 1-1 High Level Summary

DESCRIPTION	Total ($)
Landfill Cell 1	$4,638,000
Landfill Cell 2	$3,612,000
Landfill Cell 3	$2,710,000
Landfill Cell 4	$2,294,000
Landfill Cell 5	$3,134,000
Landfill Cell 6	$2,714,000
Total	**$19,102,000**

2 Capital Cost Estimate

For reasons of simplicity, the cost estimate has been summarised in the *Table 2-1* and details separation of costs between directs and indirect.

Table 2-1 Cost Estimate Summary

DESCRIPTION	Total ($)
Direct Cost	
Site Clearance	
- Cell 1	$228,036
- Cell 2	$185,604
- Cell 3	$135,108
- Cell 4	$110,448
- Cell 5	$164,220
- Cell 6	$138,996
Cut to Reduce Level	
- Cell 1	$389,268
- Cell 2	$388,728
- Cell 3	$245,702
- Cell 4	$290,735
- Cell 5	$219,582
- Cell 6	$267,318
Base Formation	
- Cell 1	$1,226,992
- Cell 2	$1,191,910
- Cell 3	$909,891
- Cell 4	$732,566
- Cell 5	$1,007,195
- Cell 6	$870,221
Filling (*Excluded*)	
Drainage	
- Cell 1	$752,186
- Cell 2	$615,132
- Cell 3	$507,407
- Cell 4	$379,585
- Cell 5	$545,669
- Cell 6	$462,015
Gas *System*	
- Cell 1	$41,186
- Cell 2	$6,186
- Cell 3	$4,584
- Cell 4	$4,640

DESCRIPTION	Total ($)
- Cell 5	$6,640
- Cell 6	$8,640
Fire Break	
- Cell 1	$127,200
- Cell 2	$37,800
- Cell 3	$27,900
- Cell 4	$ -
- Cell 5	$55,100
- Cell 6	$51,600
Sediment Control	
- Cell 1	$418,685
- Cell 2	$36,072
- Cell 3	$42,024
- Cell 4	$ -
- Cell 5	$221,670
- Cell 6	$60,624
New Road	
- Cell 1	$70,000
- Cell 2	$ -
- Cell 3	$ -
- Cell 4	$ -
- Cell 5	$ -
- Cell 6	$ -
Direct Cost Sub-total	
- Cell 1	$3,253,550
- Cell 2	$2,461,430
- Cell 3	$1,872,620
- Cell 4	$1,517,970
- Cell 5	$2,220,080
- Cell 6	$1,859,410
Indirect Cost	
Contractor's preliminaries, overhead and profit (including Fee)	
- Cell 1	$611,180
- Cell 2	$547,910
- Cell 3	$385,020
- Cell 4	$393,380
- Cell 5	$391,340
- Cell 6	$401,500
Client's indirect costs (Excluded)	
Client's contingency	
- Cell 1	$772,946

DESCRIPTION	Total ($)
- Cell 2	$601,868
- Cell 3	$451,528
- Cell 4	$382,270
- Cell 5	$522,284
- Cell 6	$452,182
Indirect Cost Sub-Total	
- Cell 1	$1.384,126
- Cell 2	$1,149,778
- Cell 3	$836,548
- Cell 4	$775,650
- Cell 5	$913,624
- Cell 6	$853,682
Total Cost (Rounded)	
- Cell 1	$4,638,000
- Cell 2	$3,612,000
- Cell 3	$2,710,000
- Cell 4	$2,294,000
- Cell 5	$3,133,700
- Cell 6	$2,714,000
Grand Total Cost	**$19,102,000**

The above costs are exclusive of GST.

A detailed breakdown of the estimate can be found in Appendix 2: of this report.

2.1 CIVIL WORKS

2.1.1 Demolition

- Demolish existing road and dispose spoil to an agreed on site location

2.1.2 Site Clearance

- Clear the site from vegetation including shrubs with roots and stumps
- Clear the site from trees
- Dispose all spoil to an agreed on site location

2.1.3 Cut to Reduce Level

- Cut to reduce level in 6 stages – each stage for one landfill cell
- Cut to reduce level cost as per David Hojem email dated 8 Mar 2018
    - Plant
        - Komatsu HM300 off road 6x4 dump truck $1,600 per week

        - Komatsu PC450LC-8 tracked excavator $3,500 per week
    - Labour
        - Operator $60,000 per year x 2 (add on costs of 30%)
    - Production
        - Estimate excavation 100,000m3 per year
    - Cost
        - Annual Cost $421,200
        - Cost per m3 = $4.21
- Remove 100mm thick topsoil layer
- Reduce the level to RL42.5/43.5 as per the design
- Remove spoil to an agreed on site location

2.1.4 Base Formation

- 1.0m Thick of imported compacted clay Liner (CCL) with two slope sides 1 vertical and 2 horizontal
- Form 0.6m x 0.6m anchored trench
- General fill using excavated material between the new landfill cells 1, 2 and 6 of stage 4 and the existing stage 3
- New 2.0mm HDPE Geomembrane to protect the landfill cell clay base at level RL42.5/43.5, the sloping sides, the berm and the anchored trench of each landfill cell
- Non-Woven Geotextile Protection layer to protect HDPE Geomembrane
- Non-Woven Geotextile Separation layer to protect the 300mm thick leachate drainage layer

2.1.5 Drainage

- 300mm thick leachate drainage layer to be placed across the entire landfill cell base floor and above the HDPE Geomembrane level RL42.5/43.5
- OD200mm HDPE leachate spur pipe with 3% cross fall across the landfill cells and drain into the main leachate spine pipe
- OD200mm HDPE leachate spine pipe to collect leachate from the spur pipe with a 1% longitudinal fall along the landfill cell floor invert and drain into the leachate side riser collection pipes, 8 sumps will be constructed along the HDPE leachate spine pipe
- OD600mm HDPE leachate side rise collection pipes to drain into the leachate collection pump line
- OD600mm HDPE leachate collection pump line to drain into the existing site leachate infrastructure, including the existing leachate dam
- The leachate spur pipe will be installed for each stage separately
- The main leachate spine pipe, leachate collection sumps, leachate side risers and the leachate collection pump line will be installed with landfill cell 1
- Two pumps, pump #1 at the bottom corner of landfill cell 5 to pump the flow to pump #2 which will be located at the top corner of landfill cell 6
- The Two storage leachate tanks at the northern end of stage 4 will be supplied and installed with cells 1 and 5, Giordano has suggested around $15k for each tank
- Allowed for groundwater bores and piezometers as recommended by Giordano Bianco, each well is 25m deep

2.1.6 Gas System

- 20 Gas wells with bentonite seal including bore hole to be installed as follows:
    - Cell 1: 4 gas wells;
    - Cell 2: 4 gas wells;
    - Cell 3: 3 gas wells;

    - Cell 4: 3 gas wells;
    - Cell 5: 3 gas wells; and
    - Cell 6: 3 gas wells
- 5 Well head stations to be installed as follows:
    - Cell 1: 2 WHS;
    - Cell 5: 1 WHS; and
    - Cell 6: 2 WHS
- Gas ring main will be installed around cell 1, 2, 3,5 and cell 6, this gas main will be installed at the same time as construction of cell 1

2.1.7 Fire Break

- 10m, 6m and 20m wide of vegetation will be as follows:
    - Cell 1: 424m of fire break 10m wide;
    - Cell 2: 126m of fire break 10m wide;
    - Cell 3: 93m of fire break 10m wide;
    - Cell 5: 113m of fire break 10m wide and 106m of 6m wide; and
    - Cell 6: 86m of fire break 20m wide

2.1.8 Sediment Control

- 278m of sediment fence as follows:
    - Cell 1: 101m;
    - Cell 2: 60m;
    - Cell 3: 23m; and
    - Cell 6: 94m
- 1,431m of pasture furrows as follows:
    - Cell 1: 357m;
    - Cell 2: 226m;
    - Cell 3: 178m;
    - Cell 5: 415m; and
    - Cell 6: 255m
- 83m of drainage bund as follows
    - Cell 1: 41m; and
    - Cell 5: 42m
- 699m of drop structure as follows
    - Cell 1: 216m;
    - Cell 2: 88m;
    - Cell 3: 106m;
    - Cell 5: 137m; and
    - Cell 6: 152m
- 174m of pack-push bank as follows:
    - Cell 1: 153m; and
    - Cell 5: 21m

2.1.9 Sediment dams

    - Cell 1: 2,314m2 sediment dam
    - Cell 5: 1,098m2 Sediment dam

2.1.10 New Access and Perimeter Roads

- 400m long x 3.5m wide road will be constructed with Cell 1
- 125mm thick Density Graded Subbase (DGS40)
- 125mm thick Density Graded Base (DGB20)
- Cement stabilised sand

2.2 SOURCE OF DIRECT COSTS

The quantities used in the development of the direct costs have been measured from the drawings (see appendix 1) and the pricing is based on the first principle and Aquenta's similar projects. All costs are based on current market rates 4th quarter of 2017 and exclude escalation.

2.3 INDIRECT COSTS

We have assessed other similar large infrastructure projects to make allowances for the following based on percentages of contractor's direct and indirect costs.

2.3.1 Contractor Indirect Cost

- Mobilisation, site establishment and demobilisation - allowed for 1% of direct cost, it covers temporary site office, temporary sheds and toilets, notice board, telephone calls, first aid, disposal bins and any other administration cost.
- Project management – no program has been provided, assumed 45 weeks as follows:
    - Procurement: 6 weeks
    - Design: 17 weeks
    - Construction period: 16 weeks
    - Commissioning: 3 weeks
    - Close-out and transfer: 3 weeks
- Allowance of $35k for Independent third party Construction Quality Assurance (CQA) during construction and final capping
- Insurances & Securities – allowed for 1% of direct cost.
- Other Contractor's Design – allowed for 0.8% of direct cost to cover the paper, ink, printing machines maintenance, etc.
- Overhead & Profit – allowed for 5% of direct cost.

2.3.2 Clients Indirect Costs

- Excluded client's cost.

3 Risk & Contingency

A risk workshop was not completed or requested and a contingency allowance of 20% of Contractor's direct and indirect cost has been included.

4 Escalation

The estimate base date is 4th Quarter 2017 and escalation is excluded beyond this period.

5 Source of Rates

The rates used for the estimate was done using:

- Cost breakdown
- Market rates
- Historical projects
- Advice from the client

6 Assumptions / Exclusions

The main assumptions / exclusions from the base estimate are as follows:

6.1 ASSUMPTIONS

- Demolish existing road running through the proposed stage 4
- Remove 100m2 of trees per hour
- Stockpile the excavated material in stockpile area within 10km from the site
- Used Compacted Clay Layer (CCL) for base formation
- Used the excavated material for the engineering general fill and anchored trench
- The leachate spur pipe will be installed for each stage separately
- The main leachate spine drain, leachate collection sumps, leachate side risers and the leachate collection pump line will be installed at the same time as cell 1
- Gas ring main will be installed around cell 1, 2, 3,5 and cell 6, this gas main will be installed with cell 1
- Allowed for 3 trees for each 1m2 for fire break
- Assumed drainage bund to be U shape 1.0m wide x 0.5m height x 0.15m thick
- Assumed drop structure is L shape 1.0m wide x 0.5m height x 0.25m thick
- Assumed new road 400m long x 3.5m wide, 125mm DGB40, 125mm DGS20 and layer of cement and stabilised sand

6.2 EXCLUSIONS

- Remove tree leaves off site, use leaf shredder and grinding up wood branches to mulch
- Waste disposal fees and EPA Waste levy
- Rock excavation
- Filling of cells up to level RL59.0
- Demolition of any existing structures, other than noted
- Abnormal foundations and ground conditions
- Supply and install treatment units
- Work outside site boundary (other than where noted)

- Blower/flare or vacuum for gas system
- Level spreader
- Erosion vegetation layer
- Client indirect cost
- Wet weather delays
- Escalation
- GST
- Sale costs
- Finance costs, taxes etc.

Appendix 1: Information Received

The information received by Aquenta Consulting that forms the basis of this estimate, is as below:

Drawing No's	Rev
General arrangement & drawing list – Fig 00	C
Master plan layout – Fig 01	A
Existing site survey layout – Fig 02	B
Proposed landfill extension location & buffer layout – Fig 03	B
Proposed base of landfill cells layout – Fig 04	B
Proposed final landform layout – Fig 05	B
Typical section through stage 4 – Fig 06	B
Typical lining system – Fig 07	B
Proposed leachate drainage layout – Fig 08	B
Leachate drainage typical sections – Fig 09	B
Filling plan stage 4 cell 1 – Fig 10	B
Filling plan stage 4 cell 2 – Fig 11	B
Filling plan stage 4 cell 3 – Fig 12	B
Filling plan stage 4 cell 4 – Fig 13	B
Filling plan stage 4 cell 5 – Fig 14	B
Filling plan stage 4 cell 6 – Fig 15	B
Proposed landfill base 3D layout – Fig 16	B
Proposed final landform 3D layout – Fig 17	B
Monitoring locations layout – Fig 18	B
Typical gas management layout & details – Fig 19	B
Disturbance footprint for landfill and firebreak layout – Fig 20	A
Proposed filling plan layouts – Fig 21	A
Total disturbance area stage 4 extension layout – Fig 22	A
Conceptual erosion sediment control plan – Fig 23	C

Appendix 2: Detailed breakdown of Cell estimates

Shoalhaven Recycling and Waste Facility

CELL 1

Item	Item description	Unit	Quantity	Rate	Cost $
1	**Contractor's Direct Cost**				
1.1	**Site clearance**				
1.1.1	Clearing the site of vegetation including shrubs <0.5m girth with roots and stumps, dispose spoil off site	m2	17,253	$ 10.00	$ 172,530
1.1.2	Clear site from tress	m2	17,253	$ 2.00	$ 34,506
1.1.3	Remove leaves and use leaf shredder, grinding up wood branches to mulch using wood chipper	m2	17,253		Excluded
1.1.2	Demolish existing road within stage 4 and dispose spoil off site to tip	m2	1,400	15	$ 21,000
1.2	**Cut to reduce level**				
1.2.1	Cut to reduce level at proposed landfill base to RL42.5/43.5, topsoil 100mm thick. Cart spoil to designated stockpile area	m3	92,463	$ 4.21	$ 389,268
1.2.2	Load, transport and disposal of excavation to a licenced EPA waste facility classified as general solid waste (GSW) putrescible, assumed	Tonne	136,208		Excluded
1.3	**Base Formation**				
1.3.1	1000mm Thick imported Compacted Clay Liner, spread, watering, compact and test	m3	18,512	$ 38.00	$ 703,451
1.3.2	600 x 600mm Anchore trench, remove excavated material from stockpile to work area, spread, watering, compact and test	m3	202	$ 20.00	$ 4,046
1.3.3	Engineered general fill, remove excavated material from stockpile to work area, spread, watering, compact and test	m3	228	$ 68.00	$ 15,504
1.3.4	Supply and lay 2.0mm Double rough HDPE Geomembrane	m2	13,349	$ 10.00	$ 133,489
1.3.5	Supply and lay Non Woven Geotextile protection layer	m2	13,349	$ 15.00	$ 200,234
1.3.6	Supply and lay Non Woven Geotextile separation layer	m2	11,351	$ 15.00	$ 170,268
1.4	**Filling**				
1.4.1	Imported topsoil 200mm thick, spread, watering and compact	m3	3,451	$ 15.00	Excluded
1.4.2	Hydroseed Final Surface Level	m2	17,253	$ 1.00	Excluded
1.4.3	Waste Fill, remove material from stockpile to work area, spread, watering and compact	m3	161,470	$ 31.00	Excluded
1.4.4	Waste regulation layer	m3	2,522	$ 32.00	Excluded
1.4.5	Protection soils, remove excavated material from stockpile to work area, spread, watering, compact and test	m3	5,045	$ 39.00	Excluded
1.5	**Drainage**				
1.5.1	Supply and lay 300mm thick leachate drainage blanket	m3	3,363	$ 165.00	$ 554,846
1.5.2	supply and lay OD200 HDPE leachate SPUR drain	m	315	$ 70.00	$ 22,050
1.5.4	Supply and lay OD200mm HDPE main leachate spine drain	m	714	$ 70.00	$ 49,980
1.5.5	Supply and install leachate collection sump	no	8	$ 500.00	$ 4,000
1.5.6	Supply and Lay OD600mm HDPE leachate side riser	m	47	$ 460.00	$ 21,620
1.5.7	Supply and lay OD600mm HDPE (assumed) leachate collection pump line	m	174	$ 460.00	$ 80,040
1.5.9	Supply and install leachate storage tank	No	1	$ 15,000.00	$ 15,000
1.5.10	Supply and install treatment units	item			Excluded
1.5.11	Supply and install groundwater wells	m	50	$ 93.00	$ 4,650
1.6	**Gas System**				
1.6.1	Supply and install landfill gas wells	no	4	$ 200.00	$ 800
1.6.3	Supply and install well head station	no	2	$ 2,000.00	$ 4,000
1.6.4	Supply and lay gas ring main	m	775	$ 40.00	$ 31,000
1.6.5	Filling with bentonite seal	m3	1	$ 100.00	$ 74
	Liner to well				
1.6.6	Excavate bore hole in material other than rock using hydraulic equipment, load spoil into trucks and dispose off site to tip	m	64	$ 83.00	$ 5,312
1.7	**Fire Break**				
1.7.1	Allow for vegetation for fire break, 10m wide	m	424	$ 300.00	$ 127,200
1.8	**Sediment Control**				
1.8.1	Allow for sediment fence	m	101	$ 6.00	$ 606
1.8.2	Sediment dams	m2	2,314	$ 130.00	$ 300,820
1.8.3	Allow for Pasture Furrows	m	357	$ 12.00	$ 4,284
1.8.4	25MPa reinforced concrete for drainage bund, including placing, vibrating, finishing of concrete, formwork and steel reinforcement	m	41	$ 500.00	$ 20,500
1.8.5	25MPa reinforced concrete for drop structure, including placing, vibrating, finishing of concrete, formwork and steel reinforcement	m	216	$ 375.00	$ 81,000
1.8.6	Allow for Back-push bank	m	153	$ 75.00	$ 11,475
1.9	**New Road**				
1.9.1	New road to replace the existing which runs through stage 4	m2	1,400	$ 50.00	$ 70,000
	Total of Contractor's Direct Cost				**$ 3,253,550**

Cell 1 - Continue

2	**Contractor's Preliminaries, Overheads and Profit (including Fee)**				
2.1	Mobilization & Site Establishment	item	1	$ 32,535.50	$ 32,536
2.2	Project Management including construction quality assurance	item	1	$ 336,041.34	$ 336,041
2.3	Insurances & Securities	item	1	$ 32,535.50	$ 32,536
2,4	Other Contractor's Design	item	1	$ 26,028.40	$ 26,028
2.5	Allow for Offsite Overheads & Profit	item	1	$ 184,034.54	$ 184,035
	Sub-Total of Contractor's Preliminaries, Overheads and Profit				**$ 611,180**
3	**Client Costs**				
3.1	Procurement phase	item	1		Excluded
3.2	Delivery management	item	1		Excluded
3.3	Integrated services planning	item	1		Excluded
3.4	Environmental services	item	1		Excluded
3.5	Community relations and stakeholder management	item	1		Excluded
3.6	Customer delivery	item	1		Excluded
3.7	Miscellaneous costs	item	1		Excluded
3.8	Legal / Contractual advice	item	1		Excluded
3.9	Capital uplift	item	1		Excluded
	Sub-Total of Client Costs				**$ -**
4	**Client Contingency**				
4.1	Clients Contingency - allow for 20% od contractor's direct & indirect costs	item	1	$ 772,946.00	$ 772,946
	Sub-Total of Clients Contingency				**$ 772,946**
	Total of Preliminaries, client's indirect and Client's Contingency				**$ 1,384,126**
	Grand Total				**$ 4,637,680**
	Total Project Cost				**$ 4,638,000**

Shoalhaven Recycling and Waste Facility

CELL 2

Item	Item description	Unit	Quantity	Rate	Cost $
1	**Contractor's Direct Cost**				
1.1	**Site clearance**				
1.1.1	Clearing the site of vegetation including shrubs <0.5m girth with roots and stumps, dispose spoil off site	m2	15,467	$ 10.00	$ 154,670
1.1.2	Clear site from tress	m2	15,467	$ 2.00	$ 30,934
1.1.3	Remove leaves and use leaf shredder, grinding up wood branches to mulch using wood chipper	m2	15,467		Excluded
1.2	**Cut to reduce level**				
1.2.1	Cut to reduce level at proposed landfill base to RL42.5/43.5, topsoil 100mm thick. Cart spoil to designated stockpile area	m3	92,334	$ 4.21	$ 388,728
1.2.2	Load, transport and disposal of excavation to a licenced EPA waste facility classified as general solid waste (GSW) putrescible, assumed	Tonne	136,108		Excluded
1.3	**Base Formation**				
1.3.1	1000mm Thick imported Compacted Clay Liner, spread, watering, compact and test	m3	16,809	$ 38.00	$ 638,733
1.3.2	600 x 600mm Anchore trench, remove excavated material from stockpile to work area, spread, watering, compact and test	m3	216	$ 20.00	$ 4,313
1.3.3	Engineered general fill, remove excavated material from stockpile to work area, spread, watering, compact and test	m3	154	$ 68.00	$ 10,465
1.3.4	Supply and lay 2.0mm Double rough HDPE geomembrane	m2	14,299	$ 10.00	$ 142,991
1.3.5	Supply and lay Non Woven Geotextile protection layer	m2	14,299	$ 15.00	$ 214,487
1.3.6	Supply and lay Non Woven Geotextile separation layer	m2	12,061	$ 15.00	$ 180,921
1.4	**Filling**				
1.4.1	Imported topsoil 200mm thick, spread, watering and compact	m3	3,093	$ 15.00	Excluded
1.4.2	Hydroseed Final Surface Level	m2	15,467	$ 1.00	Excluded
1.4.3	Waste Fill, remove material from stockpile to work area, spread, watering and compact	m3	161,246	$ 31.00	Excluded
1.4.4	Waste regulation layer	m3	2,519	$ 32.00	Excluded
1.4.5	Protection soils, remove excavated material from stockpile to work area, spread, watering, compact and test	m3	5,038	$ 39.00	Excluded
1.5	**Drainage**				
1.5.1	Supply and lay 300mm thick leachate drainage blanket	m3	3,563	$ 165.00	$ 587,872
1.5.2	supply and lay OD200 HDPE leachate SPUR drain	m	323	$ 70.00	$ 22,610
1.5.10	Supply and install treatment units	item			Excluded
1.5.11	Supply and install groundwater wells	m	50	$ 93.00	$ 4,650
1.6	**Gas System**				
1.6.1	Supply and install landfill gas wells	no	4	$ 200.00	$ 800
1.6.5	Filling with bentonite seal	m3	1	$ 100.00	$ 74
	Liner to well				
1.6.6	Excavate bore hole in material other than rock using hydraulic equipment, load spoil into trucks and dispose off site to tip	m	64	$ 83.00	$ 5,312
1.7	**Fire Break**				
1.7.1	Allow for vegetation for fire break, 10m wide	m	126	$ 300.00	$ 37,800
1.8	**Sediment Control**				
1.8.1	Allow for sediment fence	m	60	$ 6.00	$ 360
1.8.3	Allow for Pasture Furrows	m	226	$ 12.00	$ 2,712
1.8.5	25MPa reinforced concrete for drop structure, including placing, vibrating, finishing of concrete, formwork and steel reinforcement	m	88	$ 375.00	$ 33,000
	Total of Contractor's Direct Cost				**$ 2,461,430**
2	**Contractor's Preliminaries, Overheads and Profit (including Fee)**				
2.1	Mobilization & Site Establishment	item	1	$ 24,614.30	$ 24,614
2.2	Project Management including construction quality assurance	item	1	$ 335,688.30	$ 335,688
2.3	Insurances & Securities	item	1	$ 24,614.30	$ 24,614
2,4	Other Contractor's Design	item	1	$ 19,691.44	$ 19,691
2.5	Allow for Offsite Overheads & Profit	item	1	$ 143,301.92	$ 143,302
	Sub-Total of Contractor's Preliminaries, Overheads and Profit				**$ 547,910**
3	**Client Costs**				
3.1	Procurement phase	item	1		Excluded
3.2	Delivery management	item	1		Excluded
3.3	Integrated services planning	item	1		Excluded
3.4	Environmental services	item	1		Excluded
3.5	Community relations and stakeholder management	item	1		Excluded
3.6	Customer delivery	item	1		Excluded
3.7	Miscellaneous costs	item	1		Excluded
3.8	Legal / Contractual advice	item	1		Excluded
3.9	Capital uplift	item	1		Excluded
	Sub-Total of Client Costs				**$ -**
4	**Client Contingency**				
4.1	Clients Contingency - allow for 20% od contractor's direct & indirect costs	item	1	$ 601,868.00	$ 601,868
	Sub-Total of Clients Contingency				**$ 601,868**
	Total of Preliminaries, client's indirect and Client's Contingency				**$ 1,149,778**
	Grand Total				**$ 3,611,210**
	Total Project Cost				**$ 3,612,000**

Shoalhaven Recycling and Waste Facility

CELL 3

Item	Item description	Unit	Quantity	Rate	Cost $
1	**Contractor's Direct Cost**				
1.1	**Site clearance**				
1.1.1	Clearing the site of vegetation including shrubs <0.5m girth with roots and stumps, dispose spoil off site	m2	11,259	$ 10.00	$ 112,590
1.1.2	Clear site from tress	m2	11,259	$ 2.00	$ 22,518
1.1.3	Remove leaves and use leaf shredder, grinding up wood branches to mulch using wood chipper	m2	11,259		Excluded
1.2	**Cut to reduce level**				
1.2.1	Cut to reduce level at proposed landfill base to RL42.5/43.5, topsoil 100mm thick. Cart spoil to designated stockpile area	m3	58,361	$ 4.21	$ 245,702
1.2.2	Load, transport and disposal of excavation to a licenced EPA waste facility classified as general solid waste (GSW) putrescible, assumed	Tonne	#REF!		Excluded
1.3	**Base Formation**				
1.3.1	1000mm Thick imported Compacted Clay Liner, spread, watering, compact and test	m3	12,224	$ 38.00	$ 464,529
1.3.2	600 x 600mm Anchore trench, remove excavated material from stockpile to work area, spread, watering, compact and test	m3	155	$ 20.00	$ 3,103
1.3.4	Supply and lay 2.0mm Double rough HDPE geomembrane	m2	11,660	$ 10.00	$ 116,600
1.3.5	Supply and lay Non Woven Geotextile protection layer	m2	11,660	$ 15.00	$ 174,900
1.3.6	Supply and lay Non Woven Geotextile separation layer	m2	10,051	$ 15.00	$ 150,759
1.4	**Filling**				
1.4.1	Imported topsoil 200mm thick, spread, watering and compact	m3	2,252	$ 15.00	Excluded
1.4.2	Hydroseed Final Surface Level	m2	11,259	$ 1.00	Excluded
1.4.3	Waste Fill, remove material from stockpile to work area, spread, watering and compact	m3	101,918	$ 31.00	Excluded
1.4.4	Waste regulation layer	m3	#REF!	$ 32.00	Excluded
1.4.5	Protection soils, remove excavated material from stockpile to work area, spread, watering, compact and test	m3	3,184	$ 39.00	Excluded
1.5	**Drainage**				
1.5.1	Supply and lay 300mm thick leachate drainage blanket	m3	2,969	$ 165.00	$ 489,892
1.5.2	supply and lay OD200 HDPE leachate SPUR drain	m	217	$ 70.00	$ 15,190
1.5.10	Supply and install treatment units	item			Excluded
1.5.11	Supply and install groundwater wells	m	25	$ 93.00	$ 2,325
1.6	**Gas System**				
1.6.1	Supply and install landfill gas wells	no	3	$ 200.00	$ 600
	Liner to well				
1.6.6	Excavate bore hole in material other than rock using hydraulic equipment, load spoil into trucks and dispose off site to tip	m	48	$ 83.00	$ 3,984
1.7	**Fire Break**				
1.7.1	Allow for vegetation for fire break, 10m wide	m	93	$ 300.00	$ 27,900
1.8	**Sediment Control**				
1.8.1	Allow for sediment fence	m	23	$ 6.00	$ 138
1.8.3	Allow for Pasture Furrows	m	178	$ 12.00	$ 2,136
1.8.5	25MPa reinforced concrete for drop structure, including placing, vibrating, finishing of concrete, formwork and steel reinforcement	m	106	$ 375.00	$ 39,750
	Total of Contractor's Direct Cost				**$ 1,872,620**
2	**Contractor's Preliminaries, Overheads and Profit (including Fee)**				
2.1	Mobilization & Site Establishment	item	1	$ 18,726.20	$ 18,726
2.2	Project Management including construction quality assurance	item	1	$ 225,083.14	$ 225,083
2.3	Insurances & Securities	item	1	$ 18,726.20	$ 18,726
2,4	Other Contractor's Design	item	1	$ 14,980.96	$ 14,981
2.5	Allow for Offsite Overheads & Profit	item	1	$ 107,506.82	$ 107,507
	Sub-Total of Contractor's Preliminaries, Overheads and Profit				**$ 385,020**
3	**Client Costs**				
3.1	Procurement phase	item	1		Excluded
3.2	Delivery management	item	1		Excluded
3.3	Integrated services planning	item	1		Excluded
3.4	Environmental services	item	1		Excluded
3.5	Community relations and stakeholder management	item	1		Excluded
3.6	Customer delivery	item	1		Excluded
3.7	Miscellaneous costs	item	1		Excluded
3.8	Legal / Contractual advice	item	1		Excluded
3.9	Capital uplift	item	1		Excluded
	Sub-Total of Client Costs				**$ -**
4	**Client Contingency**				
4.1	Clients Contingency - allow for 20% od contractor's direct & indirect costs	item	1	$ 451,528.00	$ 451,528
	Sub-Total of Clients Contingency				**$ 451,528**
	Total of Preliminaries, client's indirect and Client's Contingency				**$ 836,548**
	Grand Total				**$ 2,709,170**
	Total Project Cost				**$ 2,710,000**

Shoalhaven Recycling and Waste Facility

CELL 4

Item	Item description	Unit	Quantity	Rate	Cost $
1	**Contractor's Direct Cost**				
1.1	**Site clearance**				
1.1.1	Clearing the site of vegetation including shrubs <0.5m girth with roots and stumps, dispose spoil off site	m2	9,204	$ 10.00	$ 92,040
1.1.2	Clear site from tress	m2	9,204	$ 2.00	$ 18,408
1.1.3	Remove leaves and use leaf shredder, grinding up wood branches to mulch using wood chipper	m2	9,204		Excluded
1.2	**Cut to reduce level**				
1.2.1	Cut to reduce level at proposed landfill base to RL42.5/43.5, topsoil 100mm thick. Cart spoil to designated stockpile area	m3	69,058	$ 4.21	$ 290,735
1.2.2	Load, transport and disposal of excavation to a licenced EPA waste facility classified as general solid waste (GSW) putrescible, assumed	Tonne	101,749		Excluded
1.3	**Base Formation**				
1.3.1	1000mm Thick imported Compacted Clay Liner, spread, watering, compact and test	m3	10,073	$ 38.00	$ 382,779
1.3.2	600 x 600mm Anchore trench, remove excavated material from stockpile to work area, spread, watering, compact and test	m3	140	$ 20.00	$ 2,794
1.3.3	Engineered general fill, remove excavated material from stockpile to work area, spread, watering, compact and test	m3	169	$ 68.00	$ 11,499
1.3.4	Supply and lay 2.0mm Double rough HDPE geomembrane	m2	8,926	$ 10.00	$ 89,258
1.3.5	Supply and lay Non Woven Geotextile protection layer	m2	8,926	$ 15.00	$ 133,887
1.3.6	Supply and lay Non Woven Geotextile separation layer	m2	7,490	$ 15.00	$ 112,350
1.4	**Filling**				
1.4.1	Imported topsoil 200mm thick, spread, watering and compact	m3	1,841	$ 15.00	Excluded
1.4.2	Hydroseed Final Surface Level	m2	9,204	$ 1.00	Excluded
1.4.3	Waste Fill, remove material from stockpile to work area, spread, watering and compact	m3	120,299	$ 31.00	Excluded
1.4.4	Waste regulation layer	m3	1,879	$ 32.00	Excluded
1.4.5	Protection soils, remove excavated material from stockpile to work area, spread, watering, compact and test	m3	3,759	$ 39.00	Excluded
1.5	**Drainage**				
1.5.1	Supply and lay 300mm thick leachate drainage blanket	m3	2,205	$ 165.00	$ 363,805
1.5.2	supply and lay OD200 HDPE leachate SPUR drain	m	159	$ 70.00	$ 11,130
1.5.10	Supply and install treatment units	item			Excluded
1.5.11	Supply and install groundwater wells	m	50	$ 93.00	$ 4,650
1.6	**Gas System**				
1.6.1	Supply and install landfill gas wells	no	3	$ 200.00	$ 600
1.6.5	Filling with bentonite seal	m3	1	$ 100.00	$ 56
	Liner to well				
1.6.6	Excavate bore hole in material other than rock using hydraulic equipment, load spoil into trucks and dispose off site to tip	m	48	$ 83.00	$ 3,984
	Total of Contractor's Direct Cost				**$ 1,517,970**
2	**Contractor's Preliminaries, Overheads and Profit (including Fee)**				
2.1	Mobilization & Site Establishment	item	1	$ 15,179.70	$ 15,180
2.2	Project Management including construction quality assurance	item	1	$ 259,860.86	$ 259,861
2.3	Insurances & Securities	item	1	$ 15,179.70	$ 15,180
2,4	Other Contractor's Design	item	1	$ 12,143.76	$ 12,144
2.5	Allow for Offsite Overheads & Profit	item	1	$ 91,016.70	$ 91,017
	Sub-Total of Contractor's Preliminaries, Overheads and Profit				**$ 393,380**
3	**Client Costs**				
3.1	Procurement phase	item	1		Excluded
3.2	Delivery management	item	1		Excluded
3.3	Integrated services planning	item	1		Excluded
3.4	Environmental services	item	1		Excluded
3.5	Community relations and stakeholder management	item	1		Excluded
3.6	Customer delivery	item	1		Excluded
3.7	Miscellaneous costs	item	1		Excluded
3.8	Legal / Contractual advice	item	1		Excluded
3.9	Capital uplift	item	1		Excluded
	Sub-Total of Client Costs				**$ -**
4	**Client Contingency**				
4.1	Clients Contingency - allow for 20% od contractor's direct & indirect costs	item	1	$ 382,270.00	$ 382,270
	Sub-Total of Clients Contingency				**$ 382,270**
	Total of Preliminaries, client's indirect and Client's Contingency				**$ 775,650**
	Grand Total				**$ 2,293,620**
	Total Project Cost				**$ 2,294,000**

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Shoalhaven Recycling and Waste Facility

CELL 5

Item	Item description	Unit	Quantity	Rate	Cost $
1	**Contractor's Direct Cost**				
1.1	**Site clearance**				
1.1.1	Clearing the site of vegetation including shrubs <0.5m girth with roots and stumps, dispose spoil off site	m2	13,685	$ 10.00	$ 136,850
1.1.2	Clear site from tress	m2	13,685	$ 2.00	$ 27,370
1.1.3	Remove leaves and use leaf shredder, grinding up wood branches to mulch using wood chipper	m2	13,685		Excluded
1.2	**Cut to reduce level**				
1.2.1	Cut to reduce level at proposed landfill base to RL42.5/43.5, topsoil 100mm thick. Cart spoil to designated stockpile area	m3	52,157	$ 4.21	$ 219,582
1.2.2	Load, transport and disposal of excavation to a licenced EPA waste facility classified as general solid waste (GSW) putrescible, assumed	Tonne	#REF!		Excluded
1.3	**Base Formation**				
1.3.1	1000mm Thick imported Compacted Clay Liner, spread, watering, compact and test	m3	14,724	$ 38.00	$ 559,526
1.3.2	600 x 600mm Anchore trench, remove excavated material from stockpile to work area, spread, watering, compact and test	m3	167	$ 20.00	$ 3,341
1.3.4	Supply and lay 2.0mm Double rough HDPE geomembrane	m2	11,743	$ 10.00	$ 117,435
1.3.5	Supply and lay Non Woven Geotextile protection layer	m2	11,743	$ 15.00	$ 176,152
1.3.6	Supply and lay Non Woven Geotextile separation layer	m2	10,049	$ 15.00	$ 150,741
1.4	**Filling**				
1.4.1	Imported topsoil 200mm thick, spread, watering and compact	m3	2,737	$ 15.00	Excluded
1.4.2	Hydroseed Final Surface Level	m2	13,685	$ 1.00	Excluded
1.4.3	Waste Fill, remove material from stockpile to work area, spread, watering and compact	m3	91,084	$ 31.00	Excluded
1.4.4	Waste regulation layer	m3	1,423	$ 32.00	Excluded
1.4.5	Protection soils, remove excavated material from stockpile to work area, spread, watering, compact and test	m3	2,846	$ 39.00	Excluded
1.5	**Drainage**				
1.5.1	Supply and lay 300mm thick leachate drainage blanket	m3	2,967	$ 165.00	$ 489,624
1.5.2	supply and lay OD200 HDPE leachate SPUR drain	m	196	$ 70.00	$ 13,720
1.5.8	Supply and install leachate pumps	item	1	$ 25,000.00	$ 25,000
1.5.9	Supply and install leachate storage tank	No	1	$ 15,000.00	$ 15,000
1.5.10	Supply and install treatment units	item			Excluded
1.5.11	Supply and install groundwater wells	m	25	$ 93.00	$ 2,325
1.6	**Gas System**				
1.6.1	Supply and install landfill gas wells	no	3	$ 200.00	$ 600
1.6.3	Supply and install well head station	no	1	$ 2,000.00	$ 2,000
1.6.5	Filling with bentonite seal	m3	1	$ 100.00	$ 56
	Liner to well				
1.6.6	Excavate bore hole in material other than rock using hydraulic equipment, load spoil into trucks and dispose off site to tip	m	48	$ 83.00	$ 3,984
1.7	**Fire Break**				
1.7.1	Allow for vegetation for fire break, 10m wide	m	113	$ 300.00	$ 33,900
1.7.2	Allow for vegetation for fire break, 6m wide	m	106	$ 200.00	$ 21,200
1.8	**Sediment Control**				
1.8.2	Sediment dams	m2	1,098	$ 130.00	$ 142,740
1.8.3	Allow for Pasture Furrows	m	415	$ 12.00	$ 4,980
1.8.4	25MPa reinforced concrete for drainage bund, including placing, vibrating, finishing of concrete, formwork and steel reinforcement	m	42	$ 500.00	$ 21,000
1.8.5	25MPa reinforced concrete for drop structure, including placing, vibrating, finishing of concrete, formwork and steel reinforcement	m	137	$ 375.00	$ 51,375
1.8.6	Allow for Back-push bank	m	21	$ 75.00	$ 1,575
	Total of Contractor's Direct Cost				**$ 2,220,080**
2	**Contractor's Preliminaries, Overheads and Profit (including Fee)**				
2.1	Mobilization & Site Establishment	item	1	$ 22,200.80	$ 22,201
2.2	Project Management including construction quality assurance	item	1	$ 204,824.93	$ 204,825
2.3	Insurances & Securities	item	1	$ 22,200.80	$ 22,201
2,4	Other Contractor's Design	item	1	$ 17,760.64	$ 17,761
2.5	Allow for Offsite Overheads & Profit	item	1	$ 124,353.36	$ 124,353
	Sub-Total of Contractor's Preliminaries, Overheads and Profit				**$ 391,340**
3	**Client Costs**				
3.1	Procurement phase	item	1		Excluded
3.2	Delivery management	item	1		Excluded
3.3	Integrated services planning	item	1		Excluded
3.4	Environmental services	item	1		Excluded
3.5	Community relations and stakeholder management	item	1		Excluded
3.6	Customer delivery	item	1		Excluded
3.7	Miscellaneous costs	item	1		Excluded
3.8	Legal / Contractual advice	item	1		Excluded
3.9	Capital uplift	item	1		Excluded
	Sub-Total of Client Costs				**$ -**
4	**Client Contingency**				
4.1	Clients Contingency - allow for 20% od contractor's direct & indirect costs	item	1	$ 522,284.00	$ 522,284
	Sub-Total of Clients Contingency				**$ 522,284**
	Total of Preliminaries, client's indirect and Client's Contingency				**$ 913,624**
	Grand Total				**$ 3,133,700**
	Total Project Cost				**$ 3,134,000**

Shoalhaven Recycling and Waste Facility

CELL 6

Item	Item description	Unit	Quantity	Rate	Cost $
1	**Contractor's Direct Cost**				
1.1	**Site clearance**				
1.1.1	Clearing the site of vegetation including shrubs <0.5m girth with roots and stumps, dispose spoil off site	m2	11,583	$ 10.00	$ 115,830
1.1.2	Clear site from tress	m2	11,583	$ 2.00	$ 23,166
1.1.3	Remove leaves and use leaf shredder, grinding up wood branches to mulch using wood chipper	m2	11,583		Excluded
1.2	**Cut to reduce level**				
1.2.1	Cut to reduce level at proposed landfill base to RL42.5/43.5, topsoil 100mm thick. Cart spoil to designated stockpile area	m3	63,496	$ 4.21	$ 267,318
1.2.2	Load, transport and disposal of excavation to a licenced EPA waste facility classified as general solid waste (GSW) putrescible, assumed	Tonne	93,470		Excluded
1.3	**Base Formation**				
1.3.1	1000mm Thick imported Compacted Clay Liner, spread, watering, compact and test	m3	12,544	$ 38.00	$ 476,670
1.3.2	600 x 600mm Anchore trench, remove excavated material from stockpile to work area, spread, watering, compact and test	m3	154	$ 20.00	$ 3,089
1.3.3	Engineered general fill, remove excavated material from stockpile to work area, spread, watering, compact and test	m3	186	$ 68.00	$ 12,662
1.3.4	Supply and lay 2.0mm Double rough HDPE geomembrane	m2	10,033	$ 10.00	$ 100,334
1.3.5	Supply and lay Non Woven Geotextile protection layer	m2	10,033	$ 15.00	$ 150,501
1.3.6	Supply and lay Non Woven Geotextile separation layer	m2	8,464	$ 15.00	$ 126,966
1.4	**Filling**				
1.4.1	Imported topsoil 200mm thick, spread, watering and compact	m3	2,317	$ 15.00	Excluded
1.4.2	Hydroseed Final Surface Level	m2	11,583	$ 1.00	Excluded
1.4.3	Waste Fill, remove material from stockpile to work area, spread, watering and compact	m3	110,884	$ 31.00	Excluded
1.4.4	Waste regulation layer	m3	1,732	$ 32.00	Excluded
1.4.5	Protection soils, remove excavated material from stockpile to work area, spread, watering, compact and test	m3	3,465	$ 39.00	Excluded
1.5	**Drainage**				
1.5.1	Supply and lay 300mm thick leachate drainage blanket	m3	2,493	$ 165.00	$ 411,305
1.5.2	supply and lay OD200 HDPE leachate SPUR drain	m	158	$ 70.00	$ 11,060
1.5.8	Supply and install leachate pumps	item	1	$ 35,000.00	$ 35,000
1.5.10	Supply and install treatment units	item			Excluded
1.5.11	Supply and install groundwater wells	m	50	$ 93.00	$ 4,650
1.6	**Gas System**				
1.6.1	Supply and install landfill gas wells	no	3	$ 200.00	$ 600
1.6.3	Supply and install well head station	no	2	$ 2,000.00	$ 4,000
1.6.5	Filling with bentonite seal	m3	1	$ 100.00	$ 56
	Liner to well				
1.6.6	Excavate bore hole in material other than rock using hydraulic equipment, load spoil into trucks and dispose off site to tip	m	48	$ 83.00	$ 3,984
1.7	**Fire Break**				
1.7.3	Allow for vegetation for fire break, 20m wide	m	86	$ 600.00	$ 51,600
1.8	**Sediment Control**				
1.8.1	Allow for sediment fence	m	94	$ 6.00	$ 564
1.8.3	Allow for Pasture Furrows	m	255	$ 12.00	$ 3,060
1.8.5	25MPa reinforced concrete for drop structure, including placing, vibrating, finishing of concrete, formwork and steel reinforcement	m	152	$ 375.00	$ 57,000
	Total of Contractor's Direct Cost				**$ 1,859,410**
2	**Contractor's Preliminaries, Overheads and Profit (including Fee)**				
2.1	Mobilization & Site Establishment	item	1	$ 18,594.10	$ 18,594
2.2	Project Management including construction quality assurance	item	1	$ 241,773.44	$ 241,773
2.3	Insurances & Securities	item	1	$ 18,594.10	$ 18,594
2,4	Other Contractor's Design	item	1	$ 14,875.28	$ 14,875
2.5	Allow for Offsite Overheads & Profit	item	1	$ 107,662.35	$ 107,662
	Sub-Total of Contractor's Preliminaries, Overheads and Profit				**$ 401,500**
3	**Client Costs**				
3.1	Procurement phase	item	1		Excluded
3.2	Delivery management	item	1		Excluded
3.3	Integrated services planning	item	1		Excluded
3.4	Environmental services	item	1		Excluded
3.5	Community relations and stakeholder management	item	1		Excluded
3.6	Customer delivery	item	1		Excluded
3.7	Miscellaneous costs	item	1		Excluded
3.8	Legal / Contractual advice	item	1		Excluded
3.9	Capital uplift	item	1		Excluded
	Sub-Total of Client Costs				**$ -**
4	**Client Contingency**				
4.1	Clients Contingency - allow for 20% od contractor's direct & indirect costs	item	1	$ 452,182.00	$ 452,182
	Sub-Total of Clients Contingency				**$ 452,182**
	Total of Preliminaries, client's indirect and Client's Contingency				**$ 853,682**
	Grand Total				**$ 2,713,090**
	Total Project Cost				**$ 2,714,000**