Re-Use Goulburn

APPENDIX



CONTAMINATION INVESTIGATION













SITE ACCEPTANCE CRITERIA EXCEEDANCES

GOULBURN WASTE TRANSFER, REUSE AND RECYCLE CENTRE

Legend



Project Boundary



0	25	50	75	100
	5	Car	dno	
		by Cardno NSW 8-07-30 Project	: 82018253-01	,

Coordinate System: GDA 1994 MGA Zone 55 Map: 8201825301-GS-005-TestPits.mxd 00-01 Aerial imagery supplied by nearmap (March 2018)

Table A - Laboratory results for heavy metals

Location	Depth (m)	Date Sampled	Filling (F) /	рН	Clay Content	CEC				Heavy	Metals			
Location	Deptil (III)	Date Sampled	Natural (N)	рп	Content	CEC	As	Cd	Cr	Cu	Pb	Hg	Ni	Zn
					(%w/w)		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
TP101	0.1 - 0.2	12-Jul-2018	F				5	<1	13	110	28	<0.1	4	26
TP102	0.1 - 0.3	12-Jul-2018	F				7	<1	24	30	53	<0.1	8	79
TP103	0.1 - 0.3	12-Jul-2018	F				<5	<1	20	12	16	<0.1	6	25
TP105	0.2 - 0.3	12-Jul-2018	F				<5	<1	18	12	26	<0.1	8	53
TP107	0.2 - 0.4	12-Jul-2018	Ν				9	<1	15	<5	28	<0.1	3	70
TP108	0.1 - 0.3	12-Jul-2018	N				<5	<1	8	<5	<5	<0.1	<2	<5
	Guideline Value	S	ALS PQL	-	-	-	5	1.0	2	5	5	0.1	2	5
NEPM (2013) HIL	NEPM (2013) HILs for Residential A Land-Use (HIL A)					NC	3000	900	3600	240000	1500	730	6000	400000
NEPM (2013) EIL		NC	NC	NC	160 ²	NC	310 ⁴	85 ³	1800 ³	NC	55 ³	110 ³		
NSW EPA, Guidelines for Assessing Service Station Sites, 1994				NC	NC	NC	NC	NC	NC	NC	300	NC	NC	NC
NSW DECCW (2009) General Solid Waste Contaminant Threshold				NC	NC	NC	100	20	100	NC	100	4	40	NC
Concentrations ⁴ (CT1)							100	20	100		100	-	υ	
NSW DECCW (2 Concentrations (0	Threshold	NC	NC	NC	400	80	400	NC	400	16	160	NC		
Notes														

Commercial/Industrial D - Commercial/industrial, includes premises such as shops, offices, factories and industrial sites

HIL D - Health-based Investigation Levels for Commercial/Industrial Land-Use D

1 - The EIL is calculated by summing the ACL and the ABC. In the absence of pH, CEC and/or % clay content testing, the most conservative ACL value from Tables 1B(1) to 1B(3) NEPM (2013) is adopted as the EIL.

2 - Generic EIL

3 - EIL is the most conservative ACL value adopted from Table 1B(1) to 1B(3) NEPM 2013 in the absence of pH, CEC and/or % clay content testing

4 - Values are the same for general solid waste (putrescible) and general solid waste (non-putrescible)

Contaminant Exceedance Indicators:

Bold - Indicates exceedance of NEPM (2013) HIL D criteria values - National Environment Protection (Assessment of Site Contamination) Measure 1999 (April 2013)

Italics - Indicates exceedance of NEPM (2013) EIL criteria values for Commercial/Industrial Land-Use D - National Environment Protection (Assessment of Site Contamination) Measure 1999 (April 2013)

Underline - Indicates exceedance of criteria values NSW EPA Guidelines for Assessing Service Station Sites for sensitive land-use

	Indicates exceedance of the General Solid Waste C	Criteria Values without TCLP testing	- NSW DECCW, Waste Classification Guidelines,	Part 1: Classifying Waste, 2009
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Indicates exceedance of the Restricted Solid Waste Criteria Values without TCLP testing - NSW DECCW, Waste Classification Guidelines, Part 1: Classifying Waste, 2009

<u>Acronyms:</u>

Acronyms:	
As	Arsenic
Cd	Cadmium
Cr	Chromium
Cu	Copper
Pb	Lead
Hg	Mercury
Ni	Nickel
Zn	Zinc
NEPM (2013)	National Environment Protection Council, National Environment Protection (Assessment of Site Contamination) Measure, 1999 (ammended April 2013)
NSW DECCW (2009)	NSW DECCW, Waste Classification Guidelines, Part 1: Classifying Waste, 2009
NSW EPA (1994)	NSW EPA, Guidelines for Assessing Service Station Sites, 1994
HIL	Health-based Investigation Levels
EIL	Ecological Investigation Level
ACL	Added Contaminant Limit
ABC	Ambient Background Concentration
NC	No Criteria

NT	Not Tested
ND	Not Detected

Table B - Laboratory results for TRH, BTEX and Naphthalene

Table B - Laboratory results for TRH, BTEX and Naphthalene						TF	RH			BTEX				
I continu	Filling (F) /		0 0		F1	F2 >	F3 >	F4 >	Naphth- alene	Davasa	Taluana	Ethyl	Total	
Location	Depth (m)	Date Sampled	Natural (N)	C ₆ - C ₉	C ₁₀ - C ₄₀	C ₆ - C ₉	C ₁₀ - C ₁₆	C ₁₆ - C ₃₄	C ₃₄ - C ₄₀	dieffe	Benzene	Toluene	Benzene	Xylenes
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
TP101	0.1 - 0.2	12-Jul-2018	F	<10	<250	<10	<50	<100	<100	<1	<0.2	<0.5	<0.5	<3
TP102	0.1 - 0.3	12-Jul-2018	F	<10	<250	<10	<50	130	<100	<1	<0.2	<0.5	<0.5	<3
TP103	0.1 - 0.3	12-Jul-2018	F	<10	<250	<10	<50	<100	<100	<1	<0.2	<0.5	<0.5	<3
TP105	0.2 - 0.3	12-Jul-2018	F	<10	<250	<10	<50	<100	<100	<1	<0.2	<0.5	<0.5	<3
TP107	0.2 - 0.4	12-Jul-2018	N	<10	<250	<10	<50	<100	<100	<1	<0.2	<0.5	<0.5	<3
TP108	0.1 - 0.3	12-Jul-2018	N	<10	<250	<10	<50	<100	<100	<1	<0.2	<0.5	<0.5	<3
	Guideline Value	۱ د	ALS PQL	10	50	10	50	100	100	1	0.5	0.5	0.5	0.5
		-	ALOT QL											
, ,	L D - Sand from 0r	•		NC	NC	260	NL	NC	NC	NL	3	NL	NL	230
. ,	L D - Slit from 0m	-		NC	NC	250	NL	NC	NC	NL	4	NL	NL	NL
. ,		<u> </u>		NC	NC	310	NL	NC	NC	NL	4	NL	NL	NL
. ,		ndustrial Land-Use I		NC	NC	NC	NC	NC	NC	370 ¹	NC	NC	NC	NC
NEPM (2013) ES Grained Soils	L ² for Commercial/	Industrial Land-Use	D - Course	NC	NC	215 *	170 *	1,700	3,300	NC	75	135	165	180
NEPM (2013) ES Grained Soils	D - Fine	NC	NC	215 *	170 *	2,500	6,600	NC	95	135	185	95		
NEPM (2013) Management Limits ³ for Commercial/Industrial Land- Use D - Course Grained Soils				NC	NC	700	1000	3,500	10,000	NC	NC	NC	NC	NC
NEPM (2013) Ma Use D - Fine Grai	strial Land-	NC	NC	800	1000	5,000	10,000	NC	NC	NC	NC	NC		
NSW EPA, Guidelines for Assessing Service Station Sites , 1994				65	1000	NC	NC	NC	NC	NC	1	130	50	25
NSW DECCW (2 Concentrations (0	t Threshold	650	10,000 ⁵	NC	NC	NC	NC	NC	10	288	600	1,000		
NSW DECCW (2	NSW DECCW (2009) Restricted Solid Waste Contaminant Threshold Concentrations (CT2)					NC	NC	NC	NC	NC	40	1152	2,400	4,000
Notes to Table XXX	Notes to Table XXX-XXX													

Notes to Table XXX-XXX

Commercial/Industrial D - Commercial/industrial, includes premises such as shops, offices, factories and industrial sites

HSL D - Health Screening Levels for Commercial/Industrial Land-Use D

1 - Generic EIL

2 - ESLs are of low reliability except where indicated by * which indicates that the ESL is of moderate reliability

3 - Management limits are applied after consideration of relevant ESLs and HSLs. They are applicable as screening levels following evaluation of human health and ecological risks and risks to groundwater resources. They are relevant for operating sites where significant sub-surface leakage of petroleum compounds has occurred and when decommissioning industrial and commercial sites.

4 - Values are the same for general solid waste (putrescible) and general solid waste (non-putrescible)

5 - Contaminants only assessed using the SCC (Specific Contaminant Concentration)

DUPX is the duplicate sample of TPXXX/XX

Contaminant Exceedance Indicators:

Bold - Indicates exceedance of NEPM (2013) HIL D criteria values - National Environment Protection (Assessment of Site Contamination) Measure 1999 (April 2013)

Italics - Indicates exceedance of NEPM (2013) EIL/ESL criteria values for Commercial/Industrial Land-Use D - National Environment Protection (Assessment of Site Contamination) Measure 1999 (April 2013)

Underline - Indicates exceedance of criteria values NSW EPA Guidelines for Assessing Service Station Sites for sensitive land-use

Double Underline - Indicates exceedance of NEPM (2013) Management Limits for Commercial/Industrial Land-Use D - National Environment Protection (Assessment of Site Contamination) Measure 1999 (April 2013)

Indicates exceedance of the General Solid Waste Criteria Values without TCLP testing - NSW DECCW, Waste Classification Guidelines, Part 1: Classifying Waste, 2009

Indicates exceedance of the Restricted Solid Waste Criteria Values without TCLP testing - NSW DECCW, Waste Classification Guidelines, Part 1: Classifying Waste, 2009

Acronyms:

TRH	Total Recoverable Hydrocarbons
BTEX	Benzene, Toluene, Ethyl Benzene, Xylene
NEPM (2013)	National Environment Protection Council, National Environment Protection (Assessment of Site Contamination) Measure, 1999 (ammended April 2013)
NSW DECCW (2009)	NSW DECCW, Waste Classification Guidelines, Part 1: Classifying Waste, 2009
NSW EPA (1994)	NSW EPA, Guidelines for Assessing Service Station Sites, 1994
HIL	Health-based Investigation Levels
HSL	Health Screening Levels
BGL	Below Ground Level
EIL	Ecological Investigation Level
ESL	Ecological Screening Levels
NL	Not Limiting
NC	No Criteria
NT	Not Tested
ND	Not Detected

Table C - Laboratory results for PAH, OCP, OPP, PCB and Asbestos

					PAH		OI	PP			
Location	Depth (m)	Date Sampled	Filling (F) / Natural (N)	Total	B(a)P	B(a)P TEQ (PQL)	Total	Chlor- pyrifos	Total PCB	Phenols	
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	
TP101	0.1 - 0.2	12-Jul-2018	F	1.7	<0.5	1.2	<1.2	<0.2	<0.1		
TP102	0.1 - 0.3	12-Jul-2018	F	19.5	1.6	2.4	<1.2	<0.2	<0.1		
TP103	0.1 - 0.3	12-Jul-2018	F	<0.5	<0.5	1.2	<1.2	<0.2	<0.1		
TP105	0.2 - 0.3	12-Jul-2018	F	<0.5	<0.5	1.2	<1.2	<0.2	<0.1		
TP107	0.2 - 0.4	12-Jul-2018	Ν	<0.5	<0.5	1.2	<1.2	<0.2	<0.1		
TP108	0.1 - 0.3	12-Jul-2018	N	<0.5	<0.5	1.2	<1.2	<0.2	<0.1		
	Guideline Value	es	ALS PQL	0.50	0.50	0.5	1.4	0.05	0.1	8	
NEPM (2013) HI	Ls for Commercia	al/Industrial D Land	-Use (HIL D)	4,000	NC	40	NC	2,000	7	240,000	
NEPM (2013) EI	L for Commercial	/Industrial Land-Us	e D	NC	NC	NC	NC	NC	NC	NC	
NEPM (2013) ES Course Grained	NC	0.7	NC	NC	NC	NC	NC				
NEPM (2013) ESL ² for Commercial/Industrial Land-Use D - Fine Grained Soils				NC	0.7	NC	NC	NC	NC	NC	
NSW EPA, Guid	20	1	NC	NC	NC	NC	NC				
NSW DECCW (2 Threshold Conce	200 4	0.8	NC	250 ⁴	4	< 50 ⁴	288				
NSW DECCW (2 Threshold Conce	800 ⁴	3.2	NC	1,000 ⁴	16	< 50 ⁴	1152				
Notos to Table XX											

Notes to Table XXX-XXX

Commercial/Industrial D - Commercial/industrial, includes premises such as shops, offices, factories and industrial sites

HIL D - Health-based Investigation Levels for Commercial/Industrial Land-Use D

1 - Generic EIL

2 - ESLs are of low reliability except where indicated by * which indicates that the ESL is of moderate reliability

- 3 Values are the same for general solid waste (putrescible) and general solid waste (non-putrescible)
- 4 Contaminants only assessed using the SCC (Specific Contaminant Concentration)

5 - Envirolab PQL Values

Contaminant Exceedance Indicators:

Bold - Indicates exceedance of NEPM (2013) HIL D criteria values - National Environment Protection (Assessment of Site Contamination) Measure 1999 (April 2013)

Italics - Indicates exceedance of NEPM (2013) EIL/ESL criteria values for Commercial/Industrial Land-Use D - National Environment Protection (Assessment of Site Contamination) Measurement Median Industrial Land-Use D - Indicates exceedance of criteria values NSW EPA Guidelines for Assessing Service Station Sites for sensitive land-use

Indicates exceedance of the General Solid Waste Criteria Values without TCLP testing - NSW DECCW, Waste Classification Guidelines, Part 1: Classifying Waste, 2I Indicates exceedance of the Restricted Solid Waste Criteria Values without TCLP testing - NSW DECCW, Waste Classification Guidelines, Part 1: Classifying Waste,

Acronyms:

РАН

Polycyclic Aromatic Hydrocarbons

B(a)P	Benzo(a)Pyrene
TEQ	Toxic Equivalence Quotient
РСВ	Polychlorinated Biphenyls
OCP	Organochlorine Pesticides
OPP	Organophosphorus Pesticides
PQL	Practical Quantitation Limit
NEPM (2013)	National Environment Protection Council, National Environment Protection (Assessment of Site Contamination) Measure, 1999 (ammended April 20
NSW DECCW (2009)	NSW DECCW, Waste Classification Guidelines, Part 1: Classifying Waste, 2009
NSW EPA (1994)	NSW EPA, Guidelines for Assessing Service Station Sites, 1994
HIL	Health-based Investigation Levels
EIL	Ecological Investigation Level
ESL	Ecological Screening Levels
NC	No Criteria
NT	Not Tested
ND	Not Detected

Table D - Laboratory results for PAH, OCP, OPP, PCB and Asbestos

				OCP									
Location	Depth (m)	Date Sampled	Filling (F) / Natural (N)	Total	DDT+DDE+ DDD	DDT	Aldrin + Dieldrin	Chlor-dane	Endo- sulfan	Endrin	Hepta- chlor	НСВ	Methoxy- chlor
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
TP101	0.1 - 0.2	12-Jul-2018	F	<2.0	<0.3	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.05	<0.2
TP102	0.1 - 0.3	12-Jul-2018	F	<2.0	<0.3	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.05	<0.2
TP103	0.1 - 0.3	12-Jul-2018	F	<2.0	<0.3	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.05	<0.2
TP105	0.2 - 0.3	12-Jul-2018	F	<2.0	<0.3	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.05	<0.2
TP107	0.2 - 0.4	12-Jul-2018	N	<2.0	<0.3	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.05	<0.2
TP108	0.1 - 0.3	12-Jul-2018	N	<2.0	<0.3	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.05	<0.2
G	uideline Values	3	ALS PQL	1.35	0.05	0.2	0.05	0.05	0.05	0.05	0.05	0.05	0.2
NEPM (2013) HILs	for Commercial/	Industrial D Land-I	Jse (HIL D)	NC	3,600	NC	45	530	2,000	100	50	80	2,500
NEPM (2013) EIL fo	or Commercial/Ir	ndustrial Land-Use	D	NC	NC	640 ¹	NC	NC	NC	NC	NC	NC	NC
NEPM (2013) ESL ² for Commercial/Industrial Land-Use D - Course Grained Soils				NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
NEPM (2013) ESL ² for Commercial/Industrial Land-Use D - Fine Grained Soils			NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	
NSW EPA, Guidelines for Assessing Service Station Sites , 1994			NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	
NSW DECCW (2009) General Solid Waste Contaminant Threshold Concentrations (CT1) ³			< 50 ⁴	NC	NC	NC	NC	60	NC	NC	NC	NC	
NSW DECCW (200 Threshold Concent		blid Waste Contam	inant	< 50 ⁴	NC	NC	NC	NC	240	NC	NC	NC	NC

Notes

Commercial/Industrial D - Commercial/industrial, includes premises such as shops, offices, factories and industrial sites

HIL D - Health-based Investigation Levels for Commercial/Industrial Land-Use D

1 - Generic EIL

2 - ESLs are of low reliability except where indicated by * which indicates that the ESL is of moderate reliability

3 - Values are the same for general solid waste (putrescible) and general solid waste (non-putrescible)

4 - Contaminants only assessed using the SCC (Specific Contaminant Concentration)

5 - Envirolab PQL Values

DUPX is the duplicate sample of TPXXX/XX

Contaminant Exceedance Indicators:

Bold - Indicates exceedance of NEPM (2013) HIL D criteria values - National Environment Protection (Assessment of Site Contamination) Measure 1999 (April 2013)

Italics - Indicates exceedance of NEPM (2013) EIL/ESL criteria values for Commercial/Industrial Land-Use D - National Environment Protection (Assessment of Site Contamination) Measure 1999 (April 2013) <u>Underline</u> - Indicates exceedance of criteria values NSW EPA Guidelines for Assessing Service Station Sites for sensitive land-use

Indicates exceedance of the General Solid Waste Criteria Values without TCLP testing - NSW DECCW, Waste Classification Guidelines, Part 1: Classifying Waste, 2009

Indicates exceedance of the Restricted Solid Waste Criteria Values without TCLP testing - NSW DECCW, Waste Classification Guidelines, Part 1: Classifying Waste, 2009

 Acronyms:

 PAH
 Polycyclic Aromatic Hydrocarbons

 B(a)P
 Benzo(a)Pyrene

 TEQ
 Toxic Equivalence Quotient

 PCB
 Polychlorinated Biphenyls

 OCP
 Organochlorine Pesticides

OPP	Organophosphorus Pesticides
PQL	Practical Quantitation Limit
NEPM (2013)	National Environment Protection Council, National Environment Protection (Assessment of Site Contamination) Measure, 1999 (ammended April 2013)
NSW DECCW (2009)	NSW DECCW, Waste Classification Guidelines, Part 1: Classifying Waste, 2009
NSW EPA (1994)	NSW EPA, Guidelines for Assessing Service Station Sites, 1994
HIL	Health-based Investigation Levels
EIL	Ecological Investigation Level
ESL	Ecological Screening Levels
NC	No Criteria
NT	Not Tested
ND	Not Detected

Location	Depth (m)	Date Sampled	Filling (F) / Natural (N)	Material Description	Asbestos ID in soil	Trace Analysis	ACM >7mm Estimation*	ACM <7mm Estimation*		Total Asbestos g/kg*	ACM >7mm Estimation %(w/w)*	Estimation %(w/w)*	FA and AF Estimation %(w/w)*	Total Asb Est w/w* Note#
					g/kg	-	g	g	g	g/kg	%	%	%	%
TP101	0.1 - 0.2	12/07/2018	F		No	No						<0.01		
TP102	0.1 - 0.3	12/07/2018	F		Ch + Am	No*						<0.01		
TP103	0.1 - 0.3	12/07/2018	F		No	No						<0.01		
TP105	0.2 - 0.3	12/07/2018	F		No	No						<0.01		
	Guidelir	e Values		ALS PQL	0.1	-	-	-	-	<0.1	<0.01	<0.001	<0.001	<0.001
NEPM (2013) HSLs for Residential A Land-Use (HSL A) - Bonded ACM ¹						-	-	-	-	-	0.01	-	-	-
NEPM (2013) H	ISLs for Resider	ntial B Land-Use	(HSL B) - Bonde	ed ACM ¹	-	-	-	-	-	-	0.04	-	-	-
NEPM (2013) H	ISLs for Recrea	tional C Land-Use	e (HSL C) - Bon	ded ACM ¹	-	-	-	-	-	-	0.02	-	-	-
NEPM (2013) H	ISLs for Comme	ercial/Industrial D	Land-Use (HSL	D) - Bonded ACM ¹	-	-	-	-	-	-	0.05	-	-	-
NEPM (2013) H Fines ³	ISLs for Resider	ntial A Land-Use	(HSL A) - Fibrou	us Asbestos ² and Asbestos	-	-	-	-	-	-	-	0.001	0.001	-
NEPM (2013) H Fines ³	ISLs for Reside	ntial B Land-Use	(HSL B) - Fibrou	us Asbestos ² and Asbestos	-	-	-	-	-	-	-	0.001	0.001	-
NEPM (2013) H Fines ³	ISLs for Recrea	tional C Land-Use	e (HSL C) - Fibr	ous Asbestos ² and Asbestos	-	-	-	-	-	-	-	0.001	0.001	-
NEPM (2013) HSLs for Commercial/Industrial D Land-Use (HSL D) - Fibrous Asbestos 2 and Asbestos Fines 3					-	-	-	-	-	-	-	0.001	0.001	-
NEPM (2013) HSLs for Residential A Land-Use (HSL A) - All forms of asbestos					No visible asbestos within surface soils									
NEPM (2013) H	ISLs for Resider	ntial B Land-Use	(HSL B) - All for	ms of asbestos	No visible asbestos within surface soils									
NEPM (2013) HSLs for Recreational C Land-Use (HSL C) - All forms of asbestos					No visible asbestos within surface soils									
NEPM (2013) H	ISLs for Comme	ercial/Industrial D	Land-Use (HSL	D) - All forms of asbestos				No vi	sible asbestos	within surface	e soils			

Table E - Laboratory results for Asbestos Testing

Notes

Bold - Indicates exceedance of NEPM (2013) HSL criteria values - National Environment Protection (Assessment of Site Contamination) Measure 1999 (April 2013)

Residential A - residential land-use with garden/accessible soil (home grown produce <10% fruit and vegetable uptake (no poultry)), also includes childcare centres, preschools and primary schools

Residential B - Residential with minimal opportunities for soil access, includes dwellings with fully and permanently paved yard space such as high-rise buildings and apartments

Recreational C - Public open space such as parks, playgrounds, playing fields (e.g. ovals), secondary schools and footpaths. This does not include undeveloped public open space where potential for exposure is lower and where a site specific assessment may be more appropriate

Commercial/Industrial D - Commercial/industrial, includes premises such as shops, offices, factories and industrial sites

HSL - Health Screening Levels

1 - Bonded ACM comprises asbestos-containing-material which is in sound condition, although possibly broken or fragmented, and where the asbestos is bound in a matrix such as cement or resin (e.g. asbestos fencing and vinyl tiles). This term is restricted to material that cannot pass a 7 mm x 7 mm sieve.

2 - Fibrous asbestos comprises friable asbestos material and includes severely weathered cement sheet, insulation products and woven asbestos material. This type of friable asbestos is defined here as asbestos material that is in a degraded condition such that it can be broken or crumbled by hand pressure.

3 - Asbestos fines includes free fibres, small fibre bundles and also small fragments of bonded ACM that pass through a 7 mm x 7 mm sieve.



CERTIFICATE OF ANALYSIS

Work Order	: CA1804291	Page	: 1 of 10
Client		Laboratory	: ALS Water Resources Group
Contact	: Mr Miles Thompson	Contact	Client Services
Address	26 Lithgow Street	Address	: 16B Lithgow Street Fyshwick ACT Australia 2609
	Fyshwick ACT 2609		
Telephone		Telephone	: +61 2 6202 5404
Project	: Soil Samples	Date Samples Received	: 16-Jul-2018 09:26
Order number	:	Date Analysis Commenced	: 17-Jul-2018
C-O-C number	:	Issue Date	: 24-Jul-2018 12:40
Sampler	: MST		
Site	: 82018253 - Goulburn Reuse Waste Transfer Station		
Quote number	:		
No. of samples received	: 18		Accredited for compliance with
No. of samples analysed	: 7		ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Kai Squires	Laboratory Manager	Administration, Fyshwick, ACT
Kai Squires	Laboratory Manager	Inorganics, Fyshwick, ACT

Page	: 2 of 10
Work Order	: CA1804291
Client	: CARDNO
Project	Soil Samples



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key: CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

- ø = ALS is not NATA accredited for these tests.
- ~ = Indicates an estimated value.
- EA200 'Cr' Crocidolite (blue asbestos)
- EA200 'Ch' Chrysotile (white asbestos)
- EA200 'Am' Amosite (brown asbestos)
- EA200: 'No*' No asbestos found, at the reporting limit of 0.1g/kg, by polarised light microscopy including dispersion staining. Asbestos material was detected and positively identified at concentrations below LORs
- EA200 Performed at ALS Sydney
- EP066 Performed at ALS Sydney
- EP068 Performed at ALS Sydney
- EP071 Performed at ALS Sydney
- EP075(SIM) Performed at ALS Sydney
- EP080 Performed at ALS Sydney

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Work Order	: CA1804291
Client	: CARDNO
Project	: Soil Samples



Sub-Matrix: SOLID (Matrix: SOLID)		Clie	ent sample ID	TP101	TP102	TP103	TP105	TP107
				0.1 - 0.2	0.1 - 0.3	0.1 - 0.3	0.2 - 0.3	0.2 - 0.4
	Cli	ient samplir	ng date / time	12-Jul-2018 00:00	12-Jul-2018 00:00	12-Jul-2018 00:00	12-Jul-2018 00:00	12-Jul-2018 00:00
Compound	CAS Number	LOR	Unit	CA1804291-001	CA1804291-003	CA1804291-004	CA1804291-008	CA1804291-011
				Result	Result	Result	Result	Result
A200: AS 4964 - 2004 Identification of	of Asbestos in bulk	samples						
Asbestos Detected	1332-21-4	0.1	g/kg	No	No*	No	No	
Asbestos Type	1332-21-4	1		No	Ch + Am	No	No	
Sample weight (dry)		0.01	g	2390	1860	2170	1770	
Description		1		Mid brown sandy soil.	Mid brown clay soil plus four fragments of asbestos cement sheeting	Mid brown sandy soil.	Mid brown sandy soil.	
APPROVED IDENTIFIER:		1		G.MORGAN	S.SPOONER	G.MORGAN	S.SPOONER	
G020T: Total Metals by ICP-MS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Cadmium	7440-43-9	0.05	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	5	mg/kg	13	24	20	18	15
Copper	7440-50-8	1	mg/kg	110	30	12	12	<5
Nickel	7440-02-0	1	mg/kg	4	8	6	8	3
Lead	7439-92-1	1	mg/kg	28	53	16	26	28
Zinc	7440-66-6	1	mg/kg	26	79	25	53	70
Arsenic	7440-38-2	1	mg/kg	5	7	<5	<5	9
EP066: Polychlorinated Biphenyls (P0	CB)							
Total Polychlorinated biphenyls		0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EP068A: Organochlorine Pesticides (0C)							
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05

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Sub-Matrix: SOLID (Matrix: SOLID)		Clie	ent sample ID	TP101 0.1 - 0.2	TP102 0.1 - 0.3	TP103 0.1 - 0.3	TP105 0.2 - 0.3	TP107 0.2 - 0.4
	Cl	ient sampliı	ng date / time	12-Jul-2018 00:00				
Compound	CAS Number	LOR	Unit	CA1804291-001	CA1804291-003	CA1804291-004	CA1804291-008	CA1804291-011
				Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticio	des (OC) - Continued							
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
EP068B: Organophosphorus Pes	sticides (OP)							
Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Coumaphos	56-72-4	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Disulfoton	298-04-4	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Ethoprophos	13194-48-4	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Fenchlorphos (Ronnel)	299-84-3	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Fenitrothion	122-14-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Mevinphos	7786-34-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	< 0.05

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Work Order	CA1804291
Client	: CARDNO
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Sub-Matrix: SOLID (Matrix: SOLID)		Clie	ent sample ID	TP101 0.1 - 0.2	TP102 0.1 - 0.3	TP103 0.1 - 0.3	TP105 0.2 - 0.3	TP107 0.2 - 0.4
	Cli	ent sampliı	ng date / time	12-Jul-2018 00:00				
Compound	CAS Number	LOR	Unit	CA1804291-001	CA1804291-003	CA1804291-004	CA1804291-008	CA1804291-011
				Result	Result	Result	Result	Result
EP068B: Organophosphorus Pestici	des (OP) - Continued							
Phorate	298-02-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
EP075(SIM)B: Polynuclear Aromatic	Hydrocarbons							
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	0.9	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	3.0	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	0.8	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	0.9	2.9	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	0.8	3.1	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	1.3	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	1.3	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	1.6	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	0.6	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	1.6	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	1.0	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	1.4	<0.5	<0.5	<0.5
Sum of polycyclic aromatic hydrocarb	ons	0.5	mg/kg	1.7	19.5	<0.5	<0.5	<0.5
EP080/071: Total Petroleum Hydroca	arbons							
C6 - C9 Fraction		10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction		50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction		100	mg/kg	<100	<100	<100	<100	<100
C29 - C36 Fraction		100	mg/kg	<100	<100	<100	<100	<100
C10 - C36 Fraction (sum)		50	mg/kg	<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydro	ocarbons - <u>NEPM 201</u>	3 Fraction	าร					
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10
C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	<10
>C10 - C16 Fraction		50	mg/kg	<50	<50	<50	<50	<50
>C16 - C34 Fraction		100	mg/kg	<100	130	<100	<100	<100
>C34 - C40 Fraction		100	mg/kg	<100	<100	<100	<100	<100
>C10 - C40 Fraction (sum)		50	mg/kg	<50	130	<50	<50	<50

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Work Order	: CA1804291
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Sub-Matrix: SOLID (Matrix: SOLID)		Clie	ent sample ID	TP101 0.1 - 0.2	TP102 0.1 - 0.3	TP103 0.1 - 0.3	TP105 0.2 - 0.3	TP107 0.2 - 0.4
	Cli	ient sampli	ng date / time	12-Jul-2018 00:00				
Compound	CAS Number	LOR	Unit	CA1804291-001	CA1804291-003	CA1804291-004	CA1804291-008	CA1804291-011
				Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydroca	rbons - NEPM 201	3 Fractio	ns - Continued					
>C10 - C16 Fraction minus Naphthalene (F2)		50	mg/kg	<50	<50	<50	<50	<50
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Total Xylenes		0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Sum of BTEX		0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1

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Work Order	: CA1804291
Client	: CARDNO
Project	: Soil Samples



Sub-Matrix: SOLID (Matrix: SOLID)		Client sample ID		TP108 0.1 - 0.3	TP102 F	 	
	CI	Client sampling date / time		12-Jul-2018 00:00	12-Jul-2018 00:00	 	
Compound	CAS Number	LOR	Unit	CA1804291-013	CA1804291-016	 	
				Result	Result	 	
EA200: AS 4964 - 2004 Identification	of Asbestos in bulk	samples					
Asbestos Detected	1332-21-4	0.1	g/kg		Yes	 	
Asbestos Type	1332-21-4	1			Ch + Cr	 	
Sample weight (dry)		0.01	g		91.2	 	
Description		1			One piece of	 	
					asbestos cement		
					sheeting		
					approximately		
					145x70x5mm		
APPROVED IDENTIFIER:		1			A.SMYLIE	 	
EG020T: Total Metals by ICP-MS							
Mercury	7439-97-6	0.1	mg/kg	<0.1		 	
Cadmium	7440-43-9	0.05	mg/kg	<1		 	
Chromium	7440-47-3	5	mg/kg	8		 	
Copper	7440-50-8	1	mg/kg	<5		 	
Nickel	7440-02-0	1	mg/kg	<2		 	
Lead	7439-92-1	1	mg/kg	<5		 	
Zinc	7440-66-6	1	mg/kg	<5		 	
Arsenic	7440-38-2	1	mg/kg	<5		 	
EP066: Polychlorinated Biphenyls (P	CB)						
Total Polychlorinated biphenyls		0.1	mg/kg	<0.1		 	
EP068A: Organochlorine Pesticides	(OC)						
alpha-BHC	319-84-6	0.05	mg/kg	<0.05		 	
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05		 	
beta-BHC	319-85-7	0.05	mg/kg	<0.05		 	
gamma-BHC	58-89-9	0.05	mg/kg	<0.05		 	
delta-BHC	319-86-8	0.05	mg/kg	<0.05		 	
Heptachlor	76-44-8	0.05	mg/kg	<0.05		 	
Aldrin	309-00-2	0.05	mg/kg	<0.05		 	
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05		 	
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05		 	
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05		 	
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05		 	
Dieldrin	60-57-1	0.05	mg/kg	<0.05		 	
4.4`-DDE	72-55-9	0.05	mg/kg	<0.05		 	

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Work Order	: CA1804291
Client	: CARDNO
Project	: Soil Samples



Sub-Matrix: SOLID (Matrix: SOLID)	Client sample ID		TP108 0.1 - 0.3	TP102 F	 		
	Cli	lient sampling date / time		12-Jul-2018 00:00	12-Jul-2018 00:00	 	
Compound	CAS Number	LOR	Unit	CA1804291-013	CA1804291-016	 	
				Result	Result	 	
EP068A: Organochlorine Pesticide	es (OC) - Continued						
Endrin	72-20-8	0.05	mg/kg	<0.05		 	
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05		 	
Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05		 	
4.4`-DDD	72-54-8	0.05	mg/kg	<0.05		 	
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05		 	
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05		 	
4.4`-DDT	50-29-3	0.2	mg/kg	<0.2		 	
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05		 	
Methoxychlor	72-43-5	0.2	mg/kg	<0.2		 	
EP068B: Organophosphorus Pesti							
Dichlorvos	62-73-7	0.05	mg/kg	<0.05		 	
Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05		 	
Monocrotophos	6923-22-4	0.2	mg/kg	<0.2		 	
Dimethoate	60-51-5	0.05	mg/kg	<0.05		 	
Diazinon	333-41-5	0.05	mg/kg	<0.05		 	
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05		 	
Parathion-methyl	298-00-0	0.2	mg/kg	<0.2		 	
Malathion	121-75-5	0.05	mg/kg	<0.05		 	
Fenthion	55-38-9	0.05	mg/kg	<0.05		 	
Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05		 	
Parathion	56-38-2	0.2	mg/kg	<0.2		 	
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05		 	
Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05		 	
Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05		 	
Fenamiphos	22224-92-6	0.05	mg/kg	<0.05		 	
Prothiofos	34643-46-4	0.05	mg/kg	<0.05		 	
Ethion	563-12-2	0.05	mg/kg	<0.05		 	
Carbophenothion	786-19-6	0.05	mg/kg	<0.05		 	
Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05		 	
Coumaphos	56-72-4	0.05	mg/kg	<0.05		 	
Disulfoton	298-04-4	0.05	mg/kg	<0.05		 	
Ethoprophos	13194-48-4	0.05	mg/kg	<0.05		 	
Fenchlorphos (Ronnel)	299-84-3	0.05	mg/kg	<0.05		 	
Fenitrothion	122-14-5	0.05	mg/kg	<0.05		 	

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Work Order	CA1804291
Client	: CARDNO
Project	: Soil Samples



Sub-Matrix: SOLID (Matrix: SOLID)		Client sample ID		TP108 0.1 - 0.3	TP102 F				
	Cli	ent sampliı	ng date / time	12-Jul-2018 00:00	12-Jul-2018 00:00				
Compound	CAS Number	LOR	Unit	CA1804291-013	CA1804291-016				
				Result	Result				
EP068B: Organophosphorus Pesticide	es (OP) - Continued								
Mevinphos	7786-34-7	0.05	mg/kg	<0.05					
Phorate	298-02-2	0.05	mg/kg	<0.05					
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg	<0.5					
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5					
Acenaphthene	83-32-9	0.5	mg/kg	<0.5					
Fluorene	86-73-7	0.5	mg/kg	<0.5					
Phenanthrene	85-01-8	0.5	mg/kg	<0.5					
Anthracene	120-12-7	0.5	mg/kg	<0.5					
Fluoranthene	206-44-0	0.5	mg/kg	<0.5					
Pyrene	129-00-0	0.5	mg/kg	<0.5					
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5					
Chrysene	218-01-9	0.5	mg/kg	<0.5					
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5					
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5					
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5					
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5					
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5					
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5					
Sum of polycyclic aromatic hydrocarbon	IS	0.5	mg/kg	<0.5					
EP080/071: Total Petroleum Hydrocar	bons								
C6 - C9 Fraction		10	mg/kg	<10					
C10 - C14 Fraction		50	mg/kg	<50					
C15 - C28 Fraction		100	mg/kg	<100					
C29 - C36 Fraction		100	mg/kg	<100					
C10 - C36 Fraction (sum)		50	mg/kg	<50					
EP080/071: Total Recoverable Hydroc	arbons - NEPM 201	3 Fraction	าร						
C6 - C10 Fraction	C6_C10	10	mg/kg	<10					
C6 - C10 Fraction minus BTEX	C6_C10-BTEX	10	mg/kg	<10					
(F1)	_								
>C10 - C16 Fraction		50	mg/kg	<50					
>C16 - C34 Fraction		100	mg/kg	<100					
>C34 - C40 Fraction		100	mg/kg	<100					
>C10 - C40 Fraction (sum)		50	mg/kg	<50					

Page	: 10 of 10
Work Order	: CA1804291
Client	: CARDNO
Project	: Soil Samples



Sub-Matrix: SOLID	Client sample ID		TP108	TP102 F					
(Matrix: SOLID)				0.1 - 0.3					
	Cli	ient sampli	ng date / time	12-Jul-2018 00:00	12-Jul-2018 00:00				
Compound	CAS Number	LOR	Unit	CA1804291-013	CA1804291-016				
				Result	Result				
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
>C10 - C16 Fraction minus Naphthalene		50	mg/kg	<50					
(F2)									
EP080: BTEXN	EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2					
Toluene	108-88-3	0.5	mg/kg	<0.5					
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5					
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5					
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5					
Total Xylenes		0.5	mg/kg	<0.5					
Sum of BTEX		0.2	mg/kg	<0.2					
Naphthalene	91-20-3	1	mg/kg	<1					



SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order	: CA1804291					
Client Contact Address	: CARDNO : Mr Miles Thompson : 26 Lithgow Street Fyshwick ACT 2609	Contact : Client S Address : 16B Lith	 ALS Water Resources Group Client Services 16B Lithgow Street Fyshwick ACT Australia 2609 			
E-mail Telephone Facsimile	: miles.thompson@cardno.com.au : :	E-mail: ecowiseTelephone: +61 2 6Facsimile: +61 2 6				
Project Order number C-O-C number Site Sampler	: Soil Samples : : : 82018253 - Goulburn Reuse Waste Transfer Station : MST		CARDNO0001 2013 B3 & ALS QC Standard			
Dates Date Samples Recei Client Requested Du Date		Issue Date Scheduled Reporting Date	: 16-Jul-2018 : 30-Jul-2018			
Delivery Deta Mode of Delivery No. of coolers/boxes Receipt Detail	: Undefined	Security Seal Temperature No. of samples received / analyse	: Not Available : 12.7°C - Ice present d : 18 / 7			

General Comments

• This report contains the following information:

- Summary of Sample(s) and Requested Analysis

- Requested Deliverables



Summary of Sample(s) and Requested Analysis

process necessa tasks. Packages as the determine tasks, that are inclu- lf no sampling default 00:00 on	ry for the executi may contain ad ation of moisture uded in the package. time is provided, the date of samplin sampling date wi	be part of a laboratory on of client requested ditional analyses, such content and preparation the sampling time will g. If no sampling date II be assumed by the ckets without a time	On Hold) SOLID Vo analysis requested	SOLID - EA200 (Subcontracted) Asbestos Identification in bulk solids	SOLID - EG020X-T Total Metals in Soil by ICP-MS (Screen)	SOLID - EP066 (Subcontracted) Polychlorinated Biphenyls (PCB)	SOLID - S-07 (Subcontracted) TRH/BTEXN/PAH (SIM)	SOLID - S-12 (Subcontracted) OC/OP Pesticides
Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hol No anal	SOLID - Asbestc	SOLID - Total M	SOLID - Polychic	SOLID . TRH/BT	SOLID - OC/OP
CA1804291-001	12-Jul-2018 00:00	TP101 0.1 - 0.2		✓	✓	1	✓	✓
CA1804291-002	12-Jul-2018 00:00	TP101 3.0 - 3.1	1					
CA1804291-003	12-Jul-2018 00:00	TP102 0.1 - 0.3		1	1	1	1	✓
CA1804291-004	12-Jul-2018 00:00	TP103 0.1 - 0.3		1	✓	1	1	✓
CA1804291-005	12-Jul-2018 00:00	TP103 0.4 - 0.5	✓					
CA1804291-006	12-Jul-2018 00:00	TP104 0.2 - 0.3	✓					
CA1804291-007	12-Jul-2018 00:00	TP104 0.5 - 0.6	1					
CA1804291-008	12-Jul-2018 00:00	TP105 0.2 - 0.3		✓	✓	1	✓	✓
CA1804291-009	12-Jul-2018 00:00	TP106 0.2 - 0.3	1					
CA1804291-010	12-Jul-2018 00:00	TP106 0.8 - 1.0	1					
CA1804291-011	12-Jul-2018 00:00	TP107 0.2 - 0.4			1	1	1	✓
CA1804291-012	12-Jul-2018 00:00	TP108 0.5 - 0.7	1					
CA1804291-013	12-Jul-2018 00:00	TP108 0.1 - 0.3			1	1	1	1
CA1804291-014	12-Jul-2018 00:00	TP109 0.1 - 0.3	✓					
CA1804291-015	12-Jul-2018 00:00	TP109 0.6 - 0.7	1					
CA1804291-016	12-Jul-2018 00:00	TP102 F		✓				
CA1804291-017	12-Jul-2018 00:00	QAQC1	1					
CA1804291-018	12-Jul-2018 00:00	QAQC2	✓					

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

Accounts

- A4 - AU Tax Invoice (INV)	Email	accountspayable@cardno.com.au
Miles Thompson		
- A4 - AU Sample Receipt Notification - Environmental (WRG)	Email	miles.thompson@cardno.com.au
(SRN)		
 AU Certificate of Analysis - NATA (WRG) 	Email	miles.thompson@cardno.com.au
(AU_COA_2_A4_ENV_NATA)		
- Chain of Custody (CoC) (COC)	Email	miles.thompson@cardno.com.au
 WRG Legacy Format (XTAB_WRGLEG) 	Email	miles.thompson@cardno.com.au
Mitch Blencowe		
 A4 - AU Sample Receipt Notification - Environmental (WRG) (SRN) 	Email	mitch.blencowe@cardno.com.au
- A4 - AU Tax Invoice (INV)	Email	mitch.blencowe@cardno.com.au
		•
- AU Certificate of Analysis - NATA (WRG)	Email	mitch.blencowe@cardno.com.au
(AU_COA_2_A4_ENV_NATA)		
 Chain of Custody (CoC) (COC) 	Email	mitch.blencowe@cardno.com.au
 WRG Legacy Format (XTAB_WRGLEG) 	Email	mitch.blencowe@cardno.com.au
Wollongong		
- A4 - AU Tax Invoice (INV)	Email	wollongong@cardno.com.au

Instrument Serial No.

PhoCheck Tiger T-108801



Air-Met Scientific Pty Ltd 1300 137 067

ltem	Test	Pass			0	
Battery	Charge Condition	1			Commen	its
	Fuses	1				
	Capacity	1				
	Recharge OK?	1				
Switch/keypad	Operation	1				
Display	Intensity	1				
	Operation (segments)	1				
Grill Filter	Condition	1				
	Seal	1				
Pump	Operation	1				
	Filter	1				
	Flow	1				
	Valves, Diaphragm	1				
РСВ	Condition	1				
Connectors	Condition	1				
Sensor	PID	1	10.6 ev			
larms	Beeper	✓	Low	High	TIA/A	
	Settings	1	50ppm	100ppm	TWA	STEL
Software	Version	✓	coppin	rooppin		
Data logger	Operation	✓				
Download	Operation	1				
Other tests:						

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Calibration gas and concentration	Certified	Gas bottle No	Instrument Reading
PID Lamp		98ppm Isobutylene	NATA	SY137	95.4ppm

Calibrated by: MW. Michelle Wagner

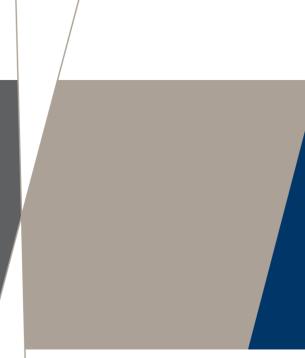
Calibration date: 10/07/2018 Next calibration due:

9/01/2019



GEOTECHNICAL INVESTIGATION









Test Pits

GOULBURN WASTE TRANSFER, REUSE AND RECYCLE CENTRE

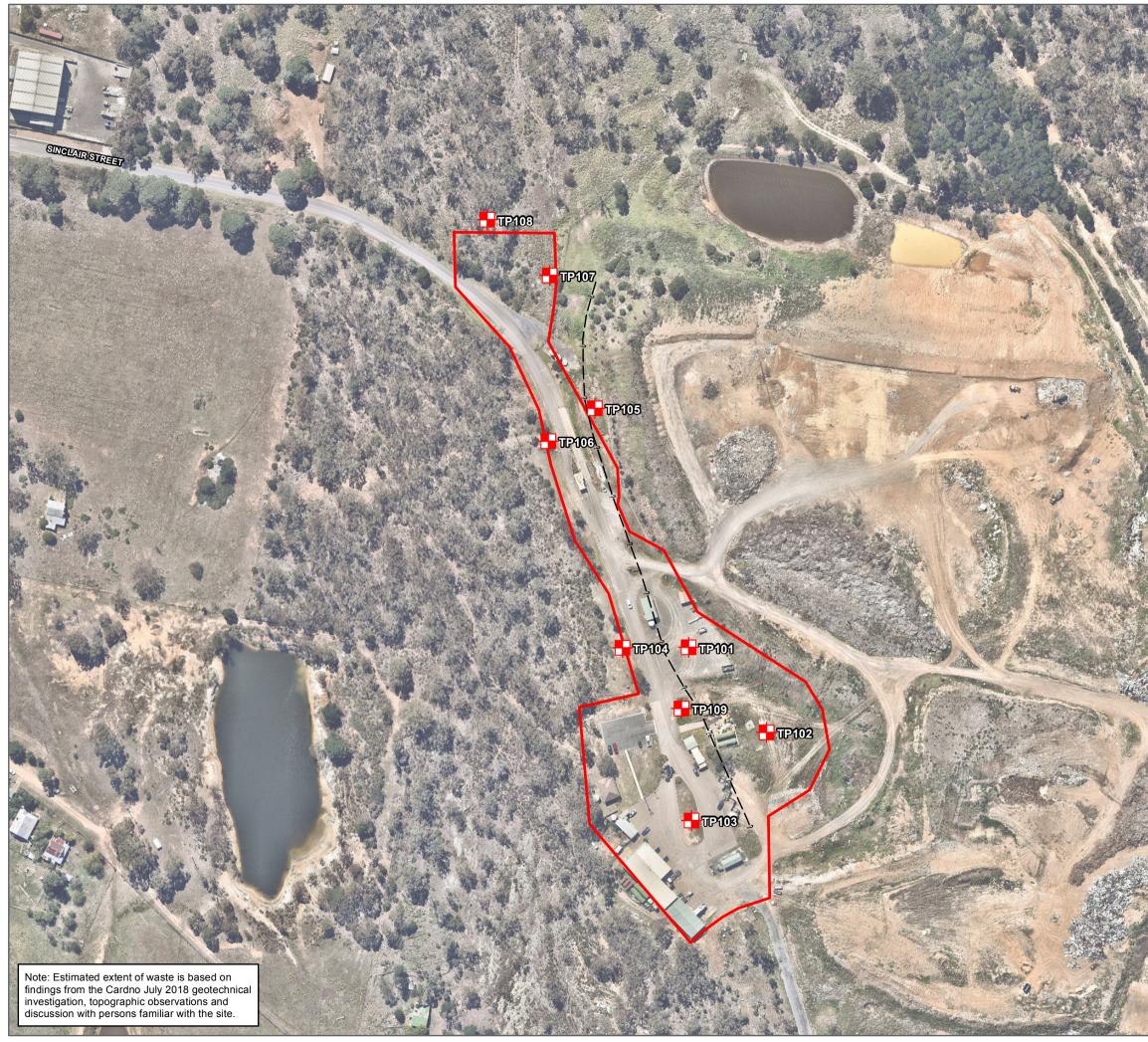
Legend



Project Boundary

1:2,000 Scale at A3









Estimated Extent of Waste

GOULBURN WASTE TRANSFER, REUSE AND RECYCLE CENTRE

Legend



Project Boundary



- Test Pits
- —?— Estimated Extent of Waste

FIGURE 3

1:2,000 Scale at A3





Map Produced by Cardno NSW/ACT Pty Ltd (WOL) Date: 2018-07-30 | Project: 82018253-01 Coordinate System: GDA 1994 MGA Zone 55 Map: 8201825301-GS-008_ExtentOfWaste.mxd 00-01 Aerial imagery supplied by nearmap (March 2018)





Geology

GOULBURN WASTE TRANSFER, REUSE AND RECYCLE CENTRE

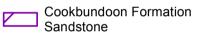
Legend





- —?— Estimated Extent of Waste
 - Cadastre (DFSI-SS, 2017)

Rock Unit / Geology (DPE Seamless Geology, 2016)

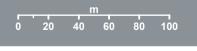




Residual deposits

FIGURE 1

1:2,500 Scale at A3







Map Produced by Cardno NSW/ACT Pty Ltd (WOL) Date: 2018-07-30 | Project: 82018253-01 Coordinate System: GDA 1994 MGA Zone 55 Map: 8201825301-GS-006-GeologyTestPits.mxd 00-01 Aerial imagery supplied by nearmap (March 2018)

	\mathcal{D}	C	arc	dno°							TE	ST PIT LOG SHEET
	ject:	F	Reus	burn Mulwaree e Goulburn Inf	rastructu	re De	sign				Η	ole No: TP101
	ation			burn Waste Ma 073 6150945	inagemer	nt Cer	itre		Job No: 82018253		Curfoo	Sheet: 1 of 1
				073 6150945 tachi 6T					Angle from Horizontal: 90° Excavation Method: 450mm sta			e Elevation:
				nsions: 3.00m		ח חו	45m W	IDE	Excavation Method: 450mm sta			ctor: Southern Demolitions
				12/7/18	Lono A	10 0.			Logged By: MST			ed By: BT
	cavat			Sampling &	Festina				Material Description			
					DCP	Ê		c				
Method	Resistance	Stability	Water	Sample or Field Test	(blows per 150 mm)	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
A				50.0.40.0.00		-		SP	0.10m FILL: Gravelly SAND: fine to coarse grained, poorly graded, grey, fine to medium, gravel gravel.	_	VD	FILL
	F			ES 0.10 - 0.20 m PID=1.9	_i i bë	1		СІ	graded, grey, fine to medium, gravel gravel, (ROADBASE), dry	′	VSt	
						ł	\bigotimes		FILL: Sandy CLAY: medium plasticity, brown, fine to medium sand, trace gravel, [INTERMEDIATE 0.40m COVER]. drv		VSL	
						- 0.5	X		0.40m COVER], dry FILL: Clayey gravelly SAND, fine to coarse, with cobbles and boulders, concrete, plastic, glass, tyres, plastic, brick, metal, timer. Strong refuse odour. [MUNICIPAL REFUSE]			-
						F	Δ					
						Ľ	5					
						- 1.0	\bigotimes					
			R			ł	\mathbb{R}					
			untere			-	$\mathbb{X}\!\!\times\!\!\!\times$					
		Ð	Groundwater Not Encountered				KX			D		
Ĵ		Minor spalling	r Not			-1.5	$\langle X \rangle$					
ЖЦ		ior sp	twater			-	555	sc				
	E	Min	round			-	\otimes				D	
			Ū		liiii	Ē	\bigotimes					
						-2.0	\mathbb{X}					
						- 2.0	\mathbb{R}					
						F	\mathbb{X}					
						F	RX3					
						-	\boxtimes					
						-2.5 -	555					
						F	\otimes					
						F	\bigotimes		2.80m FILL: SAND: medium to coarse grained, dark grey		-	
						L 3 0	\mathbb{X}	sw	mottled brown, moist 3.00m	м		
V				ES 3.00 - 3.10 m PID=0.8		- 3.0	KX	СН	3.10m FILL: CLAY: high plasticity, grey brown, moist		н	
					-1	ŀ			TERMINATED AT 3.10 m End of hole at 3.1m. Maximum reach of excavator.			
					liii	F			Hole backfilled with arising. Groundwater not encountered.			
						F						
						- 3.5						
						F						
						╞						
						F						
						-4.0						
						ŀ						
						-						
						F						
						-4.5						
						ŀ						
						╞						
						F						
	тнор				ETRATION	•			ELD TESTS SAMPLES		·	SOIL CONSISTENCY
EX R	Ri	kcavato pper		Ē	Very Easy (No Easy	o Resistar	nce)		P - Hand/Pocket Penetrometer D - Di	Ik disturb sturbed s	ample	S - Soft
HA PT	Ρι	and aug ush tub	e	F	Firm Hard	,		C	CP - Dynamic Cone Penetrometer S - Er	ivironmen in wall tu		turbed' St - Stiff
SC AH	I Ai	onic dril r hamm	ner	. VH	Very Hard (Re	etusal)		N	C - Moisture Content MOISTURE	1		VSt - Very Stiff H - Hard
PS AS	Sł	ercussion ort spi	ral aug	jer 🗌 🦯	∕ Water L	evel or	Date		BT - Plate Bearing Test D - Dr IP - Borehole Impression Test M - Me			
AD AD	/T So	olid flig	nt aug	er: V-Bit er: TC-Bit	shown water in			F	D - Photoionisation Detector W - W			VL - Very Loose L - Loose
HF	3 W	ollow fli ashbor	e drilli		water o				B=Bendual (upperfected kBe) LL - Lie	quid limit pisture co	ntent	MD - Medium Dense D - Dense
RR	K Ro	ock roll	er									VD - Very Dense
				for details of lescriptions			CAR	RDI	NO (NSW/ACT) PTY LTD			
									· /			

Clie	nt:			dino ° burn Mulwaree	Coun	sil						ST PIT LOG SHEET
Proj	ect: atior	F	Reus	e Goulburn Infr burn Waste Ma	astruc	ture De	esign otre		Job No: 82018253		HC	DIE NO: TP102 Sheet: 1 of 1
				121 6160901	nagen				Angle from Horizontal: 90°		Surface	Elevation:
			-	tachi 6T					Excavation Method: 450mm stan			
				nsions: 3.00m	LONG	AND 0.	50m W	/IDE				tor: Southern Demolitions
Date	e Exc	cavat	ed: 1	12/7/18					Logged By: MST		Checke	d By: BT
Ex	cavat	ion		Sampling & T	esting				Material Description			
Method	Resistance	Stability	Water	Sample or Field Test	DCI (blov per 150 m	Depth (uu	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
-EX	н	Generally stable	Groundwater Not Encountered	ES 0.10 - 0.30 m PID=1.0	- 	학 - - -		СІ	FILL: Gravelly sandy CLAY, dark dark brown motiled pale red and light grey, medium plasticity; gravel, fine to meidum, angular; sand, fine, dry [LANDFILL CAP] At 0.3m, suspected ACM	D	н	FILL
		Gene	ndwate			-05			0.60m			
T	Е		Grou				XX	SP	0.70m FILL: SAND, dark grey, fine to medium, with paper, plastic, tile, brick, glass bottles, cloth, moist to wet [MUNICIPAL REFUSE]	М	VD	
						- - - - - - - - - -			TERMINATED AT 0.70 m End of hole at 0.7m. Target lithology. Hole backfilled with arising. Groundwater not encountered.			
ME EX R HA PT SO AH PS AD AD HF WE R	Rij Ha Pu N Sc Air Pe Sh V Sc V Sc V Sc V T Sc V S V V S V V S V V S V V S V	cavator pper and aug ish tub pnic dril r hamm ercussion port spir blid fligh	ger e ling er on sam ral aug nt aug nt aug ght au ght au	et VE E F H VH VH VH VE E F TO-Bit ger	Easy Firm Hard Very Hard ER Wate show wate	y (No Resista d (Refusal) er Level or		S F F M F	P Hand/Pocket Penetrometer D - Dist CP Dynamic Cone Penetrometer ES - Env SP Perth Sand Penetrometer U - Thir IC Moisture Content MOISTURE BT Plate Bearing Test D - Dry ID Photoionisation Detector W Weight S Vane Shear; P=Peak, Plate Plate	turbed sa <i>r</i> ironmen n wall tu st t stic limit	tal sample be 'undistu	S - Soft F - Firm

CARDNO 2.01.6 LIB.GLB Log CARDNO NON-CORED 82018253.GPJ <<DrawingFile>> 30/07/2018 11:38 10.0.000 Datgel AGS RTA, Photo, Monitoring Tools

	\supset	C	arc	dno							ΤE	ST PIT LOG SHEET
Clie Proj		(Goul	burn Mulwaree e Goulburn Infi	Council	ıre De	sian				Η	ole No: TP103
Loca		n: (Goul	burn Waste Ma	nageme	nt Cer	ntre		Job No: 82018253			Sheet: 1 of 1
Posi	ition	: 55⊦	l 752	073 6150863					Angle from Horizontal: 90°		Surfac	e Elevation:
				tachi 6T					Excavation Method: 450mm sta			
				nsions: 3.00m	LONG A	ND 0.	50m W	IDE				ctor: Southern Demolitions
			ea: ·	12/7/18	o otin a	1			Logged By: MST		Спеске	ed By: BT
EX	cavat			Sampling & T	-			-	Material Descriptior	1		
Method	Resistance	Stability	Water	Sample or Field Test	DCP (blows per 150 mm)		Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
A		υ	tered					ML	0.10m Sandy SILT, dark brown, low plasticity; sand, fine, rootlets throughout.	_		TOPSOIL
EX	F	Generally stable	idwater Not Encountered	ES 0.10 - 0.30 m PID=1.1 B 0.30 - 0.50 m	-	-		sc	FILL: clayey SAND, trave gravel of sandstone, brown mottled grey, orange and dark brown, fine to coarse; gravel, angular to subangular; clay, medium	D	MD to D	FILL
		enera	ter No	ES 0.40 - 0.50 m		F			0.40m plasticity, dry. SANDSTONE, light grey, medium grained,			ROCK
V I	н	Ű		PID=0.7	41111	-0.5			moderately weathered, high strength.			
			Gro			- 1.0			TERMINATED AT 0.6m m End of hole at 0.6m. Refusal. Hole backfilled with arisings. Groundwater not encountered.			
						- - 3.5 - - - - - - - - - -						
EX R HA PT SOI AH PS AD/ AD/ HF/ WB	Ri Ha Pu N Sci Ain Pe Sh V Sci V Sci Sci V Sci Sci V Sci V Sci Sci V Sci Sci Sci Sci Sci Sci Sci Sci Sci Sci	cavato pper and aug ush tub pnic dri r hamm ercussio nort spi blid flig blid flig blow fli ashbor	ger e lling her on san ral aug nt aug ght au ght au	et VE E F H VH VH VH VE E F TO-Bit ger	I I I I I I I I I I I I I I I I I	^{efusal)} Level on nflow		S F F F	IP - Hand/Pocket Penetrometer D - D ICP Dynamic Cone Penetrometer U - T SP - Perth Sand Penetrometer U - T IC - Moistrue Content D - D BT - Plate Bearing Test D - D - D ID - Plate Bearing Test M - M M ID - Photoionisation Detector W - W S - Vane Shear; P=Peak, L - L	ulk disturb isturbed s nvironmen hin wall tu E ry loist	ample ital sampl be 'undist	le S - Soft turbed' S - Firm St - Stiff VSt - Very Stiff H - Hard RELATIVE DENSITY VL - Very Loose L - Loose MD - Medium Dense D - Dense
	er to ex		/ notes	for details of descriptions			CAF		NO (NSW/ACT) PTY LTD			VD - Very Dense

	>	C	arc	dno°							ΤE	ST PIT LOG SHEET
	ject:		Reus	burn Mulwaree e Goulburn Inf	rastructu	ire De	sign				Η	ole No: TP104
	atior			burn Waste Ma	inagemei	nt Cer	ntre		Job No: 82018253			Sheet: 1 of 1
Pos	ition	n: 55H	1752	039 6150949					Angle from Horizontal: 90°			e Elevation:
				tachi 6T					Excavation Method: 450mm star			
Exc	avat	ion D	Dime	nsions: 2.50m	LONG A	ND 0.	50m W	IDE				ctor: Southern Demolitions
Date	e Exe	cava	ted: '	12/7/18					Logged By: MST		Check	ed By: BT
Ex	kcavat	tion		Sampling & T	Festing				Material Description			
Method	Resistance	Stability	Water	Sample or Field Test	DCP (blows per 150 mm)	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
A	~		ered		1 3 6 12			о МL	ο 10m Sandy SILT, dark brown, low plasticity; sand, fine,			TOPSOIL
- EX	F	l Generally stable	Indwater Not Encountered	ES 0.20 - 0.30 m PID=0.7		-		ѕм	rootlets throughout. FILL: sity SAND, brown and red brown mottled orange and grey, medium to coarse, trace gravel of sandstone, medium, angular.	ם	MD to D	FILL
V	н	Gene	undwater	D 0.40 - 0.50 m ES 0.50 - 0.60 m PID=1.1		- 0.5			SANDSTONE, light grey, medium grained, moderately weathered, high strength, quartz veins 0.60m throughout.			ROCK
			Grou		-1	-			TERMINATED AT 0.60 m End of hole at 0.6m. Refusal. Hole backfilled with arising. Groundwater not encountered.			
						- 1.0 -						
						-						
						1.5 -						
						-						
						2.0 - -						
						- - 2.5						
						-						
						- 3.0						
						-						
						- 3.5 -						
						-						
						-4.0						
						-						
						-4.5 - -						
						-			EI D TESTS			
EX R HA PT SO AF S AD AD AD HF W	Ri Ha Pu N So Ain Sh VV So VV So VT So A Ho 3 W	xcavato ipper and au ush tub onic dri r hamn ercussi hort sp olid flig olid flig ollow fl /ashbol	ger illing ner on san iral aug ht aug ight au ight au re drilli	et VE F H VH ger er: V-Bit er: TC-Bit ger	ETRATION Very Easy (N Easy Firm Hard Very Hard (Ru TER Water L shown water ir • water o	efusal) ∟evel on nflow		S F F M F	P Hand/Pocket Penetrometer D Display CP Dynamic Cone Penetrometer U Th SP Perth Sand Penetrometer U Th CF Moisture Content MOISTURE BT Plate Bearing Test D Dr ID Photoionisation Detector M Wc S Vane Shear; P=Peak, L LL	sturbed s vironmen in wall tu vist et astic limit uid limit	ital sampl be 'undis'	ie S - Soft turbed' St - Stiff VSt - Very Stiff H - Hard RELATIVE DENSITY VL - Very Loose L - Loose MD - Medium Dense D - Dense
	er to ex		y notes	for details of descriptions			CAF		NO (NSW/ACT) PTY LTD	isture co	mont	VD - Very Dense

	nt:	0	Goult	ourn Mulwaree	Council								ST PIT LOG SHEE
Loca	ect:	F	Reus	e Goulburn Infr ourn Waste Ma	astructu	re De	sign		Job No. 82018252				ole No: TP10
				029 6151068	nagemen		iu e		Job No: 82018253 Angle from Horizontal	· 90°		Surface	Sheet: 1 of e Elevation:
				achi 6T					Excavation Method: 4				
				sions: 3.00m l		ID 0.	50m W	IDE					actor: Southern Demolitions
Date	Exc	cavat	ed: 1	2/7/18					Logged By: MST		(Checke	ed By: BT
Exc	cavati	ion		Sampling & T	esting				Materia	al Description			
Method	Resistance	Stability	Water	Sample or Field Test	DCP (blows per 150 mm)	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle cha colour, secondary and minor com ROCK TYPE, grain size and type fabric & texture, strength, weath defects and structure	ponents , colour,	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
•					1 3 6 12		2222	ML	0.10m Sandy SILT, dark brown, low plasticit	/; sand, fine,			TOPSOIL
	F			ES 0.20 - 0.30 m PID=0.9		- - - - 0.5 -		СН	rootlets throughout. FILL: Gravelly sandy CLAY, dark bro plasticity; gravel, fine, angular; sand, coarse, with trace plastic. [LANDFILI	wn, high medium to	D	н	FILL
EX	E	Minor spalling	Groundwater Not Encountered			- - - - - - - - - - - - - - -		SP	0.70m FILL: SAND, fine to coarse, dark bro cobbles and boulders, concrete, plas tyres, plastic, brick, metal, timer. Stro odour. [MUNICIPAL REFUSE]	tic, glass,	м	VD	
V						- 2.0 - - - 2.5 - - - - - - - - - - - - - - - - - - -			2.70m increasing sand content and moisture 3.10m	content.	M to W		
						- - - - - - - - - - - - - - - - - - -			TERMINATED AT 3.10 m End of hole at 3.1m. Maximum reach Hole backfilled with arising. Groundw encountered.				
MET EX R HA PT SON AH PS AD/7 HFA WB RR	Riµ Ha Pu N Sc Air Pe Sh V Sc T Sc A Hc Wa	ccavator pper and aug ish tub nic dril hamm rccussic nort spin blid fligh blid fligh blow flig ashbor ock rolle	ler e er on sam ral auge at auge ght auge ght auge ght auge	et VE F H VH er er: V-Bit er: TC-Bit ger	ETRATION Very Easy (No Easy Firm Hard Very Hard (Re ER Shown water in Water ou	^{fusal)} evel on flow		S H D M P	CP - Dynamic Cone Penetrometer SP - Perth Sand Penetrometer C - Moisture Content BT - Plate Bearing Test P - Borehole Impression Test D - Photoionisation Detector	D - Dist ES - Env U - Thir MOISTURE D - Dry M - Moi W - Wei PL - Plas LL - Liqu	urbed sa ironment wall tub st st	al sampl	Ie S - Soft F - Firm

Proj	nt: ect:	F	Reus	burn Mulwaree e Goulburn Infr	astructu	re De	esign					H	ole No:	TP10
	ation			burn Waste Ma	nagemer	nt Cei	ntre		Job No: 82018253	•••				Sheet: 1 of
			-	996 6151051					Angle from Horizontal:				e Elevation:	
				tachi 6T nsions: 2.60m l			50m W		Excavation Method: 45	umm stand			κετ ctor: Southerr	Domolitio
				12/7/18			30111 44		Logged By: MST				ed By: BT	Demontio
_	cavati			Sampling & T	estina					Description			<u>, , , , , , , , , , , , , , , , , , , </u>	
					1	Ē		-						
Method	Resistance	Stability	Water	Sample or Field Test	DCP (blows per 150 mm)	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle chara colour, secondary and minor compr ROCK TYPE, grain size and type, c fabric & texture, strength, weather defects and structure	acteristic, onents colour, ring,	Moisture Condition	Consistency Relative Density		CTURE oservations
EX	F	Generally stable	Groundwater Not Encountered	ES 0.20 - 0.30 m PID=0.6		- - - - 0.5	0.000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.000000	SM GW	Sandy SILT, dark brown, low plasticity; s rootlets throughout. 0.20m Sandy GRAVEL, brown, fine to coarse, to sub rounded; sand, fine to medium, w	sub angular	D	L to VD	COLLUVIUM	
		Gener	Groundw			-	0.00 0.00		0.70m SANDSTONE, light grey mottled pale re grained, moderately weathered, high str				ROCK	
	н			ES 0.80 - 1.00 m PID=0.5		-			1.00m	engui.				
						-1.0			TERMINATED AT 1.00 m End of hole at 1.0m. Refusal. Hole back arising. Groundwater not encountered.	(filled with				
ME X RATSAADDAH WBR	Rip Ha Pu N So Air Pe Sh V So V So V So V So V So V So V So V So	cavator pper sh tub- sh tub- crussica flight id fligh id fligh id fligh id fligh id fligh shborn ck rolle	ger e ling er on sam ral aug nt aug nt aug ght au ght au	et VE F H VH ger TC-Bit ger	TRATION Very Easy (Ne Easy Firm Hard Very Hard (Ro R Z Water L Shown water in ◀ water o	efusal) Level or		S H D P N I	CP - Dynamic Cone Penetrometer SP - Perth Sand Penetrometer C - Moisture Content BT - Plate Bearing Test IP - Borehole Impression Test D - Photoionisation Detector	SAMPLES B - Bulk D - Distu ES - Envir U - Thin MOISTURE D - Dry M - Moist W - Wet PL - Plasti LL - Liqui W - Moist	rbed sa onmen wall tul ic limit d limit	ample tal sampl be 'undist	e VS - S - urbed' St - VSt - H - RELAT VL - L - MD -	ONSISTENCY Very Soft Soft Firm Stiff Very Stiff Hard IVE DENSITY Very Loose Loose Medium Den Dense Very Dense

Clie Proj	nt: ect:	F	Reus	ourn Mulwaree e Goulburn Inf	rastruct	ure De	sign					H	ole No:	TP10
	ation	: 0	Goull	ourn Waste Ma	anageme	ent Cer	ntre		Job No: 82018253					Sheet: 1 o
			-	999 6151153					Angle from Horizontal:				e Elevation:	
				achi 6T					Excavation Method: 45	0mm stan				
				sions: 3.00m	LONG A	ND 0.	50m W	/IDE	Lowerd Dry MOT				ctor: Souther	n Demolitio
			ea: 1	2/7/18		-	1		Logged By: MST			Спеске	ed By: BT	
EX	cavati	on		Sampling &	lesting				Material	Description	1	1	1	
Method	Resistance	Stability	Water	Sample or Field Test	DCP (blows per 150 mn	Dept (r	Graphic Log	Classification	SOIL TYPE, plasticity or particle chara colour, secondary and minor comp ROCK TYPE, grain size and type, fabric & texture, strength, weathe defects and structure	onents colour,	Moisture Condition	Consistency Relative Density		CTURE bservations
1		stable	untered			-		ML	Sandy SILT, dark brown, low plasticity; rootlets throughout. 0.20m	sand, fine,			TOPSOIL	
- EX	F	Generally stable	Groundwater Not Encountered	B 0.20 - 0.50 m		-	0.000 0.000	GW	Sandy GRAVEL, brown, fine to coarse, to sub rounded; sand, fine to medium, v	sub angular vell graded.	D	L to D	COLLUVIUM	
V	н	Ğ	water	ES 0.50 - 0.70 m		0.5-			0.45m 0.50m SANDSTONE, light grey mottled pale re	ed, medium 🕝	<u> </u>		ROCK	
			ound	PID=0.6 QAQC1,		F			grained, moderately weathered, high st TERMINATED AT 0.50 m	rength.				
			ē	QAQC2	- 111	-			End of hole at 0.5m. Refusal. Hole back arising. Groundwater not encountered.	cfilled with				
						-			ansing. Groundwater not encountered.					
						1								
						- 1.0								
						F								
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						-4.5								
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				I _						o			 	
ME EX	THOD Fx	cavator	huck		IETRATION				ELD TESTS PT - Standard Penetration Test	SAMPLES B - Bull	k dieturh	ed sampl		- Very Soft
R	Rip	per		E	Very Easy (Easy	No Resista	nce)	н	P - Hand/Pocket Penetrometer	D - Dist	turbed sa	ample	S	- Soft
HA PT	Pu	nd aug sh tub	Э	F	Firm Hard				CP - Dynamic Cone Penetrometer			tal sampl be 'undist	turbed' St	- Firm - Stiff
SO AH	N So	nic dril hamm	ing	VH	Very Hard (Refusal)			SP - Perth Sand Penetrometer IC - Moisture Content	MOISTURE			VSt	 Very Stiff Hard
PS AS	Pe	rcussic	n sam	p.o.		ا در م	Dete	PI	BT - Plate Bearing Test	D - Dry				TIVE DENSITY
AD/	'V So	ort spir lid fligh	t auge	er: V-Bit –	Water Showr		1 Date		IP - Borehole Impression TestID - Photoionisation Detector	M - Mois W - Wet	st		VL	- Very Loose
AD/ HF/	A Ho	llow flig	ght au		- water	inflow			S - Vane Shear; P=Peak,		stic limit		MD	LooseMedium Den
WB	Wa	shbore ck rolle	drillir		- water	outflow			R=Resdual (uncorrected kPa)		ua iimit sture coi	ntent	D VD	DenseVery Dense
RR	1.00												VL	

roj	nt: ect:	F	Reus	ourn Mulware e Goulburn In	fras	truc	ctur						Η	ole No: TP10
	ation			ourn Waste M	ana	gen	nen	t Cen	tre		Job No: 82018253		<u> </u>	Sheet: 1 of
			-	954 6151179							Angle from Horizontal: 90° Excavation Method: 450mm sta			e Elevation:
				achi 6T Isions: 3.00m		NG	A N		50m \A		Excavation Method: 450mm Sta			ctor: Southern Demolitio
				2/7/18		NO		0.	50111 44		Logged By: MST			ed By: BT
_	cavati		<u>.</u>	Sampling &	Test	ina					Material Descriptio		Uncon	
				earriphing a		-	_	Ê		6				
Method	Resistance	Stability	Water	Sample or Field Test	1	DCF (blow per 50 m	vs nm)	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
			red	ES 0.10 - 0.30 m PID=0.6				-	0. 0. 0 0. 0	ML	0.10m Sandy SILT, dark brown, low plasticity; sand, fine, rootlets throughout. Sandy GRAVEL, yellow brown, fine to coarse, sub	~		TOPSOIL COLLUVIUM
		ble	Groundwater Not Encountered					-	• • • • • • • •	1	angular to sub rounded; sand, fine to medium, well graded.			
 EX	F	ly stable	er Not	ES 0.50 - 0.70 m PID=0.5				-0.5	0 0 0 0 0 0 0 0 0	GW		D	MD	
Ï		Generally	dwate	FID=0.5				-	o o					
		Ge	Grour					-	. œ . o o•. œ.					
								- 1.0	• •	1				
						I I I	ì.	- 1.0	• • • •	-	1.10m			POCK
*	Н							_	:::::		1.20m SANDSTONE, light grey mottled pale red, medium grained, moderately weathered, high strength.	\square		ROCK
								-			Depth varies between 0.9 and 1.2m]		
								- 1.5			End of hole at 1.2m. Refusal. Hole backfilled with arising. Groundwater not encountered.			
								-			-			
							- E	-						
							- 1 L	-						
								-2.0						
							Ì	-						
								-						
							- i H	-						
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								-						
								- 						
							1	-						
							. H	-						
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						i i i	ì	-4.0						
								-						
								-						
							. L	-						
								-4.5						
								-						
							j.	-						
							╏	-						
	THOD				NETR	ATIC	N		1		ELD TESTS SAMPLE			SOIL CONSISTENCY
EX R	Rip	cavato per		E	Eas	sy	y (No	Resistan	ce)	S H	P - Hand/Pocket Penetrometer D - [Bulk disturt	ample	S - Soft
HA PT	Pu	nd aug sh tub	e	F	Fin Hai	m rd	4 (P - *	fue of)			CD Dumannia Cana Banatramatan ES - E	Environmer Thin wall tu	ntal sampl be 'undis	turbed' St - Stiff
SOI AH PS	Air	nic dril hamm	er	vH Ner WA	Vei	ry Haro	ı (Ref	usal)		M	C - Moisture Content MOISTUR			VSt - Very Stiff H - Hard
AS AD/	Sh	rcussic ort spii lid fligh	al aug	p. 0.	$\overline{}$			evel on	Date	IN	BT - Plate Bearing Test D - [IP - Borehole Impression Test M - [Noist		RELATIVE DENSITY VL - Very Loose
AD/ AD/ HF/	T So	lid fligh lid fligh llow flig	nt auge	er: TC-Bit		shov wate		low		P V	ID - Photoionisation Detector W - V S - Vane Shear: P=Peak PL - F	Vet Plastic limit		L - Loose MD - Medium Dens
WB RR	Wa	ashbor ck rolle	e drillir		-	wate	er ou	tflow			B-Boodual (uncorrected (Da) LL - L	iquid limit. Noisture co	ntent	D - Dense VD - Very Dense
											1			,

	ect:	F	Reus	burn Mulwaree e Goulburn Inf	rastru	ictur	re De	sign						H	ole No	: TP10
	ation			burn Waste Ma	nage	men	t Cen	tre			Job No: 82018253					Sheet: 1 o
			-	072 6150915							Angle from Horizontal:				e Elevation:	
				tachi 6T nsions: 2.60m		2 4 1		50m W			Excavation Method: 48	oumm stan				ern Demolitio
				2/7/18	LONG		0.0	50111 44			Logged By: MST				ed By: BT	
_	cavati			Sampling & ⁻	Testina							Description			<i></i>	
					DC		(L)		-							
Method	Resistance	Stability	Water	Sample or Field Test	(blo pe	ws er mm)	Depth (r	Graphic Log	Classification	S	DIL TYPE, plasticity or particle char colour, secondary and minor comp ROCK TYPE, grain size and type, fabric & texture, strength, weather defects and structure	colour,	Moisture Condition	Consistency Relative Density	& Other	RUCTURE Observations
				ES 0.10 - 0.30 m PID=0.5			-		sw		FILL: Gravelly SAND, grey brown, mec medium; gravel, fine to medium, sub ar Fill varies between 0.3m (west) to 1.0n thickness.	ngular.		н	FILL	
		able	Groundwater Not Encountered	ES 0.60 - 0.80 m		. . .	- 0.5 -		ѕм	0.50m	Sandy SILT, dark brown, low plasticity; rootlets throughout.	sand, fine,			TOPSOIL	
	F	lly sta	ter Not	PID=0.5			-			0.80m			D			
		Generally stable	Groundwa				- 1.0 - -		GW		Sandy GRAVEL, yellow brown, fine to angular to sub rounded; sand, fine to n graded.	coarse, sub redium, well			COLLUVIUM	
					lii	i i	- 1.5	0 0 0 0		1.50m						
	н					11		:::::		1.60m	SANDSTONE, light grey, medium grain moderately weathered, high strength.	ned,			ROCK	
							-				TERMINATED AT 1.60 m End of hole at 1.6m. Refusal. Hole bac	kfilled with				
							-				arising. Groundwater not encountered.					
							-2.0									
					1	i i l	-									
					1	!!	-									
							-									
							-									
							-2.5									
					1		_									
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							-4.0 -									
						11	-									
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					ii	1 I L	-									
							-4.5									
						; ; ;	-									
							-									
							-									
ME EX	THOD		- hu-l	at	ETRATI						STS Standard Penetration Test	SAMPLES B - Bull	k dist	od correr '		L CONSISTENCY
R HA	Rip	cavator oper ind auc		E	Easy	asy (No	Resistan	ice)	н	Р-	Hand/Pocket Penetrometer	D - Dist	turbed sa	ed sampl ample tal sample	S	 Very Soft Soft Firm
HA PT SO	Pu	ina aug ish tub inic dril	e	F H VH	Firm Hard Very Ha	ard (Pet	fusel)			CP - SP -	Dynamic Cone Penetrometer Perth Sand Penetrometer		n wall tub	tai sampi be 'undist		- Firm - Stiff - Very Stiff
AH PS	Air	hamm hamm rcussio	er			(rtei	uədi)		M	IC -	Moisture Content	MOISTURE			н	- Hard
AS AD/	Sh	ort spi	ral aug	ipio.	∕ Wa		evel on	Date	IN	/IP -	Plate Bearing Test Borehole Impression Test	D - Dry M - Mois	st		REL VL	- Very Loose
AD/ AD/ HF/	/T So	lid fligh lid fligh	nt auge	er: TC-Bit	≝_ sho — wat		flow		P		Photoionisation Detector Vane Shear; P=Peak,	W - Wet PL - Plas	t stic limit			 Very Loose Loose Medium Den
WB RR	8 Wa	ashbor ck rolle	e drillir		- wat						R=Resdual (uncorrected kPa)	LL - Liqu		ntent	D VD	 Medium Den Dense Very Dense
	1.0								4							



Construction Sciences Pty Ltd ABN: 74 128 806 735

Address:

Unit 3/180 Gladstone Street, Fyshwick ACT 2609 Laboratory: Fyshwick Laboratory Phone: 02 6265 5314 Fax: Email: Canberre@constructionsciences.net

MOISTURE CONTENT REPORT

Client:	Cardno AC	т	Report Number:	455/R/13579-2	
Client Address:	2/14-16 W	ormald Street, Symonston	Project Number:	455/P/31	
Project:	Goulburn 1	Transfer Station	Lot Number:		
Location:	NSW/ACT		Internal Test Request:	455/T/9268	
Supplied To:	Miles Thor	npson	Client Reference/s:	8201825301	
Area Description:			Report Date / Page:	23/07/2018	Page 1 of 1
Test Procedures:		AS1289.2.1.1			

Test Procedures:	AS1289.2.1.1			
Sample Number	455/5/59189	455/5/59190	455/5/59191	
ID / Client ID	TP 103	TP 104	TP 107	
Lot Number	-	-	-	
Date / Time Sampled	12/07/2018	12/07/2018	12/07/2018	
Sampling Method				
Date Tested	18/07/2018	18/07/2018	18/07/2018	
Material Source	-	-	-	
Material Type	-	-	-	
Client Supplied	0.3-0.5	0.4-0.5	0.2-0.4	
Moisture Content (%)	5.0	3.7	6.1	

Sample Number		
ID / Client ID		
Lot Number		
Date / Time Sampled		
Sampling Method		
Date Tested		
Material Source		
Material Type		
Client Supplied		
Moisture Content (%)		

Remarks Re-Issued F

Re-Issued Report Replaces Report No 455/R/13579-1.

The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards. Accredited for compliance with ISO/IEC 17025 - Testing

Accreditation Number: Corporate Site Number: 1986 455

Approved Signatory: Kerrina Christiansen Form ID: W20Rep Rev 1





Network Geotechnics ABN: 35 069 211 561 Unit 1, 140 Industrial Road Oak Flats NSW 2529

Laboratory:	Wollongong Laboratory			
Phone:	02 4257 4458			
Fax:	02 4257 4463			
Email:	wolongong@constructionsciences.net			

ATTERBERG LIMITS REPORT

Client:	Cardno (NSW/ACT)			Report Number:	10848/R/2960-1				
Client Address:	Level 9 - The Forum, 203 Pacific Highway, St. Leonards		Project Number:	10848/P/211					
Project:	Goulburn Transfer Station			Lot Number:					
Location:	Goulburn			Internal Test Request:	10848/T/1596				
Supplied To:	n/a			Client Reference/s:	T/9268				
Area Description:				Report Date / Page:	26/07/2018	Page 1 of 3			
Test Procedures: AS1289.3.1.1, AS 1289.3.3.1, AS1289.3.2.1, AS1289.3.4.1, AS1289.2.1.1									
Sample Number	10848/S/7427		Sample Location						
Sampling Method	Tested As Received		Client Sample ID TF		P103 (0.3-0.5m)				
Date Sampled	12/07/2018								
Sampled By	Client Sampled								
Date Tested	26/07/2018								
Att. Drying Method	Oven Dried		Material Source -						
Atterberg Preparation	n Dry Sieved		Material Type -						
Material Description	Material Description Gravelly Clayey SAND								
Atterberg Limits Results									
Atterberg Limit Specif		Specification Minimum	Specification Minimum		Specification Maximum				
Liquid Limit (%)				18					
Plastic Limit (%)				14					
Plasticity Index (%)				4					
Linear Shrinkage (%)				2.0					
Linear Shrinkage Mould Length / Defects: Mould Length: 254.0mm / -									

Remarks

NATA

The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards. Accredited for compliance with ISO/IEC 17025 - Testing

1318

10848

Accreditation Number: Corporate Site Number:

Approved Signatory: Harry Ubungen Form ID: W11bRep Rev 1



Network Geotechnics ABN: 35 069 211 561 Unit 1, 140 Industrial Road

Oak Flats NSW 2529

Laboratory: Wollongong Laboratory 02 4257 4458 Phone: 02 4257 4463 Fax: Email: wollongong@constructionsciences.net

EMERSON CLASS NUMBER REPORT

Client:	Cardno (N	SW/ACT)	Report Number:	10848/R/2961-1	
Client Address:	Level 9 - T	he Forum, 203 Pacific Highway, St. Leonards	Project Number:	10848/P/211	
Project:	Goulburn 1	Transfer Station	Lot Number:		
Location:	Goulburn		Internal Test Request:	10848/T/1596	
Supplied To:	n/a		Client Reference/s:	T/9268	
Area Description:			Report Date / Page:	26/07/2018	Page 1 of 1
Test Procedures:		AS1289.3.8.1			

Sample Number	10848/5/7427	10848/5/7429
ID / Client ID	455/5/59189	455/5/59191
Lot Number		
Date / Time Sampled	12/07/2018 12:00	12/07/2018 12:00
Material Source	-	-
Material Type	-	
Sampling Method	Tested As Received	Tested As Received
Water Type	Distilled	Distilled
Water Temperature (C°)	22	22
Client Sample ID	TP103 (0.3-0.5m)	TP107 (0.2-0.4m)
Soil Description	Gravelly Clayey SAND	Gravelly SAND
Son Description	Glavely Glayey Grave	Glavely Grad
Emerson Class Number	5	8

Remarks The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards. Accredited for compliance with ISO/IEC 17025 - Testing 1318 Accreditation Number: Corporate Site Number: 10848 Approved Signatory: Harry Ubungen Form ID: W34Rep Rev 1





Test Location Plan

GOULBURN WASTE TRANSFER, REUSE AND RECYCLE CENTRE

Legend

	Project Boundary
\bullet	Borehole
•	Borehole - Gas Well Installed
(1.0)	Depth Of Fill
÷	Test Pit
	Watercourse (LPI)
	Cadastre (DFSI-SS, 2017)

1:1,500 Scale at A3

		m		_
0	20	40	60	80
	\square	Car	dno	
	Man Draduad	by Cordoo NSW/		
₩ 	Date: 2018	8-11-09 Project:		L)
	Coordinate S	System: GDA 199	4 IMGA Zone 55	

Map: 8201825301-GS-013-TestLocationPlan.mxd 01 Aerial imagery supplied by nearmap (March, 2018)

_		$\mathbf{>}$	C	aro	<i>lno</i> °					E	BORE	EHOLE LOG SHEET
	lieı roje	nt: ect:			burn Mulwaree Cound	il						Hole No: BH1
		tion			ourn Waste Manageme	ent Cent	re		Job No: 82018253			Sheet: 1 of 2
			-	-	6150964 POWER SCOUT				Angle from Horizontal: 90° Mounting: Truck		Driller:	e Elevation:
	-			eter					j.		-	ctor: Hagstrom
Di	ata	Sta	rted	: 09/	0/18 Date Co	omplete	d: 09/1	0/1			Check	ed By: MET
		rilling	9	-	Sampling & Testing				Material Descrip	tion	1	
Method	INIEIIIOU	Resistance	Casing	Water	Sample or Field Test	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
						-		GW	FILL: Sandy GRAVEL: fine to medium, sub-angu grey, medium to coarse sand, moist 0.40m [HARDSTAND]	lar, D		FILL 0.00 m: CH4/CO2/O2 (%)
- AD/T		E	НО		SPT 1.50 - 1.95 m 3, 11, 11 N=22 SPT 3.00 - 3.45 m 6, 8, 7 N=15			SC	FILL: Clayey SAND: fine to coarse grained, dar grey, with plastic, concrete, tile, timber, paper a cloth, moist [LANDFILL WASTE]	M	MD	1.50 m: 0.4/0.3/20.5 3.00 m: 0.9/0.7/20.2
		F	-		SPT 4.50 - 4.95 m 3, 10, 8 N=18	-4 4 		sw	4.20m SAND: fine to coarse grained, brown mottled ligh brown, trace fine, sub angular gravel, moist [COLLUVIUM] Auger refusal at 6.0m.	t M	MD to VD	COLLUVIUM 4.50 m: 3.8/2.3/19.4
	4		•			6	<u> </u>		6.00m Continued as Cored Drill Hole			
						- - - - - - - - - - - - - - - - - - -						
	EX R HA PT SON AH PS AD/\ AD/\ HFA WB RR Refer	Rip Ha Pu So Air Pe Sh / So T So Wa Ro	ccavato pper and au ish tub nic dr hamn ercussi nort sp blid flig blow fl ashbo bck roll	ner illing on san iral aug ht aug ight au ight au re drilli er y notes	ppler er tors: V-Bit ger er tors: V-Bit tors: V-Bit	y (No Resistar I (Refusal) er Level or	Date	S F D F N F II	IP - Hand/Pocket Penetrometer D - ICP - Dynamic Cone Penetrometer U - ISP - Perth Sand Penetrometer U - IC Moisture Content MOISI MOISI IBT - Plate Bearing Test D - IP - Borehole Impression Test M - ID - Photoionisation Detector W - IS - Sharz P=Peak. PL -	Bulk disturk Disturbed s Environmer Thin wall tu URE Dry Moist Wet Plastic limit Liquid limit	ample ital sampl be 'undist	e F - Firm

	ncil I	Proje	ect:	ourn M Go	ulbur	n Reuse								Hole No: BH
	ation			urn W 31509		Management Cent	re	Job No:			ntol. O	No.	<u> </u>	Sheet: 3 o rface Elevation:
				POW		COUT		Angle f Mounti			ntal: 9)		iller: AB
_			eter:			Bit Type:		Bit Con	-					ntractor: Hagstrom
Data	a Sta	rted:	09/1	0/18		Date Complete	d: 09/10/18	Logged	By: N	IST			Ch	ecked By: MET
	Co	ing		(Material De	scription						Defect Description
Method	Fluid	TCR (%)	RQD (%)	RL (m AHD)	Depth (m)	Lo charao Co co ROCK O co	FYPE, plasticity o cteristic, colour, s & minor compone NAME, grain size our, fabric and te ions & minor com	econdary nts and type, kture,	Weathering	St Is ₍₅ • Axial	imated rength ⁽⁰⁾ MPa ^{O-Diametral}	Average Natural Defect Spacing (mm) R 8 8 8 9 8 8	Visual	Additional Data DEFECT TYPE, orientation, shape, roughness, infilling or coating, thickness, other
					- - - - - - - - - - - - - - - - - - -									
A HO		81	13		- - - - - - - - - - - - - - - - - - -	SANDS"	CORING AT 6.00m PONE, fine to medium artzose, iron strained v	grained, light eins	SW					 6.00 - 6.28 m: SZ 6.33 m: JT, 60°, UN, RF 6.35 m: JT, 60°, UN, RF 6.42 - 6.43 m: SZ 6.51 m: JT, 70°, UN, RF 6.55 m: JT, 70°, UN, RF 6.59 m: JT, 70°, UN, RF 6.72 m: JT, 40°, IR, RF 6.85 m: BP, 10°, PR, RF, Fe 6.99 m: JT, 30°, PR, RF 7.23 m: JT, 30°, IR, RF
DRI AD/ HF/ WB RR PQ HQ NMI DT PS SOM AH	T So A Ho Ro Ro LC Ro Di Pu Pe N So	olid fligh blid fligh blow flig ashbor ock roll otary co otary co otary co atube co ash tube	ght auge er ore (85r ore (63. ore (51. concrete e on samp ling	: TC-Bit er 9 nm) 5mm) 94mm) e coring	R R R	ATER ✓ Water Level on date shown water inflow ✓ water outflow OCK QUALITY ESCRIPTIONS QD Rock Quality Designation (%) CR Total Core Recovery (%)	ROCK STRENGT EH Extremly Higl VH Very High H High M Medium L Low VL Very Low ROCK WEATHER FR Fresh SW Slightly Weat DW Distinctly We MW Moderately V HW Highly Weat XW Extremly Weat	ING hered athered /eathered ered	JT SZ BP SM FL VN CL CS FZ DL HB	Beddi Seam Foliati Vein Cleav Crush Fractu Drift L Handi	ed zone ng Parting on age ed Seam ire Zone	IR Irreg PR Plan ST Step UN Und ROUGHNE VR Very RF Rou S Smo	red continu ular pped ulose ESS r Roug gh poth kensic	VNR Veneer (thin or patch) CT Coating (up to 1mm) INFILL MATERIALS X Carbonaceus MU Unidentified minteral h MS Secondary mineral KT Chlorite CA Calcite

lien Proje					Mulwa Reuse	ree Co	uncil										ŀ	lole No:	BH
ocat	ion:	G	oulb	ourn V	Vaste		ement Cent												t:4 of
				61509				Angle f				l: 90)°					Elevation:	
			DRA eter:		ER SC		Typo:	Mountin Bit Con	-								Iler: A		
	-			0/18			Type: Completed											or: Hagstrom By: MET	
ulu	Cori		00/1	0,10		Duit	. oompiciet	Material Description	by . 1							011		ct Description	
				Ê	ĉ		SOIL T	YPE, plasticity or particle		E	stima	ted	A	verag	e		0000		
Method	Fluid	TCR (%)	RQD (%)	RL (m AHD)	Depth (m)	Graphic Log	charac 8 ROCK I cole	teristic, colour, secondary k minor components NAME, grain size and type, pur, fabric and texture, ons & minor components	Weathering	2 9 - A) 0	Streng S ₍₅₀₎ M	nth Pa iametral ∞ ♀	۱ ۱ ۲	latura Defec pacin (mm)	ıl t g	Visual		Additional Data DEFECT TYPE, orien shape, roughness, in or coating, thickness,	filling
		81	13		-		grey, qua	ONE, fine to medium grained, light rtzose, iron strained veins <i>(continued)</i> DSS 0.40m (8.30-8.70)	sw								— 8.10 i	m: DB	
5	-	100	0		- 8.5 - -		8.70m SANDST grey, qua	ONE, fine to medium grained, light rtzose, iron strained veins							+		— 8.75 ı — 8.90 ı	m: JT, 70°, PR, RF, Fe	
_	-				9.0-	· · · · · · · ·	9.00m TERMIN Target de	ATED AT 9.00 m opth. Gas well installed.			 				 			m: DB	
					- - - 9.5 - - - - 10.0														
					- - - 10.5 - -														
					- 11.0 - - - - 11.5 - -														
AD/V AD/T HFA WB RR PQ HQ NMLC DT PT PS SON AH	Sol Sol Hol Rot Rot Dia Pus Sor	lid fligh llow flig ashbor ck rolle tary co tary co tary co atube c sh tube	oht aug e drillin ore (85 ore (63 ore (51 concret on sam ling	r: TC-Bit er g .5mm) .5mm) .94mm) e coring	RI RI RI	on d wate wate wate ccK QUA ESCRIPTI QD Ro De CR Tot		ROCK STRENGTH EH Extremly High VH Very High H High M Medium L Low ROCK WEATHERING FR Fresh SV Slightly Weathered DW Distinctly Weathered MW Moderately Weathered HW Highly Weathered HW Highly Weathered HW Highly Weathered HW Highly Weathered	DEFE JT SZ BP SM FL VN CL CS FZ DL HB DB	Join Shea Bedu Seau Folia Vein Clea Crus Frac Drift Han	t ared z ding P m ation avage shed S cture Z	earting Seam Sone Break	1	DIS IR PR ST UN ROUC VR RF S	Curv Disc Irreg Plan Step Undu HNE Very Roug Smo Sloc	ed ontinud ar ped Jlose SS Rough gh oth kensid	ı	COATING CN Clean SN Stained VNR Veneer (thin CT Coating (up t INFILL MATERIALS X Carbonaceus MU Unidentified MS Secondary m KT Chlorite CA Calcite Fe Iron Oxide Qz Quartz	o 1mm) minteral



Photo 1: BH1 - 6.00 to 9.00m of rock core



Client:	Goulburn Mulwaree Council
Project:	Reuse Goulburn
Cardno Reference:	82018253
Title:	Borehole 01 Core Photo Report
Size:	A4

Client:	(ourn Mulwaree Counc	il				_		HOLE LOG SHEET
Project: Location:			urn Reuse urn Waste Manageme	nt Cent	re		Job No: 82018253			Sheet: 1 of
Position:							Angle from Horizontal: 90°		Surfac	e Elevation:
Rig Type	: HY	DRA	POWER SCOUT				Mounting: Truck		Driller	:
Casing D	lame	eter:	HQ						Contra	ctor: Hagstrom
Data Star	rted:	09/1	D/18 Date Co	mplete	d: 09/1	0/18	Logged By: MST		Check	ed By: MET
Drilling			Sampling & Testing				Material Description			
Method Resistance	Casing	Water	Sample or Field Test	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
1	•			-		GW CI- CH	0.20m FILL: Sandy GRAVEL: fine to medium, sub-angular, grey, medium to coarse sand, moist FILL: Sandy CLAY: medium plasticity, light brown, fine to medium sand, trace fine gravel	D		FILL 0.00 m: CH4/CO2/O2 (%)
- ДДЛ -	НО —		SPT 1.50 - 1.95 m 8, 18, 18 N=36	- - 1 - - - - - - - - - - - - - - - - -		CI- CH	0.70m FILL: Sandy CLAY: medium plasticity, dark brown mottled red brown and brown, fine to medium sand, trace fine gravel	м	н	1.50 m: 0.1/0.0/20.6
¥							_{3.00m} Auguer refusal at 3.0m Continued as Cored Drill Hole			
				- - - - - - - - - - - - - - - - - - -						
R Rip HA Har PT Pus SON Sor AH Air I PS Per AS Sho AD/V Soli HFA Hol WB Wa	per nd aug sh tube nic dril hamm rcussic ort spir id fligh id fligh llow flig	e ing er al auge it auge t auge ght auge drillin	bler f: V-Bit er er vitic TC-Bit er vitic Volume vitic Volume vi	No Resistar (No Resistar) (Refusal) r Level on n		S H D M P	P Hand/Pocket Penetrometer D - Dis CP Dynamic Cone Penetrometer U - Thi SP Perth Sand Penetrometer U - Thi C Moisture Content MOISTURE T Plate Bearing Test D - Dry P Borehole Impression Test M Mo D Photoionisation Detector W - Q Vane Shear, P=Peak, L -	turbed sa vironmen n wall tub / ist	tal sampl	e S - Soft F - Firm

CARDNO 2.01.6 LIB.GLB Log CARDNO NON-CORED 82018253-2.GPJ <<DrawingFille>> 18/10/2018 14:28 10.0.000 Datgel AGS RTA, Photo, Monitoring Tools

	/			Ino												ORE LOG SHEET
Clien Proje		G	oult	ourn F	Reuse										ŀ	lole No: BH2
Locat						Manage	ement Centr		: 8201							Sheet: 2 of 3
Posit					72 ER SC				from He ing: Tr		ontal: 9	0°			iface E iller:	Elevation:
Casir					ER SU		ype:		ndition							or: Hagstrom
Data	-						Completed		d By: N							By: MET
	Corir	ıg						Material Description							Defec	t Description
Method	Fluid	TCR (%)	RQD (%)	RL (m AHD)	Depth (m)	Graphic Log	charac 8 ROCK N colo	YPE, plasticity or particle teristic, colour, secondary minor components NAME, grain size and type, pur, fabric and texture, ons & minor components	Weathering	St Is ₍ ●- Axia	timated trength 50) MPa I O-Diametral	Aver Nati Def Spac (m	ural ect cing	Visual		Additional Data DEFECT TYPE, orientation, shape, roughness, infilling or coating, thickness, other
							3.00m START C	ORING AT 3.00m								
Ĩ	ŀ	100	0		-	· · · · · · · · · · · · · · · · · · ·		ONE, fine to medium grained, light rtzose, iron strained veins	SW						~ 3.00:	0.0/0.1/20.5
На		100	33		- - - 3.5 - -		3.69m SANDST	ne grained, brown mottled light grey ONE, fine to medium grained, light rtzose, iron strained veins								n: JT, 20°, PR, S n: JT, 30°, UN, RF n: JT, 70°, UN, RF n: JT, 30°, PR, S n: DB n: JT, 70°, PR, RF n: JT, 20°, UN, RF
DRIL AD/V AD/T HFA WB RR PQ HQ NML0 DT PT PS SON AH	Solic Solic Holk Was Roc Rota Rota C Rota Diat Pust Perc Soni	d flight ow flig shbore k rolle ary col ary col	ht aug r drillin re (85r re (63. re (51. oncrete n sam	: TC-Bit er 9 mm) 5mm) 94mm) e coring	R R R	ATER Wate on da wate wate wate CR Tota	DNS ok Quality signation (%) al Core covery (%)	ROCK STRENGTH EH Extremly High VH Very High H High M Medium L Low VL Very Low ROCK WEATHERING FR Fresh SW Slightly Weathered DW Distinctly Weathered MW Moderately Weathered HW Highly Weathered XW Extremly Weathered Startendy CARDNO (NSW/	JT SZ BP SM FL VN CL CS FZ DL HB DB	Bedd Searr Foliat Vein Cleav Crush Fract Drift L Hand	red zone ing Parting ion rage ned Seam ure Zone	g IR PR ST UN RO RF S SL	B Dis Irre Pla Ste Unc UGHN Ver Rou Sm	ved continu gular nar pped dulose ESS y Roug ugh ooth ckensi	jh	COATING CN Clean SN Stained VNR Veneer (thin or patchy) CT Coating (up to 1mm) INFILL MATERALS X Carbonaceus MU Unidentified minteral MS Secondary mineral KT Chlorite CA Calcite Fe Iron Oxide Qz Quartz

) C	ard	lno	8									CORE LOG SHEE
Client: Proiect				Mulwa Reuse	ree Coun	cil							Hole No: BH2
Locatio	on: O	Goulb	urn V	Vaste	Managem	ent Cent	re Job No:	8201	8253				Sheet: 3 of
Positio	-						Angle fr			al: 90)°		rface Elevation:
Rig Typ Casing				ER SC	Bit Typ		Mountin Bit Cond	-					iller: ntractor: Hagstrom
Data St							d: 09/10/18 Logged						ecked By: MET
	Coring					<u></u>	Material Description	_ <u>,</u>				•	Defect Description
			₽	Ê		SOIL T	YPE, plasticity or particle	_	Estima	ated	Average		
Fluid	TCR (%)	RQD (%)	RL (m AHD)	Depth (m)	Graphic Log	charac 8 ROCK I colo	teristic, colour, secondary & minor components NAME, grain size and type, our, fabric and texture, ions & minor components	Weathering	Stren Is ₍₅₀₎ M ●-Axial O- 5	ЙРа	Natural Defect Spacing (mm) ରୁ ଛ ରି ଡି ଚି	Visual	Additional Data DEFECT TYPE, orientation, shape, roughness, infilling or coating, thickness, other
				-		SANDST grey, qua	ONE, fine to medium grained, light rtzose, iron strained veins <i>(continued)</i>	SW					- 4.00 m: JT, 20°, UN, RF - 4.21 m: JT, 20°, UN, RF
	100	33		-	· · · · · · · · · · · · · · · · · · ·								4.32 - 4.41 m: SZ
				- 4.5	· · · · · · · · · · · · · · · · · · ·								— 4.48 m: JT, 80°, UN, RF, Fe — 4.54 m: DB
				-	· · · · · · · · · · · · · · · · · · ·								
) 2 				- 5.0	· · · · · · · · · · · · · · · · · · ·								— 4.84 - 4.93 m: SZ — 4.96 m: JT, 20°, PR, RF — 5.06 m: JT, 60°, PR, RF
	100	12		-	· · · · · · · · · · · · · · · · · · ·								
				- 5.5	· · · · · · · · · · · · · · · · · · ·								- 5.38 - 5.57 m: SZ - 5.57 m: DB
				-	· · · · · · · · · · · · · · · · · · ·								5.64 m: DB 5.67 m: JT, 20°, IR, RF 5.67 m: JT, 20°, IR, RF 5.72 m: JT, 20°, IR, RF 5.78 m: JT, 60°, PR, RF
¥.	100	33		6.0	6.00		ATED AT 6.00 m						5.85 m: JT, 30°, UN, RF 5.94 m: DB
				-			opth. Gas well installed.						
				- 6.5 - -									
				-									
				- 7.0									
				-									
				- 7.5 -									
				-									
AD/T HFA WB RR	NG Solid flig Solid flig Hollow fli Washbo Rock roll Rotary c	ht auger ight auge re drilling ler	: TC-Bit er 9		ATER Water L on date water ir water o	shown nflow	ROCK STRENGTH EH Extremly High VH Very High H High M Medium L Low VL Very Low	JT SZ BP SM FL	CT TYPE Joint Sheared Bedding Seam Foliation		IR Irreg PR Plan ST Step	/ed continu jular jar oped	COATING CN Clean SN Stained VNR Veneer (thin or patchy) CT Coating (up to 1mm) INFILL MATERIALS
HQ NMLC DT PT PS SON	Rotary c Rotary c Diatube Push tub Percussi Sonic dri Air hamn	ore (63. ore (51. concrete e ion samp illing	5mm) 94mm) e coring	Di R	CR Total C	S Quality nation (%)	ROCK WEATHERING FR Fresh SW Slightly Weathered DW Distinctly Weathered MW Moderately Weathered HW Highly Weathered XW Extremly Weathered	CL CS FZ DL HB	Vein Cleavage Crushed Fracture Drift Lift Handing Drilling B	Seam Zone Break	ROUGHNE VR Very RF Rou S Smo	Roug gh ooth kensic	X Carbonaceus MU Unidentified minteral MS Secondary mineral KT Chlorite CA Calcite
	explanator tions and b						CARDNO (NSW/A	CT)	PTY	LT)		1



Photo 1: BH2 – 2.80m to 6.0m of rock core



Client:	Goulburn Mulwaree Council
Project:	Reuse Goulburn
Cardno Reference:	82018253
Title:	Borehole 02 Core Photo Report
Size:	A4

Clier Proje				ourn Mulv ourn Reus	waree Counc se	il						Hole No: BH
	tion				e Manageme	ent Centr	e		Job No: 82018253			Sheet: 1 o
Posit	tion	752	080 e	6150921					Angle from Horizontal: 90°	;	Surfac	e Elevation:
Rig T	Гуре	: HY	'DRA	POWER \$	SCOUT				Mounting: Truck	I	Driller	:
Casi	ng D	lam	eter:	HQ						(Contra	ctor: Hagstrom
Data	Sta	rted:	08/1	0/18	Date Co	mpleted	1: 08/ 1	10/18	Logged By: MST	(Check	ed By: MET
D	rilling			Samp	ling & Testing				Material Description			
Method	Resistance	Casing	Water		ample or ield Test	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure		Consistency Relative Density	STRUCTURE & Other Observations
						-		sw	FILL: Gravelly Clayey SAND: fine to coarse grained, brown, medium plasticity clay, fine to medium gravel			FILL 0.00 m: CH4/CO2/O2 (%)
——	E	— НО —				- - 1 -		sw	0.60m FILL: Gravelly SAND: fine to coarse grained, grey to dark grey, fine to medium gravel	М	VD	
╈┟	н	V		SPT 1.50 - 36/140mm		-	XXXX		1.60m 1.70m SANDSTONE, light grey, fine to medium grained,	D		1.50 m: 0.1/0.0/20.0 BEDROCK
						2 3 4 4 4 5 6 6 7 6 7 7 7 7			\quartz rich, moderately weathered, high strength TERMINATED AT 1.70 m Target depth. Gas well installed.			
MET EX R A PT SON A PS A A D/T A B A A D/T A WB R R	Rip Ha Pu: Air Pei Sh Sol Sol G Sol Ho Wa	per nd aug sh tub nic dril hamm rcussic ort spii id fligh id fligh llow flig	e ling er on sam ral auge nt auge ght auge ght auge e drillin	pler er r: V-Bit r: TC-Bit ger	E Easy F Firm H Hard VH Very Hard WATER Wate show wate	r (No Resistan (Refusal) er Level on /n		S H D P N	CP - Dynamic Cone Penetrometer ES - Env SP - Perth Sand Penetrometer U - C - Moisture Content MOISTURE BT - Plate Bearing Test D - IP - Borehole Impression Test M - D - Photoionisation Detector W -	urbed sa ironment wall tub st stic limit id limit	ample tal sampl be 'undist	le S - Soft F - Firm

	\square) <i>C</i>	arc	<i>lno</i> °					E	BORE	EHOLE LOG SHEET
	ent: ject:			burn Mulwaree burn Reuse	Council						Hole No: BH4
	ation			ourn Waste Man	agement Cen	tre		Job No: 82018253			Sheet: 1 of 2
				6150900	_			Angle from Horizontal: 90			e Elevation:
-			YDRA neter:		Γ			Mounting: Truck		Driller Contra	: ictor: Hagstrom
			: 08/1		ate Complete	d: 08/1	10/1	8 Logged By: MST			ed By: MET
	Drillin	ng		Sampling & T	i			Material Des			
Method	Resistance	Casing	Water	Sample o Field Tes		Graphic Log	Classification	SOIL TYPE, plasticity or particle character colour, secondary and minor componer ROCK TYPE, grain size and type, colou fabric & texture, strength, weathering defects and structure	ur, tsib	Consistency Relative Density	STRUCTURE & Other Observations
							GW	FILL: Gravelly CLAY: medium plasticity, grey coarse gravel, moist [LANDFILL COVER]	y, fine to M to D		FILL 0.00 m: CH4/CO2/O2 (%)
T/0	E	НО		SPT 1.50 - 1.95 m 1, 15, 25 N=40	-1			0.60m FILL: Clayey SAND: fine to coarse gr dark grey, with timber, plastic, concrete, p cloth, wool, moist [LANDFILL WASTE]	ained, paper,		1.50 m: 10.7/1.5/18.3
AD/T	E	Ť		SPT 3.00 - 3.45 m 3, 2, 5 N=7	3		sc		м	MD to VE	3.00 m: 17.2/2.3/13.6
		•			- 4			4.40m Auguer refusal at 4.4m Continued as Cored Drill Hole			
					-5 - - - - -						
					-7						
					- - - - 8						
					- - - - 9 -						
EX R	R	xcavato	or buck		TRATION Very Easy (No Resista Easy	nce)	s	PT - Standard Penetration Test B P - Hand/Pocket Penetrometer D	AMPLES - Bulk disturb - Disturbed s	ample	S - Soft
HA PT SC AF PS AD AD HF WI RF	H P S N A S V S S V T A B	land au onic dr ir hamr ercuss hort sp olid flig olid flig lollow fl	be illing mer ion sam biral aug ght aug ght aug light au bre drilling	npler WAT er V-Bit er: TC-Bit ger	Firm Hard Very Hard (Refusal)	n Date	F F F	CP - Dynamic Cone Penetrometer U SP - Perth Sand Penetrometer	S - Environmen - Thin wall tu OISTURE - Dry - Moist - Wet - Plastic limit - Liquid limit	ital sampl be 'undis	
Rel abb	fer to ex previatio	xplanator ons and b	ry notes basis of o	ior details of lescriptions		CAF	RDI	NO (NSW/ACT) PTY LTE)		

	Gal	rdn												C	ORE L	OG S	HEE
Client: Project:		oulbu oulbur			rre Council									H	ole	No:	BH4
Location:	Go	ulbur	n Wa	aste	Management Ce	entre	Job No:										3 of
Position: 7							Angle fr			ntal: 9	0°				evation:		
Rig Type: Casing Dia				RSC	Bit Type:		Mountin Bit Conc	-						iller:	r: Hagst	rom	
Data Start						eted: 08/10/18	Logged								By: MET		
Corin	ıg					Material Des	laterial Description							Defect	Defect Description		
Method Fluid	TCR (%)		KL (m AHU)	Depth (m)	Cha Log ROC ROC	IL TYPE, plasticity or p racteristic, colour, sec & minor component CK NAME, grain size a colour, fabric and textu lusions & minor comp	condary s ind type, ure,	Weathering	St Is ₍₁ • Axia	timated rength 50) MPa I O-Diametral	Avera Natu Defe Spac (mn	ral ect ing	Visual	s	EFECT TY hape, roug	onal Data PE, orienta Ihness, infi hickness, c	ling
PH 1	100 1	6		- 4.5 - 5.0 - 5.5 - 6.0	SAN	RT CORING AT 4.40m DSTONE, fine to medium gra iron stained veins thoroughd		SW						4.42 m 4.47 m 4.47 m 4.64 m 4.70 m 5.00 m 5.11 m 5.11 m 5.11 m 5.11 m 5.27 m 5.33 m 5.43 m 5.52 m 5.58 m 5.574 m 6.00 m 6.00 m 6.00 m 6.06 m 6.622 - 0 6.655 m 6.61 m	: JT2, 60°, U :HB :JT, 60°, PR :JT, 30°, PR :BP, 10°, PF :BP, 10°, PF :JT, 70°, PR :JT, 60°, IR, :HB :JT, 60°, UN :JT, 60°, UN :JT, 60°, UN	I, RF I, RF , RF , RF , RF , RF , RF , RF , RF	ned
	100 5	50	-	- 7.0		MINATED AT 7.40 m et depth. Gas well installed.								— 7.00 m — 7.22 m — 7.31 m	: JT, 60°, UN	I, RF	
AD/T Solic HFA Holk WB Was RR Rocl PQ Rota HQ Rota NMLC Rota DT Diatt PT Push PS Perc SON Soni	d flight at d flight at shbore d k roller ary core ary core ube con n tube cussion s c drilling ammer	uger: TC auger rilling (85mm) (63.5mr (51.94n crete co sampling	Bit C-Bit (m) nring	W - R D		ROCK STRENGTH EH Extremly High VH Very High H High M Medium L Low VL Very Low ROCK WEATHERIN FR Fresh SW Slightly Weather OW Distinctly Weath HW Highly Weather XW Extremly Weath	ered hered athered red	DEFE JT SZ BP SM FL VN CL CS FZ DL HB DB	Beddi Seam Foliat Vein Cleav Crush Fracto Drift L Hand	red zone ng Parting ion age ied Seam ure Zone	CU DIS IR PR ST UN VR VR SSL	Irregu Plana Stepj Undu JGHNE Very Roug Smoo	ed ontinu Jlar ar Ded Ilose SS Roug Jh oth kensic	h	VNR Ver CT Co: INFILL MA X Cai MU Uni MS See KT Ch CA Cai Fe Iror	ined neer (thin o ating (up to	1mm)



Photo 1: BH4 - 4.40 to 7.40m of rock core



Goulburn Mulwaree Council
Reuse Goulburn
82018253
Borehole 04 Core Photo Report
A4

	nt: ect:			burn Mulwarre C ourn Reuse	ouncil								Hole N	lo: BH
	ation			urn Waste Mana	gement C	ent	re		Job No: 82018253					Sheet: 1 o
osi	ition	: 752	136 (6150860					Angle from Horizont	al: 90°	;	Surfac	e Elevation:	
Rig	Туре	: H)	'DRA	POWER SCOUT					Mounting: Truck			Driller		
Cas	ing [Diam	eter:										ctor: Hagstro	om
Data	a Sta	rted:	10/1	0/18 Da	te Comple	eteo	d: 10/1	0/18	Logged By: MST			Check	ed By: MET	
[Drilling)		Sampling & Te	sting				Mate	erial Description				
Method	Resistance	Casing	Water	Sample or Field Test		Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle o colour, secondary and minor or ROCK TYPE, grain size and ty fabric & texture, strength, we defects and structure	omponents	Moisture Condition	Consistency Relative Density		UCTURE Observations
A	Е	A						sw	.20m FILL: Clayey SAND: fine to mediur	m grained, brown,	м		FILL 0.00 m: CH4/CO2	(02 (%)
Т	Н			PDT 1 50 - 1 05 m		1		sw	Iow plasticity clay, dry FILL: Gravelly SAND: fine to coars brown, fine to coarse gravel, with t concrete, dry [BUILDING WASTE] .40m FILL: Sandy GRAVEL: fine to med	ivirick and	D		0.00 m: CH4/CO2	(02 (%)
- AU/ I	E	ОН		SPT 1.50 - 1.95 m 6, 6, 3 N=9		2		GW SC	grey, mediúm to coarse sand, mo COVER] 240m FILL: Clayey SAND: fine to coars dark grey, with metal, plastic, cloth [LANDFILL WASTE]	ist [LANDFILL	м	L		
					;	3		00						
¥	Н	V		SPT 3.00 - 3.03 m 25/30mm HB N=R		<u> </u>	<u> </u>		8.10m <u>SANDSTONE</u> , fine to medium gra \light grey	ined, massive,	D	VD	3.00 m: 0.2/0.0/21 BEDROCK	.0
						8			Refusal					
ME EX R HA P SO A DZ A DZ A DZ A DZ A DZ A DZ A DZ A DZ	Rip Ha Pu N So Air Pe Sh V So T So A Ho Wa	oper nd aug sh tub nic dril hamm rcussic ort spi lid flig lid flig llow fli	e ling ler on sam ral aug nt aug ght aug ght au e drillir	et VE F F H H VH WATE er Y: V-Bit r: TC-Bit ger	IRATION Very Easy (No Re Easy Firm Hard Very Hard (Refusi R 7 Water Leve 7 Shown − water inflor ¶ water outflo	^{al)} el on w		S H D P	P Dynamic Cone Penetrometer P Perth Sand Penetrometer C Moisture Content T Plate Bearing Test P Borehole Impression Test O Photoionisation Detector	SAMPLES B - Build D - Dist ES - Env U - Thir MOISTURE D - Dry M - Mois W Wet PL - Plaq W - Mois	st st st stc limit uid limit	ample tal sampl be 'undist	le VS s turbed' St VSt H REL/ VL L D	CONSISTENCY - Very Soft - Soft - Firm - Stiff - Very Stiff - Hard XTIVE DENSITY - Very Loose - Loose - Loose - Medium Den - Dense - Very Dense

$\boldsymbol{\langle}$	\square	C	arc	lno°						B	BORE	EHOLE LOG SHEET
	ent: ject:			burn Mulw burn Reuse	aree Council							Hole No: BH6
Loc	ation	n: G	Goulb	urn Waste	Managemen	t Cent	re		Job No: 82018253			Sheet: 1 of 1
		-		0150959 POWER S	COLIT				Angle from Horizontal: 90° Mounting: Truck		Surfac Driller	e Elevation:
_		Diam			0001				incurring. Truck		-	ictor: Hagstrom
Dat	a Sta	arted:	10/1	0/18	Date Con	nplete	d: 10/1	10/18	Logged By: MST		Check	ed By: MET
	Drillin	g	-	Samplir	ng & Testing	_			Material Description		1	T
Method	Resistance	Casing	Water		mple or eld Test	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
						-		GW	FILL: Sandy GRAVEL: fine to medium, sub-angular, grey, medium to coarse sand, moist 0.40m [HARDSTAND]	D		FILL 0.00 m: CH4/CO2/O2 (%) -
	Е	АН		SPT 1.50 - 1 5, 5, 9 N=14	.95 m	- - - - - - - - - - - - - - - - - - -		sc	FILL: Clayey SAND: fine to coarse grained, dark grey, with plastic, concrete, tile, timber, paper and cloth, moist [LANDFILL WASTE] 1.70m SAND: fine to coarse grained, brown mottled light brown, trace fine, sub angular gravel, moist [COLLUVIUM]	м	MD	- - - - - - - - - - - - - - - - - - -
						-		-	2.60m SANDSTONE, fine to medium grained, massive, light grey			BEDROCK
	н			SPT 3.00 - 3		-3					VD	3.00 m: 0.3/0.2/20.5
				22/140mm H	IB N=R				3.30m TERMINATED AT 3.30 m Refusal			
						-4 - - - - - - - - - - - - - - - - - -						
HA EX R HA PT SC AH PS AS AE AS AE HFF R R R R R	Ri Ha DN So DN SO	cavato pper and aug ush tub onic dril r hamm ercussio nort spi blid fligl	ger e lling her on sam ral auge nt auge nt auge ght auge ght auge	pler er r: V-Bit r: TC-Bit jer	PENETRATION VE Very Easy (F E Easy F Firm VH Very Hard (F WATER WATER Water i water i	No Resistar Refusal) Level on		S H D P N	P Hand/Pocket Penetrometer D Director CP Dynamic Cone Penetrometer ES En CP Perth Sand Penetrometer U Th CF Moisture Content MOISTURE AT Plate Bearing Test D D IP Borehole Impression Test M M D Photoionisation Detector W W Q Vane Shear, P=Peak, PL Piac	y bist	ample tal sampl be 'undis	le F - Firm
Re abl	fer to ex previation	planatory ns and b	/ notes f asis of d	or details of escriptions			CAF	, DI	NO (NSW/ACT) PTY LTD			

Rig Type: HYDRAPOWER SCOUT Mounting: Truck D Casing Diameter: HQ C Data Started: 10/10/18 Date Completed: 10/10/18 Logged By: MST C Drilling Sampling & Testing Material Description	OREHOLE LOG SHEE				
Position: 751945 6151166 Angle from Horizontal: 90' S Rig Type: HYDRAPOWER SCOUT Mounting: Truck D Casing Diameter: HQ C Data Started: 10/10/18 Date Completed: 10/10/18 Logged By: MST C C Dilling O G G G G G G G G G G G G G G G G G G	Hole No: BH7a				
Rig Type: HYDRAPOWER SCOUT Mounting: Truck D Casing Diameter: HQ C Data Started: 10/10/18 Date Completed: 10/10/18 Logged By: MST C Drilling Sampling & Testing Image: Sampling & Testing Image: South Type: plasticity or particle characteristic, clobul; stepcharaty and minor components Image: South Type: plasticity or particle characteristic, clobul; stepcharaty and minor components Image: South Type: plasticity or particle characteristic, clobul; stepcharaty and minor components Image: South Type: plasticity or particle characteristic, clobul; stepcharaty and minor components Image: South Type: plasticity or particle characteristic, clobul; stepcharaty and minor components Image: South Type: plasticity or particle characteristic, clobul; stepcharaty and minor components Image: South Type: plasticity or particle characteristic, clobul; stepcharaty and minor components Image: South Type: plasticity or particle characteristic, clobul; stepcharaty and minor components Image: South Type: plasticity or particle characteristic, clobul; stepcharaty and minor components Image: South Type: plasticity or particle characteristic, clobul; stepcharaty and minor components Image: South Type: plasticity or particle characteristic, clobul; stepcharaty and minor components Image: South Type: plasticity or particle characteristic, clobul; stepcharaty and minor components Image: South Type: plasticity or particle characteristic, clobul; stepcharaty and minor components LOG F C C South Type: plasticity or particle character	Sheet: 1 of urface Elevation:				
Casing Diameter: HQ C Data Started: 10/10/18 Date Completed: 10/10/18 Logged By: MST C Drilling Sampling & Testing Toge Source Control of the Completed: 10/10/18 Logged By: MST C Drilling Sampling & Testing Sample or Field Test F Q F Q F C F C F C F C F C F C F C F C	riller:				
Data Started: 10/10/18 Date Completed: 10/10/18 Logged By: MST C Dilling Sampling & Testing Material Description outgoing & gring & gring & Testing Sample or Field Test Image:	ontractor: Hagstrom				
Drilling Sampling & Testing Material Description 00 gr	hecked By: MET				
Dot with the second	•				
F Q Gravely SAND: line to coarse grained, dark brown, fine to coarse surrandod gravel, trace of sandstone cobles, sty M Gravely SAND: line to coarse grained, dark brown, fine to coarse surrandod gravel, trace of sandstone cobles, sty M Gravely SAND: line to coarse grained, dark brown, fine to coarse grained, dark brown, fine to coarse surrandod gravel, trace of sandstone cobles, sty M Gravely SAND: line to coarse grained, dark brown, fine to coarse surrandod gravel, trace of sandstone cobles, sty M Gravely SAND: line to coarse grained, dark brown, fine to coarse grained, dark brown	Constructions STRUCTURE & Other Observations G				
F Q M M M M M M M M M M M M M M M M M M	COLLUVIUM				
• • <td></td>					
METHOD PENETRATION FIELD TESTS SAMPLES EX Excavator bucket VE Very Easy (No Resistance) SPT SPT Standard Penetration Test B - Bulk disturbed HA Hand auger Firm Firm DCP Dynamic Cone Penetrometer D D PT Push tube Firm Hard PSP Perth Sand Penetrometer U Thin wall tube SON Sonic drilling VH Very Hard (Refusal) WC Moisture Content MOSTURE	nple S - Soft Il sample F - Firm				
Arr failure WATER Water Level on Date PBT Plate Bearing Test D D Dry AD/V Solid flight auger: V-Bit Water Level on Date MMP Borehole Impression Test M Moist AD/V Solid flight auger: CF-Bit Water Level on Date MP Ponehole Impression Test M Moist MWB Washbore drilling water outflow water outflow VS Vane Shear; P=Peak, W PL Plastic limit RR Rock roller water outflow water outflow R Resedual (uncorrected kPa) w Moisture context	RELATIVE DENSITY VL - Very Loose L - Loose MD - Medium Dense D - Dense				

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<u>(</u>	\square	C	arc	lno°						E	BORE	EHOLE LOG SHEET			
	ent: ject: atior		Goull	burn Mulwar burn Reuse burn Waste M			~				ŀ	lole No: BH7b			
					lanayemer	it Cent	e		Job No: 82018253		Comfee	Sheet: 1 of 1			
				6151163					Angle from Horizontal: 90°			e Elevation:			
-				POWER SC	001				Mounting: Truck		Driller: Contractor: Hagstrom				
			neter: : 10/1		Data Car	malata	J. 10/4	0/4			Checked By: MET				
			: 10/1		Date Cor	npieteo		10/10	Logged By: MST		•				
	Drillin	g	-	Sampling	& Testing	_			Material Descr	iption					
Method	Resistance	Casing	Water		ple or Test	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteris colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	tic, Woisture Condition	Consistency Relative Density	STRUCTURE & Other Observations			
— AD/T —	F	Р Р Н				-		sw	Gravelly SAND: fine to coarse grained, dark b fine to coarse, subrounded gravel, trace of sandstone cobbles, dry	nrown, M		COLLUVIUM			
¥.		•					o. o		0.30m TERMINATED AT 0.30 m						
						- - 0.5 -			Refusal			-			
						- 1.0									
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EX R HA PT SO AH PS AD AD HF	Ri Ha Pu So Ai Sh Sh Sh Sh Sh Sh Sh Sh Sh Sh Sh Sh Sh	ccavato pper and au ush tul onic dr r hamr ercuss nort sp olid flig olid flig ollow fl	be illing ner ion sam iral aug ht auge ht auge ight auge	et v pler V er sr: V-Bit ger	Easy Firm H Hard Wery Hard (WATER Water showr water	No Resistan Refusal) Level on inflow		S H D P N	T Standard Penetration Test B P Hand/Pocket Penetrometer D SP Dynamic Cone Penetrometer U P Peth Sand Penetrometer U C Moisture Content MOK T Plate Bearing Test D P Borehole Impression Test M O Photoionisation Detector W S Vane Shear; P=Peak, L	IPLES - Bulk distur - Disturbed s - Environmei - Thin wall tu STURE - Dry - Moist - Wet - Plastic limit - Liquid limit	sample ntal sampl ube 'undist	e S - Soft turbed' St - Stiff VSt - Stiff H - Hard RELATIVE DENSITY VL - Very Loose L - Loose MD - Medium Dense			
	er to ex	planato	ry notes f	or details of escriptions	water		CAF			- Moisture co	ontent	D - Dense VD - Very Dense			

CARDNO 2.01.6 LIB. GLB Log CARDNO NON-CORED 82018253-2.GPJ <<DrawingFile>> 18/10/2018 14:28 10.0.000 Datgel AGS RTA, Photo, Monitoring Tools

C	\square	C	arc	lno°						В	ORE	HOLE	LOG SH	EET
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				6151155	gement cen	ue		Job No: 82018253	n°		Surface	e Elevation	Sheet: 1	I OT 1
					•			Angle from Horizontal: 9 Mounting: Truck	0		Driller:		1.	
			ieter:	POWER SCOUT				Mounting. Truck				ntractor: Hagstrom		
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			10/1		i				oporintion	Checked By: MET				
	Drillin	y T	-	Sampling & Te	-		-	Material De						
Method	Resistance	Casing	Water	Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle charact colour, secondary and minor compon ROCK TYPE, grain size and type, col fabric & texture, strength, weatherin defects and structure	teristic, ients lour, ng,	Moisture Condition	Consistency Relative Density		TRUCTURE ner Observations	6
— AD/T —	F	HQ H			-		sw	Gravelly SAND: fine to coarse grained, da fine to coarse, subrounded gravel, trace o sandstone cobbles, dry	ark brown, of	м		COLLUVIUM		
						5 · 0 ·		10						
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					- 0.5 - - -			Refusal						
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EX R HA PT SO AH PS AD	Ri Ha Pu N So Air Pe Sh V So	cavato pper and au ush tub onic dri r hamn ercussi nort sp blid flig	oe illing ner ion sam iral aug ht auge	er Ve	TRATION Very Easy (No Resista Easy Firm Hard Very Hard (Refusal) ER Z Water Level o Shown		S H D P N	T Standard Penetration Test F Hand/Pocket Penetrometer Dynamic Cone Penetrometer P Dynamic Cone Penetrometer C Moisture Content T Plate Bearing Test P Borehole Impression Test	SAMPLES B - Bulk d D - Disturl ES - Enviro U - Thin w MOISTURE D - Dry M - Moist W - Wet	bed sa nment	al sample	e V: S e F urbed' S V: H R V	- Soft - Firm t - Stiff St - Very Stif - Hard ELATIVE DENSI L - Very Loo	t f TY
	A Ho B W C Ro er to ex	ollow fi ashbo ock roll planator	light au re drillir ler ry notes f		 water inflow water outflow 	CAF	V	- Vane Shear; P=Peak,	PL - Plastic LL - Liquid w - Moistu	limit	itent	L M D VI	D - Medium - Dense	

CARDNO 2.01.6 LIB.GLB Log CARDNO NON-CORED 82018253-2.GPJ <<DrawingFile>> 18/10/2018 14:28 10.0.000 Datgel AGS RTA, Photo, Monitoring Tools



Construction Sciences Pty Ltd ABN: 74 128 806 735

Address:

Unit 3/180 Gladstone Street, Fyshwick ACT 2609

CALIFORNIA BEARING RATIO REPORT

Client:	Cardno ACT				Report	Number:	455/R/15086-1	
Client Address:	2/14-16 Worm	a l d Street, Symonst	on			Number:	455/P/31	
Project:	Goulburn Tran	•			Lot Nur			
-		Sier Station						
Location:	NSW/ACT				Interna	Test Request:	455/T/10281	
Supplied To:	Miles Thompso	on			Client F	Reference/s:	8201825301	
Area Description:					Report	Date / Page:	16/10/2018	Page 2 of 2
Test Procedures	AS1289.6.1.1,	AS1289.5.1.1, AS1	289.2.1.1					
Sample Number	455/S/64490					Samp	le Location	
Sampling Method				Sample ID			TP101	
Date Sampled	5/10/2018			Depth Ran	ge	m	0.2-0.5m	
Sampled By	Client Sample	d		Sample Ty	ре			
Date Tested	15/10/2018							
Material Source	Not Specified			Material Li	mit Start		-	
Material Type	-			Material Li	mit End		-	
Client Reference	-			Compactiv	e Effort		Standard	
Material Description	Gravelly Silt							
Maximum Dry Density	(t/m³):	1.87			CBR	PENETRATIC	N PLOT	
Optimum Moisture Cor	ntent (%):	12.5	_		05788		9 5 A.M. AVA	
Field Moisture Content	t (%):	7.2	7000 -					
Sample Percent Overs	size (%)	17.0	1					/
Oversize Included / Ex	cluded	-	6000 -					
Target Density Ratio (%):	95						
Target Moisture Ratio	(%):	100	5000				/	
Placement Dry Density	y (t/m³):	1.76						
Placement Dry Density	y Ratio (%):	94.0	⊊ 4000 -					
Placement Moisture C		13.5	N) P			/		
Placement Moisture R		108.0	(N) peor					
Test Condition / Soaki	ng Period:	Soaked / 4 Days	3000			/		
CBR Surcharge (kg)		-	in the second		/			
Dry Density After Soal		-	2000 -		/			
Total Curing Time (hrs	5)	n/a	-	/				
Liquid Limit Method		Estimation	1000 -	/				
Moisture (top 30mm) A		14.6	-					
Moisture (remainder) A	After Soak (%)	14.8	0	Tan management in a species of the second se	arhearlaarha	ninitia internitia interniti	, , , , , , , , , , , , , , , , , , ,	
CBR Swell (%):		-	C 0	0 H 5	ω 5	4 5 6 5 5 5	7.5	12.5
Minimum CBR Specific		-	85			Penetratio		UL CI
CBR Value @ 5.0mm	(%):	15				reneudui	20 (unit)	

Remarks

The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards. Accredited for compliance with ISO/IEC 17025 - Testing

Accreditation Number: Corporate Site Number: 1986 455

K fla

Approved Signatory: Kevin Spicer Form ID: W2ASRep Rev2



Construction Sciences Pty Ltd ABN: 74 128 806 735

Address:

Unit 3/180 Gladstone Street, Fyshwick ACT 2609

CALIFORNIA BEARING RATIO REPORT

Oliont					Dam	a unde De La coma		455/0/45000 4	
Client:	Cardno ACT				-	ort Num		455/R/15086-1	
Client Address:	2/14-16 Worma	a l d Street, Symonst	on		Proje	ect Num	nber:	455/P/31	
Project:	Goulburn Tran	sfer Station			Lot N	lumber			
Location:	NSW/ACT				Inter	nal Tes	t Reques	t: 455/T/10281	
Supplied To:	Miles Thompso	on			Clier	nt Refer	ence/s:	8201825301	
Area Description:					Repo	ort Date	e / Page:	16/10/2018	Page 1 of 2
Test Procedures	AS1289.6.1.1,	AS1289.5.1.1, AS1	289.2.1.1						
Sample Number	455/S/64489						Sam	ple Location	
Sampling Method				Sample I	D			TP103	
	5/10/2018			Depth Ra	nge	I	m	0.3-0.5m	
Sampled By	Client Sampled	t		Sample T	уре				
Date Tested	15/10/2018								
Material Source	Not Specified			Material I	imit Sta	art		-	
Material Type	-			Material I	.imit En	d		-	
Client Reference	-			Compact	ve Effo	rt		Standard	
Material Description	Gravelly SILT								
Maximum Dry Density	(t/m³):	1.94			CB	r pen	ETRATI	ON PLOT	
Optimum Moisture Con	ntent (%):	11.5	1920-2011		0802	SANA (1992)			
Field Moisture Content	(%):	7.1	4500						
Sample Percent Oversi	ize (%)	10.0	4000						/
Oversize Included / Exe	cluded	Excluded	1000						
Target Density Ratio (%	%):	95	3500					/	
Target Moisture Ratio ((%):	100	1						
Placement Dry Density	r (t/m³):	1.88	3000					/	
Placement Dry Density	Ratio (%):	96.5	- area						
Placement Moisture Co	ontent (%):	10.8	(N) 2500				/		
Placement Moisture Ra	atio (%):	94.0	2000			1	/		
Test Condition / Soakin	ng Period:	Soaked / 4 Days				/			
CBR Surcharge (kg)		4.5	1500		1				
Dry Density After Soak	(t/m³):	-			/				
Total Curing Time (hrs))	n/a	1000	/					
Liquid Limit Method		Estimation	500	/					
Moisture (top 30mm) A	fter Soak (%)	12.4	500 -	/					
Moisture (remainder) A	fter Soak (%)	11.0	o 1/						
CBR Swell (%):		-	5	2 1 1	υω nun	44 N	ហ ភ ហ ហ	2	Ki l
Minimum CBR Specific	ation (%):	-	U	ւ տ ե	n 01	G		ίπ.	12.5
CBR Value @ 5.0mm	(%):	10					Penetrat	ion (mm)	

Remarks

The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards. Accredited for compliance with ISO/IEC 17025 - Testing

Accreditation Number: Corporate Site Number: 1986 455

K fla

Approved Signatory: Kevin Spicer Form ID: W2ASRep Rev2



Network Geotechnics ABN: 35 069 211 561

Oak Flats NSW 2529

Laboratory: Wollongong Laboratory Phone: 02 4257 4458 02 4257 4463 Fax: Email: wollongong@constructionsciences.net

POINT LOAD STRENGTH INDEX REPORT

Client:	Cardno (NSW/ACT)	Report Number:	10848/R/5150 - 2	
Client Address:	Level 9 - The Forum, 203 Pacific Highway, St. Leonards	Project Number:	10848/P/3	
Project:	Laboratory Testing	Lot Number:		
Location:	Sydney, NSW	Internal Test Request:	10848/T/3271	
Supplied To:	Cardno (NSW/ACT)	Client Reference/s:	82018253	
Area Description:		Report Date / Page:	16/10/2018	Page 2 of 2
Test Precedures:	AS4133.4.1			

Test Procedures:	AS4133.4.1			
Sample Number	10848/S/14119			
ID / Client ID	-			
Lot Number	-			
Date / Time Tested	15/10/2018			
Material Source	Goulburn WMC			
Material Type	Rock Core			
Sampling Method	-			
Borehole Number	BH1			
Section Tested (m)	6.85-7.0			
Client Sample ID	BH1 6.85-70m			
Manner of Testing	Diametral			
Failure Mode	Double Shear			
Storage History	As received			
Moisture Condition	n/a			
Lithology	n/a			
Weakness Plane (Orientation)	n/a			
Weakness Plane (Nature)	n/a			
Uncorrected Point Load Strength (MPa) - Is	6.3			
Point Load Strength Index (MPa) - Is(50)	6.9			
Specimen Remarks	n/a			

Remarks

Re-Issued Report Replaces Report No 10848/R/5150-1.

The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards. Accredited for compliance with ISO/IEC 17025 - Testing

Accreditation Number: Corporate Site Number:

1318 10848

Approved Signatory: Tim Mathie Form ID: W50Rep Rev 1



Network Geotechnics

Oak Flats NSW 2529

Laboratory: Wollongong Laboratory Phone: 02 4257 4458 02 4257 4463 Fax: Email: wollongong@constructionsciences.net

POINT LOAD STRENGTH INDEX REPORT

Client:	Cardno (NSW/ACT)	Report Number:	10848/R/5150-2	
Client Address:	Level 9 - The Forum, 203 Pacific Highway, St. Leonards	Project Number:	10848/P/3	
Project:	Laboratory Testing	Lot Number:		
Location:	Sydney, NSW	Internal Test Request:	10848/T/3271	
Supplied To:	Cardno (NSW/ACT)	Client Reference/s:	82018253	
Area Description:		Report Date / Page:	16/10/2018	Page 1 of 2

Test Procedures:	AS4133.4.1			
Sample Number	10848/S/14117	10848/S/14117	10848/S/14118	10848/S/14118
ID / Client ID	-	-	-	-
Lot Number	-	-	-	-
Date / Time Tested	15/10/2018	15/10/2018	15/10/2018	15/10/2018
Material Source	Goulburn WMC	Goulburn WMC	Goulburn WMC	Goulburn WMC
Material Type	Rock Core	Rock Core	Rock Core	Rock Core
Sampling Method	-	-	-	-
Borehole Number	BH2	BH2	BH4	BH4
Section Tested (m)	3.9-4.0	3.9-4.0	6.8-7.0	6.8-7.0
Client Sample ID	BH2 3.9-4.0m	BH2 3.9-4.0m	BH4 6.8-7.0m	BH4 6.8-7.0m
Manner of Testing	Diametral	Axial	Diametral	Axial
Failure Mode	Double Shear	Axial Splitting	Axial Splitting	Axial Splitting
Storage History	As received	As received	As received	As received
Moisture Condition	n/a	n/a	n/a	n/a
Lithology	n/a	n/a	n/a	n/a
Weakness Plane (Orientation)	n/a	n/a	n/a	n/a
Weakness Plane (Nature)	n/a	n/a	n/a	n/a
Uncorrected Point Load Strength (MPa) - Is	6.5	6.8	7.7	8.2
Point Load Strength Index (MPa) - Is(50)	7.2	7.1	8.4	8.5
Specimen Remarks	n/a	n/a	n/a	n/a

Remarks

Re-Issued Report Replaces Report No 10848/R/5150-1.

The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards. Accredited for compliance with ISO/IEC 17025 - Testing

Accreditation Number: Corporate Site Number:

1318 10848

Approved Signatory: Tim Mathie Form ID: W50Rep Rev 1



Borehole Location Plan

GOULBURN WASTE TRANSFER, REUSE AND RECYCLE CENTRE

Legend



A Borehole



A Gas Well



FIGURE 2

1:1,436 Scale at A3



Map Produced by Cardno NSW/ACT Pty Ltd (WOL) Date: 2018-10-25 | Project: 82018253-01 Coordinate System: GDA 1994 MGA Zone 55 Map: 8201825301-GS-012-GeologyBoreholes.mxd 00-01 Aerial imagery supplied by nearmap (March 2018)



Important Information about this Geotechnical Report

Scope of Work

The purpose of this report and any associated documentation is expressly stated in the document. This document does not form a complete assessment of the site, and no implicit determinations about Cardno's scope can be taken if not specifically referenced. Whilst this report is intended to reduce geotechnical risk, no level of detail or scope of work can entirely eliminate risk.

The nature of geotechnical data typically precludes auxiliary environmental assessment without undertaking specific methods in the investigation. Therefore, unless it is explicitly stated in the scope of work, this report does not provide any contamination or environmental assessment of the site or adjacent sites, nor can it be inferred or implied from any component of the document.

The scope of work, geotechnical information, and assessments made by Cardno may be summarised in the report; however, all aspects of the document, including associated data and limitations should be reviewed in its entirety.

Standard of care

Cardno have undertaken investigations, performed consulting services, and prepared this report based on the Client's specific requirements, data that was available or was collected, and previous experience.

Cardno's findings and assessment represent its reasonable judgment, diligence, skill, with sound professional standards, within the time and budget constraints of its commission. No warranty, expressed or implied, is made as to the professional advice included in this report.

Data sources

In preparing this document, or providing any consulting services during the commission, Cardno may have relied on information from third parties including, but not limited to; sub-consultants, published data, and the Client including its employees or representatives. This data may not be verified and Cardno assumes no responsibility for the adequacy, incompleteness, inaccuracies, or reliability of this information.

Cardno does not assume any responsibility for assessments made partly, or entirely based on information provided by third parties.

Variability in conditions and limitations of data

Subsurface conditions are complex and can be highly variable; they cannot be accurately defined by discrete investigations. Geotechnical data is based on investigation locations which are explicitly representative of the specific sample or test points. Interpretation of conditions between such points cannot be assumed to represent actual subsurface information and there are unknowns or variations in ground conditions between test locations that cannot be inferred or predicted.

The precision and reliability of interpretive assessment between discrete points is dependent on the uniformity of the subsurface strata, as well as the frequency, detail, and method of sampling or testing.

Subsurface conditions are formed by various natural and anthropogenic processes and therefore are subject to change over time. This is particularly relevant with changes to the site ownership or usage, site boundary or layout, and design or planning modifications. Aspects of the site may also not be able to be determined due to physical or project related constraints and any information provided by Cardno cannot apply following modification to the site, regulations, standards, or the development itself.

It is important to appreciate that no level of detail in investigation, or diligence in assessment, can eliminate uncertainty related to subsurface conditions and thus, geotechnical risk. Cardno cannot and does not provide unqualified warranties nor does it assume any liability for site conditions not observed or accessible during the investigations.



Verification of opinions and recommendations

Geotechnical information, by nature, represents an opinion and is based extensively on judgment of both data and interpretive assessments or observation. This report and its associated documentation are provided explicitly based on Cardno's opinion of the site at the time of inspection, and cannot be extended beyond this.

Any recommendations or design are provided as preliminary until verified on site during project implementation or construction. Inspection and verification on site shall be conducted by a suitably qualified geotechnical consultant or engineer, and where subsurface conditions or interpretations differ from those provided in this document or otherwise anticipated, Cardno must be notified and be provided with an opportunity to review the recommendations.

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APPENDIX

BUSHFIRE ASSESSMENT





Bushfire Assessment

Proposed Additions

Re-Use Goulburn (RUG)

100 Sinclair Street, Goulburn

12 December 2018 (Ref: 18162)

report by david peterson

0455 024 480 david@petersonbushfire.com.au po box 391 terrigal nsw 2260 petersonbushfire.com.au

FPA AUSTRALIA (NO.BPAD18882) BPAD LEVEL 3 ACCREDITED PRACTITIONER ABN 28 607 444 833

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2	Bushfire hazard	7
1	Introduction	3



david peterson 0455 024 480 • david@petersonbushfire.com.au po box 391 terrigal nsw 2260 • petersonbushfire.com.au

1 Introduction

Street address:	100 Sinclair Street		
Suburb:	Goulburn	Postcode:	2555
Lot/DP no:	Lot 265 DP 750050 and Lot 1 DP 1064103		
Council:	Goulburn Mulwaree Council		

1.1 Background

On behalf of their client Goulburn Mulwaree Council, Cardno commissioned Peterson Bushfire to prepare a Bushfire Assessment Report for the proposed additions to the Re-Use Goulburn (RUG) facility at the Goulburn Waste Management Centre.

The subject land and facility are identified as 'bushfire prone land'. This technical report presents the assessment and recommendations to ensure compliance with the relevant bushfire protection legislation for development proposals on bushfire prone land.

This bushfire assessment has been prepared by a consultant accredited by the Fire Protection Association of Australia's BPAD scheme (Accreditation No. BPD-L3-18882).

1.2 Location and land description

As shown in Figure 1, the subject land and Goulburn Waste Management Centre is located at the eastern end of Sinclair Street on the eastern fringes of town. The landfill operations and administrative functions are located within a large cleared area located at the north-western corner of the subject land. The facility is surrounded by woodland and forests predominantly on upslopes to the north, east and south, with some exposure to downslopes to the west.

1.3 Development proposal

The proposed built form that requires a bushfire assessment consists of the following:

- New Resource Recovery Shed to be located at the existing administrative area that will include an office, education centre, and weighbridge facilities; and
- New Re-use Hub to be located near the entrance to the site.

Figure 2 is a site plan showing the location of each proposed building element.

1.4 Assessment requirements

Development proposals on bushfire prone land are required to be assessed against the NSW Rural Fire Service (RFS) document *Planning for Bushfire Protection 2006* (NSWRFS 2006), referred to as 'PBP' within this report. As the proposal does not involve habitable dwellings



(Class 1, 2 or 3) or Special Fire Protection Purpose (SFPP) development, the proposal is only required to comply with the aim and objectives of PBP.

As stated within Section 4.3.6.f of PBP, the National Construction Code (NCC) does not provide for any bushfire specific performance requirements for the development type proposed. As such the Asset Protection Zone and building construction requirements of PBP and Australian Standard *AS 3959-2009 Construction of buildings in bushfire-prone areas* (AS 3959) do not apply as deemed-to-satisfy provisions for bushfire protection. However, the aim and objectives of PBP still apply in relation to other matters such as access and the provision of water for fire-fighting.



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Figure 1: Location of subject land and Gouburn Waste Management Centre



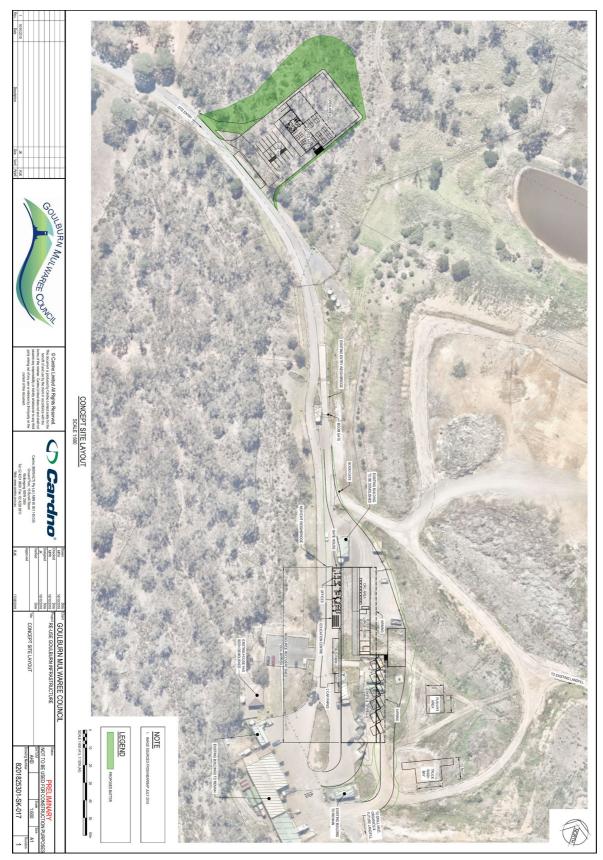


Figure 2: Development site plan



2 Bushfire hazard

In accordance with PBP, the bushfire hazard has been evaluated through an analysis of a combination of vegetation and slope, as discussed below. Vegetation mapping and topography are shown on Figure 3.

2.1 Predominant vegetation

Bushfire fuel is the vegetative material in the landscape that burns during a bushfire. Bushfire behaviour is influenced by fuel load, and the availability of the fuel which is mostly determined by the arrangement of the fuel and its moisture content. Fuel load and availability affects the intensity of a bushfire. The predominant vegetation class is used as a surrogate for expected fuel load and its contribution to fire intensity at the site.

In accordance with PBP the predominant vegetation class has been determined for a distance of at least 140 m out from the proposed development. The vegetation on the lower slopes surrounding the facility is mapped 'Tableland Low Woodland' (DECCW 2009). The open structure of the canopy and lack of midstorey and tall shrubbery validates a 'woodland' classification in accordance with PBP.

The woodland is located to the west of the existing administrative area and the proposed Resource Recovery Shed. The proposed Re-use Hub located near the entrance to the site will have woodland on all sides.

2.2 Effective slope

Steeper slopes can significantly increase the rate of spread of fires, and it has been shown that with each 10 degree increase or decrease in slope a corresponding doubling or halving, respectively, in the rate of spread can be expected (McArthur 1967). Slope is a major factor determining the direction and rate of fire spread.

In accordance with PBP the effective slope underneath the woodland is within the PBP slope class of 'downslope 5-10 degrees' to the west of the proposed Resource Recovery Shed and to the west and north of the proposed Re-use Hub. The moderate downslopes would influence fire spread uphill towards the assets.



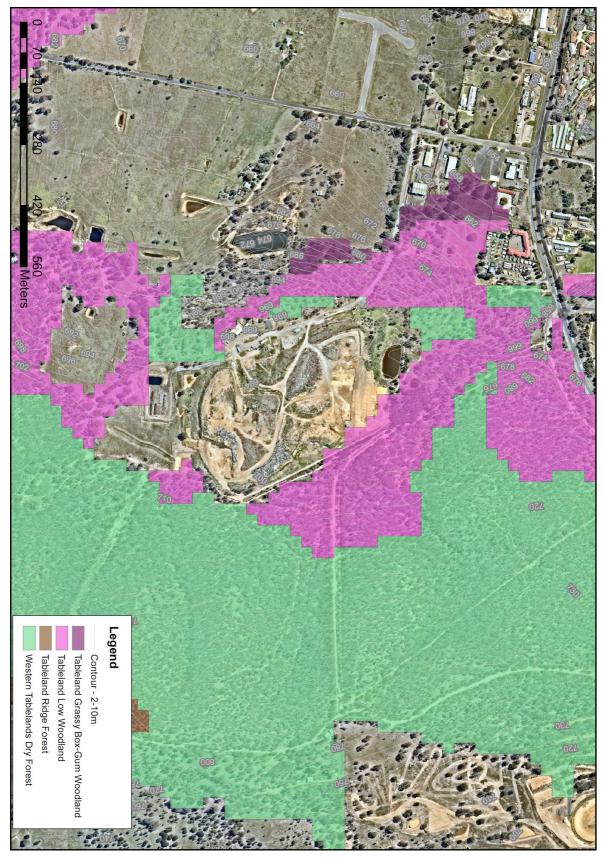


Figure 3: Vegetation mapping and topography



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Bushfire protection measures

PBP requires the assessment of a suite of bushfire protection measures that in total provide an adequate level of protection for development proposals on bushfire prone land. The measures required to be assessed are addressed below.

3.1 Defendable space

For habitable development types such as dwellings, an Asset Protection Zone (APZ) dimension is related to the vulnerability of an asset typically in terms of combustibility of external materials or the nature of the occupants. The resulting APZ would stipulate a construction standard under *AS* 3959-2009 Construction of buildings in bushfire-prone areas (AS 3959).

As the proposal does not include a dwelling or habitable building, PBP does not list an APZ requirement. However, PBP does require the consideration of a managed hazard-separation area for fire-fighting purposes referred to as 'defendable space'. A defendable space is defined by PBP as "an area within the asset protection zone that provides an environment in which a person can undertake property protection after the passage of a bushfire with some level of safety". Therefore, the defendable space dimension is defined by the ability to gain access around an asset and conduct defensive fire-fighting operations. Relying on a defendable space in lieu of an APZ is deemed acceptable whereby construction materials are typically non-combustible and meet building and structural fire requirements under the NCC.

Therefore, the two proposed buildings are to have a defendable space between the building and the hazard identified in Section 2:

- The Resource Recovery Shed, containing the office and education centre, will have an access road around all sides. It will also have a hazard separation distance (i.e. Asset Protection Zone) of at least 20 m to the woodland to the west at its northern end, widening to 60 m at its southern end. The defendable space provided to the Resource Recovery Shed is adequate as it will allow fire-fighters to access all sides of the building in fire appliances, utilising the access roads that have been designed for the maneuverability of large vehicles used in day-to-day operations of the facility. In addition, the existing hazard separation of minimum 20 m to the west complies with the APZ distance specified by PBP for residential development. Although not a requirement for the proposal, the existing APZ distance will provide additional protection for occupants within the office and education centre to a standard commensurate with habitable development.
- The Re-use Hub will have a separation around the building of 6 m to the proposed batter on the sides (north-west and south-east elevations) and 20 m to the rear (north-east elevation into the open area) and 30 m to the front (south-west elevation towards the access road). The defendable space is adequate as it will allow fire-fighters around all sides of the building.



The defendable space is to remain cleared of vegetation so that it satisfies the fuel management performance requirements of an Asset Protection Zone (APZ) as described by PBP. Additional vegetation management is not required.

3.2 Building construction

As introduced in Section 1.4, building construction provisions within AS 3959 do not apply to developments of the type proposed as a deemed-to-satisfy requirement under the NCC. Due to the type of development and compliance with NCC requirements for building and structural fire, it is generally accepted that buildings will survive bushfire attack at all Bushfire Attack Levels (BAL) as specified by AS 3959. In addition, staff will not reside within the proposed buildings and will be familiar with the access routes should an evacuation be necessary.

A BAL assessment provides an understanding of the bushfire attack the building could experience in the 'design' bushfire scenario. If deemed appropriate, a BAL assessment provides a platform on which to develop any further recommendations specific to the bushfire threat, modes of bushfire attack, or vulnerabilities of the proposed building. An aspect of AS 3959 that is not addressed in the structural building fire safety provisions of the NCC for the development type proposed is the protection of the building from bushfire ember attack. The following recommendations are therefore made:

- 1. Weepholes, vents and openable portions of windows (with exception to the service window at the weighbridge) be screened against the entry of embers with steel mesh with maximum aperture of 2 mm;
- 2. Weather strips to external doors (side-hung);
- 3. Nylon brush seals to prevent the entry of embers around roller doors and other vehicle access doors and the like;
- 4. Preventing or sealing gaps at joins of external cladding (walls and roof) to prevent the entry of embers; and
- 5. Roof mounted ventilators be screened against embers with steel mesh with a maximum aperture of 2mm.

3.3 Access

The assessment of access is to consider the adequacy of public road access, property access roads and defendable space.

The site is accessed by Sinclair Street in the north-west corner of the subject land. The public roads accessing the site comply with the public road design and construction standards specified by PBP.

Although it is the only vehicular access into and out of the site, the site access road is deemed adequate in providing the required level of access for fire-response and egress for evacuation as it leads away from the bushfire hazard and threat. It is only 300 m long from the commencement of the bushland hazard at the boundary to the proposed Resource Recovery



Shed. The proposed Re-use Hub will be within 100 m of the site boundary. The length of road traversing the hazard is approximately 100 m. PBP states a threshold of 200 m before requiring an alternate access road (for residential development proposals). The access road is a paved 6 m wide road allowing ample room for passing and turning throughout the facility.

The access roads (existing and proposed) provide adequate perimeter access and defendable space for the proposed development. The layout complies with PBP property access road requirements. Additional access provisions are not required to support the proposed development.

3.4 Water supply and utilities

Water supply

The development will require fire hydrants to be installed to comply with AS 2419.1 – 2005 Fire Hydrant Installations - System Design, Installation and Commissioning (AS 2419) so that all sides of a proposed building are within 70 m of a hydrant by lay of the hose (or 90 m with a tanker parked in-line maximum 20 m from the hydrant).

Electrical supply

Where overhead electrical transmission lines are installed, the vegetation clearance distances are to comply with *ISSC 3 Guideline for Managing Vegetation Near Power Lines* (Industry Safety Steering Committee 2005.

Gas supply

Any gas services are to be installed and maintained in accordance with *AS/NZS* 1596-2008 The storage and handling of *LP* gas.



4 Conclusion and recommendations

4.1 Conclusion

The proposal consists of the proposed additions to the Goulburn Waste Management Centre. The bushfire hazard consists of woodland on moderate downslopes adjacent the facility.

Planning for Bushfire Protection 2006 does not require specific Asset Protection Zone measures or construction standards under *AS 3959-2009 Construction of buildings in bushfire proneareas* for the development type proposed. However, a defendable space between the proposed buildings and the hazard is required. This assessment demonstrates that the proposed buildings will have an adequate defendable space.

The existing and proposed access ways provide adequate defendable space to allow firefighting operations to occur, whilst also providing a platform for rapid operational response and, in the unlikely event, evacuation.

4.2 Recommendations

The recommendations made within this assessment are repeated below:

- 1. To complement the NCC structural fire requirements with protection measures specific to bushfire attack, the following ember protection is recommended to both proposed buildings:
 - a. Weepholes, vents and openable portions of windows (with exception to the service window at the weighbridge) be screened against the entry of embers with steel mesh with maximum aperture of 2 mm;
 - b. Weather strips to external doors (side-hung);
 - c. Nylon brush seals to prevent the entry of embers around roller doors and other vehicle access doors and the like;
 - d. Preventing or sealing gaps at joins of external cladding (walls and roof) to prevent the entry of embers; and
 - e. Roof mounted ventilators be screened against embers with steel mesh with a maximum aperture of 2mm.
- The development will require fire hydrants to be installed to comply with AS 2419.1 2005 Fire Hydrant Installations System Design, Installation and Commissioning (AS 2419) so that all sides of a building envelope are within 70 m of a hydrant by lay of the hose (or 90 m with a tanker parked in-line maximum 20 m from the hydrant).



- 3. Where overhead electrical transmission lines are installed, the vegetation clearance distances are to comply with *ISSC 3 Guideline for Managing Vegetation Near Power Lines* (Industry Safety Steering Committee 2005.
- 4. Any gas services are to be installed and maintained in accordance with *AS/NZS* 1596-2008 The storage and handling of *LP* gas.

4.3 Compliance with Planning for Bushfire Protection 2006

This assessment demonstrates that the proposal, together with the recommendations, complies with *Planning for Bushfire Protection 2006*.

David Peterson





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References

DECCW, (NSW Department of Environment, Climate Change and Water) 2009. *Vegetation Goulburn – 8828*. Native Vegetation Mapping Report Series 4, Native Vegetation Mapping Program, Edition 3, December 2009.

McArthur, A.G. 1967. *Fire behaviour in eucalypt forests*. Australian Forestry and Timber Bureau Leaflet, no. 100.

NSW Rural Fire Service (RFS). 2006. *Planning for Bush Fire Protection: A Guide for Councils, Planners, Fire Authorities, Developers and Home Owners*. Australian Government Publishing Service, Canberra.

Standards Australia. 2005. *Fire hydrant installations - System design, installation and commissioning,* AS2419.1, Fourth edition 2005, Standards Australia International Ltd, Sydney.

Standards Australia. 2008. *The storage and handling of LP Gas*, AS/NZS 1596-2008, Fourth edition 2005, Standards Australia International Ltd, Sydney.

Standards Australia. 2009 (Amendment 3). *Construction of buildings in bushfire-prone areas*, AS 3959, Third edition 2009, Standards Australia International Ltd, Sydney.





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APPENDIX

CROWN LANDS CORRESPONDENCE



Robert Kempton

From:	Teena Riley <teena.riley@goulburn.nsw.gov.au></teena.riley@goulburn.nsw.gov.au>
Sent:	Tuesday, 12 February 2019 9:23 AM
То:	Daniel Thompson; Kaeley Draper; Robert Kempton; RUG
Subject:	FW: RUG Project - Land owners consent (8201825301)

From: Sara Williams [mailto:sara.williams@crownland.nsw.gov.au]
Sent: Monday, 11 February 2019 4:47 PM
To: Ken Wheeldon
Subject: Re: RUG Project - Land owners consent (8201825301)

Hi Ken,

The advice is to note that Council as the applicant is the Crown Land Manager and under s2.23 of the CLMA they can take consent as given for this project.

Kind regards

Sara

Sara Williams | Property Services Officer Crown Lands NSW Department of Industry | Lands and Water Division 26-28 Johnston Street Wagga Wagga | PO Box 2185 | Dangar NSW 2309 T: +61 2 6937 2703 E: sara.williams@crownland.nsw.gov.au W: www.industry.nsw.gov.au

On Mon, 11 Feb 2019 at 12:48, Ken Wheeldon <<u>ken.wheeldon@goulburn.nsw.gov.au</u>> wrote:

Hi Sara

I refer to emails below, the series of correspondence you attached to your this morning and our discussions today.

As mentioned, Council is Reserve Manager of Goulburn Waste Management Centre at 100 Sinclair Street Goulburn (Lot 265 DP 750050) under provisions of the *Crown Land Management Act 2016*.

Firstly, it is my understanding Council's General Manager can sign the Owner's section on the DA form for and on behalf of Council as Council's authorised delegate under s377 of the *Local Government Act 1993* and also on behalf of Council as the appointed Reserve Manager of this Crown Land. Furthermore, it is confirmed this Crown Land/Reserve purpose is for sanitary purposes and that this DA is for that same purpose. Council is therefore not required to seek Land Owners Consent from NSW Department of Industry | Lands and Water Division in this instance.

Secondly, whilst Council has engaged CARDNO to prepare this DA on its behalf, it may be more practical for Council to also sign the DA form as the Applicant rather than introducing a third party (i.e. CARDNO). Please discuss this suggestion further with your Area Manager - Grant Marsden and provide Council with some clarification on this issue A.S.A.P.

Cheers

Ken Wheeldon Business Manager Property & Community Services

P: 02 4823 4484 | F: 02 4823 4456 | M: 0408 978 765 Goulburn Mulwaree Council | Locked Bag 22 Goulburn NSW 2580 W: www.goulburn.nsw.gov.au | <image001.jpg> Find us on Facebook

<image002.jpg>

From: Sara Williams [mailto:sara.williams@crownland.nsw.gov.au]
Sent: Monday, 11 February 2019 8:47 AM
To: Ken Wheeldon
Cc: mandy.franklin@crownland.nsw.gov.au
Subject: Re: RUG Project - Land owners consent (8201825301)

Hi Ken,

Thats me, see correspondence attached. Feel free to call if you have any queries.

Kind regards

Sara

Sara Williams | Property Services Officer Crown Lands NSW Department of Industry | Lands and Water Division

26-28 Johnston Street Wagga Wagga | PO Box 2185 | Dangar NSW 2309 T: +61 2 6937 2703

E: <u>sara.williams@crownland.nsw.gov.au</u>

W: www.industry.nsw.gov.au

On Sat, 9 Feb 2019 at 15:33, Ken Wheeldon <<u>ken.wheeldon@goulburn.nsw.gov.au</u>> wrote:

Hi Mandy & Sarah

See emails below.

Have either of you been speaking with anyone at Cardno?

Will phone you on Monday.

Cheers

Ken

Sent from my iPhone

Begin forwarded message:

From: Teena Riley <<u>teena.riley@goulburn.nsw.gov.au</u>> Date: 8 February 2019 at 4:45:16 PM AEDT To: Ken Wheeldon <<u>ken.wheeldon@goulburn.nsw.gov.au</u>> Cc: Marina Hollands <<u>marina.hollands@goulburn.nsw.gov.au</u>> Subject: FW: RUG Project - Land owners consent (8201825301)

Hi Ken,

Please see an email below from Cardno re advice they have had from Crown lands. Is this something you are comfortable with or have done before? I can chase up something in writing from Crown Lands if required,

Cheers

Teena

Teena Riley Business Manager Waste & Recycling

P: 02 4823 4412 | F: 02 4822 0977 Goulburn Mulwaree Council | Locked Bag 22 Goulburn NSW 2580 W: www.goulburn.nsw.gov.au | <image001.jpg>_Find us on Facebook

<image002.jpg>

From: Robert Kempton [mailto:robert.kempton@cardno.com.au]
Sent: Friday, 8 February 2019 4:37 PM
To: Teena Riley <<u>teena.riley@goulburn.nsw.gov.au</u>>
Cc: Kaeley Draper <<u>kaeley.draper@cardno.com.au</u>>; Wollongong Document Control
<<u>wollongong.doccontrol@cardno.com.au</u>>
Subject: RUG Project - Land owners consent (8201825301)

Hi Teena,

Apologies, just realised that I forgot to pass this on yesterday afternoon. Feedback from Kaeley re: Land Owners consent is as follows:

Kaeley spoke to one of the Property Service Officers at Crown Lands and she advised that Goulburn Mulwaree Council are the Crown Land Manager for the site and have authority to provide owner's consent for the RUG DA. She suggested that we flag this with MC Planning Team when submitting the DA for adequacy review and note that Council's Crown Land manager is to provide consent for the actual DA lodgement.

Would you mind getting in touch with the relevant Crown Lands Manager at GMC to see if they need anything further from us to sign off on Land Owners Consent for this?

PS – we will hopefully have the Aboriginal Heritage report from Pejar on Monday, will send you a copy once it comes in.

Many thanks, Robert

Robert Kempton

SENIOR PROJECT MANAGER CARDNO

<image003.jpg>

Phone +61 2 4231 9600 Direct +61 2 4254 8718 Mobile +61 404 373 681 Address Ground Floor, 16 Burelli Street, Wollongong, New South Wales 2500 Australia

Email <u>robert.kempton@cardno.com.au</u> Web <u>https://clicktime.symantec.com/34XZqHtL32susB6WkGcNyHe7Vc?u=www.cardno.com</u>

CONNECT<image004.png><image005.png><image006.png><image007.png> WITH CARDNO

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The Crown Land Management Act 2016 commenced on 1 July 2018. Click here to find out more.

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Re-Use Goulburn

ENVIRONMENTAL PROTECTION LICENCE



Licence - 6780

Licence Details		
Number:		
Anniversary Date:		

6780 15-April

Licensee

GOULBURN MULWAREE COUNCIL

LOCKED BAG 22

GOULBURN NSW 2580

Premises

GOULBURN WASTE MANAGEMENT CENTRE

100 SINCLAIR STREET

GOULBURN NSW 2580

Scheduled Activity

Composting

Waste disposal (application to land)

Fee Based Activity

Composting

Waste disposal by application to land

Region

South East - Queanbeyan 11 Farrer Place QUEANBEYAN NSW 2620 Phone: (02) 6229 7002 Fax: (02) 6229 7006

PO Box 622 QUEANBEYAN

NSW 2620

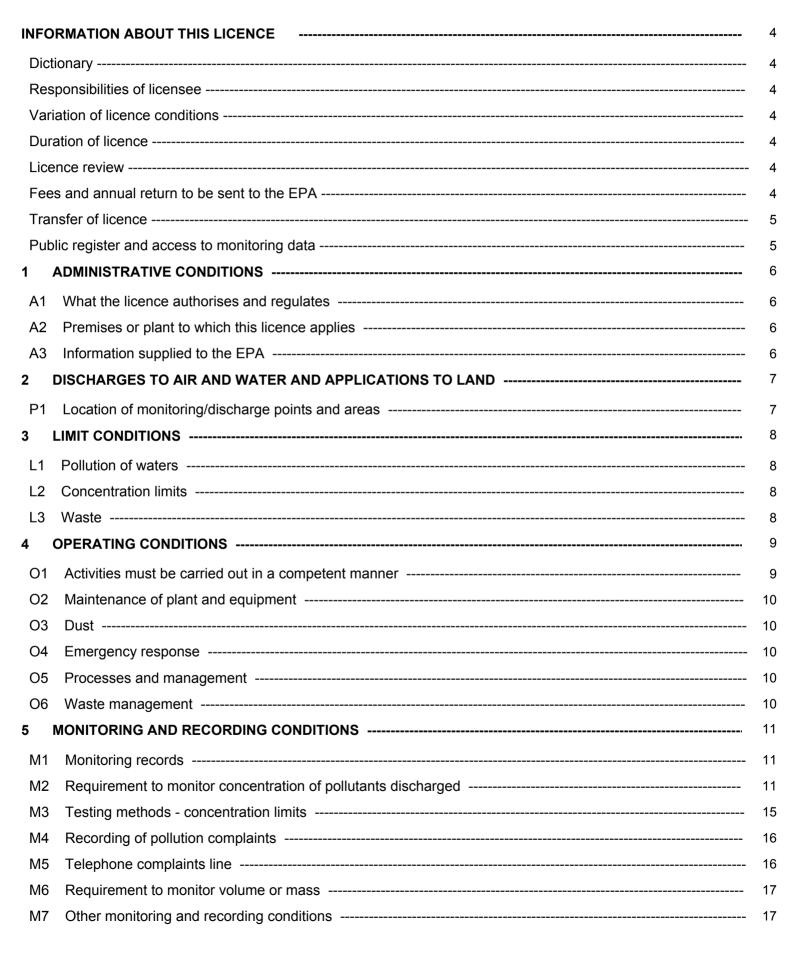


<u>Scale</u>

> 5000-50000 T annual capacity to receive organics Any capacity Section 55 Protection of the Environment Operations Act 1997

Environment Protection Licence

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Information about this licence

Dictionary

A definition of terms used in the licence can be found in the dictionary at the end of this licence.

Responsibilities of licensee

Separate to the requirements of this licence, general obligations of licensees are set out in the Protection of the Environment Operations Act 1997 ("the Act") and the Regulations made under the Act. These include obligations to:

- ensure persons associated with you comply with this licence, as set out in section 64 of the Act;
- control the pollution of waters and the pollution of air (see for example sections 120 132 of the Act);
- report incidents causing or threatening material environmental harm to the environment, as set out in Part 5.7 of the Act.

Variation of licence conditions

The licence holder can apply to vary the conditions of this licence. An application form for this purpose is available from the EPA.

The EPA may also vary the conditions of the licence at any time by written notice without an application being made.

Where a licence has been granted in relation to development which was assessed under the Environmental Planning and Assessment Act 1979 in accordance with the procedures applying to integrated development, the EPA may not impose conditions which are inconsistent with the development consent conditions until the licence is first reviewed under Part 3.6 of the Act.

Duration of licence

This licence will remain in force until the licence is surrendered by the licence holder or until it is suspended or revoked by the EPA or the Minister. A licence may only be surrendered with the written approval of the EPA.

Licence review

The Act requires that the EPA review your licence at least every 5 years after the issue of the licence, as set out in Part 3.6 and Schedule 5 of the Act. You will receive advance notice of the licence review.

Fees and annual return to be sent to the EPA

For each licence fee period you must pay:

- an administrative fee; and
- a load-based fee (if applicable).

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The EPA publication "A Guide to Licensing" contains information about how to calculate your licence fees. The licence requires that an Annual Return, comprising a Statement of Compliance and a summary of any monitoring required by the licence (including the recording of complaints), be submitted to the EPA. The Annual Return must be submitted within 60 days after the end of each reporting period. See condition R1 regarding the Annual Return reporting requirements.

Usually the licence fee period is the same as the reporting period.

Transfer of licence

The licence holder can apply to transfer the licence to another person. An application form for this purpose is available from the EPA.

Public register and access to monitoring data

Part 9.5 of the Act requires the EPA to keep a public register of details and decisions of the EPA in relation to, for example:

- licence applications;
- licence conditions and variations;
- statements of compliance;
- load based licensing information; and
- load reduction agreements.

Under s320 of the Act application can be made to the EPA for access to monitoring data which has been submitted to the EPA by licensees.

This licence is issued to:

GOULBURN MULWAREE COUNCIL

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GOULBURN NSW 2580

subject to the conditions which follow.

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1 Administrative Conditions

A1 What the licence authorises and regulates

A1.1 This licence authorises the carrying out of the scheduled activities listed below at the premises specified in A2. The activities are listed according to their scheduled activity classification, fee-based activity classification and the scale of the operation.

Unless otherwise further restricted by a condition of this licence, the scale at which the activity is carried out must not exceed the maximum scale specified in this condition.

Scheduled Activity	Fee Based Activity	Scale
Composting	Composting	> 5000 - 50000 T annual capacity to receive organics
Waste disposal (application to land)	Waste disposal by application to land	Any capacity

A2 Premises or plant to which this licence applies

A2.1 The licence applies to the following premises:

Premises Details
GOULBURN WASTE MANAGEMENT CENTRE
100 SINCLAIR STREET
GOULBURN
NSW 2580
LOT 100 DP 132937, LOT 30 DP 750050, LOT 31 DP 750050, LOT 32 DP 750050

A3 Information supplied to the EPA

A3.1 Works and activities must be carried out in accordance with the proposal contained in the licence application, except as expressly provided by a condition of this licence.

In this condition the reference to "the licence application" includes a reference to:

a) the applications for any licences (including former pollution control approvals) which this licence replaces under the Protection of the Environment Operations (Savings and Transitional) Regulation 1998; and

b) the licence information form provided by the licensee to the EPA to assist the EPA in connection with the issuing of this licence.

A3.2 The Landfill Environment Management Plan (LEMP), document entitled "Goulburn City Council, Goulburn Waste Depot, Plan of Management, September 1997" is not to be taken as part of the documentation in A4.1, other than those parts specifically referenced in this licence.

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2 Discharges to Air and Water and Applications to Land

P1 Location of monitoring/discharge points and areas

P1.1 The following points referred to in the table below are identified in this licence for the purposes of monitoring and/or the setting of limits for the emission of pollutants to the air from the point.

		Air	
EPA identi-	Type of Monitoring	Type of Discharge	Location Description
fication no.	Point	Point	
13	Landfill Gas Monitoring		Areas where intermediate or final cover
			has been placed
14	Landfill gas Monitoring		Inside all buildings within 250 metres of
			deposited waste

- P1.2 The following utilisation areas referred to in the table below are identified in this licence for the purposes of the monitoring and/or the setting of limits for any application of solids or liquids to the utilisation area.
- P1.3 The following points referred to in the table are identified in this licence for the purposes of the monitoring and/or the setting of limits for discharges of pollutants to water from the point.

Water and lan

EPA Identi- fication no.	Type of Monitoring Point	Type of Discharge Point	Location Description
4	Surface Water Monitoring		In the natural watercourse downstream of the main (western) leachate dam
6	Surface Water Monitoring		Just outside the chain wire fence and to the south of the lesser (southern) leachate dam
7	Ground Water Monitoring		North of the lesser (southern) leachate dam
8	Ground Water Monitroing		Approximately 20 metres inside and midway along the chain link fence running north west from the eastern corner of the site.
9	Ground Water Monitoring		Approximately 30 metres west of the western corner of the main (western) leachate dam
10	Dust Monitoring		Approximately 60 metres south south east of the gatehouse
11	Leachate Quality Monitoring		Main (western) leachate dam
15	Groundwater monitoring		Immediately downstream of the leachate cutoff trench near the main (western) leachate dam.

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3 Limit Conditions

L1 Pollution of waters

L1.1 Except as may be expressly provided in any other condition of this licence, the licensee must comply with section 120 of the Protection of the Environment Operations Act 1997.

L2 Concentration limits

L2.1 There must be no discharge of contaminated stormwater to waters under dry weather conditions or storm event(s) of less than 1:10 year 24 hour duration, average recurrence interval.

Note: A 1:10 year, 24 hour duration rainfall event at the premises equates to a rainfall depth of 98 millimetres over any consecutive 24 hour period.

L2.2 There must be no discharge of leachate to waters under dry weather conditions or storm event(s) of less than 1:25 year 24 hour duration, average recurrence interval.

Note: A 1:25 year, 24 hour duration rainfall event at the premises equates to a rainfall depth of 119 millimetres over any consecutive 24 hour period.

L3 Waste

L3.1 The licensee must not cause, permit or allow any waste to be received at the premises, except the wastes expressly referred to in the column titled "Waste" and meeting the definition, if any, in the column titled "Description" in the table below.

Any waste received at the premises must only be used for the activities referred to in relation to that waste in the column titled "Activity" in the table below.

Any waste received at the premises is subject to those limits or conditions, if any, referred to in relation to that waste contained in the column titled "Other Limits" in the table below.

This condition does not limit any other conditions in this licence.

Code	Waste	Description	Activity	Other Limits
NA	Food waste	As defined in Schedule 1 of the POEO Act, in force from time to time.	Composting	No more than 50,000 tonnes of organics (food waste, garden waste and biosolids combined) received per year for the purpose of composting.
NA	Garden waste	As defined in Schedule 1 of the POEO Act, in force from time to time.	Composting	No more than 50,000 tonnes of organics (food waste, garden

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				waste and biosolids combined) received per year for the purpose of composting.
NA	Biosolids categorised as unrestricted use, or as restricted use 1, 2 or 3, in accordance with the criteria set out in the biosolids guidelines	As defined in Schedule 1 of the POEO Act, in force from time to time.	Composting	No more than 50,000 tonnes of organics (food waste, garden waste and biosolids combined) received per year for the purpose of composting.
NA	General solid waste (non-putrescible)	As defined in Schedule 1 of the POEO Act, in force from time to time.	Waste disposal (application to land)	NA
NA	General solid waste (putrescible)	As defined in Schedule 1 of the POEO Act, in force from time to time.	Waste disposal (application to land)	NA
NA	Asbestos waste	As defined in Schedule 1 of the POEO Act, in force from time to time.	Waste disposal (application to land)	NA
NA	Waste tyres	As defined in Schedule 1 of the POEO Act, in force from time to time.	Waste disposal (application to land)	NA
NA	Waste	Any waste received on site that is below licensing thresholds in Schedule 1 of the POEO Act, as in force from time to time	-	NA

- L3.2 The licensee must not dispose of any tyres on the premises which;
 - a) have a diameter of less than 1.2 metres; and
 - b) are delivered at the premises in a load containing more than 5 whole tyres; and
 - c) became waste in the Sydney Metropolitan Area.

4 Operating Conditions

O1 Activities must be carried out in a competent manner

O1.1 Licensed activities must be carried out in a competent manner. This includes:

a) the processing, handling, movement and storage of materials and substances used to carry out the activity; and

b) the treatment, storage, processing, reprocessing, transport and disposal of waste generated by the activity.

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O2 Maintenance of plant and equipment

O2.1 All plant and equipment installed at the premises or used in connection with the licensed activity:a) must be maintained in a proper and efficient condition; andb) must be operated in a proper and efficient manner.

O3 Dust

O3.1 All operations and activities occurring at the premises must be carried out in a manner that will minimise the emission of dust from the premises.

O4 Emergency response

- O4.1 The licensee must extinguish fires at the premises as soon as possible.
- O4.2 The licensee must have adequate fire protection measures in place, and ensure that facility personnel are able to access fire-fighting equipment and manage fire outbreaks at any part of the premises.

O5 Processes and management

- O5.1 The licensee must take all practicable steps to control entry to the premises.
- O5.2 The licensee must ensure that all gates are locked whenever the landfill is unattended.
- O5.3 The licensee must ensure that adequately trained staff are available at the premises in order to administer the requirements of this licence.

O6 Waste management

- O6.1 The licensee must submit to the EPA within three months prior to the last load of waste being landfilled a closure plan in accordance with Section 76 of the Protection of the Environment Operations Act 1997.
- O6.2 The licensee must have in place and implement procedures to identify and prevent the disposal of any waste not permitted by this licence to be disposed of at the premises.
- O6.3 The total quantity of used, rejected or unwanted tyres (including shredded tyres and tyre pieces) stockpiled at the premises must not exceed 50 tonnes.
- O6.4 The licensee must ensure that stockpiles of used, rejected or unwanted tyres (including shredded tyres and tyre pieces) are located in a clearly defined area.
- O6.5 The licensee must ensure that stockpiles of used, rejected or unwanted tyres (including shredded tyres and tyre pieces) are managed so as not to cause or to be likely to cause the spread of disease by vermin.

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O6.6 The licensee must ensure that measures are taken to prevent stockpiles of used, rejected or unwanted tyres (including shredded tyres and tyre pieces) from catching on fire.

5 Monitoring and Recording Conditions

M1 Monitoring records

- M1.1 The results of any monitoring required to be conducted by this licence or a load calculation protocol must be recorded and retained as set out in this condition.
- M1.2 All records required to be kept by this licence must be:
 - a) in a legible form, or in a form that can readily be reduced to a legible form;
 - b) kept for at least 4 years after the monitoring or event to which they relate took place; and
 - c) produced in a legible form to any authorised officer of the EPA who asks to see them.
- M1.3 The following records must be kept in respect of any samples required to be collected for the purposes of this licence:
 - a) the date(s) on which the sample was taken;
 - b) the time(s) at which the sample was collected;
 - c) the point at which the sample was taken; and
 - d) the name of the person who collected the sample.

M2 Requirement to monitor concentration of pollutants discharged

M2.1 For each monitoring/discharge point or utilisation area specified below (by a point number), the licensee must monitor (by sampling and obtaining results by analysis) the concentration of each pollutant specified in Column 1. The licensee must use the sampling method, units of measure, and sample at the frequency, specified opposite in the other columns:

M2.2 Air Monitoring Requirements

POINT 13,14

Pollutant	Units of measure	Frequency	Sampling Method
Methane	percent by volume	Every 6 months	Special Method 1

Note: Special Method 1 means using a calibrated methane gas detector.

M2.3 Water and/ or Land Monitoring Requirements

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Pollutant	Units of measure	Frequency	Sampling Method
Alkalinity (as calcium carbonate)	milligrams per litre	Quarterly	Grab sample
Ammonia	milligrams per litre	Quarterly	Grab sample
BOD	milligrams per litre	Quarterly	Grab sample
Calcium	milligrams per litre	Quarterly	Grab sample
Chloride	milligrams per litre	Quarterly	Grab sample
Conductivity	siemens	Quarterly	Grab sample
Dissolved Oxygen	milligrams per litre	Quarterly	Grab sample
Filterable iron	milligrams per litre	Quarterly	Grab sample
Fluoride	milligrams per litre	Quarterly	Grab sample
Magnesium	milligrams per litre	Quarterly	Grab sample
Manganese	milligrams per litre	Quarterly	Grab sample
Nitrate	milligrams per litre	Quarterly	Grab sample
рН	рН	Quarterly	Grab sample
Potassium	milligrams per litre	Quarterly	Grab sample
Sodium	milligrams per litre	Quarterly	Grab sample
Sulfate	milligrams per litre	Quarterly	Grab sample
Temperature	degrees Celsius	Quarterly	Grab sample
Total organic carbon	milligrams per litre	Quarterly	Grab sample
Total Phenolics	milligrams per litre	Quarterly	Grab sample
TSS	milligrams per litre	Quarterly	Grab sample

Pollutant	Units of measure	Frequency	Sampling Method
Alkalinity (as calcium carbonate)	milligrams per litre	Quarterly	Grab sample
Ammonia	milligrams per litre	Quarterly	Grab sample
BOD	milligrams per litre	Quarterly	Grab sample
Calcium	milligrams per litre	Quarterly	Grab sample
Chloride	milligrams per litre	Quarterly	Grab sample
Conductivity	siemens	Quarterly	Grab sample
Dissolved Oxygen	milligrams per litre	Quarterly	Grab sample
Filterable iron	milligrams per litre	Quarterly	Grab sample
Fluoride	milligrams per litre	Quarterly	Grab sample
Magnesium	milligrams per litre	Quarterly	Grab sample
Manganese	milligrams per litre	Quarterly	Grab sample
Nitrate	milligrams per litre	Quarterly	Grab sample
рН	pН	Quarterly	Grab sample
Temperature	degrees Celsius	Quarterly	Grab sample
Total organic carbon	milligrams per litre	Quarterly	Grab sample
Total Phenolics	milligrams per litre	Quarterly	Grab sample
TSS	milligrams per litre	Quarterly	Grab sample

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POINT 7

Pollutant	Units of measure	Frequency	Sampling Method
Alkalinity (as calcium carbonate)	milligrams per litre	Quarterly	Grab sample
Ammonia	milligrams per litre	Quarterly	Grab sample
BOD	milligrams per litre	Quarterly	Grab sample
Calcium	milligrams per litre	Quarterly	Grab sample
Chloride	milligrams per litre	Quarterly	Grab sample
Conductivity	siemens	Quarterly	Grab sample
Dissolved Oxygen	milligrams per litre	Quarterly	Grab sample
Filterable iron	milligrams per litre	Quarterly	Grab sample
Fluoride	milligrams per litre	Quarterly	Grab sample
Magnesium	milligrams per litre	Quarterly	Grab sample
Manganese	milligrams per litre	Quarterly	Grab sample
Nitrate	milligrams per litre	Quarterly	Grab sample
рН	рН	Quarterly	Grab sample
Sodium	milligrams per litre	Quarterly	Grab sample
Sulfate	milligrams per litre	Quarterly	Grab sample
Temperature	degrees Celsius	Quarterly	Grab sample
Total organic carbon	milligrams per litre	Quarterly	Grab sample
Total Phenolics	milligrams per litre	Quarterly	Grab sample
TSS	milligrams per litre	Quarterly	Grab sample

Pollutant	Units of measure	Frequency	Sampling Method
Alkalinity (as calcium carbonate)	milligrams per litre	Quarterly	Grab sample
Ammonia	milligrams per litre	Quarterly	Grab sample
BOD	milligrams per litre	Quarterly	Grab sample
Calcium	milligrams per litre	Quarterly	Grab sample
Chloride	milligrams per litre	Quarterly	Grab sample
Conductivity	siemens	Quarterly	Grab sample
Dissolved Oxygen	milligrams per litre	Quarterly	Grab sample
Filterable iron	milligrams per litre	Quarterly	Grab sample
Fluoride	milligrams per litre	Quarterly	Grab sample
Magnesium	milligrams per litre	Quarterly	Grab sample
Manganese	milligrams per litre	Quarterly	Grab sample
Nitrate	milligrams per litre	Quarterly	Grab sample
рН	рН	Quarterly	Grab sample
Potassium	milligrams per litre	Quarterly	Grab sample
Sodium	milligrams per litre	Quarterly	Grab sample
Sulfate	milligrams per litre	Quarterly	Grab sample
Temperature	degrees Celsius	Quarterly	Grab sample
Total organic carbon	milligrams per litre	Quarterly	Grab sample
Total Phenolics	milligrams per litre	Quarterly	Grab sample

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TSS

milligrams per litre

Quarterly

Grab sample

POINT 9

Pollutant	Units of measure	Frequency	Sampling Method
Alkalinity (as calcium carbonate)	milligrams per litre	Quarterly	Grab sample
Ammonia	milligrams per litre	Quarterly	Grab sample
BOD	milligrams per litre	Quarterly	Grab sample
Calcium	milligrams per litre	Quarterly	Grab sample
Chloride	milligrams per litre	Quarterly	Grab sample
Conductivity	siemens	Quarterly	Grab sample
Dissolved Oxygen	milligrams per litre	Quarterly	Grab sample
Filterable iron	milligrams per litre	Quarterly	Grab sample
Fluoride	milligrams per litre	Quarterly	Grab sample
Magnesium	milligrams per litre	Quarterly	Grab sample
Manganese	milligrams per litre	Quarterly	Grab sample
Nitrate	milligrams per litre	Quarterly	Grab sample
рН	рН	Quarterly	Grab sample
Potassium	milligrams per litre	Quarterly	Grab sample
Sodium	milligrams per litre	Quarterly	Grab sample
Sulfate	milligrams per litre	Quarterly	Grab sample
Temperature	degrees Celsius	Quarterly	Grab sample
Total organic carbon	milligrams per litre	Quarterly	Grab sample
Total Phenolics	milligrams per litre	Quarterly	Grab sample
TSS	milligrams per litre	Quarterly	Grab sample

POINT 10

Pollutant	Units of measure	Frequency	Sampling Method
Ash	grams per square metre per month	Monthly	Australian Standard 3580.10.1-1991
Combustible solids	grams per square metre per month	Monthly	Australian Standard 3580.10.1-1991
Insoluble solids	grams per square metre per month	Monthly	Australian Standard 3580.10.1-1991

Pollutant	Units of measure	Frequency	Sampling Method
Alkalinity (as calcium carbonate)	milligrams per litre	Quarterly	Grab sample
Ammonia	milligrams per litre	Quarterly	Grab sample
BOD	milligrams per litre	Quarterly	Grab sample
Calcium	milligrams per litre	Quarterly	Grab sample
Chloride	milligrams per litre	Quarterly	Grab sample
Conductivity	siemens	Quarterly	Grab sample



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Dissolved Oxygen	milligrams per litre	Quarterly	Grab sample
Filterable iron	milligrams per litre	Quarterly	Grab sample
Fluoride	milligrams per litre	Quarterly	Grab sample
Magnesium	milligrams per litre	Quarterly	Grab sample
Manganese	milligrams per litre	Quarterly	Grab sample
Nitrate	milligrams per litre	Quarterly	Grab sample
pH	рН	Quarterly	Grab sample
Potassium	milligrams per litre	Quarterly	Grab sample
Sodium	milligrams per litre	Quarterly	Grab sample
Sulfate	milligrams per litre	Quarterly	Grab sample
Temperature	degrees Celsius	Quarterly	Grab sample
Total organic carbon	milligrams per litre	Quarterly	Grab sample
Total Phenolics	milligrams per litre	Quarterly	Grab sample
TSS	milligrams per litre	Quarterly	Grab sample

POINT 15

Pollutant	Units of measure	Frequency	Sampling Method
Alkalinity (as calcium carbonate)	milligrams per litre	Quarterly	Grab sample
Ammonia	milligrams per litre	Quarterly	Grab sample
BOD	milligrams per litre	Quarterly	Grab sample
Calcium	milligrams per litre	Quarterly	Grab sample
Chloride	milligrams per litre	Quarterly	Grab sample
Conductivity	siemens	Quarterly	Grab sample
Dissolved Oxygen	milligrams per litre	Quarterly	Grab sample
Filterable iron	milligrams per litre	Quarterly	Grab sample
Fluoride	milligrams per litre	Quarterly	Grab sample
Magnesium	milligrams per litre	Quarterly	Grab sample
Manganese	milligrams per litre	Quarterly	Grab sample
Nitrate	milligrams per litre	Quarterly	Grab sample
рН	рН	Quarterly	Grab sample
Potassium	milligrams per litre	Quarterly	Grab sample
Sodium	milligrams per litre	Quarterly	Grab sample
Sulfate	milligrams per litre	Quarterly	Grab sample
Temperature	degrees Celsius	Quarterly	Grab sample
Total organic carbon	milligrams per litre	Quarterly	Grab sample
Total Phenolics	milligrams per litre	Quarterly	Grab sample
TSS	milligrams per litre	Quarterly	Grab sample

M3 Testing methods - concentration limits

M3.1 Monitoring for the concentration of a pollutant emitted to the air required to be conducted by this licence must be done in accordance with:

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a) any methodology which is required by or under the Act to be used for the testing of the concentration of the pollutant; or

b) if no such requirement is imposed by or under the Act, any methodology which a condition of this licence requires to be used for that testing; or

c) if no such requirement is imposed by or under the Act or by a condition of this licence, any methodology approved in writing by the EPA for the purposes of that testing prior to the testing taking place.

- M3.2 Subject to any express provision to the contrary in this licence, monitoring for the concentration of a pollutant discharged to waters or applied to a utilisation area must be done in accordance with the Approved Methods Publication unless another method has been approved by the EPA in writing before any tests are conducted.
- Note: The *Protection of the Environment Operations (Clean Air) Regulation 2010* requires testing for certain purposes to be conducted in accordance with test methods contained in the publication "Approved Methods for the Sampling and Analysis of Air Pollutants in NSW".

M4 Recording of pollution complaints

- M4.1 The licensee must keep a legible record of all complaints made to the licensee or any employee or agent of the licensee in relation to pollution arising from any activity to which this licence applies.
- M4.2 The record must include details of the following:
 - a) the date and time of the complaint;

b) the method by which the complaint was made;

c) any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect;

d) the nature of the complaint;

e) the action taken by the licensee in relation to the complaint, including any follow-up contact with the complainant; and

f) if no action was taken by the licensee, the reasons why no action was taken.

- M4.3 The record of a complaint must be kept for at least 4 years after the complaint was made.
- M4.4 The record must be produced to any authorised officer of the EPA who asks to see them.

M5 Telephone complaints line

- M5.1 The licensee must operate during its operating hours a telephone complaints line for the purpose of receiving any complaints from members of the public in relation to activities conducted at the premises or by the vehicle or mobile plant, unless otherwise specified in the licence.
- M5.2 The licensee must notify the public of the complaints line telephone number and the fact that it is a complaints line so that the impacted community knows how to make a complaint.
- M5.3 The preceding two conditions do not apply until 3 months after: the date of the issue of this licence.

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M6 Requirement to monitor volume or mass

- M6.1 For each discharge point or utilisation area specified below, the licensee must monitor:
 - a) the volume of liquids discharged to water or applied to the area;
 - b) the mass of solids applied to the area;
 - c) the mass of pollutants emitted to the air;
 - at the frequency and using the method and units of measure, specified below.

POINT 11

Frequency	Unit of Measure	Sampling Method
Monthly	cubic metres	Estimate

M7 Other monitoring and recording conditions

M7.1 The licensee must monitor the remaining disposal capacity (in cubic metres) of the landfill.

6 Reporting Conditions

R1 Annual return documents

- R1.1 The licensee must complete and supply to the EPA an Annual Return in the approved form comprising:1. a Statement of Compliance,
 - 2. a Monitoring and Complaints Summary,
 - 3. a Statement of Compliance Licence Conditions,
 - 4. a Statement of Compliance Load based Fee,
 - 5. a Statement of Compliance Requirement to Prepare Pollution Incident Response Management Plan,
 - 6. a Statement of Compliance Requirement to Publish Pollution Monitoring Data,
 - 7. a Statement of Compliance Environmental Management Systems and Practices; and
 - 8. a Statement of Compliance Environmental Improvement Works.

At the end of each reporting period, the EPA will provide to the licensee a copy of the form that must be completed and returned to the EPA.

- R1.2 An Annual Return must be prepared in respect of each reporting period, except as provided below.
- R1.3 Where this licence is transferred from the licensee to a new licensee:

a) the transferring licensee must prepare an Annual Return for the period commencing on the first day of the reporting period and ending on the date the application for the transfer of the licence to the new licensee is granted; and

b) the new licensee must prepare an Annual Return for the period commencing on the date the application for the transfer of the licence is granted and ending on the last day of the reporting period.

R1.4 Where this licence is surrendered by the licensee or revoked by the EPA or Minister, the licensee must prepare an Annual Return in respect of the period commencing on the first day of the reporting period and

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ending on:

a) in relation to the surrender of a licence - the date when notice in writing of approval of the surrender is given; or

b) in relation to the revocation of the licence - the date from which notice revoking the licence operates.

- R1.5 The Annual Return for the reporting period must be supplied to the EPA by registered post not later than 60 days after the end of each reporting period or in the case of a transferring licence not later than 60 days after the date the transfer was granted (the 'due date').
- R1.6 The licensee must retain a copy of the Annual Return supplied to the EPA for a period of at least 4 years after the Annual Return was due to be supplied to the EPA.
- R1.7 Within the Annual Return, the Statements of Compliance must be certified and the Monitoring and Complaints Summary must be signed by:
 - a) the licence holder; or
 - b) by a person approved in writing by the EPA to sign on behalf of the licence holder.
- Note: The term "reporting period" is defined in the dictionary at the end of this licence. Do not complete the Annual Return until after the end of the reporting period.
- Note: An application to transfer a licence must be made in the approved form for this purpose.

R2 Notification of environmental harm

- R2.1 Notifications must be made by telephoning the Environment Line service on 131 555.
- R2.2 The licensee must provide written details of the notification to the EPA within 7 days of the date on which the incident occurred.
- Note: The licensee or its employees must notify all relevant authorities of incidents causing or threatening material harm to the environment immediately after the person becomes aware of the incident in accordance with the requirements of Part 5.7 of the Act.

R3 Written report

R3.1 Where an authorised officer of the EPA suspects on reasonable grounds that:

a) where this licence applies to premises, an event has occurred at the premises; or

b) where this licence applies to vehicles or mobile plant, an event has occurred in connection with the carrying out of the activities authorised by this licence,

and the event has caused, is causing or is likely to cause material harm to the environment (whether the harm occurs on or off premises to which the licence applies), the authorised officer may request a written report of the event.

- R3.2 The licensee must make all reasonable inquiries in relation to the event and supply the report to the EPA within such time as may be specified in the request.
- R3.3 The request may require a report which includes any or all of the following information:a) the cause, time and duration of the event;

Licence - 6780



b) the type, volume and concentration of every pollutant discharged as a result of the event;

c) the name, address and business hours telephone number of employees or agents of the licensee, or a specified class of them, who witnessed the event;

d) the name, address and business hours telephone number of every other person (of whom the licensee is aware) who witnessed the event, unless the licensee has been unable to obtain that information after making reasonable effort;

e) action taken by the licensee in relation to the event, including any follow-up contact with any complainants;

f) details of any measure taken or proposed to be taken to prevent or mitigate against a recurrence of such an event; and

g) any other relevant matters.

R3.4 The EPA may make a written request for further details in relation to any of the above matters if it is not satisfied with the report provided by the licensee. The licensee must provide such further details to the EPA within the time specified in the request.

R4 Other reporting conditions

- R4.1 The licensee must record the following data in relation to fires occurring at the premises:
 - a) Time and date when the fire started.
 - b) Whether the fire was authorised by the licensee, and, if not, the circumstances which ignited the fire.
 - c) The time and date that the fire burnt out or was extinguished.
 - d) The location of fire (eg. clean timber stockpile, putrescible garbage cell, etc).
 - e) Prevailing weather conditions at the time of the fire.
 - f) Observations made in regard to smoke direction and dispersion.
 - g) The amount of waste that was combusted by the fire.
 - h) Action taken to extinguish the fire;
 - i) Action taken to prevent a reoccurrence.

The data must be recorded on each day that the fire is burning.

R4.2 The licensee or its employees or agents must notify the occurrence of all fires on the premises in accordance with conditions R2.1 and R2.2 as soon as practical after becoming aware of the fire.

7 General Conditions

G1 Copy of licence kept at the premises or plant

- G1.1 A copy of this licence must be kept at the premises to which the licence applies.
- G1.2 The licence must be produced to any authorised officer of the EPA who asks to see it.
- G1.3 The licence must be available for inspection by any employee or agent of the licensee working at the premises.

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Dictionary

General Dictionary

3DGM [in relation to a concentration limit]	Means the three day geometric mean, which is calculated by multiplying the results of the analysis of three samples collected on consecutive days and then taking the cubed root of that amount. Where one or more of the samples is zero or below the detection limit for the analysis, then 1 or the detection limit respectively should be used in place of those samples
Act	Means the Protection of the Environment Operations Act 1997
activity	Means a scheduled or non-scheduled activity within the meaning of the Protection of the Environment Operations Act 1997
actual load	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
АМ	Together with a number, means an ambient air monitoring method of that number prescribed by the Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales.
AMG	Australian Map Grid
anniversary date	The anniversary date is the anniversary each year of the date of issue of the licence. In the case of a licence continued in force by the Protection of the Environment Operations Act 1997, the date of issue of the licence is the first anniversary of the date of issue or last renewal of the licence following the commencement of the Act.
annual return	Is defined in R1.1
Approved Methods Publication	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
assessable pollutants	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
BOD	Means biochemical oxygen demand
СЕМ	Together with a number, means a continuous emission monitoring method of that number prescribed by the Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales.
COD	Means chemical oxygen demand
composite sample	Unless otherwise specifically approved in writing by the EPA, a sample consisting of 24 individual samples collected at hourly intervals and each having an equivalent volume.
cond.	Means conductivity
environment	Has the same meaning as in the Protection of the Environment Operations Act 1997
environment protection legislation	Has the same meaning as in the Protection of the Environment Administration Act 1991
EPA	Means Environment Protection Authority of New South Wales.
fee-based activity classification	Means the numbered short descriptions in Schedule 1 of the Protection of the Environment Operations (General) Regulation 2009.
general solid waste (non-putrescible)	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997

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flow weighted composite sample	Means a sample whose composites are sized in proportion to the flow at each composites time of collection.
general solid waste (putrescible)	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environmen t Operations Act 1997
grab sample	Means a single sample taken at a point at a single time
hazardous waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
licensee	Means the licence holder described at the front of this licence
load calculation protocol	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
local authority	Has the same meaning as in the Protection of the Environment Operations Act 1997
material harm	Has the same meaning as in section 147 Protection of the Environment Operations Act 1997
MBAS	Means methylene blue active substances
Minister	Means the Minister administering the Protection of the Environment Operations Act 1997
mobile plant	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
motor vehicle	Has the same meaning as in the Protection of the Environment Operations Act 1997
O&G	Means oil and grease
percentile [in relation to a concentration limit of a sample]	Means that percentage [eg.50%] of the number of samples taken that must meet the concentration limit specified in the licence for that pollutant over a specified period of time. In this licence, the specified period of time is the Reporting Period unless otherwise stated in this licence.
plant	Includes all plant within the meaning of the Protection of the Environment Operations Act 1997 as well as motor vehicles.
pollution of waters [or water pollution]	Has the same meaning as in the Protection of the Environment Operations Act 1997
premises	Means the premises described in condition A2.1
public authority	Has the same meaning as in the Protection of the Environment Operations Act 1997
regional office	Means the relevant EPA office referred to in the Contacting the EPA document accompanying this licence
reporting period	For the purposes of this licence, the reporting period means the period of 12 months after the issue of the licence, and each subsequent period of 12 months. In the case of a licence continued in force by the Protection of the Environment Operations Act 1997, the date of issue of the licence is the first anniversary of the date of issue or last renewal of the licence following the commencement of the Act.
restricted solid waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
scheduled activity	Means an activity listed in Schedule 1 of the Protection of the Environment Operations Act 1997
special waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
тм	Together with a number, means a test method of that number prescribed by the Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales.

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TSP	Means total suspended particles
TSS	Means total suspended solids
Type 1 substance	Means the elements antimony, arsenic, cadmium, lead or mercury or any compound containing one or more of those elements
Type 2 substance	Means the elements beryllium, chromium, cobalt, manganese, nickel, selenium, tin or vanadium or any compound containing one or more of those elements
utilisation area	Means any area shown as a utilisation area on a map submitted with the application for this licence
waste	Has the same meaning as in the Protection of the Environment Operations Act 1997
waste type	Means liquid, restricted solid waste, general solid waste (putrescible), general solid waste (non - putrescible), special waste or hazardous waste

Ms Debbie Maddison

Environment Protection Authority

(By Delegation)

Date of this edition: 01-December-2000

Licence - 6780



End Notes

- 1 Licence varied by notice 1013318, issued on 06-Dec-2001, which came into effect on 31-Dec-2001.
- 2 Licence varied by notice 1015802, issued on 20-Mar-2002, which came into effect on 14-Apr-2002.
- 3 Licence varied by notice 1023400, issued on 31-Jan-2003, which came into effect on 25-Feb-2003.
- 4 Licence varied by notice 1032483, issued on 27-Nov-2003, which came into effect on 22-Dec-2003.
- 5 Licence varied by notice 1035459, issued on 24-Mar-2004, which came into effect on 18-Apr-2004.
- 6 Licence transferred through application 142752, approved on 30-Jun-2004, which came into effect on 11-Feb-2004.
- 7 Licence varied by change to DEC Region allocation, issued on 27-Feb-2006, which came into effect on 27-Feb-2006.
- 8 Licence varied by change to DEC file number, issued on 15-Mar-2007, which came into effect on 15-Mar-2007.
- 9 Condition A1.3 Not applicable varied by notice issued on <issue date> which came into effect on <effective date>
- 10 Licence varied by notice 1098733, issued on 27-Mar-2009, which came into effect on 27-Mar-2009.
- 11 Licence varied by notice 1515466 issued on 09-Jul-2013

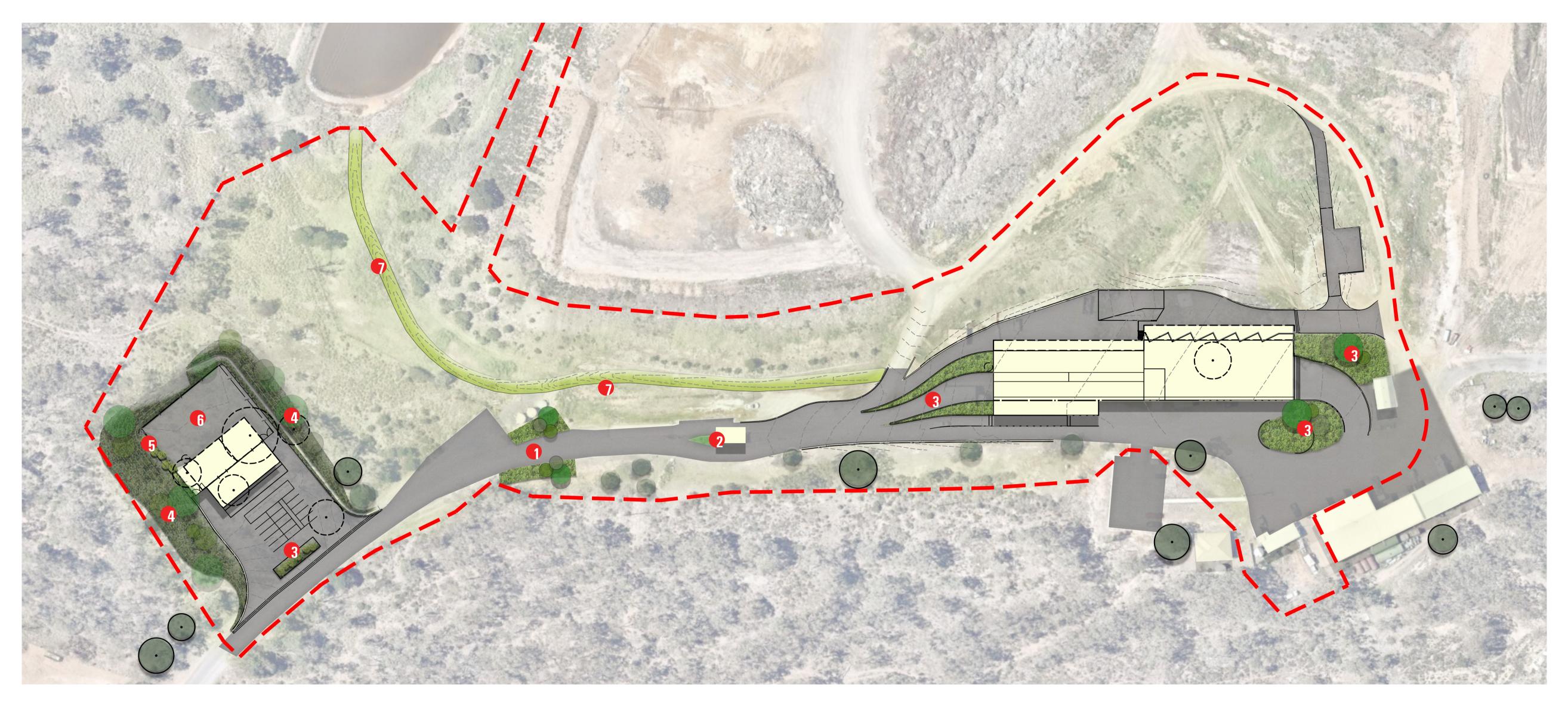
12 Licence varied by notice 1541679 issued on 23-Jun-2016

Re-Use Goulburn



LANDSCAPE PLAN





INDICATIVE PLANT LIST

Symbol	Botanical Name	Common Name	Size	Mature Height
TREES				
	Acacia decurrens Allocasuarina verticellata Brachychiton populneum Eucalyptus blakelyi Melaleuca stypheloides	Black Wattle Drooping She Oak Kurrajong Blakely's Red Gum Prickly Leaved Paperbark	75L 75L 75L 75L 75L	6m 10m 15m 25m 8m
<u>SHRUBS (PLANTII</u>	NG TO EMBANKMENT)			
	Banksia spinulosa Daviesa mimosoides	Hairpin Banksia Pea Flower	150mn 150mn	n 2m
	Hakea microcarpa	Hakea	150mn	
	Leptospermum polygalfolium Rulingia dasyphylla	Tea tree Kerrawang	150mn 150mn	
<u>GRASSES AND G</u>	ROUNDCOVERS (LOW MASS PLANT	ING TO ROADWAYS AND EM	BANKME	ENTS)
1000	Anigozanthus sp.	Bush Pearl	150mn	ו
	Carex appressa	Tall Sedge	150mn	า
	Dianella revoluta	Flax Lily	150mn	า
	Dichondra repens	Kidney Weed	150mn	า
	Festuca glauca	Blue Fescue	150mn	า
	Grevillea gaudichaudi	Grevillea	150mn	
	Lomandra longifolia	Spiny Head Matt Rush	150mn	
	Lomandra tanika	Spiny Head Matt Rush	150mn	
P. Star	Phormium tenax	Flax	150mn	
	Poa labillardieri	Tussock	150mn	
No. 3 Th	Pultanaea pedunculata	Matted Bush Pea	150mn	
111、15、121	Themeda australis	Kangaroo Grass	150mn	า

NOTE: Tree and shrub species have been taken from the Preferred Planting Species in the Goulburn Mulwaree Local Government Area as listed in the Goulburn Mulwaree Development Control Plan (2009).



STATEMENT ENTRY PLANTING

landscape architecture urban design environmental management

PRECEDENT PLANTING IMAGES

C Cardno[®]

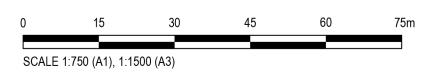


EMBANKMENT NATIVE MASS PLANTING





LOW MASS PLANTING



DATE 21.08.19

LEGEND

	PROPOSED WORKS BOUNDARY
	PROPOSED CONTOURS
	HARDSTAND
$\overline{\mathbf{\cdot}}$	EXISTING TREE TO BE RETAINED
\bigcirc	EXISTING TREE TO BE REMOVED
	PROPOSED TREES
	NATIVE MASS PLANTING
	LOW MASS PLANTING
	PROPOSED BUND
	TURF
A.S.	EXISTING GROUND CONDITION

PLANTING AREAS

STATEMENT ENTRY PLANTING	235m²
LOW MASS PLANTING	1090m²
BIO FILTRATION GARDEN	50m²
EXISTING GARDEN (TO BE RETAINED)	20m²

DESIGN NOTES

- STATEMENT FEATURE PLANTING TO SIGNIFY ENTRY INTO THE SITE.
- 2 EXISTING GARDEN TO BE RETAINED.
- LOW MASS PLANTING AND SINGLE STEM FEATURE TREES TO ENSURE SIGHT LINES ARE RETAINED FOR VEHICLES AND PEDESTRIANS.



- NATIVE MASS PLANTING ON 1:3 EARTHWORKS BATTER TO ASSIST WITH BANK STABILISATION AS WELL AS IMPROVING THE VISUAL AMENITY OF THE SITE.
- BIO FILTRATION GARDEN. G



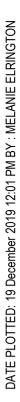
() TURF BUND TO DIRECT WATER.

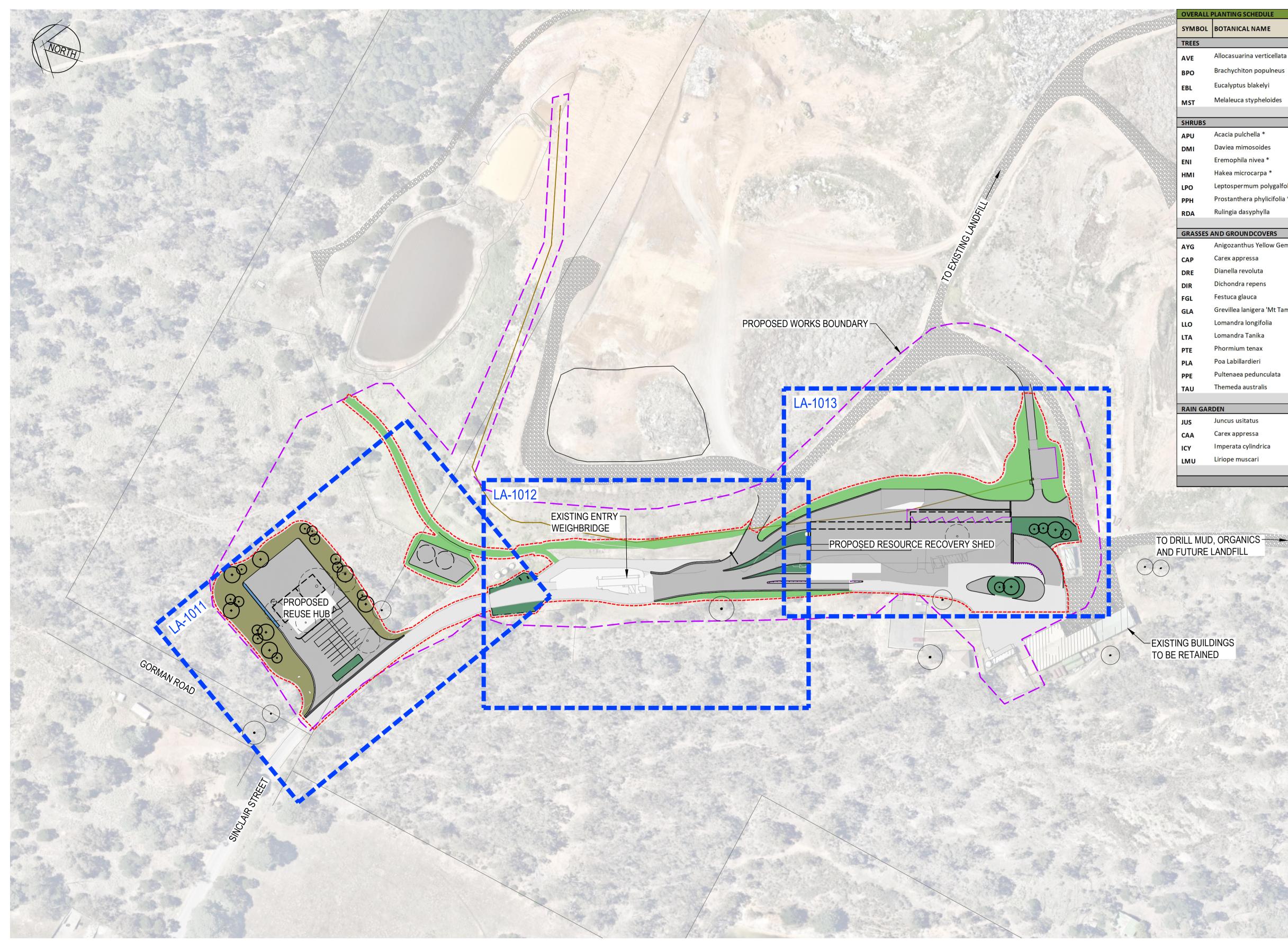
BIO FILTRATION GARDEN

LANDSCAPE CONCEPT PLAN

GOULBURN MULWAREE COUNCIL RE-USE GOULBURN INFRASTRUCTURE

PROJECT NO 82018253-01 DRAWING NO L5000





4	19/12/2019	ISSUED FOR CONSTRUCTION	ME	AG	RJK
3	13/11/2019	ISSUED FOR 80% DETAILED DESIGN REVIEW	ME	MW	MW
2	18/10/2019	ISSUED FOR 80% DETAILED DESIGN REVIEW	ME	MW	MW
1	27/09/2019	ISSUED FOR 80% DETAILED DESIGN REVIEW	ME	MW	MW
Rev.	Date	Description	Des.	Verif.	Appd.





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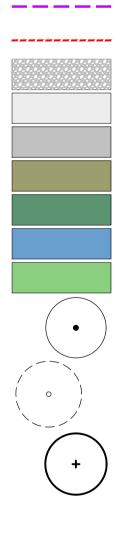
Ν	1E 7/02/2019	Client	GOULBURN MULWAREE COUNCIL			
	ecked Date IW 26/09/2019	Projec	^{CT} GOULBURN WASTE MANAGEMENT CENTRE	Status	R APPROVAL	
	signed Date IE 7/02/2019		RE-USE GOULBURN INFRASTRUCTURE		OR CONSTRUCTION F	URPOSES
	rified Date		RUG PROJECT	DATUM	Scale Siz	-
	IW 26/09/2019	Title	RUG SITE	AHD	1:1000	A1
	proved		LANDSCAPE KEY PLAN AND OVERALL PLANT SCHEDULE	Drawing Number 8201825301	-DRG-LA-1001	Revision 4
Ν	IW 26/09/2019		RET FLAN AND OVERALL FLANT SCHEDULE		2::0 =: (1001	

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		MATURE	MATURE	SPACING	SIZE	QUANTITY
SOTANICAL NAME	COMMON NAME	HEIGHT	WIDTH (m)	(m)	SIZE	QUANTIT
llocasuarina verticellata	Dreening She Oak	10	5	Ac nor plan	75L	7
	Drooping She Oak	10		As per plan		
rachychiton populneus	Kurrajong	15	10	As per plan	75L	5
ucalyptus blakelyi	Blakely's Red Gum	25	5	As per plan	75L	7
Aelaleuca stypheloides	Prickly Leaf Papaerbark	10	8	As per plan	75L	5
				TOTAL TREES		24
·		1.2	1.2	1/ 2	150	160
cacia pulchella *	Wattle	1.2	1.2	1/m2	150mm	168
)aviea mimosoides	Pea Flower	2	1.5	1/m2	150mm	106
remophila nivea *	Emu Bush	0.5	1	1/m2	150mm	106
lakea microcarpa *	Hakea	1	1	1/m2	150mm	106
eptospermum polygalfolium *	Tea Tree	2	2	1/m2	150mm	148
rostanthera phylicifolia *	Mint Bush	1	1	1/m2	150mm	106
tulingia dasyphylla	Kerrawang	1	1.5	1/m2	150mm	126
ND GROUNDCOVERS			10	TAL SHRUBS		866
nigozanthus Yellow Gem *	Kangaroo Paw	0.4	0.4	2/m2	150mm	349
čarex appressa	Tall Sedge	1	1	2/m2	150mm	212
)ianella revoluta	Flax Lily	0.5	0.5	4/m2	150mm	754
)ichondra repens	Kidney Weed	0.3	1	4/m2	150mm	472
estuca glauca	Blue Fescue	0.5	0.5	4/m2	150mm	660
Grevillea lanigera 'Mt Tamboritha' *	Grevillea	0.3	1	1/m2	150mm	261
omandra longifolia	Spiny Head Mat Rush	1	1	1/m2	150mm	164
omandra Tanika	Spiny Head Mat Rush	0.5	0.5	4/m2	150mm	1030
hormium tenax	Flax Lily	2	1.5	1/m2	150mm	205
oa Labillardieri	Tussock Grass	1	1	1/m2	150mm	140
ultenaea pedunculata	Matter Bush Pea	0.4	1	1/m2	150mm	141
hemeda australis	Kangaroo Grass	0.5	0.7	4/m2	150mm	560
	тот	TAL GRASS	ES AND GRO	UNDCOVERS		4948
EN						
uncus usitatus	Common Rush	0.5	0.5	3/m2	150mm	30
arex appressa	Tall Sedge	1	1	2/m2	150mm	30
mperata cylindrica	Blady Grass	0.5	0.5	3/m2	150mm	30
iriope muscari	Lily Turf	0.2	0.4	3/m2	150mm	30
		TOTAL RAIN GARDEN PLANTS				120

* PLANTS SPECIES HAVE BEEN RECORDED AS POTENTIAL DETERRENT OF KANGAROOS. THIS WILL NOT COMPLETELY DETER KANGAROOS BUT MAY ASSIST WITH THE ESTABLISHMENT OF PLANTS.

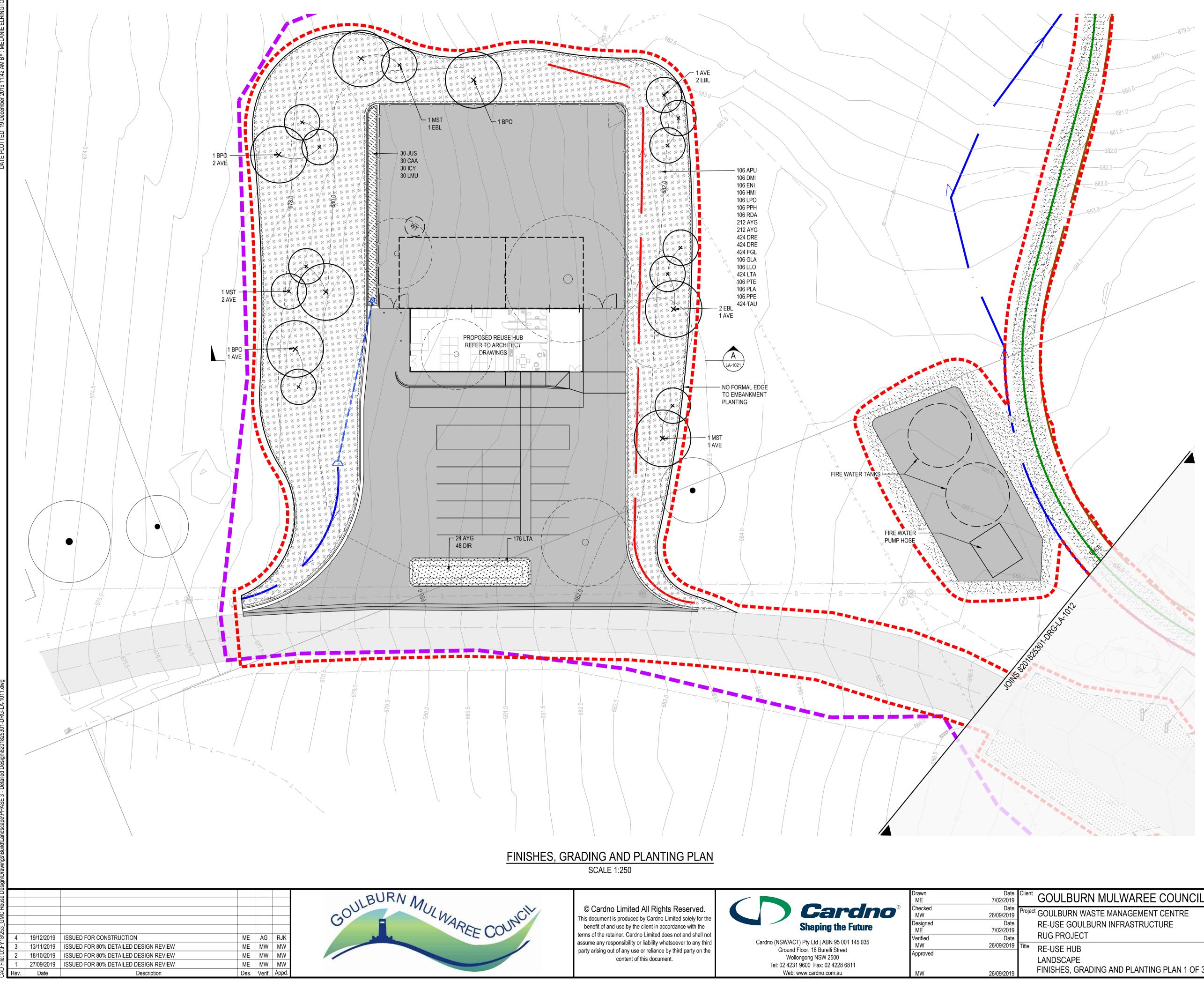
KEY PLAN LEGEND



PROPOSED WORKS BOUNDARY EXTENT OF LANDSCAPE WORKS EXISTING DIRT TRACK TO BE RETAINED EXISTING PAVEMENT TO BE RETAINED PROPOSED PAVEMENT TO ENGINEERS DETAILS EMBANKMENT PLANTING (1912m2) MASS PLANTING (985m2) RAIN GARDEN (38m2) HYDROMULCH (2939m2) EXISTING TREE TO BE RETAINED EXISTING TREE TO BE REMOVED PROPOSED TREE 100m 80

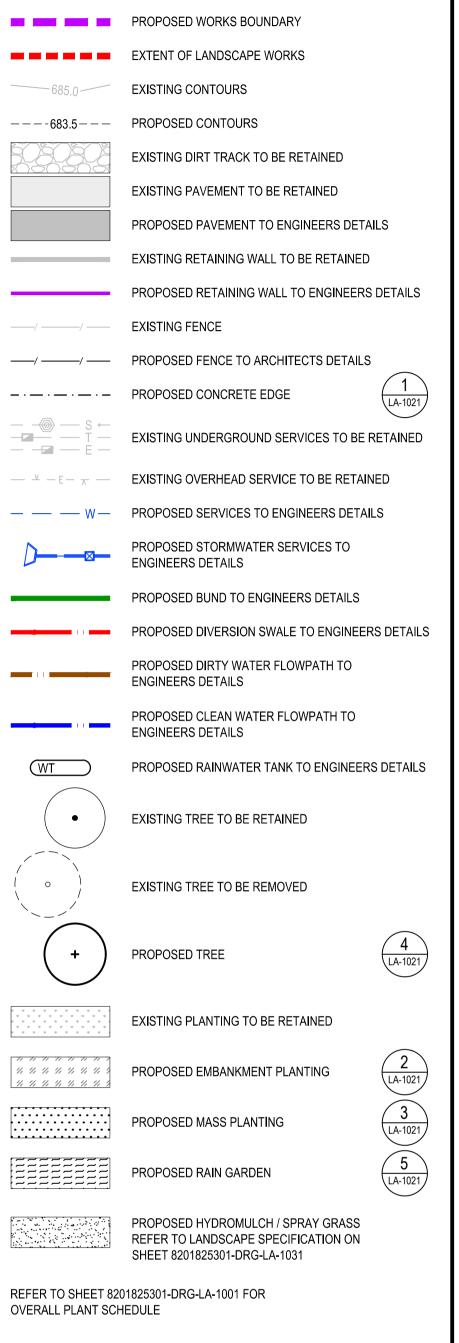
SCALE 1:1000 (A1), 1:2000 (A3)





Drawn ME	7/02/2019	Client GOULBURN
Checked MW	Date 26/09/2019	Project GOULBURN WAST
Designed ME	Date 7/02/2019	RE-USE GOULBUF
Verified MW	Date 26/09/2019	RUG PROJECT
Approved		Title RE-USE HUB LANDSCAPE FINISHES, GRADIN
MW	26/09/2019	

<u>LEGEND</u>





SCALE 1:250 (A1), 1:500 (A3)

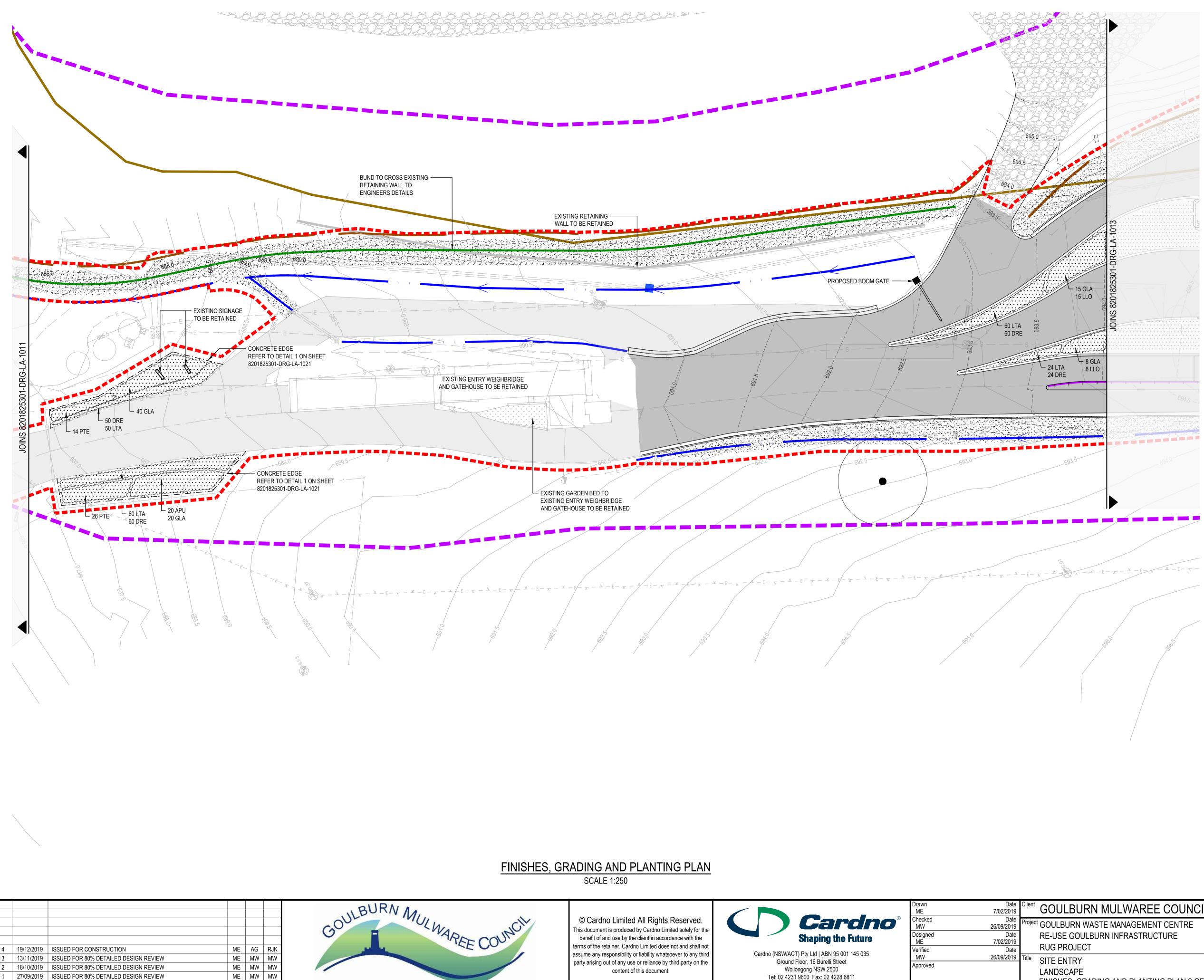
Status Status FOR APPROVAL NOT TO BE USED FOR CONSTRUCTION PURPOSES DATUM Scale 1:250 AHD A1 Drawing Number Revision 8201825301-DRG-LA-1011 4 ING AND PLANTING PLAN 1 OF 3



Date

Description

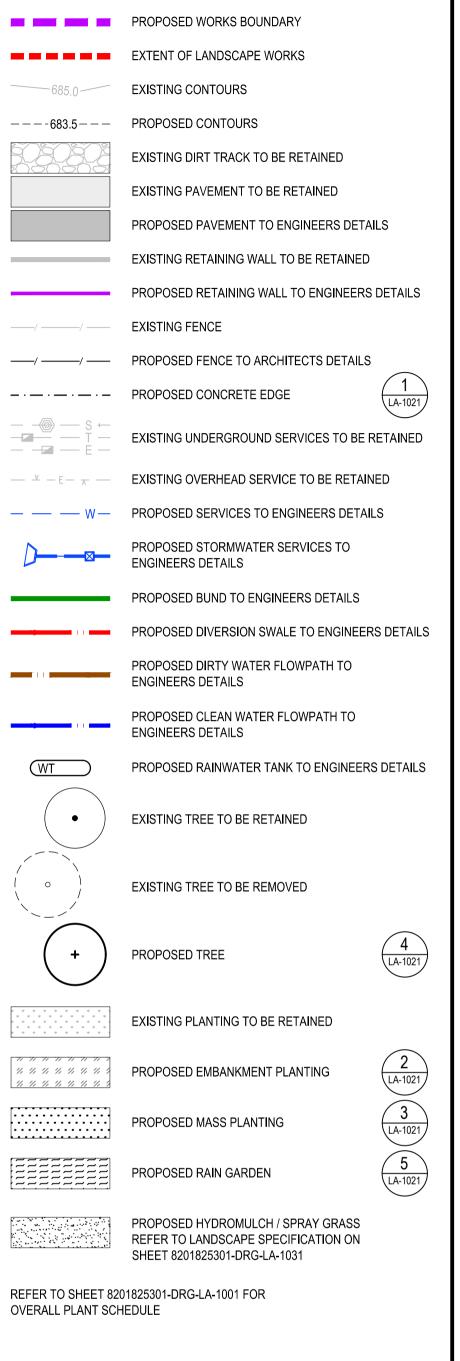
Des. Verif. Appd.



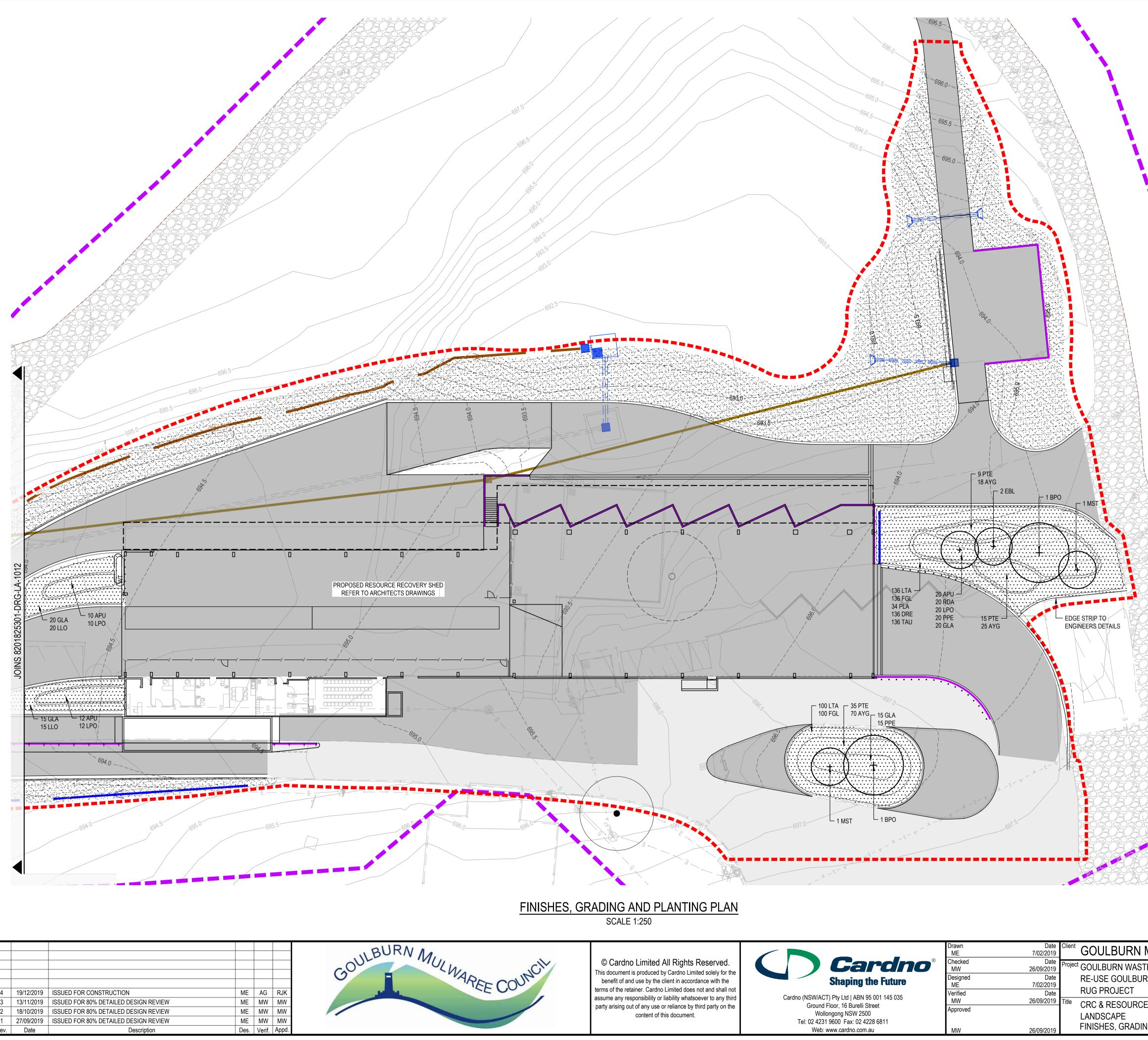
Tel: 02 4231 9600 Fax: 02 4228 6811 Web: www.cardno.com.au

Approved	26/09/2019	LANDSCAPE FINISHES, GRADING AND PLANTING PLAN 2 OF 3	Drawing Number	-DRG-LA-1012	Revision 4
Verified MW	Date 26/09/2019 T		DATUM AHD	Scale Siz	ze A1
Checked MW Designed ME	Date 26/09/2019 Date 7/02/2019	Project GOULBURN WASTE MANAGEMENT CENTRE RE-USE GOULBURN INFRASTRUCTURE	NOT TO BE USED F	R APPROVAL	PURPOSES
Drawn ME	Date C 7/02/2019	Client GOULBURN MULWAREE COUNCIL			

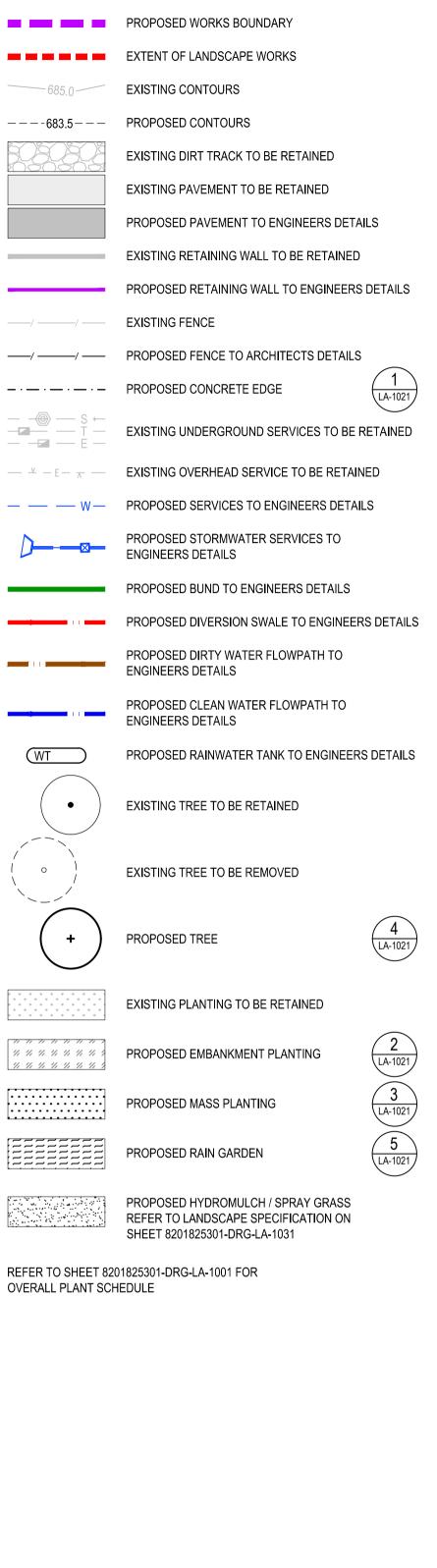
<u>LEGEND</u>



SCALE 1:250 (A1), 1:500 (A3)

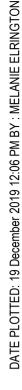


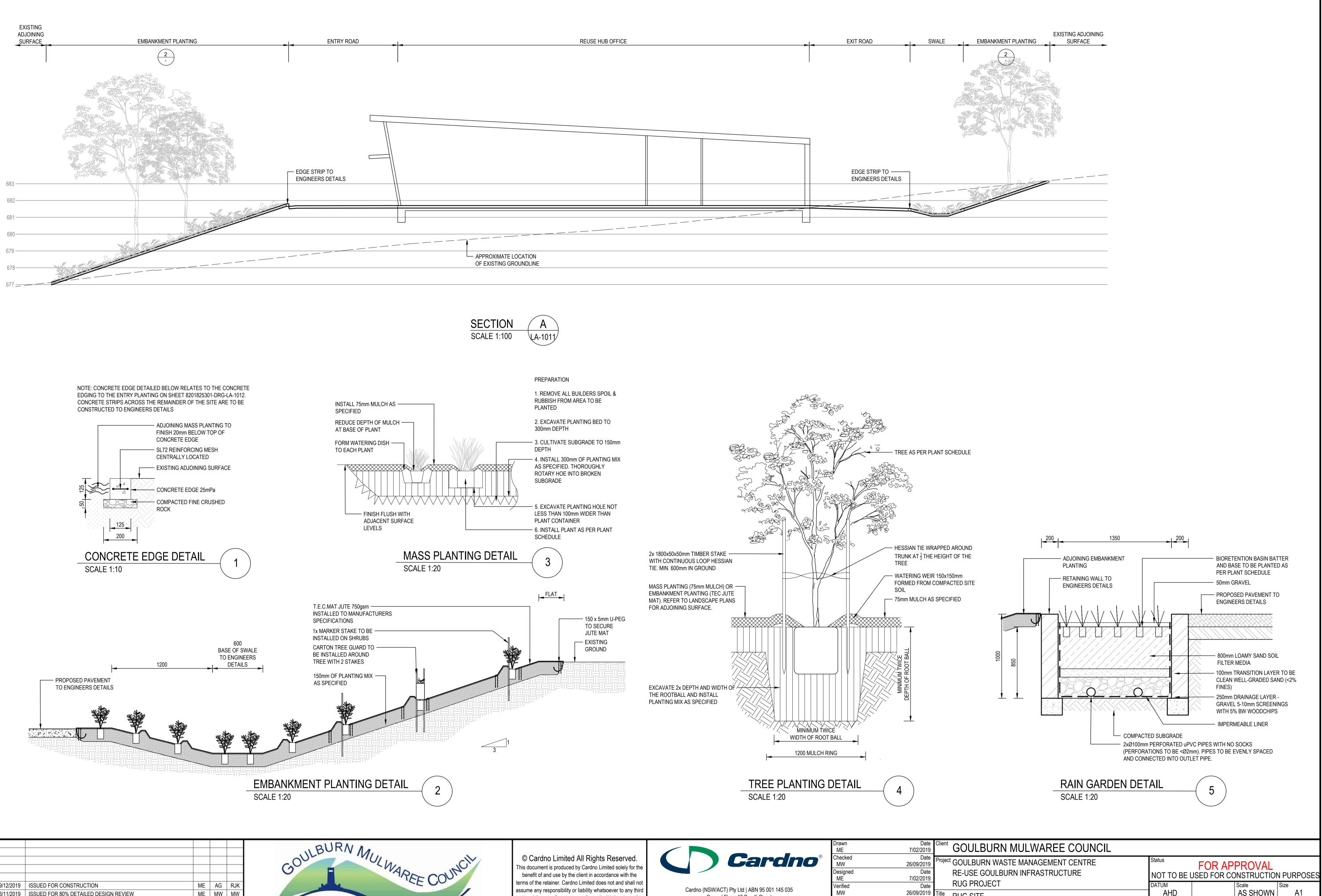
<u>LEGEND</u>

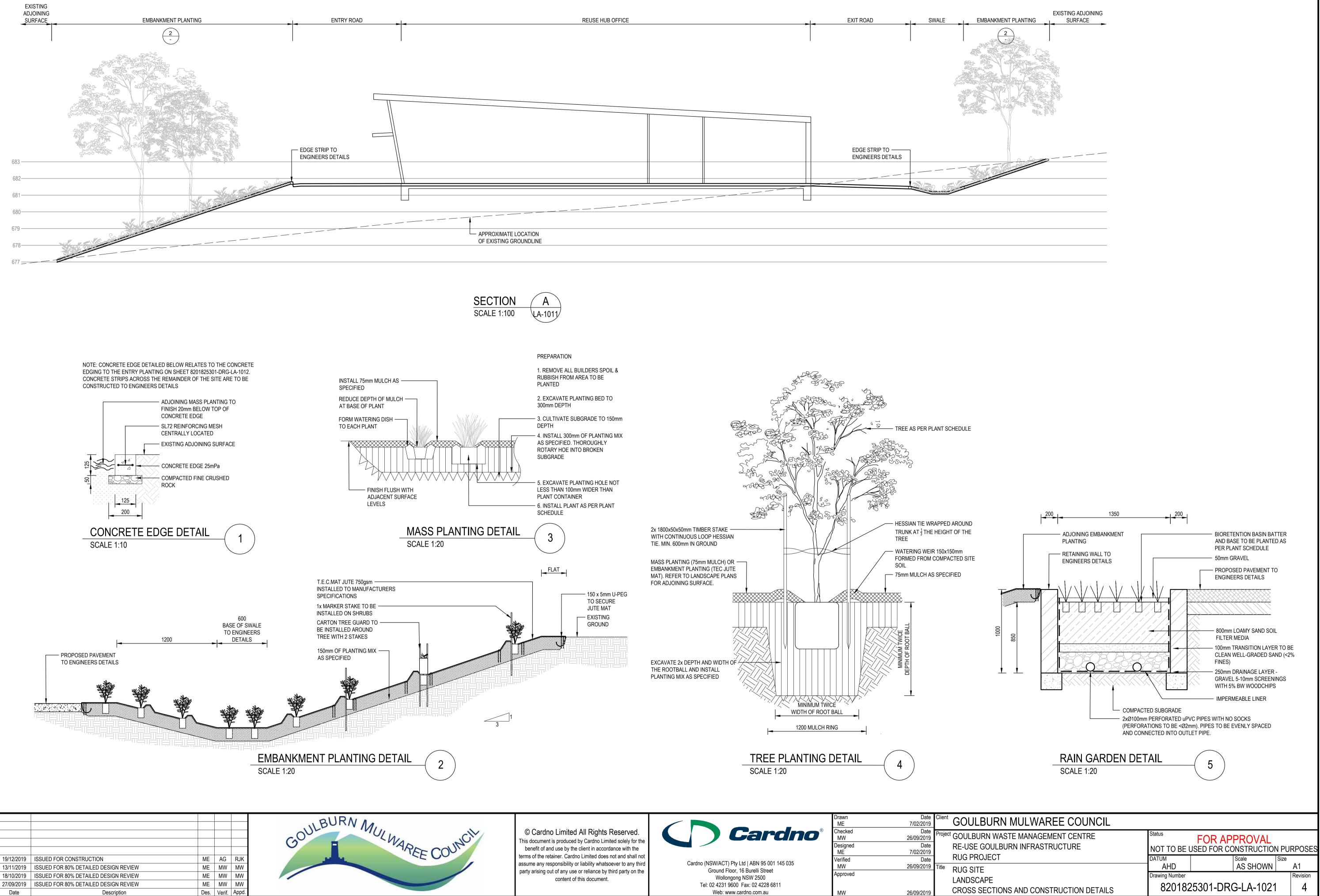


SCALE 1:250 (A1), 1:500 (A3)

N MULWAREE COUNCIL					
STE MANAGEMENT CENTRE URN INFRASTRUCTURE	Status NOT TO BE l		PROVAL	N PUI	RPOSES
	DATUM AHD		Scale 1:250	Size	A1
CE RECOVERY SHED	Drawing Number		1.200		Revision
DING AND PLANTING PLAN 3 OF 3	820182	25301-DR	G-LA-1013	3	4







Web: www.cardno.com.au

Drawn ME	Date 7/02/2019	Client	GOULBURN
Checked	Date	Project	GOULBURN WAST
MW	26/09/2019	,	GOULDURIN WAS I
Designed	Date		RE-USE GOULBUF
ME	7/02/2019		
Verified	Date		RUG PROJECT
MW	26/09/2019	Title	RUG SITE
Approved			NUG SITE
			LANDSCAPE
MW	26/09/2019		CROSS SECTIONS

		АПО
INS AND CONSTRUCTION DETAILS 82018		Drawing Number
	INS AND CONSTRUCTION DETAILS	820182

SPECIFICATION NOTES

1.0 SERVICES

Before landscape work is commenced. The Landscape Contractor is to establish the position of all servicelines and ensure tree planting is to be carried out at least 3 metres away from these services. Service lids, vents and hydrants shall be left exposed and not covered by any landscape finishes (turfing, paving, garden beds etc.) Finish adjoining surfaces flush with pit lids.

Dial Before You Dig - It is the landscape contractor's full responsibility to complete a full services search and take all required measures to ensure protection of these services including potholing to confirm locations. The client in no way will be held responsible for any damage caused to services as a result of the contract works. The contractor must obtain an Australand 'Permit to Dig' prior to excavation works of any kind occurring on the site.

Excavation

Do not excavate by machine within 1m of existing underground services.

2.0 SOILS AND CONDITIONER PLANTING MIXTURE

Shall be PREMIUM GARDEN MIX. Available from Australian Native Landscapes, Ph 13 14 58, or an approved equivalent.

IMPORTED SOIL MATERIAL AND PLANTING MIX

Provide product data sheets compliance to standard and validation certificates to the Superintendent from the manufacturer or supplier as to the physical, chemical and weed free status of each of the materials provided. Imported Garden Mixes shall be used for all planting works unless otherwise specified

TOPDRESS MATERIAL

Topdress material shall be as specified in AS 4419 - 1999. Topdress material shall be clean washed river sand, free from any clay lumps, clods, weeds, tree roots, sticks, organic matter, rubbish and material toxic to plant growth and the like, and shall have a neutral pH and minimal salt content (measured oven dry of 0.1%).

3.0 MULCH

Application: Place mulch to the required depth, (refer to drawings clear of plant stems, and rake to an even surface finishing 25mm below adjoining levels. Ensure mulch is watered in and tamped down during installation. Mulch Type: Shall be FOREST BLEND. Available from Australian Native Landscapes, Ph 13 14 58, or an approved equivalent.

4.0 PLANTS

SUPPLY

The Landscape Contractor is responsible for organising the supply and delivery of plant stock to site and checking plant stock prior to accepting delivery on site to ensure the plants possess the following characteristics: • Large healthy root systems, with no evidence of root curl, restriction or damage.

- Vigorous, well established, free from disease and pests, of good form consistent with the species or variety.
- Hardened off, not soft or forced, and suitable for planting in the natural climatic conditions prevailing at the site.
- Trees must, unless required to be multi-stemmed, have a single leading shoot. • Any plants or trees that are accepted by the landscape contractor that do not meet this specification will be
- replaced at the contractor's expense. Replacement: Replace damaged or failed plants with plants of the same type and size.

PLANTING

Do not plant in unsuitable weather conditions such as extremes of heat or cold, wind or rain. Before planting begins, complete cultivation, soil placement, fertilisation etc as previously specified.

Before plants are installed all pot sizes shall have their roots pruned with an appropriate, clean, sharp instrument to eliminate any root confusion occurring at edge of pot zone.

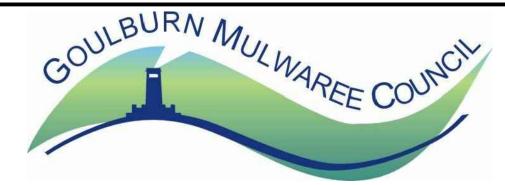
Before planting begins, thoroughly water the plants and the planting area. Keep the area and plants moist during planting. Water the plants immediately after planting, and thereafter as required to maintain growth rates free of stress.

The contractor shall give notice, of not less than 24 hours, for inspections as nominated in inspect and hold point schedule

ROOT PRUNING

Remove tree from container and root prune one inch on sides and bottom to ensure all circling roots have been either severed or aligned radially into the surrounding soil. Plant as per detail.

4	19/12/2019	ISSUED FOR CONSTRUCTION	ME	AG	RJK
3	13/11/2019	ISSUED FOR 80% DETAILED DESIGN REVIEW	ME	MW	MW
2	18/10/2019	ISSUED FOR 80% DETAILED DESIGN REVIEW	ME	MW	MW
1	27/09/2019	ISSUED FOR 80% DETAILED DESIGN REVIEW	ME	MW	MW
Rev.	Date	Description	Des.	Verif.	Appd.



5.0 FERTILISER MASS PLANTING AREAS Type: Nutricote Standard Black 270 Day (16: 4.4: 8.3) Installation: Evenly distribute 5g per litre (rootball size) of fertiliser onto backfill area around rootball prior to placing mulch. TREE PLANTING Type: Nutricote Standard Brown 360 Day blend (16: 4.4: 8.3) Installation: Distribute 5g per litre (rootball size) of fertiliser into backfill around rootball. Apply in 3 evenly spread layers as hole is filled. First layer is to be half way up the rootball, second layer 3/4 up the rootball and third layer 50-100mm from the soil finished surface level. This application ensures that the nutrients leeches evenly downwards into the soil profile and encourages outward root system growth.

6.0 STAKING AND TYING

Stakes shall be straight plantation grown hardwood, free from knots and twists, pointed at one end and sized according to size of plants to be staked.

Size: 50 x 50 x 1800mm No: 2 per plant as per the plant sheet

Ties shall be 50mm wide hessian webbing or approved equivalent nailed or stapled to stake. Drive stakes a minimum one third of their length, avoiding damage to the root system, on the windward side of the plant.

7.0 HYRDOMULCH

EXTENT OF WORK: Refer to the landscape drawings.

CONTRACTOR'S QUALIFICATIONS: Each tenderer shall submit documentary evidence of his proven ability to carry out this type of work. Such as evidence shall include a list of similar projects satisfactorily completed together with a statement of the qualifications and/or experience of the personnel to be

employed on the works. SITE PREPARATION: Where possible, prior to topsoiling, the areas should be cultivated. After topsoiling, all areas to be seeded shall be sacrificed to provide a reasonably firm but friable seed bed, free of weed or plant growth, large stones or other debris, and the whole left ready for hydromulching. APPLICATION RATES: The required areas shall be typically treated by the Contractor with the followina:

a. Certified Seed - Minimum 56kg per hectare. The seed mix will vary according to the season, seed mix to be supplied for approval.

b. Fertiliser - 250kg to 400kg per hectare. Selection will depend on soil analysis results and client requirement

c. Wood Fibre - Defibrated pinus radiata dyed green. 2.5 tonnes per ha.

d. Binder - Anionic Bitumen Emulsion or Polymer Binder. Anionic Bitumen Emulsion 50/50 bitumen water 1,000-2,000 litres per hectare. Polymer binder maximum 250 litres per hectare.

Note: The seed and fertiliser application rates are a representative sample only of the minimum quantites that should be applied per hectare.

OPERATION: Seed, fertiliser, wood-fibre mulch, water and binder (where required) shall be thoroughly mixed together with water to provide a slurry and then applied under pressure on to the area to be treated by means of hydromulching equipment specifically designed for this purpose and by operators trained in the use of this equipment.

AFTER CARE MAINTENANCE: Where possible, adequate water ensure a continuous vigorous and healthy growth of grass shall be applied regularly. A great deal will depend on natural rainfall, but as a general guide, 25mm of water should be applied to all seeded areas weekly. It is important that the wood fibre mulch be kept moist until germination occurs. After that, sufficient watering must be kept up until a healthy sward of grass is achieved. Six weeks after germination, sulphate of ammonia should be applied by hand or mechanical spreader and well watered into the grass, or it may be applied in solution. After the grass has reached a height of 20mm to 300mm it shall be done by tractor-drawn equipment and clippings shall not be collected.

MAINTENANCE PROGRAM

Maintenance shall mean the care and maintenance of the landscape works by accepted horticultural practice as rectifying any defects that become apparent in the landscape works under normal use. This shall include, but shall not be limited to, watering, mowing, fertilising, reseeding, returfing, weeding, pest and disease control, staking and tying, replanting and plant replacement, cultivation, pruning, aerating, renovating, topdressing, maintaining the site in a neat and tidy condition as follows:-

1.0 GENERAL

The Landscape Contractor shall maintain the landscape works for the term of the maintenance (or plant establishment) period to the satisfaction of the Landscape Architect and Client. The Landscape Contractor shall attend to the site on a weekly basis. The maintenance period shall commence at practical completion and continue for a period of fifty two (52) weeks.

2.0 WATERING

Grass and trees shall be watered regularly so as to ensure continuous healthy growth.

3.0 RUBBISH REMOVAL

During the term of the maintenance period the Landscape Contractor shall remove rubbish that may occur and reoccur throughout the maintenance period. This work shall be carried out regularly so that at weekly intervals the area may be observed in a completely clean and tidy condition.

4.0 REPLACEMENTS

The Landscape Contractor shall replace all plants that are missing, unhealthy or dead at the Landscape Contractor's cost. Replacements shall be of the same size, quality and species as the plant that has failed unless otherwise directed by the Landscape Architect. Replacements shall be made on a continuing basis not exceeding two (2) weeks after the plant has died or is seen to be missing. The landscape contractor is to report any evidence of theft or vandalism to the Landscape Architect within one day of them occurring.

5.0 STAKES AND TIES

The Landscape Contractor shall replace or adjust plant stakes and tree guards as necessary or as directed by the Landscape Architect. Remove stakes and ties at the end of the maintenance period if so directed.

6.0 PRUNING

Trees and shrubs shall be pruned as directed by the Landscape Architect. Pruning will be directed at the maintenance of the dense foliage or miscellaneous pruning beneficial to the condition of the plants. Any damaged growth shall be pruned. All pruned material shall be removed from the site.

7.0 MULCHED SURFACES

All mulched surfaces shall be maintained in a clean and tidy condition and be reinstated if necessary to ensure that a depth of 75mm is maintained. Ensure mulch is kept clear of plant stems at all times.

8.0 PEST AND DISEASE CONTROL

The Landscape Contractor shall spray against insect and fungus infestation with all spraying to be carried out in accordance with the manufacturer's directions. Report all instances of pests and diseases (immediately that they are detected) to the Landscape Architect prior to spraying.

9.0 GRASS AND HYDROMULCH AREAS

The Landscape Contractor shall maintain all grass areas by watering, weeding, reseeding, rolling, mowing, trimming or other operations as necessary. Grass areas shall be sprayed with approved selective herbicide against broad leafed weeds as required by the Landscape Architect and in accordance with the manufacturer's directions. Grass areas shall be kept mown to maintain a healthy and vigorous sward.

10.0 WEED ERADICATION

Eradicate weeds by environmentally acceptable methods using a non-residual glyphosate herbicide (eg: 'Roundup') in any of its registered formulae, at the recommended maximum rate. Regularly remove by hand, weed growth that may occur or recur throughout grassed, planted and mulched areas. Remove weed growth from an area 1000mm diameter around the base of trees in grassed areas. Continue eradication throughout the course of the works and during the maintenance period.

11.0 SOIL SUBSIDENCE

Any soil subsidence or erosion which may occur after the soil filling and preparation operations shall be made good by the Landscape Contractor at no cost to the client.

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Date 7/02/2019 Date ^{oject} GOULBURN WAS[·] 26/09/2019 Date **RE-USE GOULBU** Designed 7/02/2019 **RUG PROJECT** Date Verified 26/09/2019 MW RUG SITE Approved LANDSCAPE SPECIFICATION A 26/09/2019

Cardno (NSW/ACT) Pty Ltd | ABN 95 001 145 035 Ground Floor, 16 Burelli Street Wollongong NSW 2500 Tel: 02 4231 9600 Fax: 02 4228 6811 Web: www.cardno.com.au

GOULBURN MULWAREE COUNCIL					
^t GOULBURN WASTE MANAGEMENT CENTRE RE-USE GOULBURN INFRASTRUCTURE	Status NOT TO BE U		PROVAL	N PURI	POSES
RUG PROJECT	DATUM		Scale	Size	
RUG SITE	AHD		NTS	A	41
LANDSCAPE	Drawing Number			R	Revision
SPECIFICATION AND MAINTENANCE NOTES	820182	5301-DR	G-LA-103´	1	4

Re-Use Goulburn

APPENDIX

HAZARDOUS GROUND GAS RISK ASSESSMENT







Test Pits

GOULBURN WASTE TRANSFER, REUSE AND RECYCLE CENTRE

Legend



Project Boundary

1:2,000 Scale at A3







Borehole Location Plan

GOULBURN WASTE TRANSFER, REUSE AND RECYCLE CENTRE

Legend



A Borehole



A Gas Well



FIGURE 1

1:1,436 Scale at A3



Map Produced by Cardno NSW/ACT Pty Ltd (WOL) Date: 2018-10-25 | Project: 82018253-01 Coordinate System: GDA 1994 MGA Zone 55 Map: 8201825301-GS-012-GeologyBoreholes.mxd 00-01 Aerial imagery supplied by nearmap (March 2018)

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Photo 1: BH1 - 6.00 to 9.00m of rock core



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Project:	Reuse Goulburn
Cardno Reference:	82018253
Title:	Borehole 01 Core Photo Report
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				-	· · · · · · · · · · · · · · · · · · ·								5.64 m: DB 5.67 m: JT, 20°, IR, RF 5.67 m: JT, 20°, IR, RF 5.72 m: JT, 20°, IR, RF 5.78 m: JT, 60°, PR, RF
¥.	100	33		6.0	6.00		ATED AT 6.00 m						5.85 m: JT, 30°, UN, RF 5.94 m: DB
				-			opth. Gas well installed.						
				- 6.5 - -									
				-									
				- 7.0									
				-									
				- 7.5 -									
				-									
AD/T HFA WB RR	NG Solid flig Solid flig Hollow fli Washbo Rock roll Rotary c	ht auger ight auge re drilling ler	: TC-Bit er 9		ATER Water L on date water ir water o	shown nflow	ROCK STRENGTH EH Extremly High VH Very High H High M Medium L Low VL Very Low	JT SZ BP SM FL	CT TYPE Joint Sheared Bedding Seam Foliation		IR Irreg PR Plan ST Step	/ed continu jular jar oped	COATING CN Clean SN Stained VNR Veneer (thin or patchy) CT Coating (up to 1mm) INFILL MATERIALS
HQ NMLC DT PT PS SON	Rotary c Rotary c Diatube Push tub Percussi Sonic dri Air hamn	ore (63. ore (51. concrete e ion samp illing	5mm) 94mm) e coring	Di R	CR Total C	S Quality nation (%)	ROCK WEATHERING FR Fresh SW Slightly Weathered DW Distinctly Weathered MW Moderately Weathered HW Highly Weathered XW Extremly Weathered	CL CS FZ DL HB	Vein Cleavage Crushed Fracture Drift Lift Handing Drilling B	Seam Zone Break	ROUGHNE VR Very RF Rou S Smo	Roug gh ooth kensic	X Carbonaceus MU Unidentified minteral MS Secondary mineral KT Chlorite CA Calcite
	explanator tions and b						CARDNO (NSW/A	CT)	PTY	LT)		1



Photo 1: BH2 – 2.80m to 6.0m of rock core



Client:	Goulburn Mulwaree Council
Project:	Reuse Goulburn
Cardno Reference:	82018253
Title:	Borehole 02 Core Photo Report
Size:	A4

Clier Proje				ourn Mulv ourn Reus	waree Counc se	il						Hole No: BH
	tion				e Manageme	ent Centr	e		Job No: 82018253			Sheet: 1 o
Posit	tion	752	080 e	6150921					Angle from Horizontal: 90°	;	Surfac	e Elevation:
Rig T	Гуре	: HY	'DRA	POWER \$	SCOUT				Mounting: Truck	I	Driller	:
Casi	ng D	lam	eter:	HQ						(Contra	ctor: Hagstrom
Data	Sta	rted:	08/1	0/18	Date Co	mpleted	1: 08/ 1	10/18	Logged By: MST	(Check	ed By: MET
D	rilling			Samp	ling & Testing				Material Description			
Method	Resistance	Casing	Water		ample or ield Test	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
						-		sw	FILL: Gravelly Clayey SAND: fine to coarse grained, brown, medium plasticity clay, fine to medium gravel			FILL 0.00 m: CH4/CO2/O2 (%)
——	E	— НО —				- - 1 -		sw	0.60m FILL: Gravelly SAND: fine to coarse grained, grey to dark grey, fine to medium gravel	М	VD	
┢	н	V		SPT 1.50 - 36/140mm		-	XXXX		1.60m <u>1.70m</u> SANDSTONE, light grey, fine to medium grained,	D		1.50 m: 0.1/0.0/20.0 BEDROCK
						2 3 4 4 4 5 6 6 7 6 7 7 7 7			\quartz rich, moderately weathered, high strength TERMINATED AT 1.70 m Target depth. Gas well installed.			
MET EX R A PT SON A PS A A D/T A FA A D/T A WB RR	Rip Ha Pu: Air Pei Sh Sol Sol G Sol Ho Wa	per nd aug sh tub nic dril hamm rcussic ort spii id fligh id fligh llow flig	e ling er on sam ral auge nt auge ght auge ght auge e drillin	pler er r: V-Bit r: TC-Bit ger	E Easy F Firm H Hard VH Very Hard WATER Wate show wate	r (No Resistan (Refusal) er Level on /n		S H D P N	CP - Dynamic Cone Penetrometer ES - Env SP - Perth Sand Penetrometer U - C - Moisture Content MOISTURE BT - Plate Bearing Test D - IP - Borehole Impression Test M - D - Photoionisation Detector Wet Wet	urbed sa ironment wall tub st stic limit id limit	ample tal sampl be 'undist	le S - Soft F - Firm

	\square) C	arc	<i>lno</i> °					E	BORE	EHOLE LOG SHEET
	ent: ject:			burn Mulwaree burn Reuse	Council						Hole No: BH4
	ation			ourn Waste Man	agement Cen	tre		Job No: 82018253			Sheet: 1 of 2
				6150900	_			Angle from Horizontal: 90			e Elevation:
-			YDRA neter:		Γ			Mounting: Truck		Driller Contra	: ictor: Hagstrom
			: 08/1		ate Complete	d: 08/1	10/1	8 Logged By: MST			ed By: MET
	Drillin	ng		Sampling & T	i			Material Des			
Method	Resistance	Casing	Water	Sample o Field Tes		Graphic Log	Classification	SOIL TYPE, plasticity or particle character colour, secondary and minor componer ROCK TYPE, grain size and type, colou fabric & texture, strength, weathering defects and structure	ur, tsib	Consistency Relative Density	STRUCTURE & Other Observations
							GW	FILL: Gravelly CLAY: medium plasticity, grey coarse gravel, moist [LANDFILL COVER]	y, fine to M to D		FILL 0.00 m: CH4/CO2/O2 (%)
T/0	E	НО		SPT 1.50 - 1.95 m 1, 15, 25 N=40	-1			0.60m FILL: Clayey SAND: fine to coarse gr dark grey, with timber, plastic, concrete, p cloth, wool, moist [LANDFILL WASTE]	ained, paper,		1.50 m: 10.7/1.5/18.3
AD/T	E	Ť		SPT 3.00 - 3.45 m 3, 2, 5 N=7	3		sc		м	MD to VE	3.00 m: 17.2/2.3/13.6
		•			- 4			4.40m Auguer refusal at 4.4m Continued as Cored Drill Hole			
					-5 - - - - -						
					-7						
					- - - - 8						
					- - - - 9 -						
EX R	R	xcavato	or buck		TRATION Very Easy (No Resista Easy	nce)	s	PT - Standard Penetration Test B P - Hand/Pocket Penetrometer D	AMPLES - Bulk disturb - Disturbed s	ample	S - Soft
HA PT SC AF PS AD AD HF WI RF	H P S N A S V S S V T A B	land au onic dr ir hamr ercuss hort sp olid flig olid flig lollow fl	be illing mer ion sam biral aug ght aug ght aug light au bre drilling	npler WAT er V-Bit er: TC-Bit ger	Firm Hard Very Hard (Refusal)	n Date	F F F	CP - Dynamic Cone Penetrometer U SP - Perth Sand Penetrometer	S - Environmen - Thin wall tu OISTURE - Dry - Moist - Wet - Plastic limit - Liquid limit	ital sampl be 'undis	
Rel abb	fer to ex previatio	xplanator ons and b	ry notes basis of o	ior details of lescriptions		CAF	RDI	NO (NSW/ACT) PTY LTE)		

	Gal	rdn												C	ORE L	OG S	HEE
Client: Project:		oulbu oulbur			rre Council									H	ole	No:	BH4
Location:	Go	ulbur	n Wa	aste	Management Ce	entre	Job No:										3 of
Position: 7							Angle fr			ntal: 9	0°				evation:		
Rig Type: Casing Dia				RSC	Bit Type:		Mountin Bit Conc	-						iller:	r: Hagst	rom	
Data Start						eted: 08/10/18	Logged								By: MET		
Corin	ıg					Material Des								Defect	Descript	ion	
Method Fluid	TCR (%)		KL (m AHU)	Depth (m)	Cha Log ROC ROC	IL TYPE, plasticity or p racteristic, colour, sec & minor component CK NAME, grain size a colour, fabric and textu lusions & minor comp	condary s ind type, ure,	Weathering	St Is ₍₁ • Axia	timated rength 50) MPa I O-Diametral	Avera Natu Defe Spac (mn	ral ect ing	Visual	s	EFECT TY hape, roug	onal Data PE, orienta Jhness, infi hickness, c	ling
PH 1	100 1	6		- 4.5 - 5.0 - 5.5 - 6.0	SAN	RT CORING AT 4.40m DSTONE, fine to medium gra iron stained veins thoroughd		SW						 4.42 m 4.47 m 4.64 m 4.70 m 4.87 m 5.00 m 5.11 m 5.11 m 5.11 m 5.27 m 5.33 m 5.52 m 5.58 m 5.574 m 6.00 m 6.00 m 6.06 m 6.655 m 6.61 m 	: JT2, 60°, U :HB :JT, 60°, PR :JT, 30°, PR :BP, 10°, PF :BP, 10°, PF :JT, 70°, PR :JT, 60°, IR, :HB :JT, 60°, UN :JT, 60°, UN :JT, 60°, UN	I, RF I, RF , RF , RF , RF , RF , RF , RF , RF	ned
	100 5	50	-	- 7.0		MINATED AT 7.40 m et depth. Gas well installed.								— 7.00 m — 7.22 m — 7.31 m	: JT, 60°, UN	I, RF	
AD/T Solic HFA Holk WB Was RR Rocl PQ Rota HQ Rota NMLC Rota DT Diatt PT Push PS Perc SON Soni	d flight at d flight at shbore d k roller ary core ary core ube con n tube cussion s c drilling ammer	uger: TC auger rilling (85mm) (63.5mr (51.94n crete co sampling	Bit C-Bit (m) nring	W - R D		ROCK STRENGTH EH Extremly High VH Very High H High M Medium L Low VL Very Low ROCK WEATHERIN FR Fresh SW Slightly Weather OW Distinctly Weath HW Highly Weather XW Extremly Weath	ered hered athered red	DEFE JT SZ BP SM FL VN CL CS FZ DL HB DB	Beddi Seam Foliat Vein Cleav Crush Fracto Drift L Hand	red zone ng Parting ion age ied Seam ure Zone	CU DIS IR PR ST UN VR VR SSL	Irregu Plana Stepj Undu JGHNE Very Roug Smoo	ed ontinu Jlar ar Ded Ilose SS Roug Jh oth kensic	h	VNR Ver CT Co: INFILL MA X Cai MU Uni MS See KT Ch CA Cai Fe Iror	ined neer (thin o ating (up to	1mm)



Photo 1: BH4 - 4.40 to 7.40m of rock core



Goulburn Mulwaree Council
Reuse Goulburn
82018253
Borehole 04 Core Photo Report
A4

	nt: ect:			burn Mulwarre C ourn Reuse	ouncil								Hole N	lo: BH
	ation			urn Waste Mana	gement C	ent	re		Job No: 82018253					Sheet: 1 o
osi	ition	: 752	136 (6150860					Angle from Horizont	al: 90°	;	Surfac	e Elevation:	
Rig	Туре	: H)	'DRA	POWER SCOUT					Mounting: Truck			Driller		
Cas	ing [Diam	eter:										ctor: Hagstro	om
Data	a Sta	rted:	10/1	0/18 Da	te Comple	eteo	d: 10/1	0/18	Logged By: MST			Check	ed By: MET	
[Drilling]		Sampling & Te	sting				Mate	erial Description				
Method	Resistance	Casing	Water	Sample or Field Test		Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle o colour, secondary and minor or ROCK TYPE, grain size and ty fabric & texture, strength, we defects and structure	omponents	Moisture Condition	Consistency Relative Density		UCTURE Observations
	Е	A						sw	.20m FILL: Clayey SAND: fine to mediur	m grained, brown,	м		FILL 0.00 m: CH4/CO2	(02 (%)
Т	Н			PDT 1 50 - 1 05 m		1		sw	Iow plasticity clay, dry FILL: Gravelly SAND: fine to coars brown, fine to coarse gravel, with t concrete, dry [BUILDING WASTE] .40m FILL: Sandy GRAVEL: fine to med	ium, sub-angular.	D		0.00 m: CH4/CO2	(02 (%)
- AU/ I	E	ОН		SPT 1.50 - 1.95 m 6, 6, 3 N=9		2		GW SC	grey, mediúm to coarse sand, mo COVER] 240m FILL: Clayey SAND: fine to coars dark grey, with metal, plastic, cloth [LANDFILL WASTE]	ist [LANDFILL	м	L		
					;	3		00						
¥	Н	V		SPT 3.00 - 3.03 m 25/30mm HB N=R		<u> </u>	<u> </u>		8.10m <u>SANDSTONE</u> , fine to medium gra \light grey	ined, massive,	D	VD	3.00 m: 0.2/0.0/21 BEDROCK	.0
						8			Refusal					
ME EX R HA P SO A DZ A DZ A DZ A DZ A DZ A DZ A DZ A DZ	Rip Ha Pu N So Air Pe Sh V So T So A Ho Wa	oper nd aug sh tub nic dril hamm rcussic ort spi lid flig lid flig llow fli	e ling ler on sam ral aug nt aug ght aug ght au e drillir	et VE F F H H VH WATE er Sr. V-Bit sr. TC-Bit ger	IRATION Very Easy (No Re Easy Firm Hard Very Hard (Refusi R 7 Water Leve 7 Shown − water inflov ¶ water outflo	^{al)} el on w		S H D P N	P Dynamic Cone Penetrometer P Perth Sand Penetrometer C Moisture Content T Plate Bearing Test P Borehole Impression Test O Photoionisation Detector	SAMPLES B - Build D - Dist ES - Env U - Thir MOISTURE D - Dry M - Mois W Wet PL - Plaq W - Mois	st st st stc limit uid limit	ample tal sampl be 'undist	le VS s turbed' St VSt H REL/ VL L D	CONSISTENCY - Very Soft - Soft - Firm - Stiff - Very Stiff - Hard XTIVE DENSITY - Very Loose - Loose - Loose - Medium Den - Dense - Very Dense

$\boldsymbol{\langle}$	\square	C	arc	lno°						B	BORE	EHOLE LOG SHEET	
	ent: ject:			burn Mulw burn Reuse	aree Council							Hole No: BH6	
Loc	ation	n: G	Goulb	urn Waste	Managemen	t Cent	re		Job No: 82018253			Sheet: 1 of 1	
		-		0150959 POWER S	COLIT				Angle from Horizontal: 90° Mounting: Truck		Surface Elevation: Driller:		
_		Diam			0001				incurring. Truck		-	ictor: Hagstrom	
Dat	a Sta	arted:	10/1	0/18	Date Con	nplete	d: 10/1	10/18	Logged By: MST		Check	ed By: MET	
	Drillin	g	-	Samplir	ng & Testing	_			Material Description		1	T	
Method	Resistance	Casing	Water		mple or eld Test	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteristic, colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	Moisture Condition	Consistency Relative Density	STRUCTURE & Other Observations	
						-		GW	FILL: Sandy GRAVEL: fine to medium, sub-angular, grey, medium to coarse sand, moist 0.40m [HARDSTAND]	D		FILL 0.00 m: CH4/CO2/O2 (%) -	
	Е	АН		SPT 1.50 - 1 5, 5, 9 N=14	.95 m	- - - - - - - - - - - - - - - - - - -		sc	FILL: Clayey SAND: fine to coarse grained, dark grey, with plastic, concrete, tile, timber, paper and cloth, moist [LANDFILL WASTE] 1.70m SAND: fine to coarse grained, brown mottled light brown, trace fine, sub angular gravel, moist [COLLUVIUM]	м	MD	- - - - - - - - - - - - - - - - - - -	
						-		-	2.60m SANDSTONE, fine to medium grained, massive, light grey			BEDROCK	
	н			SPT 3.00 - 3		-3					VD	3.00 m: 0.3/0.2/20.5	
				22/140mm H	IB N=R				3.30m TERMINATED AT 3.30 m Refusal				
						-4 - - - - - - - - - - - - - - - - - -							
HA EX R HA PT SC AH PS AS AE AS AE HFF R R R R R	Ri Ha DN Sci DN Sci DN Sci S D/V Sci D/T Sci B W	cavato pper and aug ush tub onic dril r hamm ercussio nort spi blid fligl	ger e lling her on sam ral auge nt auge nt auge ght auge ght auge	pler er r: V-Bit r: TC-Bit jer	PENETRATION VE Very Easy (F E Easy F Firm VH Very Hard (F WATER WATER Water i water i	No Resistar Refusal) Level on		S H D P N P	P Hand/Pocket Penetrometer D Director CP Dynamic Cone Penetrometer ES En CP Perth Sand Penetrometer U Th CF Moisture Content MOISTURE AT Plate Bearing Test D D IP Borehole Impression Test M M D Photoionisation Detector W W Q Vane Shear, P=Peak, PL Piac	y bist	ample tal sampl be 'undis	le F - Firm	
Re abl	fer to ex previation	planatory ns and b	/ notes f asis of d	or details of escriptions			CAF	, DI	NO (NSW/ACT) PTY LTD				

Rig Type: HYDRAPOWER SCOUT Mounting: Truck D Casing Diameter: HQ C Data Started: 10/10/18 Date Completed: 10/10/18 Logged By: MST C Drilling Sampling & Testing Material Description	OREHOLE LOG SHEE
Position: 751945 6151166 Angle from Horizontal: 90' S Rig Type: HYDRAPOWER SCOUT Mounting: Truck D Casing Diameter: HQ C Data Started: 10/10/18 Date Completed: 10/10/18 Logged By: MST C C Dilling O G G G G G G G G G G G G G G G G G G	Hole No: BH7a
Rig Type: HYDRAPOWER SCOUT Mounting: Truck D Casing Diameter: HQ C Data Started: 10/10/18 Date Completed: 10/10/18 Logged By: MST C Drilling Sampling & Testing Image: Sampling & Testing Image: South Type: plasticity or particle characteristic, clobul; stepcharaty and minor components Image: South Type: plasticity or particle characteristic, clobul; stepcharaty and minor components Image: South Type: plasticity or particle characteristic, clobul; stepcharaty and minor components Image: South Type: plasticity or particle characteristic, clobul; stepcharaty and minor components Image: South Type: plasticity or particle characteristic, clobul; stepcharaty and minor components Image: South Type: plasticity or particle characteristic, clobul; stepcharaty and minor components Image: South Type: plasticity or particle characteristic, clobul; stepcharaty and minor components Image: South Type: plasticity or particle characteristic, clobul; stepcharaty and minor components Image: South Type: plasticity or particle characteristic, clobul; stepcharaty and minor components Image: South Type: plasticity or particle characteristic, clobul; stepcharaty and minor components Image: South Type: plasticity or particle characteristic, clobul; stepcharaty and minor components Image: South Type: plasticity or particle characteristic, clobul; stepcharaty and minor components Image: South Type: plasticity or particle characteristic, clobul; stepcharaty and minor components LOG F C C South Type: plasticity or particle character	Sheet: 1 of urface Elevation:
Casing Diameter: HQ C Data Started: 10/10/18 Date Completed: 10/10/18 Logged By: MST C Drilling Sampling & Testing Toge Source Control of the Completed: 10/10/18 Logged By: MST C Drilling Sampling & Testing Sample or Field Test F Q F Q F C F C F C F C F C F C F C F C	riller:
Data Started: 10/10/18 Date Completed: 10/10/18 Logged By: MST C Dilling Sampling & Testing Material Description outgoing & gring & gring & Testing Sample or Field Test Image:	ontractor: Hagstrom
Drilling Sampling & Testing Material Description 00 gr	hecked By: MET
Dot with the second	
F Q Gravely SAND: line to coarse grained, dark brown, fine to coarse surrandod gravel, trace of sandstone cobles, sty M Gravely SAND: line to coarse grained, dark brown, fine to coarse surrandod gravel, trace of sandstone cobles, sty M Gravely SAND: line to coarse grained, dark brown, fine to coarse grained, dark brown, fine to coarse surrandod gravel, trace of sandstone cobles, sty M Gravely SAND: line to coarse grained, dark brown, fine to coarse surrandod gravel, trace of sandstone cobles, sty M Gravely SAND: line to coarse grained, dark brown, fine to coarse grained, dark brown	Constructions STRUCTURE & Other Observations G
F Q M M M M M M M M M M M M M M M M M M	COLLUVIUM
• • <td></td>	
METHOD PENETRATION FIELD TESTS SAMPLES EX Excavator bucket VE Very Easy (No Resistance) SPT SPT Standard Penetration Test B - Bulk disturbed HA Hand auger Firm Firm DCP Dynamic Cone Penetrometer D D PT Push tube Firm Hard PSP Perth Sand Penetrometer U Thin wall tube SON Sonic drilling VH Very Hard (Refusal) WC Moisture Content MOSTURE	nple S - Soft Il sample F - Firm
Arr failure WATER Water Level on Date PBT Plate Bearing Test D D Dry AD/V Solid flight auger: V-Bit Water Level on Date MMP Borehole Impression Test M Moist AD/V Solid flight auger: CF-Bit Water Level on Date MP Ponehole Impression Test M Moist MWB Washbore drilling water outflow water outflow VS Vane Shear; P=Peak, W PL Plastic limit RR Rock roller water outflow water outflow W Wet Wet	RELATIVE DENSITY VL - Very Loose L - Loose MD - Medium Dense D - Dense

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					lanayemer	it Cent	e		Job No: 82018253		Comfee	Sheet: 1 of 1
				6151163					Angle from Horizontal: 90°			e Elevation:
-				POWER SC	001				Mounting: Truck		Driller	
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			: 10/1		Date Cor	npieteo		10/10	Logged By: MST		Check	ed By: MET
	Drillin	g	-	Sampling	& Testing	_			Material Descr	iption		
Method	Resistance	Casing	Water		ple or Test	Depth (m)	Graphic Log	Classification	SOIL TYPE, plasticity or particle characteris colour, secondary and minor components ROCK TYPE, grain size and type, colour, fabric & texture, strength, weathering, defects and structure	tic, Woisture Condition	Consistency Relative Density	STRUCTURE & Other Observations
— AD/T —	F	Р Р Н				-		sw	Gravelly SAND: fine to coarse grained, dark b fine to coarse, subrounded gravel, trace of sandstone cobbles, dry	nrown, M		COLLUVIUM
¥.		•					o. o		0.30m TERMINATED AT 0.30 m			
						- - 0.5 -			Refusal			-
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						- 2.5 -						
EX R HA PT SO AH PS AD AD HF	Ri Ha Pu So Ai Sh Sh Sh Sh Sh Sh Sh Sh Sh Sh Sh Sh Sh	ccavato pper and au ush tul onic dr r hamr ercuss nort sp olid flig olid flig ollow fl	be illing ner ion sam iral aug ht auge ht auge ight auge	et v pler V er sr: V-Bit ger	Easy Firm H Hard Wery Hard (WATER Water showr water	No Resistan Refusal) Level on inflow		S H D P N	T Standard Penetration Test B P Hand/Pocket Penetrometer D CP Dynamic Cone Penetrometer U P Peth Sand Penetrometer U C Moisture Content MOK T Plate Bearing Test D P Borehole Impression Test M O Photoionisation Detector W G Vane Shear; P=Peak, L	IPLES - Bulk distur - Disturbed s - Environmei - Thin wall tu STURE - Dry - Moist - Wet - Plastic limit - Liquid limit	sample ntal sampl ube 'undist	e S - Soft turbed' St - Stiff VSt - Stiff H - Hard RELATIVE DENSITY VL - Very Loose L - Loose MD - Medium Dense
	er to ex	planato	ry notes f	or details of escriptions	water		CAF			- Moisture co	ontent	D - Dense VD - Very Dense

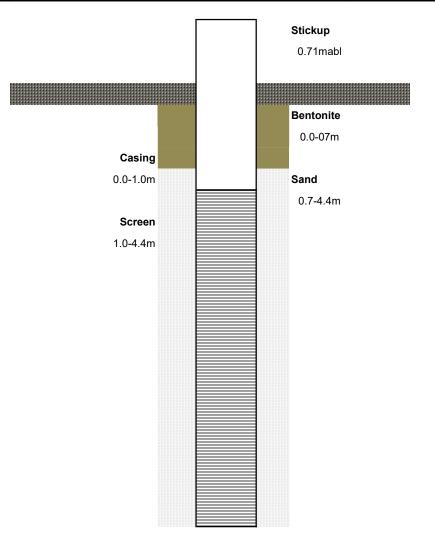
CARDNO 2.01.6 LIB. GLB Log CARDNO NON-CORED 82018253-2.GPJ <<DrawingFile>> 18/10/2018 14:28 10.0.000 Datgel AGS RTA, Photo, Monitoring Tools

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				6151155	gement cen	ue		Job No: 82018253	n°		Surface	e Elevation	Sheet: 1	I OT 1
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	Drillin	y T	-	Sampling & Te	-		-	Material De						
Method	Resistance	Casing	Water	Sample or Field Test		Graphic Log	Classification	SOIL TYPE, plasticity or particle charact colour, secondary and minor compon ROCK TYPE, grain size and type, col fabric & texture, strength, weatherin defects and structure	teristic, ients lour, ng,	Moisture Condition	Consistency Relative Density		TRUCTURE ner Observations	6
— AD/T —	F	HQ H			-		sw	Gravelly SAND: fine to coarse grained, da fine to coarse, subrounded gravel, trace o sandstone cobbles, dry	ark brown, of	м		COLLUVIUM		
						5 · 0 ·		10						
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					- - - 2.0 -									
					- - - 2.5 -									
EX R HA PT SO AH PS AD	Ri Ha Pu N So Air Pe Sh V So	cavato pper and au ush tub onic dri r hamn ercussi nort sp blid flig	oe illing ner ion sam iral aug ht auge	er Ve	TRATION Very Easy (No Resista Easy Firm Hard Very Hard (Refusal) ER Z Water Level o Shown		S H D P N	T Standard Penetration Test F Hand/Pocket Penetrometer Dynamic Cone Penetrometer P Dynamic Cone Penetrometer C Moisture Content T Plate Bearing Test P Borehole Impression Test	SAMPLES B - Bulk d D - Disturl ES - Enviro U - Thin w MOISTURE D - Dry M - Moist W - Wet	bed sa nment	al sample	e V: S e F urbed' S V: H R V	- Soft - Firm t - Stiff St - Very Stif - Hard ELATIVE DENSI L - Very Loo	t f TY
	A Ho B W C Ro er to ex	ollow fi ashbo ock roll planator	light au re drillir ler ry notes f		 water inflow water outflow 	CAF	V	- Vane Shear; P=Peak,	PL - Plastic LL - Liquid w - Moistu	limit	itent	L M D VI	D - Medium - Dense	

CARDNO 2.01.6 LIB.GLB Log CARDNO NON-CORED 82018253-2.GPJ <<DrawingFile>> 18/10/2018 14:28 10.0.000 Datgel AGS RTA, Photo, Monitoring Tools

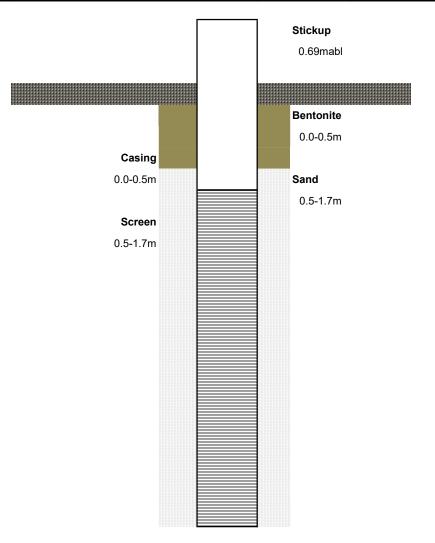


Project	Goulburn Waste Management Centre	Project Number:	82018253
Location	BH4	Date Installed	8/10/2018
Installed by	Hagstrom Drilling	Cardno Supervisor	MST
Purpose	Gas	Size	HQ



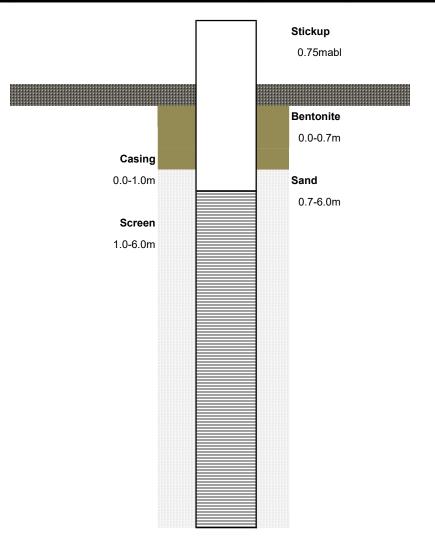


Project	Goulburn Waste Management Centre	Project Number:	82018253
Location	BH3	Date Installed	8/10/2018
Installed by	Hagstrom Drilling	Cardno Supervisor	MST
Purpose	Gas	Size	HQ



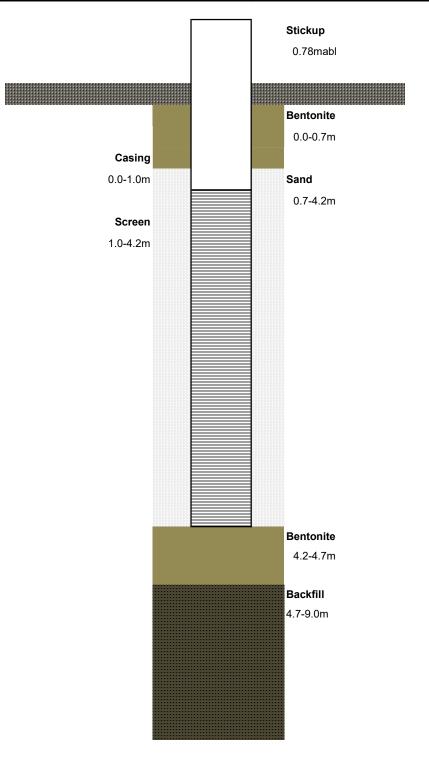


Project	Goulburn Waste Management Centre	Project Number:	82018253
Location	BH2	Date Installed	9/10/2018
Installed by	Hagstrom Drilling	Cardno Supervisor	MST
Purpose	Gas	Size	HQ





Project	Goulburn Waste Management Centre	Project Number:	82018253
Location	BH1	Date Installed	9/10/2018
Installed by	Hagstrom Drilling	Cardno Supervisor	MST
Purpose	Gas	Size	HQ



Client	GMC	Cardno Job No.	56 \$20 \$253
Project	Reuse Goulburn.	Location	GWMC
Sampler	MST	Time/Date	11/10/15 1400
BH ID	B #3	Weather	Shawer I With

Well Status

Well Damaged	Yes	Well Locked	(Yes/No
Cement footing damaged	Yes/No	Gas cap fitted	(Yes/No
Standing water/vegetation around monument	Yes/No	Well ID visible	Yes/No
Water in monument	Yes/No	Monument damaged	Yés/No
Standing water level in well (mBTOC)		Odour from well	YesNo
Ambient reading (FID)			
Initial Well pressure	0		
Initial vent	Mi / Initial pulse / Pu	ulse > 5s / Continous	
Gas flow rate			
Well pressure after initial vent	D		

	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	H ₂ S (ppm)	CO (ppm)	Flow rate	Time for stabilisation
Peak	17.9	24	16.4	0	0	-	-
Stabilised	0.2	0,0	20.9	2.	>	-	123
Flux or trend							

Client	GMC	Cardno Job No.	32018253
Project	Reuse Goulburn	Location	GWMC
Sampler	MST	Time/Date	11/10 1BSO.
BH ID	Btty	Weather	Showns / conte

Well Status

Well Damaged	Yes/Mo	Well Locked	Øes/No
Cement footing damaged	Yes/No	Gas cap fitted	Yes/No
Standing water/vegetation around monument	Yes/No	Well ID visible	∀es/No
Water in monument	Yes	Monument damaged	Yes/Ng
Standing water level in well (mBTOC)	day	Odour from well	Yes/No
Ambient reading (FID)	6. · · · ·		
Initial Well pressure	0		
Initial vent	Nil) Initial pulse / Pulse > 5s / Continous		
Gas flow rate	~		4
Well pressure after initial vent	the O		

	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	H ₂ S (ppm)	CO (ppm)	Flow rate	Time for stabilisation
Peak	79.9	11.7	0	0	6	-	-
Stabilised	74.9	11.7	O	0	6	~	Eser.
Flux or trend	up	up		1			

Client	GML	Cardno Job No.	32018253
Project	Recese Goulburn	Location	COUME
Sampler	MST	Time/Date	11/10/18 1330
BH ID	BH2	Weather	Fore / wonday

Well Status

Well Damaged	Yes/No	Well Locked	Yes/Ng
Cement footing damaged	Yes/No	Gas cap fitted	Yes/No NA - Clan
Standing water/vegetation around monument	Yes/No	Well ID visible	Yes/No
Water in monument	Yes/No Monument damaged		Yes
Standing water level in well (mBTOC)	4.3n	Odour from well	Yes/Nø
Ambient reading (FID)	-		
Initial Well pressure	0		
Initial vent	NiL Initial pulse / Pulse > 5s / Continous		
Gas flow rate	-		
Well pressure after initial vent	-		

	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	H ₂ S (ppm)	CO (ppm)	Flow rate	Time for stabilisation
Peak	1.2	1.3	15.0	-5	Ga . 7	-	-
Stabilised	1.2	1.3	4.9	-	- 3	-	3 Min.
Flux or trend	-	1	-	-	-	~	8

Stichup O.Fr

Client	OMC	Cardno Job No.	42018253
Project	Receive Goullann	Location	GWMC
Sampler	NST	Time/Date	11/10 1410
BH ID	1	Weather	Showers / Why Ly

Well Status

Well Damaged	Yes	Well Locked	Yes/No
Cement footing damaged	Yes/No	Gas cap fitted	Yes/No
Standing water/vegetation around monument	Yes/No	Well ID visible	Yes/No
Water in monument	Yes	Monument damaged	Yes/No
Standing water level in well (mBTOC)		Odour from well	Yesto
Ambient reading (FID)	<u> </u>		
Initial Well pressure	O		
Initial vent	🕅 / Initial pulse / Pu	ulse > 5s / Continous	
Gas flow rate	Constant		
Well pressure after initial vent	0		

	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	H ₂ S (ppm)	CO (ppm)	Flow rate	Time for stabilisation
Peak	527	29.6	05	4	Gl		-
Stabilised	52-4	29.5	0.5	3	77	/	180
Flux or trend							

BHI - MbII 13182 9611

Client	GMC	Cardno Job No.	8201825301
Project	Reuse Goulburn	Location	Goulburn WMC
Sampler	MST	Time/Date	1335 30/10/15
BH ID	BHI	Weather	Fre.

Well Status

Well Damaged	Yes	Well Locked	(es/No
Cement footing damaged	Yes/No	Gas cap fitted	(Yes/No
Standing water/vegetation around monument	Yes/No	Well ID visible	(Yes/No
Water in monument	Yes/No	Monument damaged	Yes/No
Standing water level in well (mBTOC)	B ullinear give	Odour from well	Yes/No
Ambient reading (FID)	6		
Initial Well pressure	20 937	~	
Initial vent	Nil / Initial pulse / Pulse	e > 5s / Continous	
Gas flow rate	20 0 1/hr		
Well pressure after initial vent	437		

	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	H ₂ S (ppm)	CO (ppm)	Flow rate	Time for stabilisation
Peak	60.4	30.2	\mathcal{O}	23	181	6.31/hr	-
Stabilised	60.3	30.2	0	Ŧ	122	3.61/4v	1205.
Flux or trend	Vr	Up	-	Z3-Up	FRap	doun.	

Client	GMC	Cardno Job No.	8201825301
Project	Reuse Goulburn	Location	Goulburn WMC
Sampler	MST	Time/Date	1415 30/10/18
BH ID	BHZ	Weather	F-4

Well Status

Well Damaged	Yes/No	Well Locked	Yes/No
Cement footing damaged	Yes/No	Gas cap fitted	(Yes/No
Standing water/vegetation around monument	Yes/Nø	Well ID visible	Kes/No
Water in monument	Yes/No	Monument damaged	Yes/No
Standing water level in well (mBTOC)	4.30	Odour from well	Yes/No
Ambient reading (FID)	0		
Initial Well pressure	934		
Initial vent	Nil Initial pulse / P	ulse > 5s / Continous	
Gas flow rate	2.6		
Well pressure after initial vent	433		

	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	H ₂ S (ppm)	CO (ppm)	Flow rate	Time for stabilisation
Peak	40-9	9.1	6.0	3	88	0252.6	-
Stabilised	40.6	9.2	00	2	46	0.1	60
Flux or trend		-	1	r	r	Pulsing.	

Client	GMC	Cardno Job No.	8201825301
Project	Reuse Goulburn	Location	Goulburn WMC
Sampler	MST	Time/Date	1430 30/10
BH ID	BH3	Weather	FAC

Well Status

Well Damaged	Yes/Na	Well Locked	(jes/No
Cement footing damaged	Yes/No	Gas cap fitted	(es/No
Standing water/vegetation around monument	Yes/No	Well ID visible	Kes/No
Water in monument	YesAK	Monument damaged	Yes/No
Standing water level in well (mBTOC)	C Tager	Odour from well	YesANo
Ambient reading (FID)	0		
Initial Well pressure	936		
Initial vent	All / Initial pulse / I	Pulse > 5s / Continous	
Gas flow rate	0		
Well pressure after initial vent	936		

	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	H₂S (ppm)	CO (ppm)	Flow rate	Time for stabilisation
Peak	47.1	89	70	6	139	0.(-
Stabilised	47.1	8-9	7.0	5	132	0.0	120
Flux or trend	(_	_	V	L	L	

Client	GMC	Cardno Job No.	8201825301
Project	Reuse Goulburn	Location	Goulburn WMC
Sampler	MST	Time/Date	1400 36/10/18
BH ID	BHG	Weather	Func

Well Status

Well Damaged	Yes/No	Well Locked	(Yes/No
Cement footing damaged	Yes/No	Gas cap fitted	(Yeš/No
Standing water/vegetation around monument	Yes/No	Well ID visible	(Yes/No
Water in monument	Yes/No	Monument damaged	YeskNo
Standing water level in well (mBTOC)		Odour from well	Yes/No
Ambient reading (FID)	0		
Initial Well pressure	434		
Initial vent	(Nil / Initial pulse / Puls	e > 5s / Continous	
Gas flow rate	4.1114.		
Well pressure after initial vent	434		e. A start and a start

	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	H ₂ S (ppm)	CO (ppm)	Flow rate	Time for stabilisation
Peak	77.6	12.1	1.3	4	93	4.1	-
Stabilised	77.6	17.1	69	3	91	0.6	100
Flux or trend	-	-	-	7	L		

G GasClam Calibration Results

Serial Number: SN000241-05-12 Gasclam Name: gb12

_

Software Version: 6.1.0 Firmware Version: 7.11 1/1 Mitch Enqip 09.10.2018 13:30:50

Sensor Type: 0>	kygen						
Offset:	-70	Enter Values 1:	20.9	%	Enter Values 2:	0	%
Slope:	1.3753	AD Values 1:	2540		AD Values 2:	51	
Calibration: 09.	.10.2018	Instalation:			Pumping Time:	30	
Units: %		Error: (C	mV	Calibration Type:		nt
Decimal Places: 1		Warm Up Time:	1		User:		
Range: 25		Response Time:	30		Location:	Enqip	
Sensor Type: Me	ethane (100%)						
Offset:	-711	Enter Values 1:	0	%	Enter Values 2:	60	%
Slope:	1.0725	AD Values 1:	663		AD Values 2:	2954	, ,
Calibration: 09.	10.2018	Instalation:			Pumping Time:	30	
Units: %		Error: 3	0	mV	Calibration Type:		nt
Decimal Places: 1		Warm Up Time: 3	0		User: I		
Range : 100		Response Time: 3	0		Location: E	Enqip	
Sensor Type: Car	rbon Dioxide (100%)						
Offset:	-617	Enter Values 1:	0	%	Enter Values 2:	40	%
Slope:	0.9307	AD Values 1:	663		AD Values 2:	2423	
Calibration: 09.10.2018		Instalation:			Pumping Time: 3	0	
Units: %		<i>Error</i> : 300 mV		mV	Calibration Type: T		t
Decimal Places: 1		Warm Up Time: 30			User: Mitch		
Range: 100		Response Time: 30	D		Location: Enqip		
Sensor Type: Bor	ehole Pressure						
Offset:	-263	Enter Values 1:	1017	mbar	Enter Values 2:	1131	mba
Slope:	1.1761	AD Values 1:	3056		AD Values 2:	3374	
Calibration: 09.1	0.2018	Instalation:			Pumping Time: 0		
<i>Units:</i> mba	r	Error: 16	00	mV	Calibration Type: Ty		
Decimal Places: 0		Warm Up Time: 0			User: Mitch		
Range: 1250		Response Time: 0		Location: Engip			
Sensor Type: Atm	ospheric Pressure						
Offset:	233	Enter Values 1:	1017	mbar	Enter Values 2:	1122	mba
Slope:	1.0118	AD Values 1:	3061		AD Values 2:	3401	mba
Calibration: 09.10	0.2018	Instalation:			Pumping Time: 0		
Units: mbar				mV	Calibration Type: Two-point		
Decimal Places: 0		Warm Up Time: 0			User: Mitch		
Range: 1250		Response Time: 0			<i>Location:</i> Engip		

G GasClam Calibration Results

Serial Number: SN000239-05-12 Gasclam Name: mb11

Software Version: 6.1.0 Firmware Version: 7.11

Sensor Type: 0	xygen						
Offset:	-72	Enter Values 1:	20.9	%	Enter Values 2:	0	%
Slope:	1.1715	AD Values 1:	2984	ļ	AD Values 2:	62	
Calibration: 09	.10.2018	Instalation:			Pumping Time:	30	
Units: %		Error:	0	mV	Calibration Type:	Two-poi	nt
Decimal Places: 1		Warm Up Time:	1		User:	Mitch	
Range : 25		Response Time:	30		Location:	Enqip	
Sensor Type: Me	ethane (100%)						
Offset:	-683	Enter Values 1:	0	%	Enter Values 2:	60	%
Slope:	1.0385	AD Values 1:	658		AD Values 2:	3024	
Calibration: 09.	10.2018	Instalation:			Pumping Time:	30	
Units: %		Error:	30	mV	Calibration Type:	Two-poir	nt
Decimal Places: 1		Warm Up Time: 🕻	30		User:	Mitch	
Range: 100)	Response Time: 3	30		Location:	Enqip	
Sensor Type: Ca	rbon Dioxide (100%)						
Offset:	-709	Enter Values 1:	0	%	Enter Values 2:	40	%
Slope:	1.0826	AD Values 1:	655		AD Values 2:	2168	
Calibration: 09.	Calibration: 09.10.2018				Pumping Time:	30	
Units: %	Units: %		<i>Error</i> : 30 mV		Calibration Type: Two-point		
Decimal Places: 1		Warm Up Time: 30			User: Mitch		
Range : 100		Response Time: 3	0		Location: Engip		
Sensor Type: Bo	rehole Pressure						
Offset:	189	Enter Values 1:	1016	mbar	Enter Values 2:	1137	mbar
Slope:	1.0339	AD Values 1:	3036		AD Values 2:	3419	
Calibration: 09.7	10.2018	Instalation:			Pumping Time: 0		
<i>Units</i> : mba	ar	Error: 1	600	mV	Calibration Type: Two-point		
Decimal Places: 0	Decimal Places: 0				<i>User:</i> Mitch		
Range: 1250		Response Time: 0		Location: E	nqip		
Sensor Type: Atn	nospheric Pressure						
Offset:	262	Enter Values 1:	1016	mbar	Enter Values 2:	1134	mbar
Slope:	1.0131	AD Values 1:	3026		AD Values 2:	3407	
Calibration: 09.1	0.2018	Instalation:			Pumping Time: 0		
<i>Units:</i> mba	r	<i>Error</i> : 1600 mV		mV	Calibration Type: Two-point		
Decimal Places: 0		Warm Up Time: 0			User: Mitch		
Range: 1250)	Response Time: 0			Location: E	nqip	



Gas Detection Air Sampling & Monitoring Environmental & Water Quality Monitoring **Air-Met Scientific Pty Ltd** ABN 73 006 849 949 **1300 137 067** Melhourne: 7-11 Cevion Street Nursurading, VIC 3131 Pb 03 8878 3380 Feb 03 0877

Melbourne: 7-11 Ceylon Street, Nunawading, VIC 3131 Ph 03 8878 3380 Fax 03 9877 1230 Sydney: Level 3, 18-26 Dickson Avenue Artarmon NSW 2064 Ph 02 8425 8388 Fax 02 8425 8399

Gas Calibration Certificate

Instrument Serial No.	GFM430 10479	\$	Sensors	CH4, CO2, CO, O2, H2S, LEL
ltem	Test	Pass		Comments
Battery	Charge Condition	1		
	Fuses	1		

	Fuses	\checkmark	
-	Capacity	✓	
	Recharge OK?	✓	
Switch/keypad	Operation	1	
Display	Intensity	1	
	Operation (segments)	✓	
Pump	Operation	1	
	Filter	✓	
	Flow	 Image: A set of the set of the	
	Valves, Diaphragm	1	
PCB	Condition	1	
Connectors	Condition	✓	
Sensor	CH4	1	
	CO2	1	
	02	1	
	H2S	1	
	СО	1	
Alarms	Settings	\checkmark	
Software	Version		
Datalogger	Operation		
Download	Operation		
Other tests:			

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Calibration gas and	Certified	Gas bottle	Instrument Deading
		Ū	Certineu		Instrument Reading
		concentration		No	
02		20.9% Vol O2		Fresh Air	21.0%
CO2		40% CO2	NATA	SY136	40.3% CO2
CH4		60% CH4	NATA	SY136	58.8% CH4

Calibration Done By:

Sarah Lian

 Calibration date:
 29/10/2018

 Next calibration due:
 30/04/2019







Calibration certificate number 41584

Instrument LaserOne01 Serial number Huberg 16709.16

Calibration procedure description

UNI IEC ISO 14253-1: 2013 states that the measurement uncertainty has to be less than the maximum admissible error limits; calibration of the instrument is performed by measuring the response of the detection sensor compared to known concentrations. When the detected uncertainty is less than the maximum admisibble error limits of the measuring equipment, the calibration is complant.

Check of the instrument between 0 ÷ 10000 ppm CH4

Full scale (ppm)	Gas concentration (ppm)	Response1 (ppm)	Response2 (ppm)	Response3 (ppm)	Average response (ppm)	Max error (ppm)	Max error (% F.s.)
1000	0	0	0	0	0,00	0,00	0,00
1000	100	100	99	100	99,67	1,00	0,10
1000	1000	997	998	998	997,67	3,00	0.30

Uncertainty	0,30	%
Max % error	0,30	% Fs

Check of the instrument between 0 ÷ 100 % vol CH4

Full scale (%vol)	Gas concentration (%vol)	Response1 (%vol)	Response2 (%vol)	Response3 (%vol)	Average response (%vol)	Max error (%vol)	Max error (% F.s.)
10	0	0	0	0	0,00	0,00	0,00
10	2,2	2,1	2,2	2,2	2,17	0,10	1,00
100	100	100	100	100	100,00	0,00	0,00

Uncertainty	1,00	%
Max % error	1,00	% Fs

Ambient condition by calibration

Temperature	:	21 °C
Pressure	;	1013 mBar
U.R.	;	42 %

CALIBRATION CERTIFICATE



Data creazione: 18.04.2007 - VeMa Ultima modifica: 18.04.2007 - VeMa



Calibration gas cylinders¹

Concentration	Serial Number	Date of expire	GAS	
Air	010212	26/01/2022	AIR	
99,9 PPM	084549	26/03/2018	CH4	
996 PPM	126837	26/01/2018	CH4	
2,19 % VOL	011632	08/09/2019	CH4	
100 % VOL	003655	12/11/2018	CH4	

Calibration results	:	POSITIVE	Next scheduled calibration	:	30/10/2018
Calibration date	;	30/10/2017	Calibration supervisor	:	Randi Mirco

Nordi 5

¹ The certificate of the gases could be downloaded at the following address http://www.huberg.com/certificati

HUBERG S.a.s.- Huber Günther & C. • Gas and Water Safety Systems • Via Copernico, 18 • T-39100 Bolzano Tel: (+39) 0471 / 936011 • Fax: (+39) 0471 / 205037 • E-Mail: huberg@huberg.com • Web: http://www.huberg.com Register of commerce 8Z, tax and VAT no.: 01279940215

Instrument	GEM2000
Serial No.	GM13360
Sensors	CH4,CO2,O2,H2S,CO



Air-Met Scientific Pty Ltd 1300 137 067

Item	Test	Pass	Comments
Battery	Charge Condition	✓	
	Fuses	1	
	Capacity	1	
	Recharge OK?	1	
Switch/keypad	Operation	1	
Display	Intensity	1	
	Operation (segments)	1	
Pump	Operation	1	
	Filter	1	
	Flow	1	
	Valves, Diaphragm	1	
PCB	Condition	1	
Connectors	Condition	1	
Sensor	CH4	✓	
	CO2	1	
	02	✓	
	H2S	✓	
	CO	1	
Alarms	Settings	✓	
Software	Version		
Datalogger	Operation		
Download	Operation		
Other tests:			

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Calibration gas and	Certified	Gas bottle	Instrument Reading
		concentration		Lot No	
02		20.9% Vol O2		Fresh Air	20.8% O2
CH4		60% CH4	NATA	SY136	59.7% CH4
CO2		40% CO2	NATA	SY136	39.8% CO2
CO		95ppm CO	NATA	SY174	97ppm CO
H2S		25ppm H2S	NATA	SY174	25ppm H2S
Calibration Dor	ne Bv:	Snahlia	Sara	nh Lian	

Calibration Done By:

Sarah Lian

Calibration date: 4/10/2018

Next calibration due: 2/04/2019 4/10/2018

Gas Calibration Certificate



22/10/2018

Instrument	GA5000
Serial No.	G500791
Sensors	CH4, CO2, O2, CO, H2S

Air-Met Scientific Pty Ltd 1300 137 067

ltem	Test	Pass	Comments
Battery	Charge Condition	1	
	Fuses	1	
	Capacity	1	
	Recharge OK?	1	
Switch/keypad	Operation	1	
Display	Intensity	1	
	Operation (segments)	1	
Grill Filter	Condition	1	
	Seal	1	
Pump	Operation	1	
	Filter	1	
	Flow	1	
	Valves, Diaphragm	1	
PCB	Condition	1	
Connectors	Condition	✓	
Sensor	02	✓	
	CH4	1	
	CO2	1	
	H2S	1	
	CO	✓	
Alarms	Beeper	✓	
	Settings	✓	
Software	Version	-	
Datalogger	Operation		
Download	Operation		
Other tests:			

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Calibration gas and	Certified	Gas bottle No	Instrument Reading
		concentration			5
02		20.90%		Fresh Air	20.80%
H2S		25ppm H2S	NATA	SY174	24ppm
СО		95ppm CO	NATA	SY174	94ppm
CH4		60% Vol CH4	NATA	SY136	59.9%
CO2		40%Vol CO2	NATA	SY136	39.7%

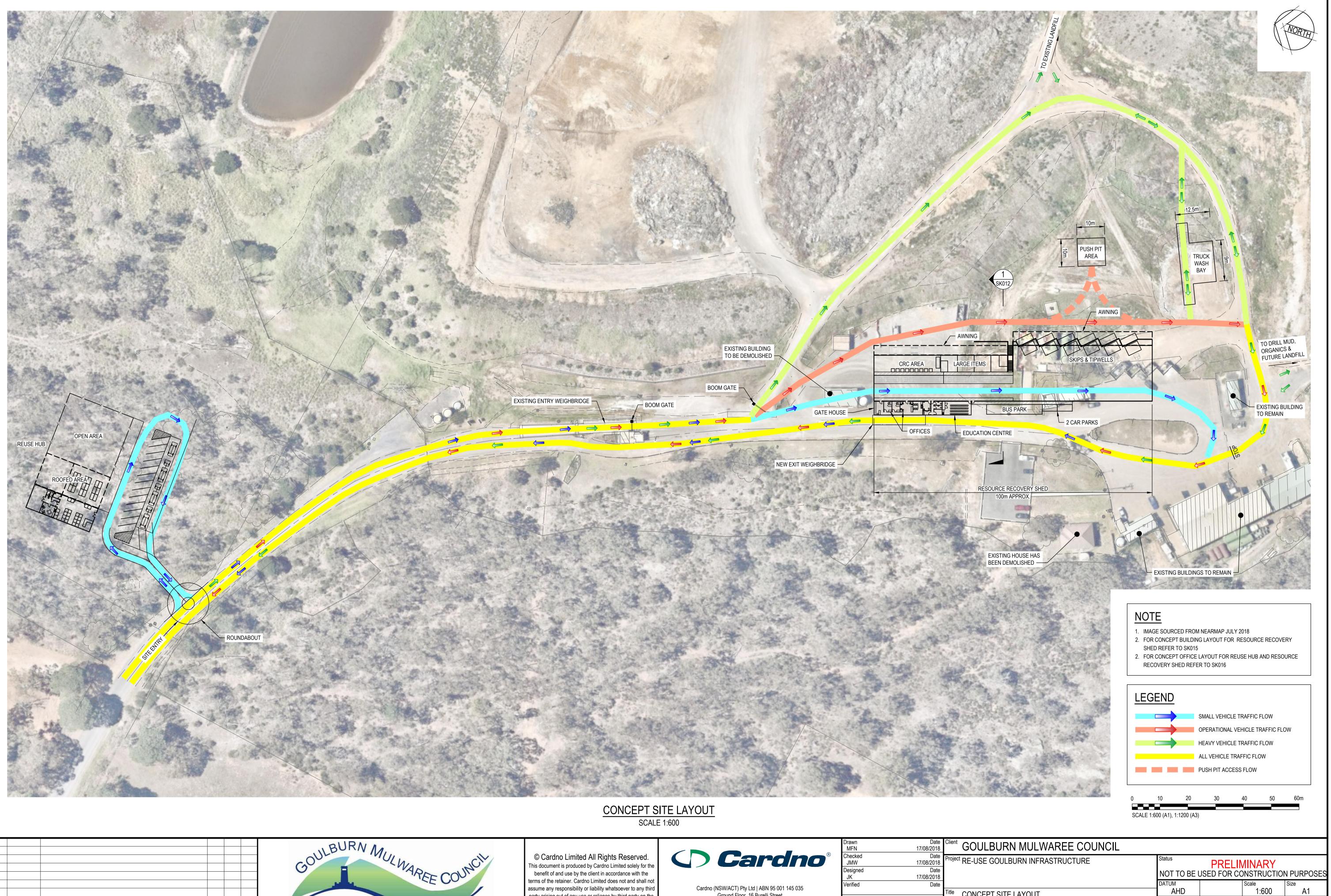
Sarah Lian

Calibration date:

Next calibration due:

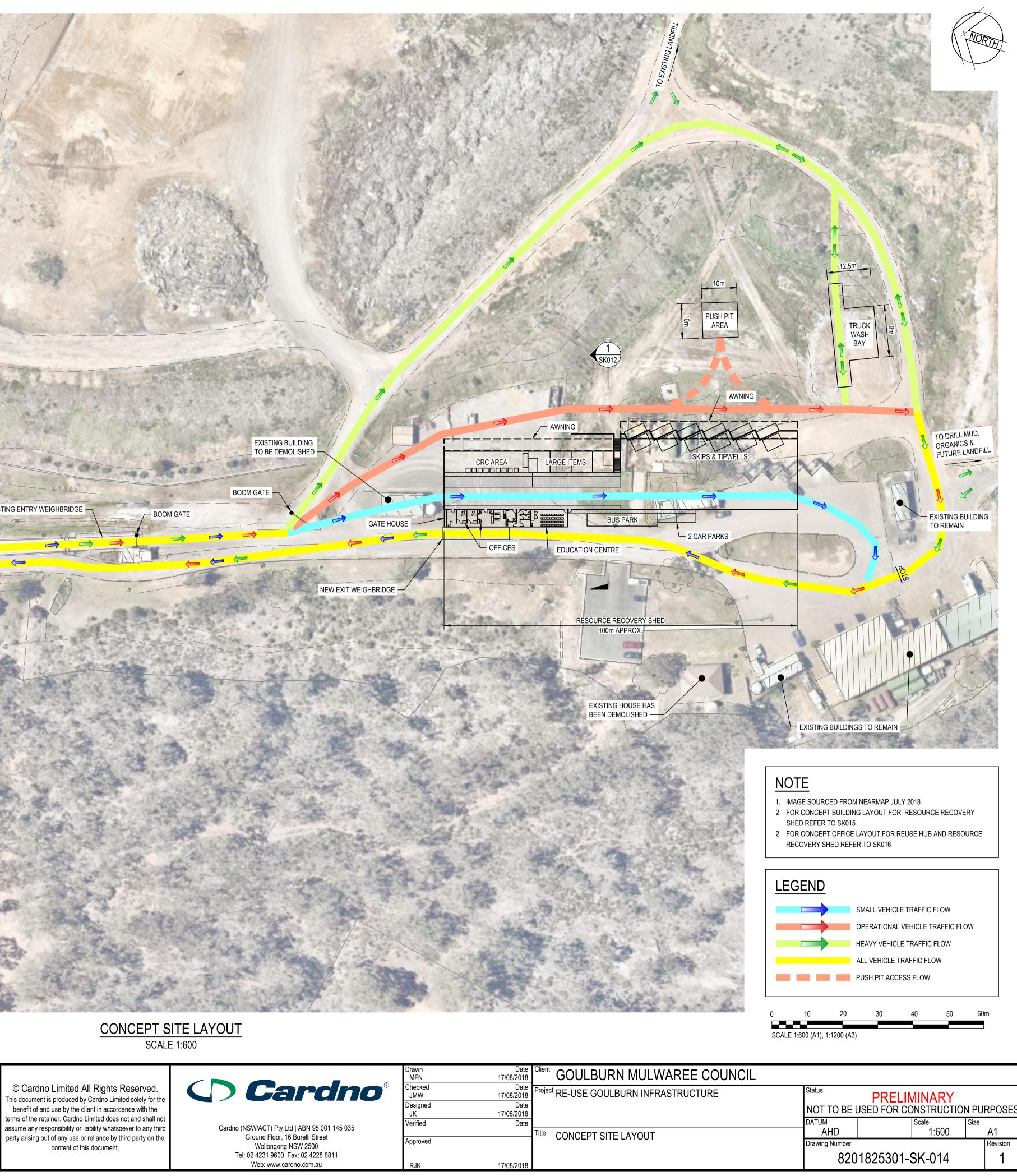
22/10/2018 20/04/2019



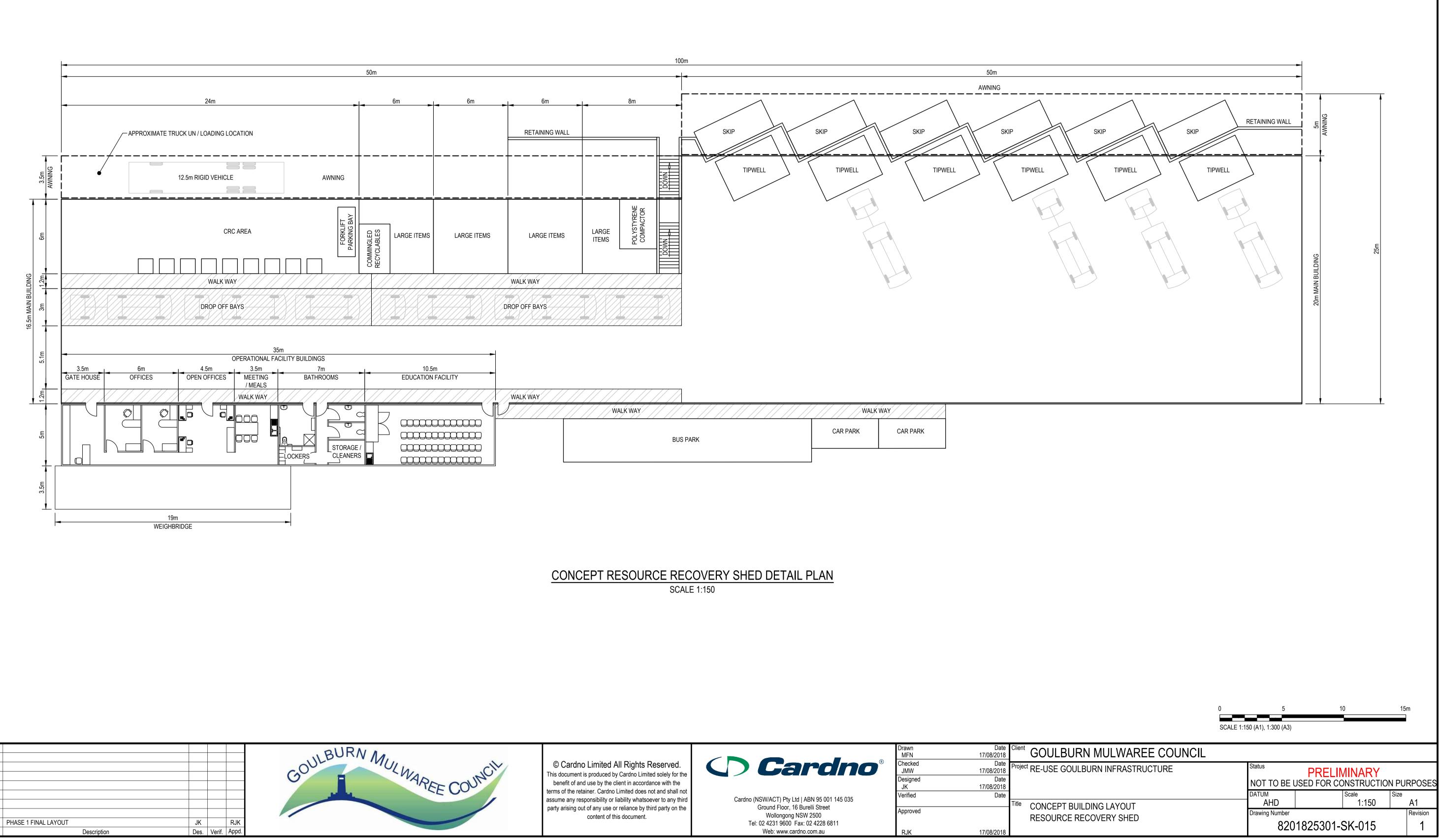


1	17/08/2018	PHASE 1 FINAL LAYOUT	JK		RJK
Rev.	Date	Description	Des.	Verif.	Appd





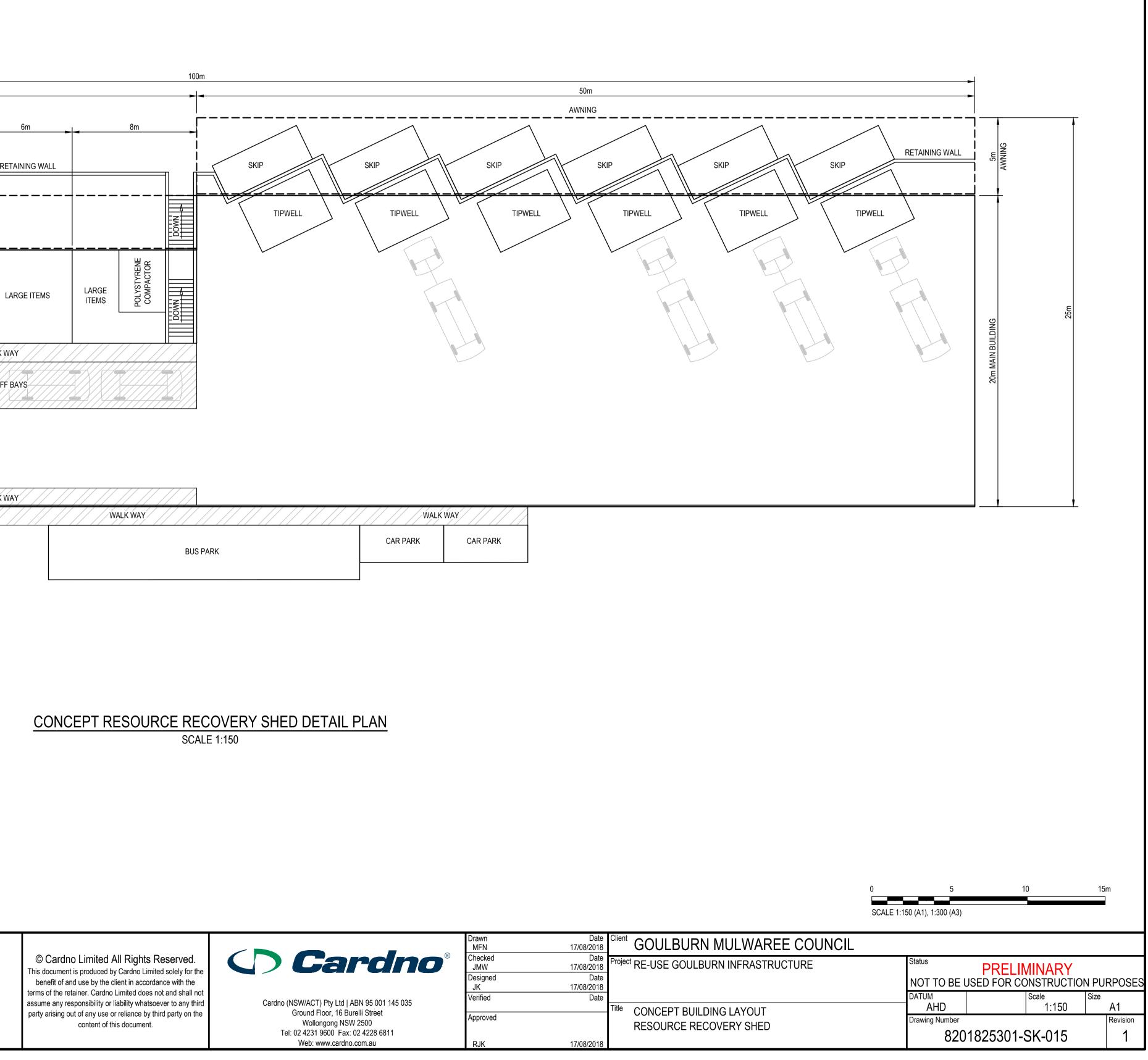
					11 03
	DATUM		Scale	Size	
YOUT	AHD		1:600		A1
	Drawing Number				Revisio
	820	1825301-	SK-014		1



1	17/08/2018	PHASE 1 FINAL LAYOUT	JK		RJK
Rev.	Date	Description	Des.	Verif.	Appd.



WALK WAY				
0/////	WALK WAY	WALK	WAY	
	BUS PARK	CAR PARK	CAR PARK	





Re-Use Goulburn

CONCEPT QUANTITY SURVEYOR ESTIMATE





29 August 2019

Cardno NSW/ACT Pty Ltd Ground Floor, 16 Burelli Street WOLLONGONG NSW 2500

ATTENTION: ROBERT KEMPTON

RE: GOULBURN REUSE FACILITY CONCEPT COST ESTIMATE – Revision 1

As per your request dated 20th August 2019, Muller Partnership has prepared an update to the Concept Cost Estimate for the above project and enclose our report.

Please note the attached Concept Cost Estimate has been prepared based on the current preliminary information and should be updated if/when additional information becomes available. Please take note of our Assumptions (Item 4.0), Exclusions (Item 5.0) and Value Engineering Items (Item 6.0).

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

Yours faithfully MULLER PARTNERSHIP

PETER DALLY DIRECTOR PD:FW 18394 - Goulburn Reuse Facility Concept Estimate R1



Newcastle | Sydney | Melbourne

GOULBURN REUSE FACILITY CONCEPT COST ESTIMATE *Revision 1*

29 AUGUST 2019



Disclaimer

Muller Partnership have prepared this report in part on the basis of information supplied to it in the ordinary course of business of Cardno NSW/ACT 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 Cardno NSW/ACT 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 Cardno NSW/ACT 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 Cardno NSW/ACT Pty Ltd require additional items or areas of assessment, these should be specifically requested and will be actioned as agreed between the parties.

The construction costs are current as at the date of this assessment only. The values assessed herein may change significantly and unexpectedly over a relatively short period (including as a result of general market movements or factors specific to the particular property). We do not accept liability for losses arising from such subsequent changes in values.

Document history & status

Revision	Date	Description	Ву	Review	Approved
0	19/12/2018	Concept Cost Estimate	CM/TK	FW	PD
1	29/08/2019	Concept Cost Estimate – VE Update	FW	PD	PD



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Glossary of Key Terms

 Construction Contingency	The Construction Contingency is a contingency allowance made for unknowns that may occur during construction due to latent conditions or issues with the documentation.
Design Development Allowance	The Design Development Allowance is a contingency included within our estimate to allow for unknown costs associated with progressing the development from the initial concept through until the 'For Construction'. At the time of For Construction documentation this contingency should be 0% as the entire project will have been designed and costed accordingly.
Preliminaries & Margin	The Preliminaries and Margin Allowance is an allowance for the builders' 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

Muller Partnership has been engaged to complete a Concept Cost Estimate for the proposed works at 100 Sinclair Street, Goulburn.

The works involve the construction of a new reuse hub and community recycling centre, including external works and services.

A value engineering exercise has been performed, resulting in a saving of circa \$765,000 from the project cost. The Total Project Cost at August 2019 rates is **\$7,224,000** seperately advised on 23rd August 2019, which includes a 5% construction and 5% design contingency and excludes GST.

Please refer to Section 6.0 – 'Value Engineering Items' for further details on value engineered items and Appendix A – 'Estimate Breakdown' for further estimate details.

Key Notes & Actions

- The Concept Cost Estimate should be considered as indicative only due to the preliminary nature of the design.
- Further design development is needed from all design consultants in order to test scope and allowances.
- The design for a push pit is now removed, the works will no longer be within the project scope.
- The remediation of landscaping will be completed at a later date.
- The refurbishment of existing amenities will be completed as a separate project (not within this project scope).

Cost Overview

A high-level cost summary of the above project is provided below:

CONCEPT COST ESTIMATE - GOULBURN REUSE FACILITY					
ITEM	COST (\$)				
Demolition & Site Preparation for Main Site	113,000				
Re-use Hub	936,000				
Resource Recovery Shed	3,633,000				
External Works & Services	959,000				
Site Stormwater System Upgrades	57,000				
Site Remediation Landscaping	EXCL				
Design Development Allowance	285,000				
Preliminaries, Overheads and Profit	897,000				
TOTAL CONSTRUCTION COST (Excl GST)	6,880,000				
Identified risk Items	EXCL				
Construction Contingency	344,000				
Professional & Consultant Fees	EXCL				
Authority Fees & Contributions	EXCL				
Furniture, Fitments & Equipment	EXCL				
Temporary Accomodation	EXCL				
TOTAL PROJECT COST (Excl GST)	7,224,000				
\$/m ² Re-use Hub Building Works	1,584				
\$/m ² Resource Recovery Shed Building Works	1,622				
\$/m ² GFA Total Construction Works Cost	2,430				
\$/m ² GFA Total Project Cost	2,552				

Note: Above costs are rounded to nearest thousand.

We note the attached estimate is for construction costs only and does not allow for items such as property acquisition, finance costs, escalation, design & documentation or planning & authority fees & charges or Client Side Project Management. The above costs are rounded to the nearest thousand. Please refer to the Qualification, Assumptions and Exclusions sections of this report for further details.



2.0 METHODOLOGY & INFO USED

1. The Concept Cost Estimate is presented in Elemental format based around the scope.

- 2. The Concept Cost Estimate has been in part benchmarked against projects of a similar nature.
- 3. All rates used within our Concept Cost Estimate are gathered from our inhouse databases as well as being constructed from first principles namely labour, materials and waste to reflect current market and project specific conditions.

Information used in compiling our Concept Cost Estimate includes:

Architectural drawings prepared by PRD Architects, received on the 27th November 2018:

- SK-01 A Concept Re-Use Hub Site & Offices Plan (Dated 20/11/18).
- SK-02 A Perspectives View (Dated 20/11/18).
- SK-03 A Sections (Dated 20/11/18).
- DA-00 Site Plan (Dated 20/11/18).
- DA-01 A Resource Recovery Shed (Dated 20/11/18).
- DA-02 A Elevations (Dated 20/11/18).
- DA-03 A Resource Recover Sections (Dated 20/11/18).
- DA-04 3D (Dated 20/11/18).
- DA-05 3D (Dated 20/11/18).
- DA-06 3D (Dated 20/11/18).
- DA-07 Detail Section (Dated 20/11/18).

Structural drawing prepared by N.Wagstaff, received on the 27th November 2018:

 ST-SK001-1 – Resource Recovery Centre – Preliminary Structural Framing Plan (Dated 23/11/18).

Services drawings prepared by EWFW, received on the 27th November 2018:

- MSK-001 Spatial Requirements Sketch (Dated 23/11/18).
- EWFW have used architectural drawing SK019 Concept Building Layouts Reuse Hub and Offices drawings for Mechanical Services – (Dated 23/11/18).
- SK019 Concept Building Layouts Reuse Hub & Offices R1 (Dated 9/11/18).
- SK018 Concept Building Layouts Resource Recovery Shed and Offices R1 (Dated 9/11/18).
- HSK-Hydraulic Spatials Rev 01 Resource Recovery Shed Hydraulic Spatial Requirements (Dated 22/11/18).

 HSK-Hydraulic Spatials – Rev 01 – Reuse Hub Offices Hydraulic Spatial Requirements (Dated 22/11/18).

- HSK-Hydraulic Spatials Rev 01 Site Plan Hydraulic Spatial Requirements (Dated 22/11/18).
- FSK-Fire Spatials Rev 01 Fire Spatials (Dated 26/11/18).
- EWFW have used architectural drawing SK019- Concept Building Layouts Reuse Hub and Offices drawings for Fire Services (Dated 9/11/18).
- EWFW have used architectural drawing SK-017 Concept Site Layout for Fire Services (Dated 9/11/18).

Civil drawings prepared by Cardno, received on the 21st August 2019:

• Civil drawing set 8201825301 – DRG Revision 3 dated 6/12/2018

Other information provided by Cardno includes:

- Email from Robert Kempton dated 4/12/18 regarding structural design.
- Email from Robert Kempton dated 30/11/18 regarding Hydraulically operated tipping bin budget pricing.
- Email from Robert Kempton dated 29/11/18 regarding fire system requirements.
- Email from Robert Kempton dated 21/08/2019 regarding list of value engineering items.
- L5000 Landscape concept plan dated 21.08.2019 Rev 4.
- Resource recovery shed main slab design options (Options 1 & 2).

3.0 AREA SUMMARY

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A summary of the areas are as follows:

AREAS SUMMARY						
FUNCTIONAL AREAS	FECA	UCA	GFA			
Reuse Hub	217	374	591			
Resource Recovery Shed	171	2,069	2,240			
TOTAL	388	2,443	2,831			

Note: Areas (m²) are measured as per the definitions stated in the AIQS Book of Areas.

- FECA = Fully Enclosed Covered Area
- UCA = Unenclosed Covered Area
- GFA = Gross Floor Area as defined by AIQS.

4.0 ASSUMPTIONS

The following assumptions & qualifications have been made during the preparation of this report:

- 1. The Concept Cost Estimate should be considered as indicative only due to the preliminary nature of the design.
- 2. Works are to be priced competitively by the appointed contractor and their sub-contractors.
- 3. Contractor will have full, uninterrupted access to site & will undertake works during normal working hours.
- 4. Refer to attached estimate for details of assumptions.
- 5. Assumed that required fill materials are sourced for free and stored on site prior to construction.
- 6. 5000L underground rainwater tanks to both re-use and resource recovery shed facilities.
- 7. Assume culverts to end of all swales.
- 8. 5% construction contingency is applied.
- 9. 5% design development allowance is applied.
- 10.3% Builders works in connection to services is applied.
- 11.15% preliminaries, overheads and margin is applied.

Reuse Hub:

- 12. Assume pad & strip footing foundations.
- 13. Roof plumbing requirements assumed.
- 14. Skylights included over office roof.
- 15. Assumed manual operation to entry double door.
- 16. Internal floor finishes assumed as vinyl, tiling and concrete seal to areas as suitable (no details provided).
- 17. Wall and ceiling finishes assumed, not specified.
- 18. UPS [required for control/ fire systems].
- 19. Statutory and directional signage required.



Resource Recovery Shed:

20. Allowed for substructure design based on Option 1 of Drawing DA-RRS-01-C provided by Cardno on 21st August 2019.

- 21. Roof plumbing requirements assumed.
- 22. Allowance for use of double glazing and mirrored tint to all windows.
- 23. Internal floor finishes assumed as vinyl, tiling and concrete seal to areas as suitable (no details provided).
- 24. Wall and ceiling finishes assumed, not specified.
- 25. UPS [required for control/ fire systems].
- 26. Ducted air- conditioning included to education centre.
- 27. Allowance for switch room and main comms room based on mechanical drawings- inclusion of 2 hour fire rated walls and doors.
- 28. Allowance included for CRC hanging signage from steel RHS based on picture in design guidelines.
- 29. Weighbridge details based on Robert Kempton advice, including control & communications system.
- 30. Statutory and directional signage required.



5.0 EXCLUSIONS

Within the following Concept Cost Estimate the acronym 'EXCL' means work that has **not** been included. We note the following exclusions:

- 1. Please refer to attached estimate for details of exclusions.
- 2. Clear existing building of loose furniture, fittings, chattels and equipment.
- 3. Services diversions.
- 4. Excavation into rock.
- 5. Tip fees.
- 6. Temporary & staging works.
- 7. Wet fire sprinkler installation.
- 8. Allowance to remove hazardous materials & remediation.
- 9. Piling works to reuse hub.
- 10. Double glazing to windows of reuse hub.
- 11. Mirror tint to windows of reuse hub.
- 12. Reuse of rainwater for toilet flushing.
- 13. Skip bins
- 14. Waste collection receptacles in CRC
- 15. GMC IS connection
- 16. Forklifts.
- 17. Lift services.
- 18. Substations.
- 19. On-site detention tanks.
- 20. Remediation of landscaping (to be completed at a later date).
- 21. The refurbishment of existing amenities (completed as a separate project, not within this project scope).
- 22. Future proofing site for future development.
- 23. Push pit now excluded from design.
- 24. Areas outside of concept drawings that might be within the site boundary.
- 25. Escalation and changes in market conditions.

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- 26. Consultant fees.
- 27. Professional & Authority fees.
- 28. Works outside the site boundary.
- 29. Delay costs, legal fees, finance and land costs.

30. GST.



6.0 VALUE ENGINEERING ITEMS



Approved Value Engineering Item	Associated QS estimate items	Impact on QS estimate items	Comment / Drawing Sheet Reference	Muller Partnership Cost Saving (\$ Excl. GST)
(2) Change dirty swale to bund type design	5.1, 5.2, 5.3	Reduced construction cost as design changed to cheaper earthen bund design (so no need to cut, assume that fill for bund is free)	See civil dwg sheets CI-1302, CI-1309	\$54k
(3) Revise slab thickness / foundation requirements at wash bay now that we don't need to design for Tana	4.2.3.2.2, 4.2.3.2.3	Potential reduction in thickness of slab	Assume similar design as per updated slab design options for CRC/Resource Recovery Shed	If wash bay slab is to adopt Option 1 slab design the cost will increase significantly. Confirmation of either 160mm thick or 280mm slab thickness and specification before a cost saving can be implemented. No change in cost, cost to remain.
(6) Revise pavement design for back of house for Resource Recovery Shed to hardstand instead of concrete slab (except for where RORO bins are)	4.2.1.5	Change in area of concrete slab pavement to hardstand instead	See civil dwg sheets CI-1506 and CI-1508, pavement type 2	\$125k
(8) Revise pavement type for access road and parking at Re Use Hub (looking at 25mm AC10 rather than 50mm AC14)	4.2.1.2	Lower spec 25mm AC10 to be used on portion of area where only light vehicles will travel and park	See civil dwg sheets CI-1506 and CI-1508, pavement type 4	\$191k
(15) Precast pits to be used for stormwater system	?	Reduction of any allowance for cast in situ stormwater pits (couldn't see any noted in QS estimate)	Amend rate as applicable in QS estimate	Allowance sufficient for new specification
(16) Use of HDPE stormwater piping rather than concrete piping	4.1.1.5	Slight reduction in cost due to easier installation? (not sure if there will be much saving on current provision for this item)	Amend rate as applicable in QS estimate	Allowance sufficient for new specification
(17) Change retaining wall to earthen batter at the ramp area at the back of house for CRC	3.25.5.2	Reduction in cost due to elimination of section of retaining wall where roadway ramps down behind the CRC (note that retaining wall still required where stainway and sawtooth bays for RORO bins)	See civil dwg sheets CI-1251 and CI-1252	\$2k
(18) Revise slab thickness / foundation requirements for CRC/Resource Recovery Shed as don't need to design for regular heavy vehicle traffic	3.3.5	Potential reduction in slab thickness / leaner design	Refer revised structural slab design, please choose which option you think will be cheapest to construct (we weren't sure so provided two design options)	\$142k
(30) Remove refurb of existing amenities, as being done currently as separate project	4.2.3.1	Removal of provision for refurbishment of existing site amenities	Remove line item from QS estimate	\$20k
(31) Removal of push pit from design (will send people up to land fill site instead, as per current operations)	1.2.6, 4.2.3.3 (all items)	Reduction in amount of fill required, removal of provision for push pit	Remove line items from QS estimate as no longer required. Refer civil dwg sheets CI-1202	\$94k
(32) Removal of remediation landscaping from project scope (to be done at a later date)	6.1	Removal of provision for site remediation landscaping	Refer attached updated landscape plan which shows revised design, noting removed remediation landscaping	\$137k

Total Cost Saving (excl. GST) \$765,000

Updated Construction Cost (excl. GST)	\$5,697,775
Above costs does not include the followings:	
Design Development Allowance (5%)	\$284,889
Preliminaries & Margin (15%)	\$897,400
Construction Contingency (5%)	\$344,004
Identified Risk Items	EXCL
Professional Fees	EXCL
Consultant Fees	EXCL
Authority and Contributions	EXCL
Escalation	EXCL
GST	EXCL
Updated Total Project Cost (excl. GST)	\$7,224,068

APPENDIX A - ESTIMATE BREAKDOWN



		Quantity	Unit	Rate	Total
1	DEMOLITION & SITE PREPARATION				\$113,124.00
2	REUSE HUB				\$935,701.00
3	RESOURCE RECOVERY SHED				\$3,633,050.00
4	EXTERNAL WORKS AND SERVICES				\$959,340.00
5	SITE STORMWATER SYSTEM UPGRADES				\$56,560.00
6	SITE REMEDIATION LANDSCAPING				
7	DESIGN DEVEOPMENT ALLOWANCE				\$284,889.00
8	PRELIMINARIES & MARGIN				\$897,400.00
9	CONSTRUCTION CONTINGENCY				\$344,004.00
10	IDENTIFIED RISK ITEMS				
11	PROFESSIONAL FEES				
12	CONSULTANT FEES				
13	AUTHORITY FEES AND CONTRIBUTIONS				
14	ESCALATION				
				Subtotal	\$7,224,068.00
				Adjustment	\$0.00

Total

\$7,224,068.00

		Quantity	Unit	Rate	Total
1	DEMOLITION & SITE PREPARATION				\$113,124.00
1.1	DEMOLITION & ALTERATIONS				\$45,600.00
1.1.1	Removal of existing FF&E, personal effects, equipment, etc.	1	Item		EXCL
1.1.2	Removal of existing buildings & e structure	538	m2	\$60.00	\$32,280.00
1.1.3	Removal of existing pavement	333	m2	\$40.00	\$13,320.00
1.1.4	Allowance to remove hazardous materials & decontamination	1	Item		EXCL
1.2	SITE PREPARATION				\$67,524.00
1.2.3	services diversions	1	Item		EXCL
1.2.4	Allowance for site clearing and levelling	6,532	m2	\$2.00	\$13,064.00
1.2.5	Proposed cut	1,570	m3	\$12.00	\$18,840.00
1.2.6	Proposed fill to Resource Recovery Shed assumed taken from site within 1 km (as per Cardno instruction it has been assumed that all fill is sourced for free)	2,932	m3	\$10.00	\$29,320.00
1.2.7	Remove existing trees	6	No.	\$300.00	\$1,800.00
1.2.8	Maintatin and protect existing trees	9	No.	\$500.00	\$4,500.00
1.2.9	Allowance for excavation into rock	1	Item		EXCL
1.2.10	Tip fees for GSW	1	Item		EXCL
1.2.11	Temporary & staging works	1	Item		EXCL
2	REUSE HUB				\$935,701.00
2.1	DEMOLITION & ALTERATIONS				
2.1.1	Nil Demolition & Alteration works	1	note		NOTED
2.2	SITE PREPARATION				\$101,624.00
2.2.1	Allowance for site clearing and levelling	2,652	m2	\$2.00	\$5,304.00
2.2.2	Proposed cut	2,360	m3	\$12.00	\$28,320.00
2.2.3	Proposed fill to Reuse Hub assumed taken from site within 1 km (as per Cardno instruction it has been assumed that all fill is sourced for free)	6,800	m3	\$10.00	\$68,000.00
2.3	SUBSTRUCTURE				\$63,855.00
2.3.1	Allowance for piling	1	item		EXCL
2.3.2	Assumed pad & strip footings foundations to building	217	m2	\$40.00	\$8,680.00
2.3.3	Assumed pad foundations to covered external areas	374	m2	\$40.00	\$14,960.00
2.3.4	200mm thick assumed 32MPa concrete slab on ground with SL82 mesh, 50mm cover laid on 100mm thick compacted DGS20 subbase course on compacted subgrade	217	m2	\$125.00	\$27,125.00

18394 - Goulburn Reuse Facility Value Engineering Items - 23/8/19

	1	Quantity	Unit	Rate	Total
2.3.5	300mm thick recycled crushed concrete compacted to 98% MMD laid on compacted subgrade to 100% SMDD	374	m2	\$35.00	\$13,090.00
2.3.6	Sealer or similar as top coat to crushed concrete	1	item		EXCL
2.4	STAIRCASES				
2.4.1	Staircases	1	Item		EXCL
2.5	UPPER FLOORS				
2.5.1	Upper floors	1	Item		EXCL
2.6	COLUMNS				\$47,200.00
2.6.1	Allowance for steel columns (no structural detail as yet)	590	m2	\$80.00	\$47,200.00
2.7	ROOF				\$153,060.00
2.7.1	Roof to reuse hub	217	m2	\$280.00	\$60,760.00
2.7.2	Skylights to resue hub	5	No	\$2,500.00	\$12,500.00
2.7.3	Roof to external covered area	285	m2	\$280.00	\$79,800.00
2.8	EXTERNAL WALLS				\$132,775.00
2.8.1	Orange highlighted finish on perspective are assumed to be Colorbond as per roof sheeting		Note		NOTED
2.8.2	Metal Colorbond clad walls to match roof sheeting (grey) with metal stud framing / RHS, girts and sisalation	565	m2	\$235.00	\$132,775.00
2.9	WINDOWS & EXTERNAL DOORS				\$42,900.00
2.9.1	Doors				\$19,500.00
2.9.1.1	Manually operated glazed hinged double main entry door including aluminium framing and all hardware and fixings complete	1	pr	\$5,000.00	\$5,000.00
2.9.1.2	Manually operated double door comprising 2 No. equal leaves in metal clad finish to match wall but finish not to be flush set with wall	1	pr	\$4,500.00	\$4,500.00
2.9.1.3	Assumed 4225mm wide x 2400mm high roller doors	2	No	\$5,000.00	\$10,000.00
2.9.2	Windows				\$23,400.00
2.9.2.1	Fixed glazed external wall	26	m2	\$450.00	\$11,700.00
2.9.2.2	Fixed glazed window comprizing 4 No. equal horizontal panels	19	m2	\$450.00	\$8,550.00
2.9.2.3	1200mm x 2400mm wide Glazed window comprising 1 No. top hung fixed glazed panel and 1 No. glazed vertically sliding bottom panel aluminium framing and all hardware and fixings complete	3	m2	\$450.00	\$1,350.00

		Quantity	Unit	Rate	Total
2.9.2.4	1600mm x 2400mm wide Glazed window comprising 1 No. fixed glazed panel and 1 No. glazed horizontally sliding panel aluminium framing and all hardware and fixings complete	4	m2	\$450.00	\$1,800.00
2.10	INTERNAL WALLS				\$64,725.00
2.10.1	3000 high stud wall comprising 64mm thick metal stud, insulation and plasterboard layer to both sides	61	m2	\$125.00	\$7,625.00
2.10.2	3000 high stud wall comprising 64mm thick metal stud, insulation and plasterboard layer to one side and water resistant plasterboard and including tiled skirting to other side complete	25	m2	\$125.00	\$3,125.00
2.10.3	3000 high single stud wall comprising 64 thick stud, insulation and water resistant plasterboard both sides	25	m2	\$125.00	\$3,125.00
2.10.4	Lining to perimeter of external wall				\$50,850.00
2.10.4.1	Partition lining to internal side of external wall	565	m2	\$90.00	\$50,850.00
2.11	INTERNAL SCREENS & BORROWED LIG	GHTS			\$900.00
2.11.1	Vision panel glass [assume 900 high]	2	m2	\$450.00	\$900.00
2.12	INTERNAL DOORS				\$6,200.00
2.12.1	2100m high x 770mm wide solid core timber door including all hardware and framing complete to unisex WCs and store	3	No.	\$850.00	\$2,550.00
2.12.2	2100m high x 930mm wide sliding cavity timber door to Accessible WC	1	No.	\$1,000.00	\$1,000.00
2.12.3	2100m high x 980mm wide solid core timber door including all hardware and framing complete to office/kitchenette	1	No	\$900.00	\$900.00
2.12.4	2100m high x 1760mm wide solid core timber double door comprising 2 No. equal leaves and all hardware and framing complete	1	pr	\$1,750.00	\$1,750.00
2.13	WALL FINISHES				\$9,336.00
2.13.1	Painting to internal walls	758	m2	\$12.00	\$9,096.00
2.13.2	600mm high tiled kitchen splashback	2	m2	\$120.00	\$240.00
2.14	FLOOR FINISHES				\$19,980.00
2.14.1	Internal				\$19,980.00
2.14.1.1	Tiling to amenities	14	m2	\$120.00	\$1,680.00
2.14.1.2	E/O for waterproofing to amenities area	14	m2		EXCL
2.14.1.3	Vinyl to Front of HouseOffice/Kitchenette and Corridor	156	m2	\$90.00	\$14,040.00
2.14.1.4	Back of House- Concrete seal finish	45	m2	\$10.00	\$450.00
2.14.1.5	Tiled skirting to amenities	24	m	\$40.00	\$960.00

		Quantity	Unit	Rate	Total
2.14.1.6	Skirting	114	m	\$25.00	\$2,850.00
2.15	CEILING FINISHES				\$23,465.00
2.15.1	Internal				\$20,615.00
2.15.1.1	Plasterboard ceiling square set to operimeter	217	m2	\$80.00	\$17,360.00
2.15.1.2	Bulkheads	1	item		EXCL
2.15.1.3	Paint to internal plasterboard ceilings	217	m2	\$15.00	\$3,255.00
2.15.2	External				\$2,850.00
2.15.2.1	External roof FC soffit	285	m2		EXCL
2.15.2.2	Anti-pigeon lining ceiling	285	m2	\$10.00	\$2,850.00
2.16	JOINERY & METALWORK				\$17,650.00
2.16.1	Joinery				\$14,500.00
2.16.1.1	2900 long x 600 deep kitchenette bench comprising laminate benchtop and under bench cupboards and shelving complete	1	No	\$5,000.00	\$5,000.00
2.16.1.2	3000 long overall x 1000 deep 'L- Shaped' sales counter	1	No	\$5,000.00	\$5,000.00
2.16.1.3	Lockable tool storage unit to workshop	1	No	\$500.00	\$500.00
2.16.1.4	Workbench to workshop	1	No	\$4,000.00	\$4,000.00
2.16.2	Metalwork				\$3,150.00
2.16.2.1	Grab rails to accessible toilet (set)	1	No	\$1,050.00	\$1,050.00
2.16.2.2	Toilet roll holder	3	No	\$50.00	\$150.00
2.16.2.3	Soap dispenser	3	No	\$150.00	\$450.00
2.16.2.4	Statutory & directional signage	1	Item	\$1,500.00	\$1,500.00
2.17	FURNITURE, FITTINGS & EQUIPMENT				\$51,650.00
2.17.1	Forklifts in back of house area	1	Item		EXCL
2.17.2	Kitchen equipment				\$3,550.00
2.17.2.1	Fridge	1	No.	\$2,500.00	\$2,500.00
2.17.2.2	Toaster	1	No.	\$100.00	\$100.00
2.17.2.3	Kettle	1	No.	\$100.00	\$100.00
2.17.2.4	Small coffee machine	1	No.	\$250.00	\$250.00
2.17.2.5	Microwave	1	No.	\$500.00	\$500.00
2.17.2.6	Bins	2	No.	\$50.00	\$100.00
2.17.3	Loose Furniture				\$48,100.00
2.17.3.1	Safe for cash	1	No.	\$800.00	\$800.00
2.17.3.2	Pallet type racking 1200 x 1200mm stacked 2 high (ne2400mm)	46	No	\$900.00	\$41,400.00

18394 - Goulburn Reuse Facility Value Engineering Items - 23/8/19

		Quantity	Unit	Rate	Total
2.17.3.3	8000 long x 600 deep U-shaped office desk fixed to wall	1	No	\$2,400.00	\$2,400.00
2.17.3.4	Table to office/ kitchenette	1	No.	\$1,500.00	\$1,500.00
2.17.3.5	Chairs to kitchenette table	4	No.	\$250.00	\$1,000.00
2.17.3.6	Chairs to desk in office/kitchenette	2	No.	\$500.00	\$1,000.00
2.18	HYDRAULIC SERVICES				\$46,325.00
2.18.1	Hydraulic Fixtures, incl. Supply, Was	te, Taps, Traps	, etc.		\$46,325.00
2.18.1.1	General provision	505	m2	\$25.00	\$12,625.00
2.18.1.2	Toilet suites	2	No.	\$3,500.00	\$7,000.00
2.18.1.3	Accessible toilet suite	1	No	\$4,500.00	\$4,500.00
2.18.1.4	Hand wash basins	3	No.	\$3,500.00	\$10,500.00
2.18.1.5	Kitchen sink	1	No.	\$3,500.00	\$3,500.00
2.18.1.6	Isolated floor wastes	3	No.	\$400.00	\$1,200.00
2.18.1.7	Hot water tank c/w 600mm x 600mm	1	each	\$5,000.00	\$5,000.00
2.18.1.8	ZIP boiling water unit in kitchen cupboard	1	No.	\$2,000.00	\$2,000.00
2.18.1.9	Hose tap	0	Item		EXCL
2.19	MECHANICAL SERVICES				\$18,690.00
2.19.1	Mechanical ventilation to amenities areas, back of house and corridor [Heat recovery ventilation]	3	No	\$350.00	\$1,050.00
2.19.2	HVAC (Reverse cycle) air-conditioning system to office area/ lunch room and inside front of house wall mounted	147	m2	\$120.00	\$17,640.00
2.20	ELECTRICAL SERVICES				\$62,060.00
2.20.1	All electrical equipment to have lockable isolation switches				
2.20.2	Electrical to Resue hub	217	m2	\$180.00	\$39,060.00
2.20.3	Electrical to covered external areas	285	m2	\$60.00	\$17,100.00
2.20.4	Security system based on GFA	590	m2	\$10.00	\$5,900.00
2.21	FIRE SERVICES				\$14,625.00
2.21.1	Dry fire protection system	505	m2	\$25.00	\$12,625.00
2.21.2	Wall mounted extinguishers	1	item	\$2,000.00	\$2,000.00
2.21.3	Wet fire sprinkler	1	item		EXCL
2.22	LIFT SERVICES				
2.22.1	Lift services	1	Item		EXCL
2.23	BUILDERS WORK IN CONNECTION WI	TH SERVICES			\$4,251.00
2.23.1	BWIC (3%)	1	Item	\$4,251.00	\$4,251.00
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18394 - Goulburn Reuse Facility Value Engineering Items - 23/8/19

		Quantity	Unit	Rate	Total
2.24.1	5000L underground rainwater tank [Provisional]	1	No	\$10,000.00	\$10,000.00
2.25	SITE & LANDSCAPING				\$44,430.00
2.25.1	Roads, Footpaths and Paving				\$5,315.00
2.25.1.1	Concrete hardstand pavement	47	m2	\$85.00	\$3,995.00
2.25.1.2	E/O for ramped area	11	m2	\$120.00	\$1,320.00
2.25.2	Fencing and Gates				\$11,500.00
2.25.2.1	Chain mesh to perimeter as boundary fence	100	m	\$25.00	\$2,500.00
2.25.2.2	Colorbond screen separating external areas	60	m	\$100.00	\$6,000.00
2.25.2.3	Double gates to above	1	pr	\$1,800.00	\$1,800.00
2.25.2.4	Single gate to above	1	No	\$1,200.00	\$1,200.00
2.25.3	Landscaping & Improvements				\$27,615.00
2.25.3.1	Allowance for soft landscaping to the Reuse Hub	1,841	m2	\$15.00	\$27,615.00
3	RESOURCE RECOVERY SHED				\$3,633,050.00
3.1	DEMOLITION & ALTERATIONS				
3.1.1	Demolition & Site Preparation - refer to Demolition & Site Preparation trade	1	item		INCL
3.2	SITE PREPARATION				
3.2.1	Demolition & Site Preparation - refer to Demolition & Site Preparation trade	1	item		INCL
3.3	SUBSTRUCTURE				\$824,560.00
3.3.1	Allowance for 6000mm long cantilevering piles under main support columns to portal [14 No.]	85	m	\$450.00	\$38,250.00
3.3.2	Pile caps	14	No	\$1,500.00	\$21,000.00
3.3.3	Mid span support piles 3000mm long [14 No.]	42	m	\$450.00	\$18,900.00
3.3.4	Pad footing on rock	14	No	\$1,200.00	\$16,800.00
3.3.5	Resource Recovery Shed Slab - Optic	on 1			\$597,609.01
3.3.5.1	Piling rig establishment	1	Item	\$8,000.00	\$8,000.00
3.3.5.2	600mm dia. pier (average depth 2000mm)	122	m	\$380.00	\$46,360.00
3.3.5.3	Excavate OTR for ground beams	135	m3	\$80.00	\$10,800.00
3.3.5.4	Temporary support to side of excavation	514	m2	\$40.00	\$20,560.00
3.3.5.5	Concrete to slab (280/160mm thick) and attached beams to shed and office	853	m3	\$350.00	\$298,550.00
3.3.5.6	Shed Reinforcement				\$180,652.41
3.3.5.6.1	N28	4.935	t	\$2,500.00	\$12,337.24
				\$2,500.00	

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18394 - Goulburn Reuse Facility Value Engineering Items - 23/8/19

		Quantity	Unit	Rate	Total
3.3.5.6.3	N16 stirrups at 250 centres	4.134	t	\$2,500.00	\$10,334.90
3.3.5.6.4	N20 at 250 centres top and bottom	37.612	t	\$2,500.00	\$94,030.43
3.3.5.6.5	N16 at 250 centres top	12.106	t	\$2,500.00	\$30,263.78
3.3.5.6.6	N12 at 250 centres bottom	6.808	t	\$2,500.00	\$17,021.04
3.3.5.7	Office Reinforcement				\$11,386.60
3.3.5.7.1	N12 at 250 centres top and bottom	2.621	t	\$2,500.00	\$6,551.63
3.3.5.7.2	N20	1.676	t	\$2,500.00	\$4,190.01
3.3.5.7.3	N12 stirrups at 250 centres	0.258	t	\$2,500.00	\$644.96
3.3.5.8	Edge formwork 280mm deep	355	m	\$60.00	\$21,300.00
3.3.6	Proprietary gas-resistant membrane PROVISIONAL ALLOWANCE	2,640	m2	\$50.00	\$132,000.00
3.4	STAIRCASES				
3.4.1	Staircases	1	Item		INCL
3.5	UPPER FLOORS				
3.5.1	Upper floors	1	Item		EXCL
3.6	COLUMNS				\$160,527.58
3.6.1	Concrete column to one side where stabilising required assumed ne 400mm dia. [14 No.]	85	m	\$350.00	\$29,750.00
3.6.2	Steel columns supporting roof- hot-dip galvanised assumed ne 450 UB [13 No.]	14.382	t	\$7,750.00	\$111,460.83
3.6.3	Allowance for Loose and rigid connections including cap and splice plates, cleats, stiffeners etc.	2.157	t	\$7,750.00	\$16,716.75
3.6.4	Chem set fasteners allowed 4 per column	52	No.	\$50.00	\$2,600.00
3.7	ROOF				\$600,863.00
3.7.1	Portal structure				\$548,223.00
3.7.1.1	Structural Steel Framing Members				\$225,373.00
3.7.1.1.1	Steel UB ne 450mm beams - hot- dip galvanised	25.287	t	\$7,750.00	\$195,972.70
3.7.1.1.2	Allowance for Loose and rigid connections including cap and splice plates, cleats, stiffeners etc.	3.794	t	\$7,750.00	\$29,399.63
3.7.1.2	Roof Sheeting				\$287,490.00
3.7.1.2.1	Colorbond roof over portal structure	2,443	m2	\$80.00	\$195,440.00
3.7.1.2.2	Steel purlins including all bolts connections and galvanising complete	2,911	m	\$30.00	\$87,330.00
3.7.1.2.3	E/O for polycarbonate roof sheeting strip for natural light including all accessories complete	236	m2	\$20.00	\$4,720.00

18394 - Goulburn Reuse Facility Value Engineering Items - 23/8/19

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		Quantity	Unit	Rate	Total
3.7.1.3.1	Gutters including all fixings and accessories complete	104	m	\$250.00	\$26,000.00
3.7.1.3.2	Down pipes	78	m	\$120.00	\$9,360.00
3.7.2	Lower roof - Office Shed				\$44,800.00
3.7.2.1	Roof Colorbond including frame, purlins, sisiltions, flashings & gutters	160	m2	\$280.00	\$44,800.00
3.7.3	Upper Roof - Over office Shed				\$7,840.00
3.7.3.1	Roof Colorbond including frame, purlins, sisiltions, flashings & gutters	28	m2	\$280.00	\$7,840.00
3.8	EXTERNAL WALLS				\$231,340.00
3.8.1	800mm high block wall in portal/ shed	4	m2	\$240.00	\$960.00
3.8.2	Colorbond metal cladding	46	m2	\$235.00	\$10,810.00
3.8.3	2600 high block wall along internal side of portal shed	170	m2	\$240.00	\$40,800.00
3.8.4	Colorbond cladding along side adjoining office sheds	562	m2	\$235.00	\$132,070.00
3.8.5	E/O for poly-carbonate sheeting to allow natural light	36	m2	\$20.00	\$720.00
3.8.6	External weatherboard walls to office shed	209	m2	\$220.00	\$45,980.00
3.9	WINDOWS & EXTERNAL DOORS				\$34,250.00
3.9.1	Doors				\$9,550.00
3.9.1.1	Single solid core timber hinged door to office shed building	4	No	\$900.00	\$3,600.00
3.9.1.2	Solid core timber double door	1	pr	\$1,750.00	\$1,750.00
3.9.1.3	2 hour fire rated self closing double doors to main switchroom & main communications rooms	2	pr	\$2,100.00	\$4,200.00
3.9.2	Windows				\$24,700.00
3.9.2.1	Allowance for double glazed fixed windows to office shed building	7	m2	\$850.00	\$5,950.00
3.9.2.2	Allowance for double glazed awning windows to office shed building	14	m2	\$850.00	\$11,900.00
3.9.2.3	Allowance for double glazed sliding windows to office shed building	5	m2	\$850.00	\$4,250.00
3.9.2.4	Extra-over for one mirrored tint	26	m2	\$100.00	\$2,600.00
3.10	INTERNAL WALLS				\$58,185.00
3.10.1	3000 high internal partition wall comprising metal stud, insulation, plasterboard and skirting to both sides complete	65	m2	\$130.00	\$8,450.00
3.10.2	3000 high internal partition wall comprising metal stud frame, insulation, plasterboard and skirting one side and aquacheck plasterboard or similar and tiled skirting to other side	64	m2	\$135.00	\$8,640.00
3.10.3	3000 high internal partition wall comprising metal stud frame, aquacheck plasterboard or similar and tiled skirtings to both sides complete	17	m2	\$140.00	\$2,380.00

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		Quantity	Unit	Rate	Total
3.10.4	2 hour fire rated wall to main switch room and main communications room comprising three layers of 13mm fire rated plasterboard together with vapour permeable membrane fixed to steel girt framing system, fixed/erected by insitu method and	15	m2	\$220.00	\$3,300.00
3.10.5	integrated into the portal structure 800mm high brick wall in portal/ shed	5	m2	\$180.00	\$900.00
3.10.6	Colourbond metal cladding under portal structure fixed atop 800 high brick wall and extending to underside of portal roof structure	33	m2	\$285.00	\$9,405.00
3.10.7	Lining to perimeter of external wall o	of occupied sp	ace		\$25,110.00
3.10.7.1	Partition lining to internal side of external wall	279	m2	\$90.00	\$25,110.00
3.11	INTERNAL SCREENS & BORROWED LIG	HTS			
3.11.1	Nil				EXCL
3.12	INTERNAL DOORS				\$5,600.00
3.12.1	Solid core timber single hinged door including framing and all hardware and fixings complete	5	No.	\$900.00	\$4,500.00
3.12.2	Solid core timber sliding cavity door to access bathroom & shower	1	No.	\$1,100.00	\$1,100.00
3.13	WALL FINISHES				\$5,912.00
3.13.1	Painting to plasterboard walls	466	m2	\$12.00	\$5,592.00
3.13.2	Rubber lining or equivalent wall protector	4	m	\$80.00	\$320.00
3.14	FLOOR FINISHES				\$103,100.00
3.14.1	Tiling to amenities, lockers and storage areas	33	m2	\$120.00	\$3,960.00
3.14.2	Vinyl to gatehouse, meeting/meals, offices and education centre	138	m2	\$90.00	\$12,420.00
3.14.3	Industrial paint on epoxy type sealer to external hardstand portal area	2,069	m2	\$40.00	\$82,760.00
3.14.4	Skirting	132	m	\$30.00	\$3,960.00
3.15	CEILING FINISHES				\$36,935.00
3.15.1	Anti-pigeon lining ceiling	2,069	m2	\$10.00	\$20,690.00
3.15.2	Suspended plasterboard ceiling	171	m2	\$80.00	\$13,680.00
3.15.3	Painting to plasterboard ceiling	171	m2	\$15.00	\$2,565.00
3.16	JOINERY & METALWORK				\$27,900.00
3.16.1	Joinery				\$15,000.00
3.16.1.1	900 wide x 370 deep accessible bathroom vanity unit	1	No	\$1,500.00	\$1,500.00
3.16.1.2	3000 long x 1000 wide Storage cupboard in education centre comprising laminate benchtop and underbench cupboards and shelving and hardware complete	1	No	\$2,500.00	\$2,500.00

18394 - Goulburn Reuse Facility Value Engineering Items - 23/8/19

	1	Quantity	Unit	Rate	Total
3.16.1.3	2500 long x 600 wide Meals room kitchenette bench joinery comprising laminate benchtop with underbench cupboards and shelving and all hardware complete	1	No	\$4,500.00	\$4,500.00
3.16.1.4	1800 long x 600 deep kitchenette joinery bench comprising under bench cupboards, shelves and hardware complete (in education centre)	1	No	\$3,000.00	\$3,000.00
3.16.1.5	4800 long x 600 deep gatehouse storage unit joinery bench fixed against wall	1	No	\$3,500.00	\$3,500.00
3.16.2	Metalwork				\$12,900.00
3.16.2.1	Grab rails to accessible toilet	1	No.	\$1,050.00	\$1,050.00
3.16.2.2	Shower curtain & track fixed to ceiling	3	m	\$450.00	\$1,350.00
3.16.2.3	Directional and statutory signage	1	Item	\$2,500.00	\$2,500.00
3.16.2.4	Signage for CRC	1	Item	\$8,000.00	\$8,000.00
3.17	FITMENTS, FITTINGS & EQUIPMENT				\$509,150.00
3.17.1	Polystyrene compactor [Quote provided by Greenmax Intco Recycling]	1	Item	\$48,000.00	\$48,000.00
3.17.2	General waste Hydraulically operated tipping bin [As per Quote Cardno advice 30.11.18]	3	No.	\$70,000.00	\$210,000.00
3.17.3	Green waste Hydraulically operated tipping binl [As per Quote Cardno advice 30.11.18]	1	No.	\$70,000.00	\$70,000.00
3.17.4	Steel Hydraulically operated tipping bin [As per Quote Cardno advice 30.11.18]	1	No.	\$70,000.00	\$70,000.00
3.17.5	Concrete Hydraulically operated tipping binl [As per Quote Cardno advice 30.11.18]	1	No.	\$70,000.00	\$70,000.00
3.17.6	RORO bins for general waste, green waste, steel and concrete	1	Item		EXCL
3.17.7	Skip bins for comingled recyclables	1	No.		EXCL
3.17.8	30m3 skip bins adjacent tipwells	6	No.		EXCL
3.17.9	Pallet sized waste collection receptables in CRC, including spares and by-catch cabinet	9	No.		EXCL
3.17.10	Lockers	6	No	\$350.00	\$2,100.00
3.17.11	Safe for cash	1	Iem	\$800.00	\$800.00
3.17.12	Blinds to operator sliding window	5	m2	\$120.00	\$600.00
3.17.13	Coat hooks	6	No.	\$50.00	\$300.00
3.17.14	Kitchen equipment				\$3,550.00
3.17.14.1	Fridge	1	No.	\$2,500.00	\$2,500.00
3.17.14.2	Toaster	1	No.	\$100.00	\$100.00
3.17.14.3	Kettle	1	No.	\$100.00	\$100.00
3.17.14.4	Small coffee machine	1	No.	\$250.00	\$250.00
3.17.14.5	Microwave	1	No.	\$500.00	\$500.00

		Quantity	Unit	Rate	Total
3.17.14.6	Bins	2	No.	\$50.00	\$100.00
3.17.15	Loose Furniture				\$33,800.00
3.17.15.1	Meeting/meals table	1	No	\$1,000.00	\$1,000.00
3.17.15.2	Chairs to meeting/meals table	6	No	\$400.00	\$2,400.00
3.17.15.3	Office storage cupboards/credenzas	2	No	\$350.00	\$700.00
3.17.15.4	Underbench storage unit	2	No	\$500.00	\$1,000.00
3.17.15.5	Chairs to desks in offices and gatehouse	6	No	\$500.00	\$3,000.00
3.17.15.6	Chairs to education centre	52	No	\$200.00	\$10,400.00
3.17.15.7	'L shaped' office desks	2	No	\$3,000.00	\$6,000.00
3.17.15.8	Workstations to open office	3	No	\$2,500.00	\$7,500.00
3.17.15.9	1700 long x 600 deep desk in gatehouse	1	No	\$600.00	\$600.00
3.17.15.10	2000 long x 600 deep storage unit in open office	1	No	\$1,200.00	\$1,200.00
3.18	HYDRAULIC SERVICES				\$55,350.00
3.18.1	Hydraulic Fixtures, incl. Supply, Was	ste, Taps, Traps	s, etc.		\$55,350.00
3.18.1.1	General provision	175	m2	\$50.00	\$8,750.00
3.18.1.2	Toilet suites	2	No.	\$3,500.00	\$7,000.00
3.18.1.3	Accessible toilet suite	1	No	\$4,500.00	\$4,500.00
3.18.1.4	Shower	1	No	\$3,500.00	\$3,500.00
3.18.1.5	Hand wash basins	3	No.	\$3,500.00	\$10,500.00
3.18.1.6	Kitchen sink	2	No.	\$3,500.00	\$7,000.00
3.18.1.7	Cleaner's sink	1	No	\$3,500.00	\$3,500.00
3.18.1.8	Isolated floor wastes	4	No.	\$400.00	\$1,600.00
3.18.1.9	Hot water tank c/w 600mm x 600mm	1	No.	\$5,000.00	\$5,000.00
3.18.1.10	ZIP boiling water unit in kitchen cupboard	2	No.	\$2,000.00	\$4,000.00
3.18.1.11	Hose tap	0	Item		EXCL
3.18.2	Rainwater for toilet flushing	1	Item		EXCL
3.19	MECHANICAL SERVICES				\$39,130.00
3.19.1	Mechanical ventilation for polystyrene compacting machine	1	Item	\$10,000.00	\$10,000.00
3.19.2	Mechanical ventilation to amenities areas	3	No	\$350.00	\$1,050.00
3.19.3	HVAC (Reverse cycle) air-conditioning system to education centre, meeting/meals, open offices, offices and gate house ducted	156	m2	\$180.00	\$28,080.00
3.20	ELECTRICAL SERVICES				\$557,580.00
3.20.1	All electrical equipment to have lockable isolation switches		Note		
3.20.2	Building lighting, power, data, comms, access control, etc.	2,239	m2	\$210.00	\$470,190.00

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		Quantity	Unit	Rate	Total
3.20.3	A/V system	1	Item	\$25,000.00	\$25,000.00
3.20.4	Security system	2,239	m2	\$10.00	\$22,390.00
3.20.5	Access control & communications system to weigh bridge	1	Item	\$15,000.00	\$15,000.00
3.20.6	GMC IS connection	1	Item		EXCL
3.20.7	Solar Power System PROVIONAL	1	Item	\$25,000.00	\$25,000.00
3.21	FIRE SERVICES				\$57,975.00
3.21.1	Dry fire protection system	2,239	m2	\$25.00	\$55,975.00
3.21.2	Fire extinguishers	1	Item	\$2,000.00	\$2,000.00
3.21.3	Wet fire sprinkler	1	Item		EXCL
3.22	LIFT SERVICES				
3.22.1	Lift services	1	Item		EXCL
3.23	BUILDERS WORK IN CONNECTION WI	TH SERVICES			\$21,302.00
3.23.1	BWIC (3%)	1	Item	\$21,302.00	\$21,302.00
3.25	SITE & LANDSCAPING				\$303,390.00
3.25.1	Roads, Footpaths and Paving				\$26,470.00
3.25.1.1	Concrete walkway around shed	171	m2	\$90.00	\$15,390.00
3.25.1.2	Concrete carpark and bus parking areas	98	m2	\$90.00	\$8,820.00
3.25.1.3	Delineate linemarking to drop off bay and ramped areas and wheelchair passing zone	226	m2	\$10.00	\$2,260.00
3.25.2	Fencing and Gates				\$8,800.00
3.25.2.1	Fencing to segregate large item bays incl. secure access gates to front & rear	88	m	\$100.00	\$8,800.00
3.25.3	External Structures				\$150,760.00
3.25.3.1	Allowance for New AWS 26m weighbridge [Quote provided by Weigh More Solutions]	1	Item	\$71,350.00	\$71,350.00
3.25.3.2	Abutments to weigh bridge	27	m	\$750.00	\$20,250.00
3.25.3.3	External ramp adjacent unloading zone	228	m2	\$220.00	\$50,160.00
3.25.3.4	External concrete staircase rising 2300mm in one flight including handrails fixings complete	3	m/rise	\$3,000.00	\$9,000.00
3.25.4	Landscaping and Improvements				
3.25.4.1	See 'External Works & Services' trade		Item		INCL
3.25.5	Retaining Walls				\$117,360.00
3.25.5.1	Foundation	89	m	\$600.00	\$53,400.00
3.25.5.2	Block retaining walls 2300mm high	204	m2	\$240.00	\$48,960.00

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	1	Quantity	Unit	Rate	Total
3.25.5.3	Treatment for earthen batter assumed ne 30deg slope	1	Item	\$15,000.00	\$15,000.00
4	EXTERNAL WORKS AND SERVICES				\$959,340.00
4.1	EXTERNAL SERVICES				\$440,790.00
4.1.1	External Stormwater Services				\$135,000.00
4.1.1.1	5000L underground rainwater tank [Provisional]	1	No	\$10,000.00	\$10,000.00
4.1.1.2	Connection to existing stormwater service	1	Item	\$5,000.00	\$5,000.00
4.1.1.3	Connection to leachate management system	1	Item	\$5,000.00	\$5,000.00
4.1.1.4	On-site detention tank	1	Item		EXCL
4.1.1.5	Upgrade main storm water pipe Drainage Line 1 to accommodate peak site flows (PROVISIONAL)	1	Item	\$10,000.00	\$10,000.00
4.1.1.6	1500 wide x 200 deep biofiltration trench	29	m	\$750.00	\$21,750.00
4.1.1.7	New leachate line	333	m	\$250.00	\$83,250.00
4.1.2	External Sewer Services				\$5,000.00
4.1.2.1	Connection of new sewage system into existing site sewage network	1	Item	\$5,000.00	\$5,000.00
4.1.3	External Water Supply				\$50,950.00
4.1.3.1	Connection to water supply line	1	item	\$5,000.00	\$5,000.00
4.1.3.2	Water meter	1	Item	\$1,500.00	\$1,500.00
4.1.3.3	Booster pump	1	Item	\$5,000.00	\$5,000.00
4.1.3.4	Allowance for External Water Protection	1	Item		EXCL
4.1.3.5	External water main	263	m	\$150.00	\$39,450.00
4.1.4	External Gas Supply				
4.1.4.1	Gas supply connection	1	Item		EXCL
4.1.5	External Fire Protection				\$150,500.00
4.1.5.1	New in-ground fire main	285	m	\$300.00	\$85,500.00
4.1.5.2	Diesel fire hydrant pumps	2	No.	\$10,000.00	\$20,000.00
4.1.5.3	144kL fire hydrant tanks above ground	2	No.	\$15,000.00	\$30,000.00
4.1.5.4	External fire hydrants	4	No.	\$2,500.00	\$10,000.00
4.1.5.5	Fire hydrant booster assembly	1	Item	\$5,000.00	\$5,000.00
4.1.6	External Electrical				\$99,340.00
4.1.6.1	Connection to electrical supply line	1	Item	\$5,000.00	\$5,000.00
4.1.6.2	External lighting to car park	1,467	m2	\$20.00	\$29,340.00
4.1.6.3	External spot lights	1	Item	\$10,000.00	\$10,000.00
4.1.6.4	Substation	1	Item		EXCL

18394 - Goulburn Reuse Facility Value Engineering Items - 23/8/19

MULLER partnership

		Quantity	Unit	Rate	Total
4.1.6.5	UPS required for control/ fire systems [PROVISIONAL]	1	Item	\$30,000.00	\$30,000.00
4.1.6.6	Backup diesel power generator	1	Item	\$25,000.00	\$25,000.00
4.1.6.7	Microwave link to GMC IS systems	1	Item		EXCL
4.2	SITE & LANDSCAPING				\$518,550.00
4.2.1	Roads, Footpaths and Paving				\$359,615.00
4.2.1.1	New kerb, incl. gutter	288	m	\$150.00	\$43,200.00
4.2.1.2	25mm AC10 asphalt concrete pavement	4,250	m2	\$45.00	\$191,250.00
4.2.1.3	150mm thick DGB20 wearing course layer compacted to 98% MMDD on 200mm thick DGS40 subbase layer compacted to 98% MMDD on compacted subgrade to 100% SMDD Gravel hardstand	130	m2	\$110.00	\$14,300.00
4.2.1.4	Sawcut existing pavement to allow for connection to new pavement	338	m	\$30.00	\$10,140.00
4.2.1.5	200mm thick 32MPa concrete slab on ground with SL82 mesh, 50mm cover to top laid on 100mm thick compacted DGS20 subbase course on compacted subgrade to 98% MDD CBR more than or equal to 5%	337	m2	\$125.00	\$42,125.00
4.2.1.6	7mm Seal - S45R to be laid after 12 months on top of 10mm primerseal -C170 binder laid on 100mm thick compacted DGB20 basecourse on 100mm thick compacted DGB40 subbase	1,465	m2	\$40.00	\$58,600.00
4.2.2	Fencing and Gates				\$10,000.00
4.2.2.1	Boom gate	2	No.	\$5,000.00	\$10,000.00
4.2.3	External Structures				\$104,720.00
4.2.3.1	Existing Amenities				
4.2.3.1.1	Allowance for minor refurbishment to existing office and amenities - Removed as per Cardno's advise, email dated 19/08/2019	1	Item		EXCL
4.2.3.2	Wash Bay				\$104,720.00
4.2.3.2.1	Slab on ground measured elsewhere	1	Item		INCL
4.2.3.2.2	Foundation to block wall	31	m	\$600.00	\$18,600.00
4.2.3.2.3	Concrete bunding to wash bay	46	m	\$120.00	\$5,520.00
4.2.3.2.4	Blockwork walls to wash bay (Assumed 2.4m high)	75	m2	\$240.00	\$18,000.00
4.2.3.2.5	High pressure water pump incl. 2 no. high pressure hoses	1	Item	\$5,000.00	\$5,000.00
4.2.3.2.6	Rainwater tank, incl. backup potable water supply	1	Item	\$5,000.00	\$5,000.00
4.2.3.2.7	Waste water sump with pump to treatment system	1	Item	\$8,000.00	\$8,000.00
	Waste water treatment system	1	Item	\$15,000.00	\$15,000.00
4.2.3.2.8	waste water treatment system	1	Item	\$15,000.00	\$15,000.00

18394 - Goulburn Reuse Facility Value Engineering Items - 23/8/19

		Quantity	Unit	Rate	Total
4.2.3.2.10	Drainage line with valve connected to site stormwater system	1	Item	\$10,000.00	\$10,000.00
4.2.3.2.11	Power & Lighting to wash bay	120	m2	\$80.00	\$9,600.00
4.2.3.3	Push Pit - Removed as per Cardno's 19/08/2019	advise, emai	l dated		
4.2.3.3.1	Concrete slab to push pit	1	Item		EXCL
4.2.3.3.2	Precast concrete push walls/ blocks to push pit (Assumed 1m high)	1	Item		EXCL
4.2.3.3.3	Cover to push pit	1	Item		EXCL
4.2.3.3.4	Lighting to push pit	1	Item		EXCL
4.2.3.3.5	Connection into existing leachate	1	Item		EXCL
4.2.3.3.6	Potable water supply	1	Item		EXCL
4.2.3.4	Transfer Station (future)				
4.2.3.4.1	Future proofing site for future development	1	Item		EXCL
4.2.4	Landscaping and Improvements				\$44,215.00
4.2.4.1	Main site landscaping	1,281	m2	\$15.00	\$19,215.00
4.2.4.2	Rock garden to western most swale	1	Item	\$25,000.00	\$25,000.00
4.2.5	Retaining Walls				
4.2.5.1	Retaining Walls - Refer Resource Recovery Shed	1	Item		INCL
5	SITE STORMWATER SYSTEM UPGRADES				\$56,560.00
5.1	Swale 1 - Average 4500 wide x 500 deep swale, including pipe and culvert	204	m		EXCL
5.2	Bund 1 - Average 3000 wide x 1000 high bund with 100mm topsoil / Hydromulch / spray grass	204	m	\$140.00	\$28,560.00
5.3	Swale 2 - Average 4500 wide x 500 deep swale, including pipe and culvert	104	m		EXCL
5.4	Bund 2 - Average 3000 wide x 1000 high bund with 100mm topsoil / Hydromulch / spray grass	104	m	\$140.00	\$14,560.00
5.5	Swale 3 - Average 9000 wide x 500 deep swale, including pipe and culvert	96	m		EXCL
5.6	Bund 3 - Average 3000 wide x 1000 high bund with 100mm topsoil / Hydromulch / spray grass	96	m	\$140.00	\$13,440.00
6	SITE REMEDIATION LANDSCAPING				
6.1	Site remediation landscaping for existing batters - Removed as per Cardno's advise, email dated 19/08/2019	1	Item		EXCL
7	DESIGN DEVEOPMENT ALLOWANCE				\$284,889.00
7.1	Design development allowance (5%)	1	Item	\$284,889.00	\$284,889.00
8	PRELIMINARIES & MARGIN				\$897,400.00
8.1	Allowance for Allowance for Builders preliminaries, overhead & margin (15%)	1	Item	\$897,400.00	\$897,400.00

		Quantity	Unit	Rate	Total
9	CONSTRUCTION CONTINGENCY				\$344,004.00
9.1	Construction Contingency Allowance (5%)	1	Item	\$344,004.00	\$344,004.00
10	IDENTIFIED RISK ITEMS				
10.1	Identified risk items	1	Item		EXCL
11	PROFESSIONAL FEES				
11.1	Professional fees	1	Item		EXCL
12	CONSULTANT FEES				
12.1	Consultant fees	1	Item		EXCL
13	AUTHORITY FEES AND CONTRIBUTIONS				
13.1	Authority fees and contributions	1	Item		EXCL
14	ESCALATION				
14.1	Escalation	1	Item		EXCL
				Subtotal	\$7,224,068.00
				Adjustment	\$0.00
				Total	\$7,224,068.00

Re-Use Goulburn

APPENDIX

BCA COMPLIANCE REVIEW REPORT





BUILDING APPROVALS ENERGY ASSESSMENTS BUSHFIRE AND BCA CONSULTATION SWIMMING POOL COMPLIANCE

BUILDING CODE ASSESSMENT REPORT FOR SINCLAIR STREET GOULBURN

REPORT BY: Building Certification Associates Pty Ltd

REPORT DATE: SEPTEMBER 2019

FILE REF: 504/19



INTRODUCTION

This report represents the findings of an assessment of the proposed developments of Sinclair Street Goulburn, for compliance with the deem-to-satisfy requirements of the Building Code of Australia 2019 Volume 1. This report has been prepared by Building Certification Associates.

The purpose of this report is to provide an assessment from the plans provided by PRD Architects fort he development of the subject buildings, for compliance with the deem-to-satisfy (DTS) requirements of the Building Code of Australia. This report will include assessment for sections:

Section C – Fire Resistance

Section D – Access – Egress

Section E – Services and Equipment

This report will also include a recommendation of any works required to achieve compliance with the Building Code of Australia.

PROPOSED BUILDINGS

Building A is the Re-Use Hub site. This is a new building where re-used items are fixed or mended for resale

Building B is A Resource Recovery Shed, items are dropped off within the shed in bays, it also contains office space and an educational room within the building.

PART C -FIRE RESISTANCE AND STABILITY

Building A Re-Use Hub site

In accordance with Table C1.1 has a rise in storeys of 1, has a classification of a Part Class 5 office/sales portion and Class 8 workshop/storage area. The building is of Type C construction.

Building A has a floor area of approximately 470m2, and a volume of under 12,000m3 which is under the maximum allowed for a Type C construction building, in accordance with Table C2.2, Maximum size of fire compartments.

Building B – Resource Recovery Shed

Has a rise in storeys of 1, and is predominantly a Class 8 Building, with a small office and educational centre within it totalling 171.5m2 & Resource recovery portion of 1914m2 in accordance with Table C1.1. The building will be Type B construction. The building is approximately 2010m2, which will make the building Type B construction which has a floor area maximum of 3500m2 and maximum volume of 21000m3, the building is within these allowed maximums in accordance with Table C2.2 Maximum size of fire compartments for Type B construction.



Building A – For a Type C construction Building is required by Table 5 Type C construction: FRL of building elements, for a Class 8 Building which is 3.0 metres or more from a boundary or any other fire source feature requires no FRL to the external walls or other building elements. From the plans provided by PRD Architects, Building A will be over 3.0 metres clear of any boundary or other fire source feature and will not be required to have an FRL.

Building B – For a Type B construction building which the Resource Recovery Shed will be, must as per Table 4 Type B construction: FRL of building elements, requires the external walls including any column or other building element incorporated within it or other external building element, where the distance from any fire source feature to which it is exposed is- for load bearing parts:

For a Class 8 Building – less than 1.5m - 240/240/240

- 1.5m to less than 3m 240/180/120
- 3m to les than 9m 240/90/60
- 9m to less than 18m 240/60/
- 18m or more --/-/-

Building B the Resource Recovery Shed has other buildings or fire source features around it which appear to be within 18 meters. From the plans available at the time of the report an exact distance from other structures could not be exactly determined however the building will be required to have an FRL in accordance with Table 4 as above depending on the actual distance from these other structures.

GENERAL CONCESSIONS

Taking into account the above Building B – The resource and recovery shed would be eligible for a general concession in accordance with Specification C1.1 – Fire-resisting construction,

Specification C1.1, Clause 2.5 General concessions states

- (a) Steel columns A steel column. Other than one in a fire wall or common wall, need not have an FRL
 - in a building that contains –
 - (i) Only 1 storey

This would mean any of the steel columns that are not located within the a fire wall do not need to have a FRL.

The main switch room in Building B – Resource recovery shed will need to be separated from any other part of the building by construction having an FRL of not less than 120/120/120 and have any doorway in that construction protected with a self-closing fire door having an FRL of not less than-/120/30. This will satisfy clause C2.13 for electricity supply systems.



SECTION D ACCESS AND EGRESS

D1.2(a) of the Building Code of Australia requires every building to have at least one exit from each storey. Both Buildings A and B meet this requirement.

D1.4 Exit travel distances

(C) for Class 5,6,7,8 or 9 buildings

(i) no point on a floor must be more than 20m from an exit or point from which travel in different directions to 2 exits is available, in which case the maximum distance to one of those exits must not exceed 40m.

Building A complies with clause D1.4

Building B **Does Not** comply with clause D1.4 and the building will require at least another 3 exit doors in the western wall to achieve compliance with the required travel distances.

The dimensions of the exits and paths of travel to exits are compliant with D1.6 for Building A, Building B will require extra exit doors to comply with Clause D1.6 of the Building Code of Australia.

Any new doors which need to be added to building B the resource recovery shed will need to be swing outwards in the direction of egress in accordance with Clause D2.20 and have a single hand down operational latch or door handle which complies with Clause D2.21 of the Building Code of Australia.

D3.1 General building access for people with a disability

Table D3.1 for a Class 8 buildings requirements for access for people with a disability, is to and within all areas normally used by the occupants. Both buildings should be able to achieve this as they are single storey with no changes of levels within the buildings.

D3.2 Access to buildings

An accessway must be provided to a building required to be accessible -

- (i) From the main points of a pedestrian entry at the allotment boundary, and
- (ii) From another accessible building connected by a pedestrian link, and
- (iii) From any required accessible carparking space on the allotment

Both buildings would generally comply with Clause D3.2 being only one single level each, levels to the entry and from the required carpark will need to be verified to comply with this clause prior to approval.

D3.5 Accessible carparking

Accessible carparking spaces must be provided in accordance with Table D3.5. For a Class 5,6,7,8 or 9c building 1 space for every 100 carparking spaces or part thereof. Each building will be required to provide 1 accessible carparking space each and be clearly marked and signage to AS 1428.1.



D3.6 Signage

Signage must be provided in accordance with AS 1428.1 to identify an ambulant accessible sanitary facility, must be located on the door of the facility

SECTION E SERVICES AND EQUIPMENT

Building A – Re-Use Hub will require the following essential fire safety services and equipment

- 1. Fire Hose Reels in accordance with Clause E1.4 of Building Code of Australia
- 2. Portable fire extinguishers in accordance with Clause E1.6 & Table E1.6
- 3. Emergency lighting in accordance with Clause E4.2
- 4. Exit signs in accordance with clause E4.5

Building B – Resource Recovery Shed will require the following essential fire safety services and equipment.

- 1. Fire Hydrant in accordance with Clause E 1.3 of the Building Code of Australia.
- 2. Fire Hose reels in accordance with Clause E1.4
- 3. Portable fire extinguishers in accordance with Clause E1.6
- 4. Emergency lighting in accordance with Clause E4.2
- 5. Exit signs in accordance with Clause E4.5

CONCLUSION

The above assessment indicates that the building A the Re-Use Hub can generally achieve compliance with the deemed -to- satisfy requirements of the Building Code of Australia. The following item must be addressed for Building B to achieve full compliance.

- 1. Provided the steel columns in building B are the only loadbearing components of the structure no fire rating requirements will apply.
- 2. Provide extra egress doors to western elevation of Building B The Resource Recovery Shed to make the building compliant with Section C of the Building Code of Australia, Clause D1.4 Exit travel distances.
- 3. Provide details of location of essential fire safety services as identified in this report.

Re-Use Goulburn

APPENDIX



FUNCTIONAL DESIGN SPECIFICATION



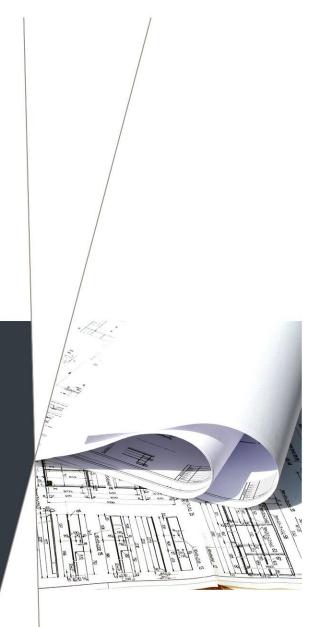
Functional Design Specification

Re-Use Goulburn

8201825301

Prepared for Goulburn Mulwaree Council

20 December 2019





Cardno[®]

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Author(s):

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Robert Kempton	Effective Date	19/12/2019
Senior Project Manager		
Approved By:		
Geoffrey Kleu	Date Approved	19/12/2019
Senior Asset Management Engineer		

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Version	Effective Date	Description of Revision	Prepared by	Reviewed by
01-00	7/12/2018	Initial draft for GMC review	RK	GK
02-00	21/12/2018	Updated draft for Phase 2 issue	RK	GK
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04-00	19/12/2019	Final version issued with Phase 3 100% Detailed Design deliverables	RK	JK

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1 Introduction

1.1 Overview

The Goulburn Waste Management Centre (GWMC), located at 100 Sinclair St Goulburn, has been officially in operation since the 29 September 1900, commencing as a site for the disposal of night soil and solid waste. Whilst the disposal of sanitary waste concluded in 1950, and the site has continued to receive solid wastes until the present day. Today, operations at the GWMC include the collection and recycling of bulky goods, comingled recyclables, batteries and oils, general landfill, and organics composting.

Goulburn Mulwaree Council (GMC) has engaged Cardno (NSW/ACT) Pty Ltd, to undertake the detailed design and construction and commissioning support for its new Re-Use Goulburn (RUG) facilities at the GWMC.

The new facilities have been designed to be modern, efficient and community focused enabling greater segregation, recovery and recycling of materials. They incorporate sustainability principles that are both practical and cost effective, to create a well presented, modern combination of structures and landscaped areas that provide a safe and appealing environment for both the public and operational staff to work together in.

As part of the design of the new facilities, consideration has been given to segregating public and operational vehicle movements, creating a logical and efficient flow of materials and vehicles on site, improving the ease of drop-off and segregation of waste, and enhancing the data capture and ability to measure and charge for individual waste streams.

Consideration has also been given to improving the environmental outcomes of the project by segregating the various grades of stormwater on site to provide greater capture, treatment, and reuse.

The design of the new RUG facilities consists of the following major items which are indicated on the site layout drawing provided in **Appendix A**

- Re-Use Hub (at Entrance of site)
- Site entry weighbridge
- Operational access road boom gate
- Community Recycling Centre (CRC)
- Resource Recovery Shed incorporating
 - o Bulky Goods Drop-Off Centre
 - Polystyrene Compactor
 - Hydraulically Operated Tipping Bins and RORO Bins
- Wash bay
- Site exit weighbridge
- Gatehouse
- Office, Site Amenities and Education Centre
- Leachate management system
- Dirty stormwater management system
- Clean stormwater management system
- Bore water collection and reuse system

1.2 Purpose of Document

This document provides a detailed description of the process, equipment, safe operating parameters and control philosophy for the new RUG facilities.

1.3 Reference Documents

8201825301-SPEC-001 RUG Project Design Requirement Specification

1.4 **Definitions**

CRC	Community Recycling Centre
EPA	Environmental Protection Authority
GMC	Goulburn Mulwaree Council
GWMC	Goulburn Waste Management Centre
RORO Bins	Roll on / roll off bins (that are lifted by hook truck)
RUG	Re-Use Goulburn

2 Basis of Safe Operation

2.1 Process Description Overview

2.1.1 Nature and Purpose of the Process

The purpose of the new RUG facilities is to allow for the safe and efficient drop-off and segregation of waste streams brought to site by the general public.

2.1.2 Overview of Major Components

Table 1-1	Major Components

Item	Nature and Purpose
Re-Use Hub	Building located at the entrance to site for the free drop-off and purchase of reusable items, such as furniture, functional white goods and appliances, sporting equipment, and building materials. It consists of an indoor sales area and public amenities, covered outdoor storage area, and uncovered outdoor storage area that is accessible by the public wishing to purchase reusable goods. The building also has a back of house area for staff incorporating a workshop and storage area for repair of items prior to sale, a small office, a lunch room and amenities.
Site entry weighbridge	Provides access control and weighs all vehicles entering site.
Operational access road boom gate	Provides access control to restrict public access to operational areas of the GWMC site. The operational areas include the tip face, wash bay, organics processing area drill mud processing area, back of house areas for the CRC and Resource Recovery Shed, collection vehicle parking area and maintenance workshop.
Community Recycling Centre (CRC)	Area for free drop-off of toxic & hazardous material that are covered by the EPA's CRC program, and any other waste streams that GMC are willing to offer free of charge (such as X-rays, mobile phones etc.).
Resource Recovery Shed	An open-sided building for drop-off of paid waste streams (see following items).
Bulky goods drop-off centre (in Resource Recovery Shed)	Collection point for large paid items such as mattresses, white goods, e- waste, comingled recyclables, tyres and polystyrene. Users are charged per item or per unit mass of waste, depending on the type of waste.
Polystyrene Compactor (in Resource Recovery Shed)	Thermal compaction equipment to reduce volume and increase density of polystyrene waste.

Bunded wash bay for gross pollutant removal from the interior and
exterior of GMC's collection vehicles and kerbside collection bins
Provides access control and weighs vehicles leaving site.
Point of sales for public waste disposal at GWMC based on measured quantities and mass of chargeable materials disposed of on site. Also monitors the access control to and from site and operational areas and records the mass of waste dropped-off by collection fleet, commercial vehicles and public vehicles using the tip face area.
Office space for site management and support staff, including lunch room and amenities for RUG facility operational staff. The education centre is a multipurpose space primarily used for community education classes about sustainable waste minimisation and management, and secondly for staff operational needs, such as training and meetings.
Collection, primary treatment and pumped transfer of water flows that have been in direct contact with waste streams on site to the leachate pond.
Collection and gravity transfer via grass lined swales of site stormwater flows that have been in contact with covered land fill areas, unsealed roadways or operational areas that are contaminated with dirt or waste materials, to the sediment dam.
Collection and gravity transfer off site via grass lined swales of site stormwater flows that have been in contact with building roofs or paved areas.
Pumped collection of ground water via an onsite bore to storage tanks, where water is then pumped to a stand pipe for filling of the water cart for dust suppression.

2.1.3 Key Utilities for the Process

The RUG facilities requires the following utilities for continuous and safe operation.

Table 1-2 Key Utilities

Item	Nature and Purpose
Electricity (415V and 240V)	Power for all electrical driven equipment, lighting, building HVAC, access and process control systems and security systems
Potable Water	Metered supply from site boundary with on site storage tank and booster pump to supply potable water from GMC network to all site amenities; back up water supply for operational uses (when bore water and rain water supplies are fully consumed)
Fire Water	Separate unmetered supply, storage tanks (x2), diesel fire water pumps (x2) and hydrant system for statutory fire water services provision.
Sewage	Gravity flow system for collection and transfer of site sewage flows to GMC's collection network.
Telecommunications	Secure microwave link to GMC Council Chambers for the provision of all onsite telecommunications and data transfer.

2.2 Potential High Risk Accident Events

2.2.1 People & Vehicle Interactions

The greatest risk for the RUG facilities is the interaction between people dropping off materials and vehicles driving around site, both public and operational vehicles. The potential consequence from this risk is a single fatality.

2.2.2 People & Equipment Interactions

Another major risk for the RUG facilities is the interaction between people and the site equipment, namely the hydraulically operated tipping bins and forklifts. The potential consequence from this risk is a single fatality.

2.2.3 Fall from Heights

There exists a risk of falling from height in the area adjacent to the hydraulically operated tipping bins to the level below where the RORO bins are located. The potential consequence from this risk is a single fatality.

2.3 High Risk Accident Controls

2.3.1 Site Access Control

A series of boom gates are used to manage and control the flow of vehicles within the site and to segregate public vehicles from operational vehicles. The Gatehouse Operator manually controls the function of the boom gates for non-inducted site users to control the flow of traffic on site. This allows the Operator to manage vehicle flows on site based on traffic volumes and operational needs. For inducted regular site users, the boom gates are automatically operated based on a vehicle number plate recognition system.

The first boom gate is located at the site entry weighbridge that restricts access to the site until the vehicle has been weighed, registration details recorded and permission is given for the vehicle to proceed onto site. A traffic light prior to the weighbridge controls traffic so that only one vehicle at a time is on the weighbridge.

The second boom gate is located at the entrance to the site operational access road that leads to the tip face, wash bay, organics processing area drill mud processing area, back of house areas for the CRC and Resource Recovery Shed, collection vehicle parking area and maintenance workshop. This boom gate is operated by the Gatehouse Operator and restricts access to those areas of the site to operational vehicles only. This is supported by appropriate signage noting restricted access to that area of the site and directing public vehicles to the CRC / Resource Recovery Shed.

The third boom gate located at the site exit weighbridge that restricts vehicles exiting the site until the vehicle has been weighed, any fees paid and/or weights logged, and permission is given for the vehicle to proceed off site. A traffic light prior to the weighbridge controls traffic so that only one vehicle at a time is on the weighbridge.

A fourth boom gate is located on the site exit bypass lane, that is used by inducted regular site users that do not need to weigh on the way out of the site (e.g. collection vehicles and operations staff vehicles. This reduces the traffic load over the site exit weighbridge, minimising wait times for those site users who need to use the weighbridge.

2.3.2 Segregated Back of House Area

The CRC and Resource Recovery Shed has a segregated back of house area where operational personnel can safely load collected materials onto heavy vehicles for transfer and recycling/disposal. Segregation is achieved through the use of barricading and fencing as described further in **Section 2.3.3**. Heavy vehicle access to the back of house area is controlled via the site operational access road controlled by the second boom gate as described in **Section 2.3.1**.

2.3.3 Walkways, Barricading and Fencing

Defined walkways and pedestrian areas are provided in the RUG facilities at the public drop-off locations, including the CRC, bulky good drop-off and hydraulically operated tipping bin areas, and are marked by line marking on the pavement. This line marking will need to be monitored and maintained to ensure that it remains visible and functional. These areas are located to the east of the vehicle stopping bays, which means that the public are separated from passing traffic by the parked vehicles.

Defined walkways are also provided for operational staff and site visitors along the side of the new office building, which is segregated from passing traffic by handrail barricading. A defined pedestrian crossing with swing gate from the walkway is incorporated to allow operational personnel to safely cross from the west to the east side of Resource Recovery Shed. A further stairway with swing gate is provided from the top level to the ground level of the Resource Recovery Shed to allow operational staff to easily and safely access the RORO bin area from the Resource Recovery Shed.

For the CRC area, the collection receptacles act as a barricade between the public drop-off area and back of house area, along with mobile concertina barricading that can be adjusted to suit the current arrangement of receptables. When receptacles are full, the concertina barricading will be used to restrict access to that receptacle whilst it is removed by forklift and an empty one is placed in its position. Wall sheeting / screening is used at either end of the CRC to provide segregation from the end of building and the adjacent bulky goods drop-off area.

For the bulky goods drop-off area, fixed mesh fencing is positioned between subsequent bays to segregate areas, and fixed concertina barricading is used at both the east and west side of the bays to segregate the public and back of house operational areas. When the bays are in use for public collection the concertina barricade at the eastern end of the bay is closed to segregate the public from the back of house area, and the barricade at the western end is open to allow public access to the bay. When the bay is to be emptied by operations, the concertina barricade at the western end of the bay is closed to go to prevent the public from accessing the bay, and the barricade at the eastern end is open to allow operations staff access to empty the bay.

Barricading is used between the hydraulically operated tipping bins to prevent the public from accessing the edge of the sawtooth drop-off bays and the sides of the hydraulically operated tipping bins, and fixed concertina barricading is used to restrict access to the hydraulically operated tipping bins when in operation as further detailed in **Section 2.3.4**.

2.3.4 Hydraulically Operated Tipping Bins Control System

The hydraulically operated tipping bins are automated waste collection and transfer units that resemble the bucket of a front end loader. When in use for waste collection, the front of the bucket is flush with ground level allowing for easy drop-off of waste by the public. When in use for waste transfer a fixed concertina barricade is closed at the front of the hydraulically operated tipping bins preventing public access, and the bucket is hydraulically lifted and rotated to empty the collected waste into a RORO bin located on the lower ground level behind the edge of the hydraulically operated tipping bin bay. (Note – the hydraulically operated tipping bins are located on the main Resource Recovery Shed floor, which is above ground level.)

Each hydraulically operated tipping bin has its own individual local control system, and there are two common hydraulic systems that power three hydraulically operated tipping bins units each. Operation of the hydraulically operated tipping bins is via manual push button control by the site operational staff, and is interlocked by a proximity switch on the concertina barricade that ensures that the barricade is closed prior to and throughout operation. When in normal operating mode the operator pushes a single start button that automatically raises and lowers the hydraulically operated tipping bins to empty the collected material. The local control system also incorporates an emergency stop push button, and selector switch for maintenance mode that allows the operator to "jog" the unit up or down manually.

2.4 Inspections, Maintenance and Testing of High Risk Accident Controls

2.4.1 Site Access Control

Inspection, maintenance and testing of site access control boom gates and weighbridge traffic lights is part of standard maintenance procedures and routine operations inspections.

2.4.2 Walkways, Barricading and Fencing

Inspection, maintenance and testing of walkways, barricading and fencing will be undertaken ad hoc as part of daily site operations.

2.4.3 Hydraulically Operated Tipping Bins Control System

Inspection, maintenance and testing of the hydraulically operated tipping bins control system is part of standard maintenance procedures and routine operations inspections.

3 Process Design Specification

3.1 Detailed Process Description

3.1.1 Process Overview

The RUG facilities cater for the public drop-off of waste materials at the GWMC providing segregation, reuse, recovery and recycling of materials.

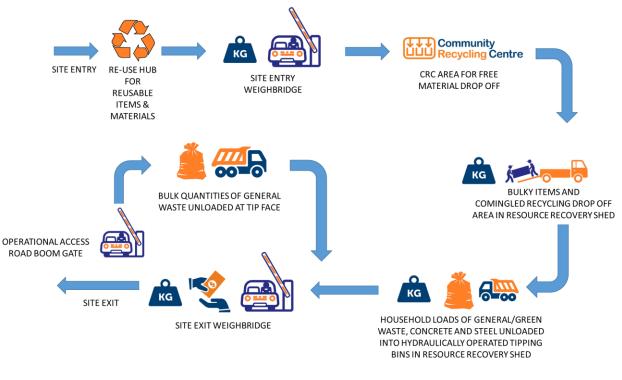
The Re-Use Hub at the entrance to the site provides a location for the public to drop-off free of charge reusable items and materials, and purchase such items at a low cost. The aim of this centre is to promote resource recovery and reuse.

For the drop-off of other materials for recycling and disposal, the public must access the main GWMC site via the site entrance weighbridge, which records the vehicle mass and controls access to the site via a boom gate. A secondary boom gate at the intersection with the operational access road for the site prevents the public from accessing the operational areas of the site. Public vehicles then proceed to a large awning structure that contains a CRC and Resource Recovery Shed incorporating a bulky goods drop-off area, and hydraulically operated tipping bins. Materials disposed of within the CRC are free of charge, and items disposed of within the Resource Recovery Shed are charged based on quantity or mass, which is recorded by the site operations staff.

Once drop-off is complete, public vehicles then proceed to the site exit weigh bridge where the vehicle mass is recorded (for data analysis of paid vs. free waste), and the user is charged based on the quantities and masses of paid materials as recorded by the site operations staff. Once payment is complete the exit boom gate is opened and the vehicles proceed off site.

For large quantities of general waste, users may be directed up to the tip face within the secure operational area once site operations personnel have first assessed the load.

A summary of the process for public drop-off and use of the RUG facilities is provided in the process flow diagram shown in Figure 3-1.



RUG SITE PROCESS FLOW DIAGRAM

Figure 3-1 RUG Site Process Flow Diagram

For GMC Collection vehicles, operational vehicles servicing the back of house of the RUG facilities, and other site operational vehicles, entrance to the site is also via the main site weighbridge where the vehicle mass is recorded prior to entry boom gate opening. Access to the operational areas is granted by the Gatehouse Operator via a secondary boom gate to the operational access road. When leaving the site, operational vehicles merge with public vehicle traffic at a one way stop sign intersection to the south of the site, and proceed to the site exit weighbridge. The vehicle mass is recorded, and if applicable a receipt of weight or payment of disposal fees is undertaken by the Gatehouse Operator. Once complete the exit boom gate is opened and the operational vehicles proceed off site, or can return back to the operational area via the operational access road (which is to the right on the site exit road).

A wash bay area is provided in the secure operational area of the site for the removal of gross pollutants from collection trucks and kerbside collection bins.

Stormwater and leachate flows from the RUG facilities are managed by segregated systems.

3.1.2 Re-Use Hub

The Re-Use Hub building is a location for the free drop-off and purchase of reusable items, such as furniture, functional white goods and appliances, sporting equipment, and building materials.

It is accessed from the northern side of Sinclair Road prior to entering the main GWMC site, so that people using this facility only don't have to enter the main site, eliminating potential interactions with public and operational vehicles.

For the drop-off of materials, a parallel stopping bay is provided at the front of the building allowing for vehicles and trailers to temporarily park. The Re-Use Hub operations personnel then inspect the items for drop-off and confirm whether they will receive them or not. If acceptable the materials are then either unloaded at that location and taken through to the back of house workshop area for cleaning and minor repairs, or in the case of building materials, directed to the outside storage area via the side entrance gates for unloading at the rear of the Re-Use Hub building.

If the materials are not deemed suitable for reuse, then the public will then be advised to dispose of them at the main GWMC site, or return home and find another potential means of reuse for them.

Additionally, the site includes accessible parking and longer term parking bays catering for cars with trailers so that the public can shop within the Re-Use Hub, which has an indoor sales area for high value & water sensitive items, a covered outdoor storage area and an uncovered outdoor area for storage for goods. A sales counter with POS system is located within the indoor sales area, as well as an accessible toilet.

The building also includes a back of house office space, lunch room and toilet facilities for operational staff, along with a workshop area to allow for the cleaning and minor repairs of items prior to sale. Behind the workshop area is also a covered storage area for goods still being worked on that is segregated by a screen from the covered outdoor storage area for saleable goods.

The building includes a safe, air conditioning and CCTV.

3.1.3 Site Entry Weighbridge

A weighbridge with boom gate is located at the site entry for recording the registration plate and mass of all vehicles entering the site. Registration details are recorded by an automatic number plate recognition system, and vehicle weights are recorded by the weighbridge management software. Once the details have been successfully captured and it is safe to do so, the Gatehouse Operator will then manually open the entry weighbridge boom gate allowing the vehicle to enter the site. For inducted regular site users, the boom gate is automatically operated based on the vehicle number plate recognition system to reduce the workload for the Gatehouse operator, and reduce the wait time for the inducted vehicle driver.

There is also an intercom system at the entry weighbridge allowing vehicles to contact and communicate with the Gatehouse Operator, and vice versa, if there are any issues. If the Gatehouse is unattended, a call buzzer will sound to attract the attention of the operational staff so the issue can be resolved.

Traffic flow onto the weighbridge is controlled by an automatic traffic light system prior to the weighbridge. If a vehicle is sensed on the weighbridge the traffic light will turn red, and remain red until a vehicle is no longer sensed, at which point it the light will turn green.

A bypass road with locked gate is provided around the site entry weighbridge to provide an alternate means of entry when the weighbridge is offline for maintenance, or when there is special free collection days that result in high volumes of traffic.

3.1.4 Operational Access Road Boom Gate

Access to the operational areas of the site is via the main operational access road coming off from the east of Sinclair St, south of the site entry weighbridge. At this intersection a boom gate is located to provide access control and restrict public access to operational areas of the GWMC site (tip face, wash bay, organics processing area drill mud processing area, back of house areas for the CRC and Resource Recovery Shed, collection vehicle parking area and maintenance workshop).

For inducted regular site users, the boom gate is automatically operated based on the vehicle number plate recognition system to reduce the workload for the Gatehouse operator, and reduce the wait time for the inducted vehicle driver. For non inducted users, the boom gate is manually operated by the Gatehouse Operator, who has direct line of site of the boom gate. If access is not granted, or if there is an operational issue preventing access, then one of the operational staff for the site will walk down to talk with the waiting operational vehicle to manage the situation.

3.1.5 Community Recycling Centre (CRC)

The CRC is located within the combined CRC / Resource Recovery Shed structure and is the first area that the public will access when driving into the structure.

It is an area for free drop-off of toxic & hazardous material that are covered by the EPA's CRC program, and any other waste streams that GMC are willing to offer free of charge (such as X-rays, mobile phones etc). Drop-off is made into custom waste receptacles designed to suit the nature of waste being contained, most of which are the size of an IBC (Intermediate Bulk Container) and are stackable via a forklift.

The collection receptacles in use are located next to a walkway and public vehicle drop-off bays that are parallel to the central access roadway running through the structure (refer to site layout in **Appendix A**). Full receptacles and empty receptacles, along with a small bycatch cupboard for hazardous chemical and liquids, are located in the back of house area.

Segregation with back of house areas is provided by the collection receptacles along with mobile concertina barricading that can be adjusted to close remaining gaps. When receptacles are full, the concertina barricading will be used to restrict access to that receptacle whilst it is removed by forklift and an empty one is placed in its position. Wall sheeting / screening is used at either end of the CRC to provide segregation from the end of building and the adjacent bulky goods drop-off area.

Assistance and monitoring of the use of the CRC areas is provided by the site operational staff, along with a CCTV system that is monitored by the Gatehouse Operator.

Collection of full receptacles is made by the EPA at scheduled intervals, with the collection vehicle accessing the back of house area via the operational access road and the receptacles loaded via forklift by the site operations staff.

3.1.6 Resource Recovery Shed

The Resource Recovery Shed is the location for the paid drop-off for waste material by the public. It consists of a bulky goods drop-off area with 4 separate bays, and 6 hydraulically operated tipping bins, which are described in further detail below. It also houses the polystyrene compactor, which is located in the back of house area.

3.1.6.1 Bulky Goods of Drop-Off Centre

The bulky goods drop-off centre consists of four of 6m by 6m bays for the drop-off of large paid waste items such as mattresses (per unit), white goods (per unit), e-waste (by mass), comingled recyclables (by mass), tyres (per unit) and polystyrene (by mass). For items with unit charges, the site operational staff record the quantity dropped-off. For items with mass charges, the site operational staff record the mass based on load cells on the receptacles used to collect the waste. Users are charged per item or per unit mass of waste, depending on the type of waste.

Assistance and monitoring of the use of the bulky goods drop-off areas is provided by the site operational staff, along with a CCTV system that is monitored by the Gatehouse Operator.

When the bays are in use for public collection the concertina barricade at the eastern end of the bay is closed to segregate the public from the back of house area, and the barricade at the western end is open to allow public access to the bay. When the bay is to be emptied by operations, the concertina barricade at the western end of the bay is closed to prevent the public from accessing the bay, and the barricade at the eastern end is open to allow operations staff to empty the bay.

3.1.6.2 Polystyrene Compactor

A proprietary thermal polystyrene compactor is located at the back of house for compaction of polystyrene waste to reduce volume and increase density. The unit is manually push button operated by an integrated local control system. The compactor is fed manually by a top loading chute, and the resulting briquettes are expelled and then manually stacked on a nearby pallet for future transport off site. The local control panel includes an emergency stop button.

3.1.6.3 Hydraulically Operated Tipping Bins and RORO Bins

Six off hydraulically operated tipping bins and six off RORO bins are configured in a saw tooth arrangement for the collection and transfer of general waste (3 off), green waste (1 off), concrete waste (1 off) and steel waste (1 off). The hydraulically operated tipping bins are automated waste collection and transfer units that resemble the bucket of a front end loader. When in use for waste collection, the front of the bucket is flush with ground level allowing for easy drop-off of waste by the public. The mass of waste is measured by load cells which are to be integrated with the hydraulically operated tipping bins, and is recorded by the site operations personnel for billing purposes.

When in use for waste transfer a fixed concertina barricade is closed at the front of the hydraulically operated tipping bins preventing public access, and the bucket is hydraulically lifted and rotated to empty the collected waste into a RORO bin located at the lower ground level behind the edge of the hydraulically operated tipping bin bay. (Note – the hydraulically operated tipping bins are located on the main Resource Recovery Shed floor, which is above ground level.)

Each hydraulically operated tipping bin has an individual local control system and hydraulic system. Operation of the hydraulically operated tipping bin is via manual push button control by the site operational staff, and is interlocked by a proximity switch on the concertina barricade that ensures that the barricade is closed prior to and throughout operation.

When in normal operating mode the operator pushes a single start button that automatically raises and lowers the hydraulically operated tipping bin to empty the collected material. The local control system also incorporates an emergency stop push button, and selector switch for maintenance mode that allows the operator to "jog" the unit up or down manually.

3.1.7 Tip Face (Existing)

The existing tip face within the operational area of the site, is to be used on an "as needs basis" for the disposal of bulk quantities of general waste by the public that are impractical to unload into the hydraulically operated tipping bins (e.g. from horse floats, small tipper trucks and other similar style vehicles).

Use of the tip face is determined by the site operational staff, as all public vehicles must first proceed to the CRC / Resource Recovery Shed for assessment by operational staff who will inspect the load to see if there is any hazardous or recoverable materials that must first be removed prior to using the tip face. Once any such materials have been removed and it is deemed that the quantity of general waste is too great to safely use the hydraulically operated tipping bins, then the vehicle will be directed to use the tip face. The vehicle will then proceed to the exit weighbridge where they will pay for any materials disposed of in the Resource Recovery Shed, prior to then proceeding to the operational access road boom gate. The Gatehouse Operator will then open the boom gate allowing the vehicle to proceed up to tip face. At the same time, one of the site operations staff will contact the Tana compactor driver at the tip face to alert them of the approaching public vehicle so that they can maintain their distance and observe the discharge of waste by the public vehicle. If necessary, one of the site operations staff may escort the public vehicle up to the tip face to ensure the safe access and egress, and to observe the discharge of materials from the to ensure that the member of the public remains safe and to also check for any hazardous materials that should be separated out. If any hazardous materials (e.g. asbestos) are observed, then existing site protocols will be followed.

Once emptied, the vehicle will then follow the operational road to the south and loop around the end of the Resource Recovery Shed back to the exit weighbridge, where they will then be weighed and charged for the amount of waste emptied at the tip face (plus any additional charges for hazardous materials found in the load).

3.1.8 Wash Bay Area

A wash bay is located in the operational area of the site that is used for the removal of gross pollutants from the interior and exterior of GMC's collection vehicles and kerbside collection bins. The GWMC site operational vehicles are washed up on the tip face using mobile high pressure hose equipment. The eastern

entrance is hard stand in accordance with the operational roadway, and the western exit is paved reducing drag out onto the paved site exit roadways.

The wash bay includes water storage tanks that are gravity fed with rain water collected in the rain water tank connected to the roof of the CRC / Resource Recovery Shed structure. In the event of extended dry periods, the water storage tanks can be filled up via a potable water make up line that has an air break to the top of the tank.

Washing of vehicles and kerbside collection bins is via high pressure water from a hand held spray nozzle that is supplied from a high pressure water pump connected to the water storage tanks. The pump is manually started and stopped.

The wash bay is a bunded area with rollover bund on the entry and exit. Wash water is collected in a sump with grated cover that provides coarse trash removal. Within the sump is a manually operated DN25 sump pump that is manually started and automatically stopped on low level. The sump pump pumps out the wash water and passes it through a gross pollutant trap / basket filter, before feeding a coalescing inclined plate oil / water separator which removes residual oils and greases, and the resulting leachate is then gravity fed into the sump in the RORO bin area. Refer to **Section 3.1.12** for further details on the leachate management system.

The sump within the wash bay also includes a manual valve and short section of pipe that empties out into the general area that feeds the site dirty stormwater collection system. This allows the site operators to discharge collected stormwater into the site dirty stormwater system following a rain event following a visual inspection to ensure that it is free of oil and grease and other noticeable contaminants, reducing the load on the leachate system. If the collected storm water is visibly contaminated then the site operators can always pump out to the leachate system as per normal operations for collected wash water as described above.

3.1.9 Site Exit Weighbridge

The site exit weighbridge with boom gate is located to the west of the Resource Recovery Shed on the exit road. The purpose of the weighbridge is for recording the registration plate and mass of all vehicles exiting the site, and for restricting exiting of the site until the vehicle has paid any fees owing for waste disposal. Registration details are recorded by an automatic number plate recognition system, and vehicle weights are recorded by the weighbridge management software. Once the details have been successfully captured and all fees have been paid the Gatehouse Operator will then manually open the exit weighbridge boom gate allowing the vehicle to exit the site.

Traffic flow onto the weighbridge is controlled by an automatic traffic light system prior to the weighbridge. If a vehicle is sensed on the weighbridge the traffic light will turn red, and remain red until a vehicle is no longer sensed, at which point it will then turn green.

A bypass road with a boom gate is provided around the site exit weighbridge to provide an alternate means of exit for inducted regular site users who do not need to use the exit weighbridge (e.g. Council collection vehicles and operations staff vehicles). For such users the boom gate is automatically operated based on the vehicle number plate recognition system. The boom gate can also be manually operated by the Gatehouse Operator to allow site egress when the weighbridge is offline for maintenance, or when there is special free collection days that result in high volumes of traffic.

3.1.10 Gatehouse

The Gatehouse is located at the northern end of the office building so that the Gatehouse Operator has clear line of site of all vehicles entering the site, the operational access road, the CRC / Resource Recovery Shed, and also the exit road from the site.

As well as providing access control for the site, the Gatehouse provides a central point of sales for waste disposal at the tip face, tip face and RUG facilities. Charges for waste disposal by commercial waste operators and public vehicles using the tip face area are based on the recorded change in mass of the vehicle from the weighbridges and the site disposal rates. Charges for waste disposal in the Resource Recovery Shed is based on measured quantities and mass of chargeable materials disposed of as recorded by the site operations personnel on a tablet PC that integrates with the Gatehouse sales system and is linked to the vehicles registration details.

The display for the site CCTV is also located within the Gatehouse so that the Operator can monitor site operations.

3.1.11 Office, Site Amenities and Education Centre

Along with Gatehouse, the building along the western side of the CRC / Resource Recovery Shed provides office space for site management and support staff, a lunch room and amenities for RUG facility operational staff, and a multipurpose education centre. The offices are located within close proximity to the Gatehouse so that site management can provide ready support to the Gatehouse Operator when dealing with difficult or threatening customers. The offices have a one-way window looking out into the CRC / Resource Recovery Shed so that staff can readily see what is happening in those operational areas. The lunch room area also doubles as a meeting space for small meetings.

The amenities are located independently to the office space so that they can also be utilised by those using the education centre, and customers of the RUG facilities. They include an accessible bathroom with shower facilities, standard unisex bathrooms, and a change room with lockers for site operations staff.

The site education centre is a multipurpose space primarily used for community education classes about sustainable waste minimisation and management, and secondly for staff operational needs, such as training and meetings. It has seating for up to 50 people, a comprehensive audio visual system, and a storage cupboard for storage of the chairs and folding tables when not in use. The room also includes a one way window looking out into the CRC / Resource Recovery Shed area so that visitors can readily see what is happening in those operational areas.

3.1.12 Leachate Management System

The leachate management system provides collection, primary treatment and pumped transfer of water streams that have been in direct contact with waste streams on site to the leachate pond.

As outlined in **Section 3.1.8**, leachate from the wash bay area is transferred via gravity following treatment into a similar sump near the RORO bin area.

This final sump is also has a grate cover, and collects leachate generated from the RORO bins associated with the Resource Recovery Shed. Within this sump is a DN80 submersible pump that is controlled via local control panel with an automatic start/stop function based on predetermined levels, and incorporates an emergency stop button and manual stop / start functionality. The pump also has a stainless steel chain attached to it that is connected near the top of the sump for easy connection to a lifting device to allow removal with lifting aid for maintenance purposes.

The leachate from this central sump is then pumped by a DN100 HDPE line to the leachate pond for containment and evaporation with other sources of leachate from the site.

3.1.13 Dirty Stormwater Management System

The dirty stormwater management system provides collection and gravity transfer of site stormwater flows that have been in contact with covered land fill areas, unsealed roadways or operational areas that are contaminated with dirt or waste materials. Collected water is transferred via a combination of existing underground pipe and grass lined swales to the sediment dam for containment on site.

3.1.14 Clean Stormwater Management System

The clean stormwater management system provides collection and gravity transfer of site stormwater flows that have been in contact with building roofs or paved areas. Collected water is transferred via grass lined swales off site in a controlled fashion.

3.1.15 Bore Water Collection and Reuse System

The bore water collection and reuse system allows the pumping of ground water via an onsite bore to a series of storage tanks at the site entrance, where water is then pumped to a stand pipe for filling of the site water cart for onsite dust suppression. Control of the bore water pump is manual via a local control panel. Control of the pump feeding the stand pipe is also manual via a local on / off switch.

3.2 Utilities

3.2.1 Electricity

Power to the site is fed from a 22kV overhead supply with a pole mounted transformer. Reticulation on site is 240V in most areas, with a 415V feed to the Resource Recovery Shed for the polystyrene compactor and TipWells.

Solar power is also provided at the Re-Use Hub and office building to supplement the grid supply to the site.

A diesel powered backup generator is incorporated into the site power supply system to allow for continued site operations in the event of an extended power outage, and UPS's are provided for the site CCTV and critical control systems to ensure the safety of the site in the event of total power failure.

3.2.2 Potable Water

Due to the lack of hydrostatic head pressure to service the site, potable water is fed to a break tank from the site mains supply which is metered at the site boundary, where it is then pumped into the site reticulation system to provide the necessary pressure. The site mains supply also incorporates a loop at the site boundary to reduce the risks associated with the site being a "dead end" on the potable water supply network.

3.2.3 Fire Water

Fire water is stored in two dedicated fire water tanks at the site entrance gate, and is pumped via a set of diesel pumps to the hydrant system at the CRC/Resource Recovery Shed. Fire water is sourced from the potable water supply network via an unmetered connection upstream of the meter set at the site boundary. Due to the lack of hydrostatic pressure, the fire water supply to the tanks also incorporates a small booster pump to provide the necessary head and fill rates for the tanks.

3.2.4 Sewage

Sewage flows from the amenity locations at the Re-Use Hub and the Offices and Site Amenities building via gravity into the mains network that discharges from site.

3.2.5 Telecommunications

Telecommunications to the site is provided via microwave link to the GMC Council Building in town, and distributed on site via fibre optic cable and network cabinets located in the collection team site office and RUG facility Gatehouse.

Communications with the Re-Use Hub is provided via fibre connection to the collection team site office.

4 Functional Design Specification

4.1 Control System Overview

4.1.1 Control System Description

The site control system consists of a series of discrete local / proprietary control systems for individual equipment items, and an overall proprietary control system (Mandalay) that integrates the captured vehicle number plate, weighbridge, and waste disposal data to allow for the generation of a unique bill for each customer, that is payable on exit from site.

The overall proprietary control system is housed in the Gatehouse office IT cabinet, and the site utilises a microwave link to GMC's central IT network that is to be relocated from the entry weighbridge cabin to the existing site office building.

4.1.2 Control Block Diagram

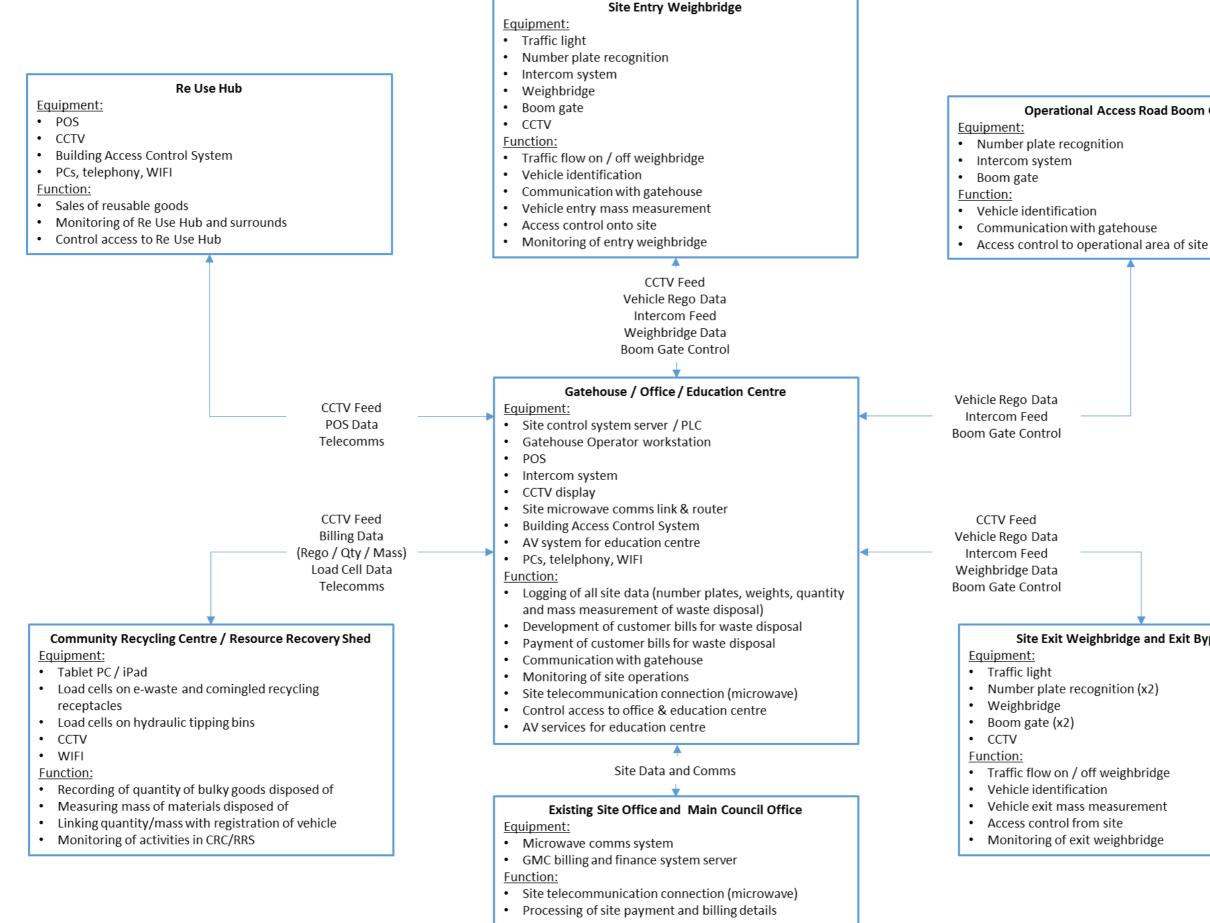
An overall concept control system block diagram is provided in Figure 4-1 outlining the equipment and function at each major location on site, and the corresponding flow of data and information between locations.

Following on from this, a concept site network architecture diagram is provided to indicate the proposed equipment and configuration for the site communication and automated equipment items.

These diagrams are presented as concept only, and are subject to confirmation by the successful site automation and control contractor as part of the detailed design and supply of the site control system. This can only be completed once all of the major equipment items have been procured by GMC.

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RUG Facility Control System Block Diagram Figure 4-1

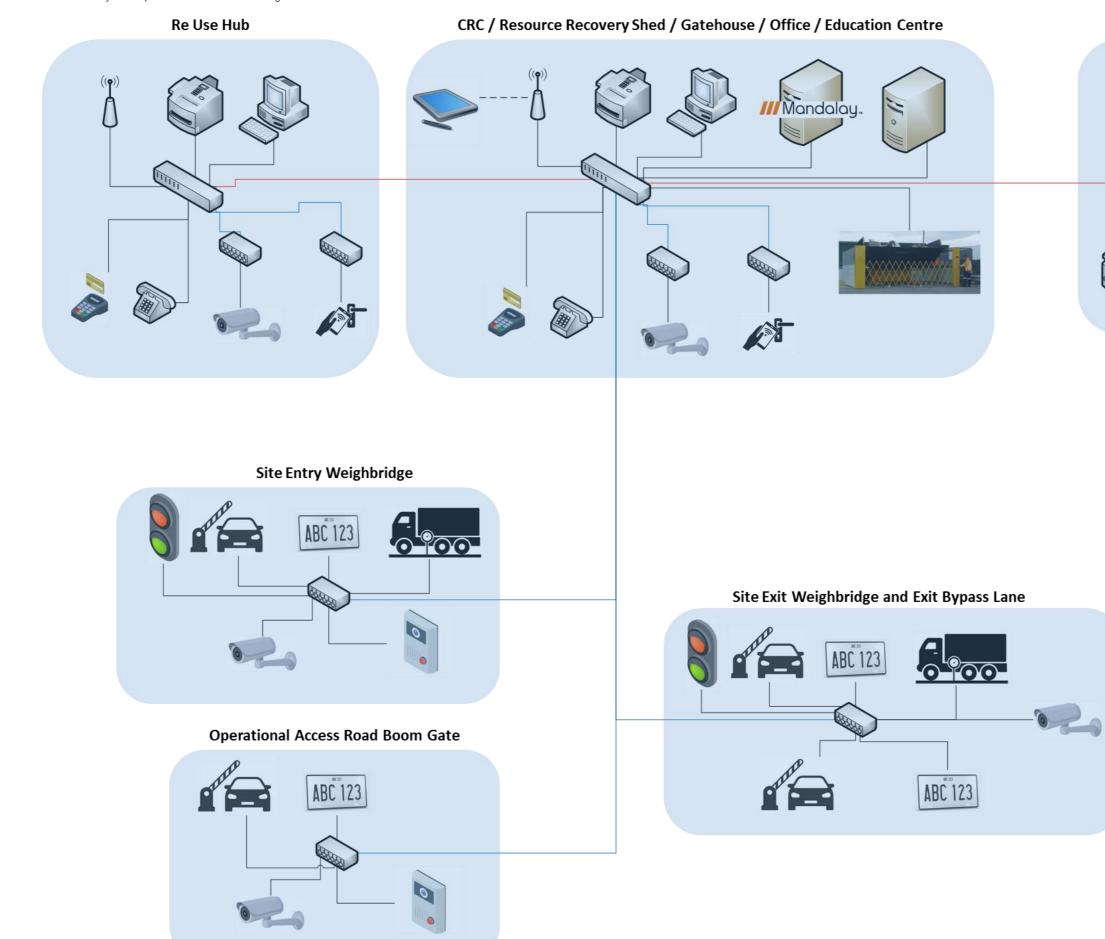


Operational Access Road Boom Gate

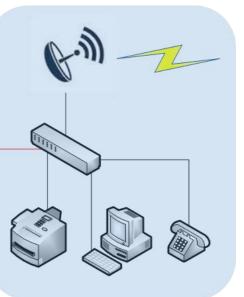
Site Exit Weighbridge and Exit Bypass Lane

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Figure 4-2 RUG Facility Concept Network Architecture Diagram



Existing Site Office



4.2 Control System Description

The key automated plant and equipment items and their associated operational design parameters are as follows.

4.2.1 Hydraulically Operated Tipping Bins

The hydraulically operated tipping bins are controlled via manual push buttons using a proprietary local control system mounted on each unit that features an automatic and manual operations mode, as well as a keyed system override (maintenance) mode. It also incorporates an emergency stop button that is a hard wired interlock that is active in all operational modes.

When in either automatic mode (normal operation) or manual mode, operation of the hydraulically operated tipping bins is interlocked by a proximity switch on the concertina barricade (normally open), and by a load cell measurement of less than 2,500kg (maximum safe working load). In automatic mode, the bin is automatically raised and lowered by a single push button. In manual mode, the bin can be raised, lowered and stopped part way using the relevant push button controls.

A security key is required to switch to the system override (maintenance) mode which allows the system to operate manually without interlocks, excepting the hard wired emergency stop button.

4.2.2 Polystyrene Compactor

The polystyrene compactor is controlled via manual push buttons using a proprietary local control system mounted on the unit (details TBC based on tendered supplier). It also incorporates an emergency stop button that is a hard wired interlock that is active in all operational modes.

4.2.3 Wash Bay High Pressure Water Pump

The wash bay high pressure water pump is operated via a manual on/off selector switch on the power supply to the pump.

4.2.4 Wash Bay Leachate Sump Pump

The Wash Bay leachate sump pump is operated via a manual on/off selector switch on the power supply to the pump. Once turned on the pump will continue to run until the low level switch is activated which automatically stops the pump by tripping the manual reset button, or until the pump is manually stopped. Once automatically stopped, the manual reset button must be depressed to allow the pump to restart the pump. Measurement of level in the sump is via a single low level switch (float style)

The sump pump also includes integral thermal overload protection that will stop the pump on high temperature, and will prevent restarting until the pump has suitably cooled.

4.2.5 RORO Bin Area Leachate Sump Pump

The RORO Bin Area leachate sump pump is controlled via manual push buttons using a proprietary local control system mounted at the sump area that features an automatic and manual operations mode, as well as a keyed system override (maintenance) mode. It also incorporates an emergency stop button that is a hard wired interlock that is active in all operational modes. Measurement of level in the sump is by a primary dual high / low level float switch, and a secondary independent high high level float switch.

When in either automatic mode (normal operation) or manual mode, operation of the sump pump is interlocked by low level in the sump. In automatic mode, the sump pump is automatically started based on observed high or high high level. In manual mode, sump pump is operated by manual start / stop push buttons.

A security key is required to switch to the system override (maintenance) mode which allows the pump to operate manually without interlocks, excepting the hard wired emergency stop button.

4.2.6 Entry and Exit Weighbridge Traffic Lights

The site entry and exit weighbridge traffic lights are operated by the proprietary control system for the weighbridges, based on the observed weight. When the observed weight is equal to the threshold tare value, the traffic light signals green indicating for vehicles to proceed on to the weighbridge. When the observed weight is above the threshold tare value the traffic light changes to red indicating for vehicles to stop and wait before proceeding onto the weighbridge.

In the event of control system failure or loss of signal (i.e. loss of system healthy signal), the traffic light will default to red.

4.2.7 Entry and Exit Weighbridge

Vehicle weight data is automatically captured from the site entry and exit weighbridges via a proprietary control system and software. The data is recorded against the automatically captured vehicle number plate details from the number plate recognition system at each weighbridge. The weighbridge system flags if there is an error with the automatic number plate recognition system, and the Operator can then manually enter the observed number plate details.

4.2.8 Site Access Control Boom Gates

The site access control boom gates are controlled by a proprietary control system on the Gatehouse Operators works station that is linked to the automatic number plate recognition system and light beam at each access point, and includes an automatic and manual control mode. They also have a hidden locally mounted maintenance mode switch allowing the boom gate to be manually raised and lowered on site for testing purposes.

In automatic mode, the boom gate is automatically raised if the captured number plate details from the number plate recognition system are found within the approved vehicle database for the site. The boom gate remains open for a preset time period or while the light beam is activated, after which it then automatically lowers. The timer is reset once the light beam has been activated. If the vehicle number plate details are not found on the approved vehicle database, or if there is a system fault with the number plate recognition system, an alert is raised on the Operator's workstation. The Operator can then manually raise the boom gate from their workstation as appropriate. In automatic mode the boom gates have a preset timer function raise the gates outside of normal operation hours when the site is not in operation to allow for unhindered access in emergency situation outside of hours.

In manual mode, operation of the boom gate is solely via the Operator's discretion (both open and closed). Selection of automatic and manual modes are made by the Operator's workstation.

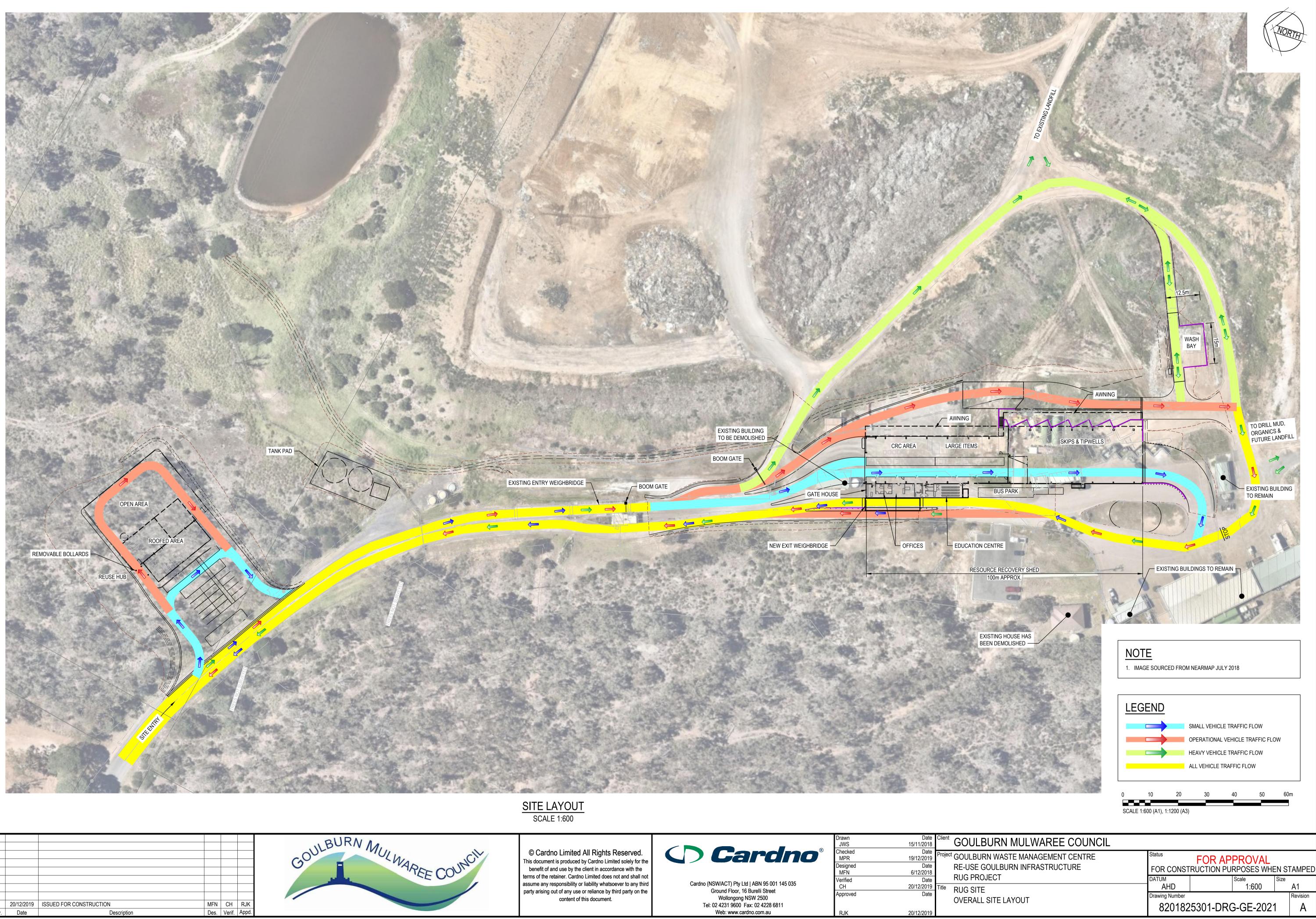
APPENDIX



SITE LAYOUT DRAWING







А	20/12/2019	ISSUED FOR CONSTRUCTION	MFN	СН	RJK	
Rev.	Date	Description	Des.	Verif.	Appd.	



content of this document.



Drawn JWS	Date 15/11/2018	Client GOULBURN
Checked MPR	Date 19/12/2019	Project GOULBURN WAST
Designed MFN	Date 6/12/2018	RE-USE GOULBUF RUG PROJECT
Verified CH	Date 20/12/2019	Title RUG SITE
Approved	Date	OVERALL SITE LA
RJK	20/12/2019	

8201825301-DRG-GE-2021

Α

About Cardno

Cardno is an ASX200 professional infrastructure and environmental services company, with expertise in the development and improvement of physical and social infrastructure for communities around the world. Cardno's team includes leading professionals who plan, design, manage and deliver sustainable projects and community programs. Cardno is an international company listed on the Australian Securities Exchange [ASX:CDD].

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Re-Use Goulburn

APPENDIX

RESOURCE RECOVERY MANAGEMENT PLAN





Goulburn Mulwaree Council Locked Bag 22 Goulburn NSW 2580 Civic Centre 184 - 194 Bourke Street Goulburn NSW 2580 t (02) 4823 4444 e council@goulburn.nsw.gov.au www.goulburn.nsw.gov.au

Resource Recovery Management Plan – Re-Use Goulburn construction

- 1. Scope To ensure that guidelines are in place to properly identify and dispose of wastes that are generated during construction and demolition activities, and ensure that waste is minimised and reused or recycled where possible.
- 2. Legislative requirements All waste generated during construction will be recycled or reused if possible, or disposed of at the appropriate location within Goulburn Waste Management Centre in accordance with Environment Protection Licence 6780 that applies to the site. With the waste centre being the construction location, any waste (such as excavated or exhumed material) that was pre-existing on the site will be safely moved to the appropriate location for disposal in accordance with all legislative requirements. Any waste from construction materials brought on to the site during construction will be disposed of in skip bins within the construction zone and then transported over the facility's weighbridge to ensure it is recorded as waste brought on to the site for disposal. Multiple skip bins will be provided to facilitate the separation of waste streams, such a landfill waste, cardboard and concrete.

No construction waste streams have been identified that will not be able to be disposed of at Goulburn Waste Management Centre under Environment Protection Licence 6780. This licence allows the Scheduled Activities of Composting and Waste Disposal (Application to Land, any capacity), which includes both putrescible and non-putrescible general solid waste plus asbestos waste.

As construction will require waste to be exhumed, approval for the same is sought from the NSW EPA as part of the Development Application process in accordance with Clause 110A of the Protection of the Environment Operations Legislation Amendment (Waste) Regulation 2018 [NSW]. Any construction activities involving the exhumation or drilling into the landfill cap will be conducted under appropriate occupational hygiene measures – as detailed in the SafeWork 'How to Manage and Control Asbestos in the Workplace – Code of Practice (2011)' and GWMC management plans, given the potential for bonded asbestos to be disturbed.

3. Waste streams – Only minimal demolition wastes will be produced during construction. The majority of this waste will be steel and building materials from the small gatehouse and a small recycling shed that will require removal. No asbestos has been identified in the buildings requiring demolition. The small recycling shed will be reused if possible.

Goulburn Waste Management Centre already features disposal areas for various waste streams, which will ensure the project has ready access to such facilities. Construction

wastes will include cardboard, steel, timber and building materials, which similarly can be well managed within the waste centre or transported to the nearby Endeavour Industries Materials Recovery Facility just down the road at 54 Sinclair Street. Goulburn Mulwaree Council will provide the skip bins and transportation for any waste streams disposed of at Goulburn Waste Management Centre or Endeavour Industries.

- 4. Implementation All staff and contractors will be inducted into this plan. Goulburn Mulwaree Council will ensure waste is minimised from the construction and demolition activities and recycling/reuse occurs through the following initiatives:
 - Ensuring separate receptacles are provided for recyclable waste.
 - Monitoring each load of waste to landfill to ensure it does not contain recyclables.
 - Ensuring spill management procedures are followed.
 - Waste is exhumed according to legislative requirements.

Re-Use Goulburn

APPENDIX



CRC OPERATIONS AND MANAGEMENT HANDBOOK

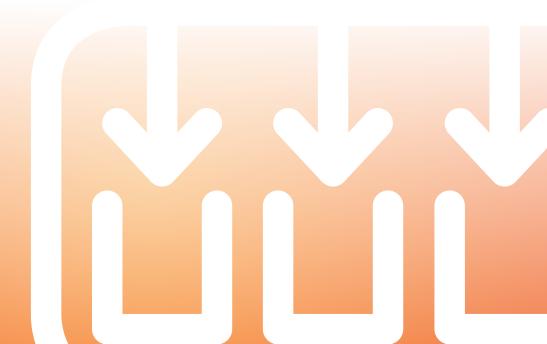




Community Recycling Centres

Operations and management handbook – 2nd ed.

Waste matters Drop off your household problem waste for recycling



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Email: info@environment.nsw.gov.au **Website:** www.epa.nsw.gov.au

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Environment Line: 131 555 (NSW only) or info@environment.nsw.gov.au See also www.epa.nsw.gov.au

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Disclaimer

This Handbook is intended to assist in the design of Community Recycling Centres (CRCs) to maximise the efficient operation of the centre or service and maximize resource recovery. It does not constitute legal or regulatory advice on any issue. It does not dissolve the user or facility from compliance with NSW waste regulations or environmental license conditions. Councils and others should seek and rely on their own advice in relation to issues such as environmental licensing, Work Health and Safety and planning approvals in relation to specific facilities. The NSW Environment Protection Authority (EPA) accepts no responsibility for errors or omissions in the Handbook or for any loss or damage arising from the use of the Handbook.

Community Recycling Centres program

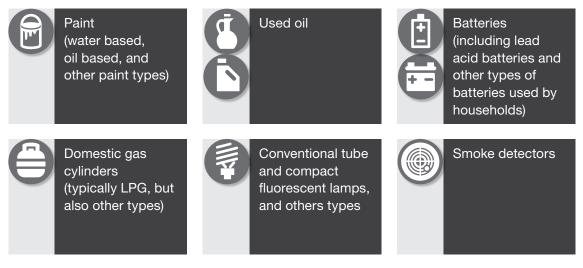
The NSW Environment Protection Authority (EPA) is establishing a network of Community Recycling Centres (CRCs) across NSW. The primary aim of this program is to make it easy for householders in NSW to safely dispose of materials that can be hazardous to the environment or to public health. CRCs are to be designed and operated to temporarily store these materials safely until they can be recycled or disposed of appropriately.

The materials being targeted by the EPA for collection at CRCs are referred to as CRC materials in this Handbook and are listed below.

Facility operators may collect other materials, but are to do so at their own discretion and cost.

The program is aimed at householders, who wherever possible will be able to have their materials accepted at any facility in the network of CRCs. Materials accepted from commercial or business operators will not form part of this program, and their collection and disposal will not be funded by the EPA.

CRC materials



Purpose of this Handbook

The EPA has prepared this Handbook to assist facility owners and operators to establish and operate a CRC. The Handbook outlines minimum standards for infrastructure, risk management, operating procedures, training, record keeping and reporting. These standards require CRC operators to ensure facilities and equipment, processes and documented procedures are in place to protect the health and safety of customers and staff at the facility, and for managing the impact of the facility on the environment.

This Handbook must be kept at the CRC for reference by operations staff.



The Handbook contains the following sections:

1.

Establishing a Community Recycling Centre

Outlines the requirements for locating a CRC, standards for infrastructure, buildings, site control measures, and equipment required for handling materials appropriately.

3.

Operating a Community Recycling Centre

Provides procedures to protect the health and safety of customers and staff, and for managing the impact of a CRC on the environment. This includes advice on safe handling of materials and emergency response, that can be used by CRC operators as is or to update their own procedures.

5.

Record keeping and reporting

Outlines the requirements for record keeping and reporting in relation to quantities of materials kept on site and collected, risks, induction and training, and performance self-assessments. Guidance is provided in using the online reporting system for CRCs.

7. Impor

Important references

Provides a list of important references and links relevant to establishing and operating a CRC.

2. Risk management

Describes the elements of risk management and how they can be applied to the design and operation of CRCs. A worksheet is provided that can be used by CRC operators to undertake a Risk Assessment and prepare a Risk Management Plan for a particular CRC.

4.

Induction and training

Outlines the requirements for induction and training of staff involved in establishing and operating a CRC. An induction checklist and templates are provided for keeping records of induction and training.

6.

Mobile Community Recycling Centre Operations

Outlines requirements for infrastructure and equipment, storage control measures, procedures to protect the health and safety of customers, and manage the impact on the environment for mobile CRC services.

8. Safety data sheets

Provides safety data sheets for the hazardous materials received at a Community Recycling Centre.



Emergency contact numbers (Write in contact details for this CRC)

NSWFB / RFS	
Hazmat	
Police	
Local hospital / medical	
Poisons information	
Local EPA	
EPA contractor for CRCs	

REFER TO EMERGENCY RESPONSE PLAN AND NOTE THE PRIORITY CALL LIST HERE:

(i.e. who to call in what order)

Important contacts (Write in contact details for this CRC)

Collection	Company	: Toxfree		
contractor	Address:	40 Christie Street, St Ma	arys NSW	2760
	Phone:	1300 869 373		
	Primary contact:			
	Name:	lan Parkes		
	Title:	Major Contract Manage	r	
	Phone:	02 9851 4200	Mobile:	0409 938 553
	Email:	i.parkes@toxfree.com.au	L	
	Alternate	contact:		
	Name:			
	Title:			
	Phone:		Mobile:	
	Email:			
	Num			
Local EPA contact	Name:			
contact	Title:			
	Phone:		Mobile:	
	Email:			
	Location:			
	Address:			



NSW Community Recycling Centres | Operations and management handbook – 2nd ed. Introduction

Council contacts	Site supervisor: Name: Title: Phone: Email: Education officer: Name: Title: Phone: Email:	Mobile:
Communication and education contact	Location address: Name: Title: Phone: Email:	Mobile:
Data reporting information	Centre ID: Registered users: Name:	Password:



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- 1.2 Infrastructure and building requirements
- 1.3 Site control measures
- 1.4 Collection of deposited materials
- 1.5 Equipment and handling procedures

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- 2.2 Risk management process

2.3 Example of risk assessment and controls Appendix 2.1: CRC risk assessment worksheet

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- 4.2 Training

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- 6.2 Risk management approach
- 6.3 Compliance with dangerous goods transport legislation
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- 6.5 Establishing a mobile CRC service
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Appendix 6.3 – Checklist for mobile CRC vehicles

Appendix 6.4 – Checklist for vehicles transporting from a satellite

Appendix 6.5 – Checklist for satellites



7. Important references

- 7.1 NSW Government agencies and legislation
- 7.2 Australian standards



8. Safety data sheets



1. Establishing a Community Recycling Centre



General requirements



Infrastructure and building requirements



Site control measures



Collection of deposited materials

Equipment and handling procedures

EPA2016/0557 ISBN 978-1-76039-493-6

Establishing a Community Recycling Centre

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1.1 General requirements

1.1.1 Preferred locations

Where drop-off centres for waste and recyclables are already in operation, it is preferable, where practical, that these existing facilities are adapted to establish CRCs.

To ensure ready access and maximise participation by the community, new centres should be located in or close to population centres.

Any adjacent facilities or activities should be taken into account to ensure that any impact on or by the CRC is minimised.

1.1.2 Site management

The council or site operator shall manage the site(s) and be responsible for ongoing risk assessment and management, and adherence to operational procedures.

1.1.3 Community involvement

A desired outcome of the program is for the local community to engage with, and feel welcome at, CRC facilities. The community should clearly understand what materials can be dropped off and where they should be placed.

As the CRCs evolve there may be opportunity for expansion to include additional household wastes that have been identified by the community as a problem waste. Facility operators are encouraged to support activities that will achieve better waste and resource recovery outcomes.

1.1.4 Site approvals and consents

Facilities are to be operated so that the volume of materials held on site remains under 'Manifest' quantities in accordance with applicable regulations and standards. Generally the local council will be the consent authority authorised to deal with Development Approvals (DAs) and other applications if required.

An EPA Environment Protection Licence is required for any activity above the scheduled size for waste storage under the *Protection of the Environment Operations Act 1997* Schedule 1 (42), which is more than 5 tonnes of hazardous waste, restricted solid waste, liquid waste, clinical or related waste, or asbestos waste stored on the premises at any time. The CRC will be designed and operated not to exceed the Schedule 1 thresholds for waste storage.

Where a CRC is established at an existing facility that is currently licensed for solid waste only, the EPA will assist in amending as appropriate the licence to accept liquid and hazardous wastes from domestic sources as described. If a licence amendment is required the CRC operator must advise the relevant EPA office.



Waste levy exemption for facility construction

Where a CRC is located at a waste facility in a regulated area where the waste levy applies on materials entering the site, the facility manager can apply to the EPA for a levy exemption for construction materials such as concrete slabs, footings, roofs, floors, posts and collection infrastructure through the Operational Purpose Deduction. The waste levy guidelines are available at: **www.epa.nsw.gov.au/wasteregulation/waste-levy.htm**.

To apply for these waste levy exemptions contact the EPA Waste Strategy and Innovation Unit at **waste.operations@epa.nsw.gov.au**.

1.1.5 Work Health and Safety

Under the *NSW Work Health and Safety Act* (WHS Act), a person conducting a business or undertaking has the primary duty to ensure, so far as is reasonably practicable, that the health and safety of workers and other persons are not put at risk from work carried out as part of the conduct of the business or undertaking.

The NSW Work Health and Safety Regulations (WHS Regulations) include specific duties for a person conducting a business or undertaking to manage the risks to health and safety associated with using, handling, generating and storing hazardous chemicals at a workplace. The duties applicable to CRCs include:

- correct labelling of containers using warning placards, outer warning placards and displaying of safety signs
- maintaining a register of hazardous chemicals and providing notification to the regulator of manifest quantities if required
- identifying risk of physical or chemical reaction of hazardous chemicals and ensuring the stability of hazardous chemicals
- ensuring that exposure standards are not exceeded
- provision of health monitoring to workers
- provision of information, training, instruction and supervision to workers
- provision of spill containment system for hazardous chemicals if necessary
- ensuring Safety Data Sheets appropriate to the materials being stored are available
- controlling ignition sources and accumulation of flammable and combustible substances
- provision and availability of fire protection, firefighting equipment and emergency and safety equipment
- preparing an emergency plan if the quantity of a class of hazardous chemical at a workplace exceeds the manifest quantity for that hazardous chemical.

Officers, such as company directors, have a duty to exercise due diligence to ensure that the business or undertaking complies with the WHS Act and Regulations. This includes taking reasonable steps to ensure that the business or undertaking has and uses appropriate resources and processes to eliminate or minimise risks that arise from hazardous chemicals at the workplace.



Workers have a duty to take reasonable care for their own health and safety and must not adversely affect the health and safety of other persons. Workers must comply with any reasonable instruction and cooperate with any reasonable policy or procedure relating to the use, handling and storage of hazardous chemicals at the workplace.

1.1.6 Risk management

The quantity of materials held on site (in particular oil based paint) will generally be above the threshold quantities under the NSW Work Health and Safety Regulation. As a result, facility operators must prepare a risk management plan for the drop-off and storage area covering both design and operations, and comply with the placarding signage requirements.

1.1.6.1 Managing the risks of hazardous chemicals

Part 2 of this Handbook provides guidance in identifying, assessing and managing the risks associated with the hazardous materials that are collected at CRCs.

The WHS Act requires CRC operators to consult, as far as reasonably practical, with workers involved in the operation of the CRC in conducting the risk assessments and implementing controls.

The WHS Act also requires that CRC operators consult, co-operate and co-ordinate activities with all other persons who have a work health or safety duty in relation to the same matter, as far as is reasonably practicable. This is particularly relevant where a CRC site has co-located activities undertaken by an external party such as a contractor, or where the CRC is operated by a contractor to the organisation which has established the CRC.

1.1.6.2 Register of hazardous chemicals

CRC operators must ensure that a register of hazardous chemicals is prepared and kept up to date. The register must be readily accessible to workers involved in using, handling or storing hazardous chemicals and to anyone else who is likely to be affected by a hazardous chemical at the workplace. The register is a list of all hazardous chemicals used, handled or stored at the workplace accompanied by the current SDS (one that is not more than five years old) for each hazardous chemical listed. It must be updated as new hazardous chemicals are introduced to the workplace or when the use of a particular hazardous chemical is discontinued.

The online dropoffwaste reporting system is appropriate for use as a register of hazardous materials stored at a CRC.

1.1.6.3 Safety Data Sheets

CRC operators must ensure Safety Data Sheets (SDSs) for the hazardous chemicals being stored at the CRC are obtained as soon as practicable.

CRC operators must also ensure the current SDSs are readily accessible to workers who handle the hazardous chemical at the workplace and emergency service workers, or anyone else, who is likely to be exposed to the hazardous chemical.



The SDSs should be kept in a location near the work area where the substance is stored. All workers likely to be exposed to the hazardous chemical must know how to find the SDS. In some cases it may be practicable to provide workers with access to SDS via an electronic database. However, this should be readily available to workers, workers should know how to use it, and a backup means of providing the SDSs should also be provided, for example as hard copies in a filing system.

The EPA has prepared a set of ten SDSs applicable to the materials that will be received at a CRC. These SDSs are provided at Tab 8 of this Handbook. NSW WHS Regulation 2011 Schedule 7(2) allows SDSs for waste products to be less detailed than those for non-waste products, and this has been taken into account in preparing SDSs for use at CRCs.

The EPA also provides a waterproof box to hold the sheets in a convenient location near the entrance to the CRC building. CRC operators are responsible for installing the box and keeping the SDSs inside it.

The waterproof box is also an appropriate location to hold a copy of emergency response procedures and other associated information.

1.1.6.4 Labels

CRC operators must ensure that containers of hazardous chemicals are correctly labelled. The collection contractor supplies labels for receptacles of CRC materials, and CRC operators must ensure these labels are correctly affixed to the relevant receptacle as soon as it is brought into service. These labels will correctly designate the receptacle both for storage and for transport of the material.

Correct labelling of receptacles as soon as they are brought into service must be included in the Safe Work Method Statements or Safe Operating Procedures for the CRC. Operations staff at the CRC must be trained in correct labelling procedures.

Additional placards as required by Schedule 11 and Schedule 13 of the WHS Regulation must be installed at a CRC. Refer to **Section 1.3.1.2** for more information.

1.1.6.5 Fire and explosion

CRC operators must manage the risk to health and safety associated with a hazardous atmosphere or an ignition source in a hazardous atmosphere at the workplace. This includes preventing ignition sources in the CRC via both design (e.g. intrinsically safe electrical equipment) and procedures (e.g. preventing customers and staff from smoking or using mobile phones in the CRC). Refer to **Part 2** of this Handbook for more detailed information on the fire and explosion risks arising from specific CRC materials.

1.1.6.6 Personal protective equipment (PPE)

PPE includes overalls, aprons, footwear, gloves, chemical resistant glasses, face shields and respirators. CRC operators must ensure that PPE is:

- selected to minimise risk to health and safety
- suitable for the nature of the work and any hazard associated with the work
- a suitable size and fit and reasonably comfortable for the person wearing it
- maintained, repaired or replaced so it continues to minimise the risk
- used or worn by workers, so far as is reasonably practicable.



Staff working in a CRC must, so far as reasonably able, wear the PPE in accordance with any information, training or reasonable instruction.

In most circumstances, PPE should not be relied on to control risk. It should be used only as a last resort when all other reasonably practicable control measures have been used and the risk has not been eliminated, or as interim protection until higher level controls are implemented. There may also be situations when the use of other controls is not practicable.

1.1.6.7 Containing spills

CRC operators must ensure, so far as is reasonably practicable that where there is a risk of a spill or leak of a hazardous chemical in a solid or liquid form, provision is made for a spill containment system. This system must contain within the workplace any spill or leak of a hazardous chemical and any resulting effluent.

When a spill, leak or accidental release of hazardous chemicals occurs, appropriate actions must be taken to contain the hazardous chemicals within the workplace. The spill containment system must describe how to contain, clean up and dispose of the spill or leak and any resulting effluent. The system must not create a hazard by bringing together different hazardous chemicals that would react together to cause a fire, explosion, harmful reaction or evolution of flammable, toxic or corrosive vapour.

1.1.6.8 Maintaining control measures

CRC operators must ensure that the implemented control measures remain effective. This includes checking that the control measures are fit for purpose, suitable for the nature and duration of the work and are installed and used correctly.

They must also ensure that a system used at the workplace for the use, handling or storage of hazardous chemicals is used only for the purpose for which it was designed, manufactured, modified, supplied or installed. It must be operated, tested, maintained, installed, repaired and decommissioned having regard to the safety or workers and other persons at the workplace.

1.1.6.9 Providing information, training, instruction and supervision

CRC operators must ensure that information, training and instruction provided to workers is suitable and adequate to:

- the nature of the work carried out by the workers
- the nature of the risks associated with the work at the time the information, training or instruction is provided, and
- the control measures implemented.

CRC operators must also provide any supervision necessary to protect workers from health and safety risks arising at the workplace, if workers:

- use, handle, generate or store a hazardous chemical
- operate, test, maintain, repair or decommission a storage or handling system for a hazardous chemical, or
- are likely to be exposed to a hazardous chemical.



Information, training, instruction and supervision must be provided not only to workers, but also to other persons at the workplace such as visitors.

Information, training and instruction should include:

- the nature of the hazardous chemicals involved and the risks to workers
- the control measures implemented, how to use and maintain them correctly
- the arrangements in place to deal with emergencies, including evacuation procedures, containing and cleaning up spills and first aid instructions
- the selection, use, maintenance and storage of any personal protective equipment (PPE) required to control risks and the limitations of the PPE
- any health monitoring which may be required and workers' rights and obligations
- the labelling of containers of hazardous chemicals, the information that each part of the label provides and why the information is being provided
- the availability of SDSs for all hazardous chemicals, how to access the SDSs, and the information that each part of an SDS provides
- the work practices and procedures to be followed in the use, handling, processing, storage, transportation, cleaning up and disposal of hazardous chemicals.

Information, training and instruction must be provided in such a way that it is easily understood. The amount of detail and extent of training will depend on the nature of the hazards and the complexity of the work procedures and control measures required to minimise the risks.

Records of training provided to workers should be kept, documenting who was trained, when and on what.

1.1.6.10 Emergency preparedness

CRC operators must prepare an effective emergency plan for the workplace. The purpose of the emergency plan is to plan for, and thus minimise the effects of, any dangerous occurrence or near miss at a workplace resulting from handling of hazardous chemicals.

The emergency plan should have provision for notifying appropriate authorities and any neighbours of the CRC that may be affected.

1.1.7 Insurance

The facility operator is to maintain adequate property, public liability, and workers compensation insurance cover for the facility and its operations.

1.1.8 Site appraisal

Upon acceptance of an Environmental Trust grant the CRC operator must provide a copy of the site plan and designs to the EPA's Community Recycling Unit for approval before construction commences. The EPA will appraise each site and provide comment on design plans and designs for the facility and its operations. Prior to the opening of each facility the EPA will provide training for site staff including guidance in conducting risk assessments.



1.1.9 Site layout and access

The site layout should support the safe and smooth flow of traffic through the facility, minimise customer waiting times, reduce the likelihood of congestion, and provide the minimum possible distances that customers need to carry materials they are delivering to the facility.

The facility should have separate entry and exit points for householder vehicles, and accessible parking immediately adjacent to the storage receptacles for materials.

The facility should provide sufficient space for truck and forklift movements including allowance for turning circles. The facility should have enough room to safely and easily move full receptacles into a storage area and to replace them with empty receptacles. It should also allow sufficient area for the loading of full storage receptacles for transport. The layout of the facility should as far as practicable ensure that truck, forklift, and customer vehicle movements do not intersect when materials are being collected. The separation of these site users may also be achieved by suitable operational procedures that are based on a risk management approach.

If a CRC is established at a works depot or other similar site where it is not desirable to allow householders access, consideration could be given to providing a drop-off area just inside the perimeter of the site that is adjacent to an external roadway. In this situation the facility layout must ensure that material storage areas can be secured out of hours.

All facility operators must obtain concept design advice from the EPA which can assist to ensure the proposed layout is operationally sound and conforms to the relevant Australian Standards. The EPA's Community Recycling Unit must approve the initial concept design and the final design. Funding may be withheld or delayed without these approvals.

1.1.10 Opening times

A considerable degree of latitude will be granted to the site host in regard to opening times. However, as a minimum it is expected that the site is supervised during householder access times which should be a minimum of 2 days during the week and 3 hours on some part of the weekend. Ideally operation 7 days per week is preferred to maximize availability and convenience for residents. Consistent and regular opening times are also preferable to encourage use by residents.

Depending on the site it may be necessary to close during periods where the receptacles are being moved or collected for the safety of members of the public and staff. Opening times for each specific centre will be incorporated into the agreement between the EPA and the facility operator.

1.1.11 No charge to householders

All materials accepted under this program are to be accepted at no charge to the householder whilst the EPA is paying the collection and processing costs. An existing facility that currently accepts the targeted materials at a charge to the householder must cease charging to be eligible for support under the CRC program.





1.2 Infrastructure and building requirements

The materials accepted should be stored out of the weather. As a minimum requirement materials are to be stored in a well-ventilated shed consisting of three sides and a roof, on a concrete or bitumen sealed surface, and with sufficient awning overhang on the open side to prevent rain ingress and provide cover for householders unloading. An appropriately designed building may also be used for storage where it has adequate forklift access and ventilation.

1.2.1 Receiving area and roadway surfaces

All surfaces where target materials are to be unloaded from householder vehicles and deposited in the storage receptacles must be sealed to contain inadvertent spills. Road surfaces should be designed and reinforced to withstand the loads applied by repeated use by heavy vehicles such as trucks collecting materials, and forklift movements, without degradation. Drainage in the immediate area should be designed and managed to prevent any spillages from entering waterways. Drainage should also be provided to minimise flooding from heavy rain within the unloading and storage areas, and within the approaches and exits from these areas.

1.2.2 Rain cover

The facility structure should provide protection from the weather, including a covered area where materials are accepted and moved from customers' vehicles to storage receptacles. Where it is intended or likely that the collection vehicle will pass under this area then it must have a minimum height of 5 metres.

1.2.3 Ventilation

Ventilation is a means of maintaining a safe atmosphere by the introduction or recirculation of air by natural, forced or mechanical means. Maintaining a safe atmosphere in the storage and handling area of hazardous chemicals is an important control measure. A CRC building or structure must be provided with adequate natural or mechanical ventilation. Natural ventilation is preferred and can be achieved by providing:

- at least two external sides completely open to the outside atmosphere
- one external side completely open to the outside atmosphere, with no other vents, provided that the distance to and the length of the opposite wall do not exceed the length of the open side
- one external side open to the atmosphere, and vents in one opposite or adjacent wall
- vents in one external wall, provided that such a wall is at least 6m long and the opposite wall is not more than 5m away from it
- vents in opposing walls.



Open or mesh sides with adequate roof overhang are recommended for natural ventilation. If an enclosed shed is to be used for either drop-off of materials and/or storage of full receptacles, vents are to be included at both the top and bottom of the shed walls and should be louvered to provide weather protection.

For guidance on providing ventilation, refer to AS/NZS 3833:2007 The storage and handling of mixed classes of dangerous goods in packages and intermediate bulk containers.

The storage of LPG gas cylinders requires unconfined air space, and in most cases locating the receptacle cage external to a building (if used) will be most appropriate.

1.2.4 Arrangement and nominal size of facility

The CRC program targets six material groups (in nine separate storage receptacles).

AS/NZ53833:2007 specifies that incompatible dangerous goods must be segregated. Receptacles used at CRCs should provide adequate segregation. However, as lead acid batteries (corrosive class 5) are usually not placed in a receptacle, they should be segregated from other materials, and in particular from LPG cylinders by a distance of at least 3 metres.

A typical arrangement for the nine storage receptacles is in a straight line including walking space between the receptacles. This would require an unloading length of between 16 and 18 metres. A roofed area of around 70 to 100 square metres is suitable for initial operation of an average size facility. However, the structure or area in which the CRC is located may be larger and may have multiple uses particularly if other materials are accepted.

Nominal dimensions above represent minimum requirements. Centres that serve large population centres may require larger areas than described above.

Further guidance on sizing a new CRC is provided in **Appendix 1.1** of this Handbook. An indicative layout of receptacles for the facility is illustrated in **Figure 1.2.4**.

1.2.5 Storage area for full and replacement receptacles

A separate area, or areas, is required for storage of full and replacement storage receptacles as well as safety cabinets for by-catch materials. This area should be secured from the drop-off area by a lockable gate if possible. Storage for the full receptacles requires adequate rain cover whether by roofing or tarpaulin. Storage of full and empty receptacles (also referred to as 'back-of-house') will typically require an area of 6m by 3m, and safety cabinets for by-catch will typically require an area of 6m by 1m.

Sufficient area must be provided to allow for easy movement of storage receptacles by forklift within the unloading and storage areas.



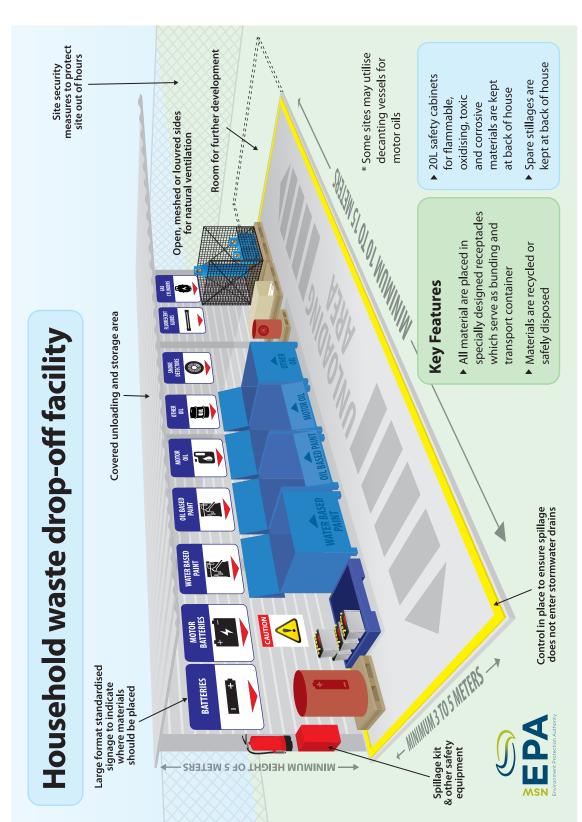


Figure 1.2.4 – Indicative layout for a Community Recycling Centre

1.2.6 Dangerous Goods Safety Cabinets (DGSC)

Irrespective of gate policies and dedicated signage, a small percentage of non-targeted by-catch materials can be expected. Separate dangerous goods safety cabinets compliant with the relevant Australian Standards for flammable, oxidising, toxic and corrosive materials will be provided by the EPA during establishment of the facility.

The DGSC are to be kept in a separate secured area out of sight from the main drop-off area to discourage the delivery of non-target materials, and should not be accessible to members of the public. The cabinets are only to be moved when empty to avoid spills and damage to the cabinet. The cabinets should remain on pallets supplied for ease of movement by forklift if required.

The appropriate primary Australian Standard for Community Recycling Centres – *AS/NZS 3833:2007 The storage and handling of mixed classes of dangerous goods in packages and intermediate bulk containers* has specific requirements relating to the use of cabinets for the storage and handling of mixed classes of dangerous goods. These include requirements relating to the types of substances kept, the maximum quantities to be kept, cabinet construction, cabinet location, and cabinet marking.

Where the quantity of dangerous goods being kept in the cabinet(s) is less than minor storage quantities as defined by AS/NZS 3833:2007, these requirements are advisory but should be implemented at CRCs. **Table 1.2.6**, extracted directly from this standard, outlines the maximum quantities for minor storage. Although the preferred approach to the storage of by-catch at CRCs is that minor storage quantities should not be exceeded, there will be circumstances where these will be exceeded, and these requirements must be met.

Box 1 on page 14 shows the requirements of the standard for minor storage, and Box 2 on page 15 shows the requirements of the standard where the quantities for minor storage are exceeded. These requirements should be considered during the design of the CRC. Note these requirements are summarised for information here – the full standard should be referenced when designing a CRC.

Table 1.2.6 – Maximum	quantities	for minor	storage
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Description	Quantity: kg or L			
Description	Packing Group I	Packing Group II	Packing Group III	
Total quantity of all dangerous goods	25	250	1,000	

Notes:

- 1. It is permissible to store, at the same time and in the same area, the maximum allowance for each of all the Packing Groups. Refer to Box 3 on page 16 for an explanation and examples of packing groups.
- 2. Where manufactured product is stored, the quantities of manufactured product may be doubled.
- 3. The maximum quantity of Class 5.2 dangerous goods (organic peroxides) allowable as minor storage is 10kg or L.
- 4. For the purpose of determining minor storage quantities Class 2 dangerous goods in retail packages, aerosols, and substances and articles of Class 9 are regarded as Packing Group III.



Arrangement of Dangerous Goods Safety Cabinets (DGSC)

In most instances the total capacity of the DGSC will be less than the requirement for minor storage. Where the total capacity of these cabinets is greater than this, the cabinets are to be arranged as two or more minor stores.

These minor stores must be:

- separated by more than 10m from any other dangerous goods store
- located to ensure there is not more than one minor store per 500m² of floor or ground area
- at least 10m apart.

Like types of DGSC are to be kept together.

As an example the following arrangement would be appropriate.

Table 1.2.6.2 – Example of arrangement of DGSCs as two minor stores

	Cabinet Capacity	Number of Cabinets	Total Capacity
Minor Store 1			
Flammable Liquid	250L	2	500L
Toxic	250L	1	250L
Total			750L
Minor Store 2			
Oxidising Agents	250L	1	250L
Corrosives – Acids	250L	1	250L
Corrosives – Alkalis	250L	1	250L
Total			750L



Box 1 - Summary of requirements of AS/NZS 3833:2007 in relation to minor storage

Classification as minor storage

Less than or equal to maximum quantities for minor storage **(Table 1.2.6)** Separated by more than 10m from any other dangerous goods store. Not more than one minor store per 500m² of floor or ground area. Minor stores shall be at least 10m apart.

Precautions applying to minor storage

Any materials that are incompatible or might react dangerously, are segregated.

Storage areas shall be away from heating and ignition sources.

Storage areas shall be provided with adequate natural or mechanical ventilation.

Packages shall be kept closed when not in use, and only opened in a well-ventilated area. If their contents are flammable, packages shall be kept away from potential ignition sources.

Appropriate spill control measures shall be provided where packages are opened and their contents transferred.

Any spills or leaks shall be cleaned up immediately and disposed of appropriately in accordance with Section 10 of this handbook. Contaminated, spilled or leaked material shall not be returned to original packaging, except for disposal where it is known that this will not increase the risk.

Dangerous goods shall not be stored or handled where they could hinder escape from a building in the event of fire.

Persons who handle dangerous goods are informed and aware of the hazards involved.

Packages are to be kept in such a manner as to avoid spillage.

Stores are to be kept clear of combustible matter and refuse.

Packages must be kept on surfaces that are resistant to attack by their contents if spilt.

Appropriate personal protective equipment is to be worn by personnel involved in product transfer or clean-up operations.

A fire extinguisher of a suitable type must be installed in each minor store. It should be located so that it is immediately accessible in an emergency, along an exit route.

A supply of water must be available at a nearby location for personal hygiene.

Additional precautions for outdoor minor storage

The ground around the storage area shall be kept clear of combustible vegetation and refuse by at least 3m.

Any potential flow of spillage shall be prevented from reaching any protected place, watercourse or boundary by such means as the use of natural ground slope, or the provision of a diversion channel, kerb or bund.

The store shall be separated from any protected place or property boundary by at least 3m.



Box 2 – Summary of requirements of AS/NZS 3833:2007 in relation to storage in cabinets where minor storage quantities are exceeded

Type of substances kept

Cabinets may be used for the storage of packaged dangerous goods of Classes 3 (Flammable Liquids), 5 (Oxidising Agents), 6.1 (Toxic Materials) and 8 (Corrosive Substances).

Maximum quantities to be kept

Where a storage cabinet is used as a means of segregating a single class within a mixed class store, the maximum quantity of the class kept in the cabinet must not exceed 850kg or L.

Cabinet location

Cabinets must be located so that they do not impede escape in an emergency.

Cabinets having a capacity greater than 250L:

- should only be installed on floors that have direct access from street or ground level;
- shall not be installed in residential or accommodation buildings, commercial buildings, hospitals, aged care buildings or school buildings;
- shall not be placed nearer than 3m to any wall that is common with another room unless that wall is constructed of concrete or masonry to ceiling height or 3m above the top of the cabinet.

The aggregate capacity of cabinets shall be no greater than 850L per 250m² of ground floor area, and 250L per 250m² on other floors.

Exclusion of ignition sources

There should be no ignition sources within the cabinet. Ignition sources must be excluded from the area outside the cabinet where flammable and dangerous goods are stored. This exclusion area should be to a distance of 3m measured laterally, and from the floor to a height of 1m above any opening in the cabinet, including the door opening.

Cabinet marking

Cabinets must be marked with placards in accordance with Schedule 13 of the NSW Work Health and Safety Regulation 2011, and provided with warning signs as appropriate. **Section 1.3.1.2** provides further information on placarding.



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Box 3 - Explanation and examples of Packing Groups (PG)

Substances are assigned to three packing groups in accordance with the degree of danger they present:

- Packing Group I: Substances presenting high danger
- Packing Group II: Substances presenting medium danger
- Packing Group III: Substances presenting low danger.

The Packing Group to which a substance is assigned is indicated in the Dangerous Goods List in Chapter 3.2 of the Australian Dangerous Goods Code.

Note that substances listed in the ADG Code under Classes 1 (Explosives), 2 (Gases) and 7 (Radioactive Materials), Divisions 5.2 (Organic peroxides) and 6.2 (Infectious substances), and other than self-reactive substances of Division 4.1 (Flammable solids, self reactive substances and solid desensitized explosives) are not assigned Packing Groups.

Examples of Packing Group I Arsenical pesticides (may be PG I or II) Hydrogen peroxide (> 60% strength)	Hydrofluoric acid (> 60% strength) Strychnine
Examples of Packing Group II Acetone (nail polish remover) Methyl ethyl ketone (common solvent) Hydrogen peroxide (> 60% strength) Lithium batteries Concentrated hydrochloric acid Calcium hypochlorite ('solid pool chlorine'), with 2 Potassium permanganate crystals or powder Solid caustic soda (may be a component in drain Some solvent based paints Sulphuric acid (any concentration except fuming)	cleaners)
Examples of Packing Group III Some solvent based paints Kerosene Ethyl alcohol (<70% strength) Metallic mercury Dilute hydrochloric acid Calcium hypochlorite ('solid pool chlorine') with 1	Lead-acid batteries Perchloroethylene (dry cleaning liquid) Hydrogen peroxide (8-20% strength) Naphthalene (old-style mothballs) Turpentine 0-39% available chlorine





1.3 Site control measures

The layout of the facility, signage, storage control measures, and interaction with staff at the facility should work together to ensure that householders are welcomed. Site visitors should clearly understand what materials they can drop-off at the facility and where they should do so, and clearly understand where they can take materials that are not accepted by the facility.

1.3.1 Signage

CRC branded signage must be used at the centre. Artwork for all signage is provided by the EPA and is online at **epa.metrographics.com.au** Contact **recycling.centres@epa. nsw.gov.au** to request an account for access or if you require graphic design support to update and customise your signage.

1.3.1.1 CRC program signage

Entry sign

A CRC branded entry sign which includes opening times and contact details must be installed at the entry gate to the facility. This may be on the roadside or facility gate or both.

Shed sign

A CRC branded sign must be installed on the building. This is a simplified version of the entry sign.

Funding acknowledgement

Signage acknowledging the NSW EPA and Environmental Trust must be installed on the CRC building.

Directional signage

Directional signage has been developed to help users navigate the CRC site and easily locate the CRC. This signage is particularly useful if the CRC is located within a larger waste management site. Please use judgement when selecting which directional signage is appropriate for the site.

If appropriate, arrows showing the direction customer vehicles are to travel to and through the CRC can be painted on the pavement leading to and inside the CRC building.

Material signs

Artwork has been developed for all of the material types that can be collected at the CRC.

Large format icons (1mx1m) are intended to be positioned above each receptacle. The large format signage includes pictorial and text descriptors.

The EPA will provide all artwork in electronic format. Customisable artwork such as the entry sign and any new artwork must be reviewed and approved by the EPA prior to printing and installation. Artwork is also available for many materials that are not targeted by the EPA's household problem wastes program.



1.3.1.2 Hazardous chemicals placarding

Placarding compliant with the NSW Work Health and Safety Regulation 2011 is to be installed at the facility. An outer warning placard, or HAZCHEM sign, is required at the entrance of the facility, and must remain visible when the entry gate is open or closed. Information placards must also be placed where the chemicals are stored. These placards are included on the labels that must be affixed to each storage receptacle as soon as it is brought into usage. On some receptacles the adhesive label is obscured when the receptacle door is open for use. Additional magnetic labels indicating material type should be placed on a visible portion of these types of receptacles when they are in use. More information on placarding can be found in the SafeWork NSW Fact Sheet available at www.safework.nsw.gov.au/media/publications/health-and-safety/placarding-for-storage-of-hazardous-chemicals.

Signs must comply with AS 1216-2006 Class labels for dangerous goods.

1.3.1.3 Warning signs

The following signs need to be displayed:

- A warning sign to prohibit smoking and to exclude other ignition sources, e.g. **DANGER: NO SMOKING, NO IGNITION SOURCES.**
- A warning sign to restrict entry to the storage area and the dangerous goods storage area as appropriate, e.g. **RESTRICTED AREA, AUTHORISED PERSONNEL ONLY.**
- Warning signs to control customer behaviour, e.g. LEAVE CHILDREN IN VEHICLE, SWITCH OFF ENGINE, SWITCH OFF MOBILE PHONE.

These signs must have lettering that contrasts with the background, and be clearly legible from any access point to the CRC. Signs must comply with AS 1319-1994 Safety signs for the occupational environment.

1.3.1.4 Signs showing location of safety and personal protective equipment

Signs showing the location of safety equipment including first aid, fire extinguishers, safety shower and eyewash, and personal protective equipment must also be installed in accordance with the relevant Australian Standards.

1.3.2 Storage control measures

All CRC materials delivered to the facility shall be contained by placement in specially designed storage receptacles that are provided by the EPA's collection contractor.

Storage receptacles must be appropriate to the class of material being stored and transported. Receptacles are typically collapsible steel-frame containers with plywood sides, fully welded steel boxes for paint and oils, cages for gas bottles, drums for batteries and smoke detectors and various boxes for fluorescent tubes. Storage receptacles must be approved segregation devices in accordance with the Australian Dangerous Goods (ADG) Code.

Products containing liquids such as used oil and lead acid batteries must be stored in purpose built storage receptacles that provide bunding to an acceptable Australian standard.



Materials accepted (with the exception of used oil when a decanting operation is used) should be stored in their original packages, as brought in by householders. Packages should then be neatly stacked directly into the storage receptacles, so that these receptacles can be picked up for recycling without the need for repacking.

Leaking containers should be over wrapped in a plastic bag before removing from vehicle. Leave the leaking container in the plastic bag and place in the appropriate receptacle.

The number of storage receptacles will be controlled to limit the total volume of materials held on site. This will minimise risks and may remove any need for licence amendments relating to waste storage limits by keeping the quantity of hazardous materials stored at any one time under 5 tonnes.

Householders are required to separate water based and oil based paints by placing them in separate storage receptacles. If unsure of paint type then place in the oil based paint receptacle.

1.3.3 Safety equipment

The following safety equipment must be provided within the CRC:

- Safety shower and eyewash
- Spill response kit
- Fire extinguishers
- Personal protective equipment (PPE)
- First aid equipment and supplies.

Procedures must be implemented to regularly:

- test the operation of the safety shower and eyewash
- check and replenish the first aid equipment and supplies
- check and replenish the PPE
- check and replenish the spill response equipment.

Spill response equipment should include adequate quantities of suitable absorbent materials. This includes a sufficient quantity of resealable waste recovery containers compatible with the substances being kept, marked for emergency use only, and shovels, brooms and scrubbing brushes. Spill response equipment must be located at both the drop-off area and the storage area.

Dry chemical powder type fire extinguishers are appropriate for all types of CRC materials except for cooking oil, for which a wet chemical type is more appropriate. It is the CRC operator's responsibility to ensure this equipment is on hand. Refer to AS 2444-2001 Portable fire extinguishers and fire blankets – Selection and location for guidance on the selection and location of fire extinguishers.



1.3.4 Safety and environmental management procedures

1.3.4.1 Safe Work Method Statements

Established processes and documented procedures such as Safe Work Method Statements (SWMSs) or Safe Operating Procedures (SOPs) should be in place to protect the health and safety of customers and staff at the facility, and for managing the impact of the facility on the environment.

These should include procedures and equipment for safe handling of materials (such as Personal Protective Equipment and Safety Data Sheets) and emergency response (such as fire detection and protection, safety shower, spill response kit and first aid equipment).

They should also outline how public and staff safety will be ensured when moving storage receptacles and loading service vehicles.

All staff involved in the operation of the CRC must be trained in the use of the SWMSs and must sign off as having been trained and agreeing to undertake the relevant tasks safely in accordance with the SWMSs.

1.3.4.2 Emergency plan and procedures

An emergency plan must be prepared to minimise the effects of any dangerous occurrence or near miss at a CRC resulting from handling of hazardous chemicals.

When preparing an emergency plan consideration should be given to:

- procedures that include:
 - an effective response to an emergency
 - evacuation procedures
 - notification procedures to advise emergency services organisations at the earliest convenience
 - medical treatment and assistance
 - communication between the person coordinating the emergency response and all persons at the workplace
- the testing of procedures, and how often this will be done
- how relevant workers will be provided with information, training and instruction about implementing the emergency procedures

A comprehensive emergency plan should include:

- a site map showing where hazardous chemicals are stored
- responsibilities of key persons in managing emergencies
- circumstances to activate the plan
- systems for raising the alarm
- estimating the extent of the emergency
- alerting emergency services organisations to the emergency, or a situation with the potential to become a dangerous occurrence
- procedures that account for all people at the workplace
- isolation of the emergency area to prevent entry by non-essential personnel



- roles of on-site emergency response teams (including first aid officers, emergency wardens) in the containment of any spillage
- the requirement for fire-water retention to ensure that contaminated fire-water cannot enter waterways, drains or ground water
- disconnection of power supplies and other energy sources except when required to maintain safety of a critical operation or to run emergency equipment such as fire booster pumps
- prevention of hazardous chemicals or contaminated material of any kind from entering drains or waterways
- provision of relevant information and assistance to the emergency services authority, both in anticipation of emergencies and when they occur
- notification of regulatory authorities, as required by law
- liaison with any neighbours of the CRC, as appropriate
- maintenance of site security throughout the emergency
- provision for dealing with the public and the press
- site rehabilitation requirements.

The extent of emergency procedures required will depend on the size and complexity of the workplace, types and quantities of hazardous chemicals and the processes involved when the goods are in use. As a minimum, emergency procedures should include instructions on:

- how to raise the alarm, including how to contact the appropriate emergency services organisation
- any actions to be taken by workers to ensure the safety and health of all persons at the workplace to minimise risks, damage to property as well as the environment
- any actions to be taken by prescribed persons such as fire wardens, for example how to evacuate the workplace or use fire extinguishers.

To be effective, workers need to be appropriately trained, and any procedures tested. Workers should be consulted and ideally directly involved in the development of emergency procedures.

An effective emergency procedure could be a simple one-page document of dot points detailing evacuation procedures, assembly areas, identifying first aid officers and emergency wardens at the workplace, contact numbers of emergency services organisations (such as fire brigade, police, ambulance, local hospital and regulatory authorities).

Copies of the Emergency Plan must located near the CRC and near the entrance to the facility.

1.3.4.3 Procedures for handling commercial waste

CRCs must not accept commercial or business waste. CRC operators must prepare and implement procedures to identify and separate commercial and business waste from household waste. If the CRC is located at a facility that accepts business or commercial waste under no circumstances should this waste be accepted at the CRC.



1.3.5 Staffing levels and operator qualifications and training

Dedicated full time supervision of the CRC is not necessary. However, it is expected that the CRCs are located within a site where adequate overall supervision is available by appropriately qualified and trained personnel.

In particular, supervision needs to be sufficient to prevent the acceptance of hazardous materials, or waste, dropped off from commercial or business activity, at the CRC.

1.3.6 Security

The sites must be secured to prevent unauthorised access out of hours. In some cases closed circuit surveillance (CCTV) may be warranted to discourage vandalism or illegal dumping.

1.3.7 Materials register

The facility should have processes and procedures in place to ensure an accurate register of materials stored is maintained and kept up-to-date, and is easily accessible in the event of an emergency.

1.3.8 Data management and reporting

Records of the quantities of each type of material accepted under this program are to be kept and reported to EPA using the online reporting system. Reporting is required at minimum on a weekly basis for an overall site capacity update, and every single occasion an EPA designated or EPA authorised third party organisation contractor collects targeted materials. In the case of lead acid batteries and used motor oil that is not collected by the EPA contractor, the means of recycling (processing and end-use) is also to be reported.

1.3.9 Specialist advice

The EPA will establish and maintain contracts for the provision of specialist advice and support arrangements in the event of unknown materials being deposited, and other unexpected or emergency situations. The CRC operator is to ensure their operating and emergency procedures appropriately reference this specialist advice.

1.3.10 Auditing

The EPA may, at its discretion, audit facilities to verify any aspect of facility design or operations including determining quantities of materials accepted, record keeping, acceptance and storage procedures, staffing and supervision, and charging of customers. Facility operators will be expected to provide full access and cooperate with the EPA in undertaking any audit.





1.4 Collection of deposited materials

1.4.1 Contracts to collect and recycle or dispose

The EPA will establish and maintain contracts for the collection and recycling (or disposal) of paint, used oil (other than motor oil), gas cylinders, household batteries, smoke detectors and fluorescent lights, as well as incidental by-catch for the duration of the program.

The facility is required to have a forklift on site to change over receptacles, move receptacles to and from the storage area, and to load the collection contractor's vehicle. If for some reason the forklift is not available, the collection contractor should be notified well in advance of collection.

The facility operator will be responsible for arranging the storage, collection and recycling (not disposal) of lead acid batteries and used motor oil. The facility operator will be required to record the quantities of lead acid batteries and used motor oil received at the facility, and report these quantities to EPA with reports on other materials.

1.4.2 Collection of other materials (facility operator's discretion)

It is envisaged that over time, many of the CRCs will evolve to become community based recycling centres collecting a wider range of targeted materials for recycling, sale, exchange or distribution as the facility operator deems fit.

Where existing facilities are to be adapted to accept materials targeted by this program, facility operators are encouraged at their own discretion to continue their current resource recovery activities and constantly seek higher order outcomes.



1.5 Equipment and handling procedures

The facility should have procedures in place to ensure that customers deliver only materials that are accepted at the site, and that these materials are handled by customers and staff in a safe and secure manner. Materials should be separated into different areas in a manner appropriate for compliant storage and ease of loading for transport.

Refer to **Section 3** of this Handbook (Operating a Community Recycling Centre) for more information on the specific requirements for acceptance and storage of CRC materials, non-targeted by-catch materials, and unknown materials.





Appendix 1.1: CRC sizing and collection frequency

The requirements of the NSW Workplace Health and Safety Regulation 2011 are applicable to CRCs as they store materials considered by the regulation as hazardous chemicals. The regulation establishes requirements for the safe use, storage and handling of hazardous chemicals as classified under the UN Globally Harmonised System of Classification and Labelling of Chemicals (GHS).

Some of the requirements depend on the quantity of hazardous chemicals stored. If more than placard quantities of hazardous chemicals are stored, outer warning placarding and placarding of the particular hazardous chemicals (349 and 350) is required. If more than manifest quantities are stored, provision of a manifest and site plan (347), and notifying the regulator of this situation (348) is required.

Placard and manifest quantities for materials to be stored at CRCs are shown in **Table A1.1(a)** below. The classifications of these materials under the Australian Dangerous Goods Code (ADG) and the GHS are also shown.

Material	ADG Class	GHS classification	Placard quantity	Manifest quantity
Batteries – household				
Lithium ion	9 Miscellaneous	None	No limit	No limit
Other types	None	None	No limit	No limit
Batteries – lead acid ¹	8 Corrosive: packing group II	Skin corrosion: category 1A	250kg or L	2,500kg or L
Fire extinguishers	2.2 Compressed gases	Compressed gas	1,000L	10,000L
Fluorescent tubes and light fittings ²	6.1 Toxic: packing group II	Acute toxicity – Category 1	250kg	2,500kg
Gas cylinders LPG or propane	2.1 Flammable gas	Flammable gases category 1	200L	5,000L
Oil – heating	3 Flammable liquid: packing group III	Flammable liquid: category 3	1,000	10,000L
Oil – motor and cooking	None	None	No limit	No limit
Paint – water based	None	None	No limit	No limit
Paint – oil based	3 Flammable liquid:	Flammable liquid:		
	Packing group II	Category 2	250L	2,500L
	Packing group III	Category 3	1,000	10,000L

Table A1.1(a): Placard and manifest quantities for materials stored at CRCs

¹ Although fluorescent tubes and fittings packed for retail distribution are not considered dangerous goods, good practice for waste lamps is to consider them as mercury containing waste, or Mercury Compounds N.O.S. which is classified as 6.1 Toxic under the ADG Code.



To ensure that the requirements for the design and operation of CRCs are manageable, the quantity of materials stored should be kept below manifest quantity.

The quantity stored at a particular CRC will depend on the population served and the frequency with which it is emptied. Data from earlier modelling based on similar programs in Victoria and Western Australia have indicated that for a population of 50,000 a CRC can typically be expected to receive the quantities indicated in **Table A1.1(b)**. The sizing and frequency of collection for a particular centre should take into account these quantities and the manifest quantities in **Table A1.1(a**).

The material of most concern is oil based paint which, if considered as all Packing Group II, would require a collection frequency of every seven weeks for the quantity stored to remain below manifest quantity. The next most frequent collection is required for lead acid batteries, every 17 weeks to remain under manifest quantity.

Material	Quantity tonnes per year	Quantity kilograms per week	Collection frequency weeks
Batteries – household	0.07	2	NA
Batteries – lead	9	150	17
Fire extinguishers	0.14	3	> 52
Fluorescent tubes and light fittings	0.71	15	> 52
Gas cylinders – LPG and propane	3.6	100	> 52
Oil	8.6	200	NA
Paint – water based	30.0	600	NA
Paint – oil based	19.1	400	7
Total	71.22	1,470	

Table A1.1(b): Typical quantities of materials anticipated at a CRC serving 50,000 people and calculated collection frequency

In the early stages of the program, the smaller number of CRCs will serve populations larger than 50,000, hence the quantities received may be higher, resulting in the need for more frequent collections. The figures provided in **Table A1.1(b)** are therefore a guide, and actual quantities will need to be monitored to determine the appropriate collection frequency.

Consideration of manifest quantities provides a useful guide for the sizing and design of these facilities.



The collection frequency noted above is presented to highlight which materials may trigger the need for a collection. The collection contractor will remove all full (or near full) receptacles at each pick up.





Appendix 1.2: Site establishment checklist

Aspect		Element
1 Locatio	'n	
1.1 Adjacer	nt activities	 What is located adjacent to the site that may be impacted on or may impact the CRC? Have appropriate controls been established to manage these impacts?
1.2 Co-loca	ated activities	 What other activities are taking place on the site that may be impacted on or may impact the CRC? Have appropriate controls been established to manage these impacts?
2 Layout		
2.1 Traffic f	low	• Does the site provide for safe and smooth flow of traffic, separate entry and exit points, and space for truck and forklift movements?
2.2 Locatio recepta		• Has double handling of materials been minimised and have the receptacles been placed in the most convenient location for customers?
•	for collection stor vehicles	Is there sufficient space for manoeuvring trucks removing materials?
3 Infrastr	ucture	
3.1 Road a	nd building	• Does the facility comprise hard surfacing, rain cover (minimum 5m high if collection vehicles are required to fit underneath), drainage, buildings, storage areas, and appropriate bunding?
3.2 Ventilat	ion	 Is there adequate ventilation provided in both drop-off area and storage areas?
4 Signage	9	
4.1 Directio	onal	Have appropriate entry / directional signs been installed?
4.2 Safety		 Have appropriate HAZCHEM / placarding / safety signs been installed?
4.3 Materia	Il designation	 Are signs designating material type included and are they the correct size (1m x 1m)? Are the signs clearly visible to CRC customers and operators?
4.4 Acknov	vledgement	Has EPA and Environmental Trust acknowledgement signage been installed?



-		
Asp	ect	Element
5	Storage	
5.1	Core materials	 Is there a sufficient quantity of appropriate storage receptacles available? Are separation distances appropriate e.g. gas cylinders separated from lead-acid batteries? Is sufficient space allocated for storing empty and full storage receptacles?
5.2	Used oil	 If used oil is decanted on site, have appropriate facilities been installed?
5.3	By catch	• Have by-catch cabinets been installed in a suitable location (i.e. not clearly visible to CRC customers)?
6	Safety and emergency res	sponse
6.1	Equipment	 Is appropriate safety equipment and information in place and operational – safety shower, first aid, SDSs, safety procedures? Is appropriate emergency response equipment (spill kit, fire extinguishers) and procedures in place?
6.2	Procedures	Are workplace health and safety procedures in place?Is there an appropriate emergency response plan?
7	Security	
7.1	Infrastructure	 Has appropriate security been provided (fencing, gates, CCTV, locking procedures and times)? Has a CCTV system been installed, and if so, is it working and monitored appropriately?
8	Staff and training	
8.1	Staff numbers	Are staffing levels appropriate?How many staff are available for the CRC?
8.2	Training	• Have all staff completed a site induction, safe work method procedure training, and training by the collection contractor on safe handling of materials and procedures for material collection?
9	Operations	
9.1	Guidance for customers	 Are appropriate arrangements in place to note and direct customers to the CRC (e.g. weighbridge log)? Are customers required to place their materials in the appropriate receptacles?
9.2	Labelling of receptacles	• Are appropriate arrangements in place to ensure receptacles are labelled correctly at the time they are brought into service?



Appendix 1.2: Site establishment checklist (continued)

Aspect	Element
9.3 Separation of paints	 Are appropriate arrangements in place to ensure separation of water based and oil based paint?
9.4 By-catch	• Are appropriate arrangements in place to ensure by-catch is stored in the appropriate cabinets and does not accumulate to unsafe levels?
9.5 Collection truck loading	• Are appropriate arrangements in place to ensure safety during collection of full receptacles and moving full and empty receptacles?
9.6 Housekeeping	• Are appropriate arrangements in place for housekeeping and to ensure the site is kept tidy and well organised?
9.7 Commercial waste	• Are appropriate arrangements in place to keep household wastes separate from commercial and industrial wastes (if commercial and industrial wastes are accepted at the facility)?
10 Collection of materials	
10.1 Core materials	 Are appropriate procedures in place for initiating pickup and subsequent reporting?
10.2 Lead-acid batteries and motor oil	• Are appropriate arrangements in place for recycling lead- acid batteries and motor oil, so that these materials are being collected regularly?
11 Record keeping	
11.1 Online system	Are appropriate arrangements in place for online reporting and completing consignor / loader checklists?
11.2 Materials register	 Is a register of materials being kept?
11.3 Other records	 Is any other record keeping planned?
12 Insurance	
	• Is appropriate insurance cover in place and have the relevant insurers been advised of the establishment of the CRC for property, public liability, and workers compensation insurance policies?





Appendix 1.3: Site commissioning checklist

Part A – Design standards	Tick
A1. Standard Community Recycling Centre (CRC) signage	
CRC Entry sign in place including opening times	
NSW EPA and Environmental Trust acknowledgement (one sign can contain both)	
 HAZCHEM sign on the front entrance to the CRC site indicating that this is a Placarded site. Note the minimum requirement is the HAZCHEM sign at the front entrance. If the CRC is distant from the front entrance then a second HAZCHEM sign is recommended at the CRC facility and at all entrances likely to be used by the emergency services. See WorkCover Placarded Site Guide. 	
Each storage receptacle should have the CRC branded icon signage above it in good view (approx. 2m off the ground) to inform the public on material placement	N
Storage receptacle for paint (water based) with branded icon signage	
Storage receptacle for paint (oil based) with branded icon signage	
Storage receptacle for fluoro tubes and globes with branded icon signage	
• Storage receptacle for smoke detectors (usually a 10L plastic bucket) with branded icon signage	
 Storage receptacle for household batteries (usually a 10L plastic bucket) with branded icon signage 	
 Storage cages for gas bottles / fire extinguishers with branded icon signage (located outdoors or in a ventilated area and at least 3m from the vehicle battery storage pallet) 	
 Vehicle battery bunded storage pallets with branded icon signage (not located next to motor oil storage, gas bottles or Dangerous Goods Safety Cabinets) 	
• Used oil storage or decanting receptacle (both bunded) with branded icon signage	
Signs clearly visible to the public	
Contact EPA CRC Program Unit on 02 9995 6880 for advice if required	
A2. Structure / Building	
• Security – there is no public access to the storage receptacles when facility is closed e.g. the CRC is fenced / lockable	
 Ventilation – there is adequate ventilation in closed buildings (not applicable to open structures) Requires high level and low level fixed ventilation at each end. This is usually louvres or grills (nominally – 1sqm for each 50sqm floor area) 	



Appendix 1.3: Site commissioning checklist (continued)

 Paints, batteries, smoke detectors, fluoro globes and tubes are under cover in specified containers 	
The area where public vehicles stop to unload is under cover	
A3. Safety equipment – close to the CRC	
• Emergency shower – installed and operational with dedicated uninterrupted water supply	
• Eye wash on hand (can be combined with the above)	
Spill kit on hand	
PPE on hand	
 Fire extinguisher(s) on hand (at CRC) as well as adequate water supply e.g. mains supply, water tank, water cart 	

Part B – Operational compliance	Tick
B1. Back of house storage	
 Dangerous Goods Safety Cabinets (DGSC) – five cabinets one for each of the following: Flammable, Toxic, Oxidisers, Corrosives (Acids) and Corrosives (Alkalis) with appropriate signage displayed. 	
• The capacity of the cabinets: Note, these should not be accessed by the public. They should be close to the drop off area but discretely placed (possibly simply with their backs to the public area or screened). Their security is important. Four of the cabinets are supplied with keyed alike locks. The Oxidisers cabinet is not lockable.	
Number of empty receptacles in reserve:	
B2. Operations	
 Roads around the CRC have arrows or directional signage to indicate traffic flow to and from the CRC 	
• The public are required to unload their materials and place directly into the receptacle	
Forklift on site	
• If commercial and industrial problem wastes are accepted at the facility there is a system in place to keep the household and commercial quantities separate.	
 CRC database operation – site staff demonstrate how they update the status report using their tablet. The CRC Status Update is required to be entered every Monday morning and whenever one of the full receptacles is swapped for an empty one. 	
• Labels and signs are being placed on all receptacles as they are brought into service. (This includes both the adhesive transportation signage supplied by the contractor, and the CRC program branded magnetic material signs).	



B3. Safety	
 Directional signage provides clear directions to and from the CRC 	
• Dangerous Goods Safety Cabinets are located in a secure area away from the drop off area and as far as possible out of public view	
• Procedures are in place to ensure public and staff safety when moving storage receptacles and loading service vehicles e.g. the area is closed to public whilst storage receptacles are moved / replaced, or some sites may be able to draw the receptacles away from the traffic flow or swap over using a pallet jack.	
• Storage cages for gas bottles and fire extinguishers are located outdoors or in a ventilated area and not placed next to the vehicle battery storage pallet.	
 Vehicle battery storage pallets are not located next to the motor oil decanter / container or gas bottles or DGSC (minimum 3m separation) 	
• The CRC area is clean and tidy i.e. all materials are contained in an appropriate storage receptacle or DGSC	
• There are no trip hazards or other site safety hazards e.g. drop off to unfenced retaining walls	
Training – Operational staff have received training by the collection contractor Date(s): Number of staff who attended	
 Safe Work Method Statements (SWMS) are prepared for the operation of the CRC and signed by all staff who will use the procedure 	

Risk Management Plan in place



2. Risk Management





Risk management process



Example of risk assessment and controls

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Risk management

A

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2.1 Introduction

CRCs must be designed and operated to temporarily store household problem waste safely until it can be recycled or disposed of appropriately. In order to support this, CRC operators must prepare a Risk Management Plan for their centre. This section of the Handbook outlines the elements of risk management and how they can be applied to the design and operation of CRCs.

Table 2.1 below provides a summary of the primary hazard events associated with the target materials and the controls that should be implemented to reduce the risk associated with these hazards. A more detailed Risk Assessment Checklist, that can be used to assess whether appropriate controls have been implemented at a CRC, is provided at the end of this document.

Appendix 2.1 provides a worksheet that can be used to undertake a full Risk Assessment and prepare a Risk Management Plan for a CRC.

Table 2.1: Primary hazards and controls for CRCs

Hazard event	Material	Possible controls
Container failure or container dropped causing release of: • compressed gas • flammable substance • corrosive substance • toxic substance	All types of materials	 Use intermediate containers Spill containment Procedures and training Do not stack cylinders Do not stack lead acid batteries
Vehicle collision that causes release of material, mixing of incompatible substances or ignition source	All types of materials	Store away from trafficProcedures to control vehicle movementsAwareness and supervision of vehicle movements
Mixing of incompatible substances causing a reaction that releases heat or toxic gases	Lead acid batteries Nickel cadmium batteries	Use intermediate containersStore acids and alkalis separatelyProcedures and training
Ignition of atmosphere or adjacent fire	Gas cylinders Solvent based paint	 Store gas cylinders separately outdoors Isolate from ignition sources Ensure adequate security Ventilate store for solvent based paint Separate from possible fire sources Fire suppression Emergency response





2.2 Risk management process

CRCs should be designed and operated to achieve the following objectives:

- protect staff and employees
- protect public health
- protect the environment
- facilitate safe collection and storage of materials collected.

Risk management is a structured way of identifying threats and opportunities in achieving these objectives, and responding to them with appropriate controls or management activities.

Risk, in the context of a CRC, is the combination of the likelihood and severity of any harm that hazards associated with the operation of the centre may cause.

These hazards may include:

- leakage from a container exposing staff, members of the public or the environment to toxic or corrosive agents
- fire or explosion caused by leaking material coming into contact with an ignition source
- unintentional mixing of incompatible or reactive substances causing a chemical reaction, explosion or fire, and exposure to unknown substances thus generated.

The key elements of the risk management process are outlined in **Table 2.2** below. This procedure will help identify issues unique to each site.

Table 2.2: Processes to mitigate risks

Step	Key elements
Step 1 Identify the hazards	 Examine all activities, work processes, plant, substances, work environment, layout and condition of the site, and any other factors Identify all of the dangerous goods and their associated hazards Identify the hazards in or arising from the storage and handling processes Identify any neighbouring or external hazards
Step 2 Assess the risks	 Identify potentially harmful situations that could arise involving each hazard Identify the potential consequences of these situations Assess the severity of the consequences Assess the likelihood of each incident taking place Determine initial prioritisation of risk Record results of assessment
Step 3 Eliminate or reduce the risks	 Apply the 'hierarchy of control' measures tackling the most serious risks first Apply Practicability Test (based on feasibility and cost of mitigating risk) Determine final risk ranking Eliminate hazards leading to risk where practicable Determine risk control measures to reduce the risk as far as practicable Implement risk control measures Identify record keeping necessary to ensure controls are maintained
Step 4 Monitor and review the control measures	 Repeat Steps 1 and 2 to ensure risks are mitigated, and record results of second assessment Implement additional risk control measures if necessary Periodically re-do the risk assessment to ensure that safety is maintained and the risk control measures are working, and to respond to changes in work practices, activities and other conditions



2.2.1 Hazard identification

The CRC site operator must identify all hazards associated with the storage and handling of CRC materials.

When identifying hazards, the following activities should be undertaken:

- a) consult with employees
- b) consult with the suppliers of the dangerous goods, structures, equipment and supplies, or other persons with specific expertise
- c) consult commercially available databases on hazardous properties of chemicals
- d) walk through and inspect the premises and the methods of storage and handling
- e) thoroughly examine plans of the premises, for all buildings and services, including water, gas, electricity, drains, fire services, roads and access ways and engineering drawings of relevant plant
- f) discuss risks with occupiers of nearby premises and the emergency services authority
- g) consult injury and illness records.

2.2.1.1 Material characteristics

The starting point for identifying the hazards associated with specific household hazardous waste (HHW) is normally the Safety Data Sheet (SDS). Due to the wide range of materials generally found in a CRC it can be helpful to group materials into several different types, depending primarily on the dangerous goods classification, but also taking into consideration toxicological hazards.

The hazards identified are not restricted to those inherent in the primary dangerous goods classification. Equally important are any secondary dangerous goods hazards as indicated by one or more subsidiary risks in addition to the primary Class.

The physical properties of the CRC materials may represent or contribute to hazards in the particular storage and handling situation. These hazards include:

- flammability the potential to burn or explode in air when ignited
- **toxicity** the immediate, delayed or long term effect on humans or animals through inhalation, skin absorption or ingestion
- **reactivity or sensitivity** the potential to react with certain conditions, other chemicals, water or other materials
- **instability** the potential to undergo a spontaneous violent reaction, such as decomposition or polymerization, under certain conditions
- ecotoxicity the effect on the environment, in particular on aquatic life
- **corrosivity** the slow destruction or damage to materials, particularly packaging and human skin, caused by a chemical reaction
- radioactivity spontaneously emitting harmful radiation.

The materials accepted at CRCs (lead acid and household batteries, used oil, domestic gas cylinders, fluorescent tubes and lamps, and oil based and water based paint) have a range of hazards as indicated by **Table 2.2.1.1** on the following page.



Table 2.2.1.1: Materials accepted by CRCs and their hazards

Material	Hazard
Batteries – lead acid	Corrosive
Batteries – nickel cadmium / other	Environmental hazard / toxic / corrosive
Fluorescent tubes and light fittings	Toxic
Gas Cylinders – other / propane	Compressed gas / flammable
Low level radioactive substances – e.g. smoke detectors	Radioactive / toxic
Paint – oil based	Flammable
Paint – water based	Low level ecotoxic

Provision is to be made for the safe storage of 'by-catch' – the small volume of higher toxicity materials which may be received as orphan or illegally dumped dangerous or hazardous materials. Hazards for these materials are outlined in **Appendix 2.2**. Consideration of these hazards guides appropriate storage and handling of these materials. More details are provided in **Appendix 2.2**.

2.2.1.2 Storage and handling

In addition to the hazards arising from the nature of the CRC materials, other hazards arise from the structures, equipment, systems of work and activities used in the storage and handling of CRC material. Hazards can be identified by considering the following:

- physical components or characteristics that have the potential to cause harm
- systems of work, including normal operating procedures and the possibility of unusual operating conditions, including the possibilities of operator error
- hazardous chemical and physical effects created in a manufacturing or handling process.

Structures, plant or equipment used in the storage or handling of materials could include, but are not limited to:

- a container (including tank or package)
- shelves or racks used for storage
- a spill containment system
- a vehicle used for the transport or transfer of materials such as a forklift
- firefighting or fire protection system.



Systems of work predominately relate to the activities involved in accepting CRC materials from householders, transferring these materials to the storage area, and the regular clearance of the storage area for treatment, recycling or disposal of the materials.

Chemical reactions are those that result in a chemical change in one or more of the goods when they come into contact. Physical processes include dilution, dissolution, abrasion, phase change, leaching and absorption. Consider the following hazards:

- physical reaction from incompatible substances coming into contact (e.g. rapid heating generated by acid mixing with water causing a steam explosion)
- chemical reaction resulting from contact with other substances (e.g. an oxidising agent such as pool chlorine coming into contact with an oil such as brake fluid).

For example, the separation of lead acid batteries from gas cylinders (to limit potential for acid corrosion of the cylinders) is a reasonable design and operational risk control measure.

2.2.1.3 Hazards within the facility site

Some activities, systems of work, structures and equipment that are not directly involved with the storage and handling of household hazardous waste (HHW) materials, may constitute a hazard for storage and handling. Potential external hazard sources include:

- any adjacent dangerous goods storages
- the proximity of other work areas, including on-site offices
- plant used or moved on the site (e.g. ignition sources from engines)
- vehicle movements on the site
- deliveries of other dangerous goods
- transfer of CRC materials between receptacles on the site
- personnel movements in normal and emergency situations
- visitor access, and unauthorised access to the drop-off or storage areas
- portable sources of ignition, generation of static electricity
- fire hazards including buildings, concentrations of combustible material and uncontrolled vegetation
- weather conditions such as temperature extremes, wind, lightning, or rainfall including the potential for flooding.

Employees are commonly aware of these hazards and operators should consult them during the identification process.

2.2.1.4 Hazards external to the facility site

There may also be hazards that are external to the facility site. For example, an adjacent forest with densely grouped eucalypt trees is an external fire risk, because if the trees catch fire, this hazard could impinge on the dangerous goods.

External hazards include:

- any dangerous goods or incompatible substances stored at other adjacent premises or public places
- activities, facilities or installations on neighbouring premises that could create a hazard (e.g. an ignition source)



- the effects of infrastructure such as a road, rail line, airport, pipeline, power line, radio transmitter or telephone tower
- fire hazards, including concentrations of combustible material or uncontrolled vegetation on neighbouring premises or public areas.

2.2.1.5 Past incidents

Incident information, such as past accidents or spills, contributes to knowledge about the hazards and risk. It is important to obtain and consider information about incidents and near misses that involved storage and handling of CRC materials at the facility and at other facilities. This information should include the nature and cause of the incident, the effectiveness of controls and how they could be improved.

2.2.2 Risk assessment

Once the materials and hazards have been identified, the next step in the risk management process is to assess the risks. It is important to gather information about both the likelihood and the severity of incidents, including the review of historical information at the site or similar sites, and estimate the frequency of various activities.

The risk assessment should include:

- identification of the events with hazard potential that could give rise to the risk
- the extent of the risk to people (workers and members of the public), other dangerous goods, other substances, and plant or buildings both on the site and beyond – in terms of the probability of the event occurring and the nature of the harm that would arise from its occurrence
- the extent and type of controls necessary to reduce the risk to a level that is appropriate
- the priority with which controls should be implemented.

Risk assessment to be documented and reviewed regularly: The risk assessment must be documented and records of the assessment kept. The risk assessment should be reviewed at least every five years, but in the case of a CRC at least every two years.

Employees to be consulted as part of the risk assessment: Facility operators must consult with employees involved with the operation of the CRC during the risk assessment process. Operators must ensure employees aware of the results of the assessment and its implications for design and operation of the facility.



2.2.2.1 Events with hazard potential arising from CRCs

The general hazards that can arise from different events are outlined in **Figure 2.2.2.1**. Location-specific hazards arise from the features of the site in which the CRC is located, and must be identified for each specific CRC.

Figure 2.2.2.1: Identification of potential hazard events

Loss of containment

- Customer or operator drops container when removing from vehicle
- Customer or facility vehicle collides with drop-off area
- Customer or facility vehicle collides with storage area
- Disposal contractor vehicle collides with storage area
- Operator drops container when transferring from drop-off area to storage area
- Container fails in drop-off area (e.g. heat from direct sunlight increases vapour pressure)
- Container fails in storage area due to sensitivity of material to environmental conditions or ageing of container
- Violent storm destroys CRC infrastructure.

Mixing of incompatible or reactive substances

- Operator places incompatible substances in same part of the storage area, with subsequent loss of containment of two or more incompatible materials
- Containers of incompatible or reactive substances fail simultaneously and mix.

Fire or explosion

- Ignition source (e.g. customer smoking, static discharge, vehicle ignition or electrical spark) near drop-off area ignites flammable atmosphere
- Ignition source in drop-off or storage area ignites flammable atmosphere
- Fire in neighbouring property ignites storage area
- Fire within facility ignites storage area.

Location-specific hazards

- Other buildings and work areas including site-offices
- Other dangerous goods storages within the facility or in adjacent premises
- Vehicle movements near the drop-off area or storage area
- Activities, facilities or installations on neighbouring premises
- Other infrastructure such as road, rail, pipeline, powerline, or telephone tower
- Occasional work such as repairs or maintenance on the storage area.



2.2.2.2 Calculating the level of risk

Risk assessments may be qualitative, quantitative, or a combination of both. In the case of a CRC, due to the many different types of materials, it is appropriate to use qualitative assessment. In such an assessment the level of risk can be determined by estimates of the likelihood of an incident that will cause harm occurring and the severity or degree of harm arising from the incident.

Table 2.2.2.2(a): Risk level

The risk level can be estimated from the following table.

			Severity (S)		
Likelihood (L)	5 Catastrophic	4 Major	3 Significant	2 Moderate	1 Minor
5 Imminent	Extreme	Extreme	Extreme	High	Medium
4 Certain	Extreme	Extreme	High	Medium	Medium
3 Likely	Extreme	High	Medium	Medium	Low
2 Unlikely	High	Medium	Medium	Low	Very Low
1 Rare	Medium	Medium	Low	Very Low	Very Low

Table 2.2.2.2(b): Priority for action

The level of risk determines the level of priority for action, which can be determined from the following table.

Risk Level	Priority for action
Extreme	Cease operations until additional controls are implemented
High	Take immediate action to implement additional controls
Medium	Action to implement additional controls is a priority
Low	Action to implement additional controls can be scheduled
Very Low	Low priority for action

Table 2.2.2.2(c): Likelihood

Likelihood (L) can be estimated using the following table.

L	Likelihood of occurrence	Indicative frequency
0	Totally eliminated	Zero
1	Rare	Could happen, but improbable, once in a thousand years
2	Unlikely	Remote, could happen but rarely, once in a hundred years
3	Likely	Could happen occasionally, once in ten years
4	Certain	Could happen frequently, less than once a year
5	Imminent	More than once a year



Table 2.2.2.2(d): Severity

S	Extent of consequence	Harm to persons on or off-site	Community damage and disruption	On-site damage	Off-site environmental damage
1	Minor	No harm to persons	No disruption or damage	No damage or interruption to operations	No off-site environmental impact
2	Moderate	Slight injury requiring first aid treatment	No disruption or damage	Slight damage Interruption to operations < 24 hours	Off-site environmental impact but is not significant
3	Significant	Medical treatment with immediate recovery Hospitalisation < 24 hours Restricted or lost work < 4 days	Disruption to essential utilities, road closures or evacuation required	Localised damage Interruption to operations 1–7 days	Some off site environmental impact and damage is significant
4	Major	Multiple injuries Hospitalisation for more than 24 hours Delayed symptoms	Disruption to essential utilities, road closures or evacuation required for some time Some damage to off-site private property, dwellings still inhabitable	Major damage Interruption to operations 1 to 12 weeks	Environmental damage is significant and recovery will take more than 20 years
5	Catastrophic	Fatality or total permanent disability	Disruption to essential utilities, road closures or evacuation required for extensive period Major damage to off-site private property, dwellings uninhabitable	Extensive damage Long-term interruption to operations > 12 weeks	Off-site environmental impact extends to more than 500m radius around incident site Recovery will take more than 20 years

The severity (S) of the incident can be estimated using the following table.



2.2.2.3 Records

A record of the risk assessment should include:

- date
- name of assessor
- names of people who provided specialist advice
- site, storage location, area
- dangerous goods involved
- identified risks
- controls required to reduce risk to an acceptable level
- existing controls in place
- controls that need to be implemented
- basis for decision-making (MSDSs, Australian Standard etc).

2.2.2.4 Changes triggering a review of the risk assessment

The risk assessment should be reviewed when:

- new dangerous goods are introduced
- quantities of dangerous goods at the site change
- goods are moved to a different location on the site
- a process or plant is modified
- new information on hazards or risks becomes available
- monitoring indicates inadequate controls
- an incident has occurred
- there are changes on a neighbouring property
- there are changes to the site, structure or buildings.

2.2.3 Risk control measures

Risk control is the process of determining and implementing appropriate measures to control the risks identified by the risk assessment. Control measures should, wherever possible, first be applied to the highest priority risks, and then to the others in order of priority. Effective risk control may require the application of more than one control measure, and a hierarchy of control measures should be applied.

2.2.3.1 Hierarchy of controls

The preferred sequence of application of risk control measures is:

- elimination
- substitution
- quantity reduction.

Where the above do not achieve the necessary risk reduction, other measures that should be applied are:

- isolation
- engineering controls
- administrative controls
- personal protective clothing and equipment.

2.2.3.2 Possible controls

Examples of other types of control measures that can be applied are listed below.

Elimination and substitution

Elimination and substitution are generally not feasible in the case of a CRC because its purpose is to deal with the targeted materials.

Quantity reduction

The careful management of the quantity of materials in a CRC can be achieved firstly by design of the facility to contain certain quantities of the materials likely to be received, and by ensuring the store is cleared regularly to keep those quantities below design limits.

Isolation

- Separation from other on-site activities, on-site buildings, property on adjoining premises, other dangerous goods, people and other property
- Enclosing a hazardous activity
- Storing incompatible dangerous goods, such as oxidising agents and flammable materials, in buildings that are sufficiently separated that interaction is impossible and an incident in one will not involve the other
- Separation from ignition sources
- Segregation within the storage area.



	Hierarchy of control measures	Examples	Applied to Community Recycling Centre
Most effective	Elimination	Use a non-harmful substance	Not feasible – the purpose of a CRC is to accept and store dangerous goods
ſ		Eliminate ignition sources in hazardous areas	Prohibit carriage of matches, lighters and spark producing tools in the CRC
	Substitution	Use a less hazardous substance	Not feasible – purpose of CRC is to accept and store dangerous goods
		Use non-sparking tools in a hazardous area	Ensure operations and maintenance procedures specify use of non- sparking tools in CRC
	Quantity reduction	Reduce the inventory of dangerous goods	Design CRC to contain specific quantities of various types of dangerous goods Ensure the CRC is cleared regularly to keep quantities within design limits
	Isolation	Introduce a restricted work area	Locate drop off area away from storage area and restrict access to storage area by trained operators only Prevent access to drop-off area and storage area when moving or loading full storage receptacles
		Separate goods from other hazards	Locate CRC away from other activities on the site
		Segregate incompatible substances	Design and operate CRC with internal segregation for incompatible substances
	Engineering controls	Total enclosure of dangerous goods	Storage of oxidisers in specific purpose cabinets
		Ventilation to eliminate flammable or toxic atmospheres	Installation of natural and mechanical ventilation in the CRC
		Provide spill control such as bunds or sumps	Construct separate bunds for different types of material within the CRC
		Install detection systems and alarms for fire or hazardous atmospheres	Include an appropriate fire detection system within the CRC
	Administrative controls	Procedures, training, emergency plans, signs, placarding	Implement these for the operation of the CRC as appropriate
Least effective	Personal protective equipment	Gloves, respirators, safety showers, generally required in addition to other control measures	Implement these for the operation of the CRC as appropriate

Table 2.2.3.2: Hierarchy of control measures



Engineering controls

Role of engineering controls

- Ensure the effectiveness and integrity of buildings, plant and equipment
- Contain or suppress dangerous goods e.g. vapours or dusts
- Eliminate or confine processes or plant that may impinge on dangerous goods
- Protect dangerous goods from environment e.g. rain and sunshine
- Limit the area of contamination in the event of spills or leaks.

Types of engineering controls

- Total or partial enclosure
- Ventilation
- Control devices, alarms or shutdown devices
- Appropriately rated electrical plant and circuitry to minimise ignition hazards
- Spill control to contain the largest foreseeable spill
- Effective barriers between incompatible goods
- Detection systems and alarms for hazardous atmospheres and fires
- Protection from external hazards e.g. crash barriers
- Fire control and suppression systems.

Administrative controls

Operations

- Safe work procedures
- Scheduling transfers at 'low-traffic' times
- Prevent use of storage area as a thoroughfare
- Transfer of packages by trolley rather than by hand
- Keep lids on receptacles when not in immediate use
- Do not open containers for identification
- Control of access to storage and handling areas
- Prohibition of the carriage of matches, lighters or spark producing tools.

Maintenance

- Maintenance procedures that ensure integrity of plant and structures
- Procedures to ensure adequacy of other controls e.g. monitoring of inventory
- Operation of bunding and fire systems
- Procedures for hot work in or around the storage area
- Procedures that ensure drop-off and storage areas are kept tidy.

Spills and emergencies

- Procedures for spill clean up and decontamination
- Procedures for waste disposal including clean-up and contaminated waste
- Emergency procedures.



Signage and labelling

- Labelling of packages and storage
- Signage in storage area
- Instructions and warnings to operators and visitors
- Placarding.

Personal Protective Equipment (PPE)

- Eye protection
- Gloves, aprons, coats and overalls
- Footwear
- Safety showers, eye washes and hygiene facilities
- Respiratory protection
- Hearing protection.



2.3 Example of risk assessment and controls

Table 2.3 on the following page outlines the hazards arising from materials to be accepted at CRCs and possible risk control measures. This table can be used as a prompt to ensure appropriate risk control measures are in place.



Table 2.3: Risk control measures of materials collected

Material	Hazard	Hazard events	L / S / risk	Possible controls
		Container failure	3 / 2 / Medium	Emergency response Do not stack cylinders
	Compressed	Container dropped	3 / 2 / Medium	Procedures and training
Ð	Compressed gas /	Vehicle collision	2 / 4 / Medium	Store away from traffic
Gas cylinders – other / propane	flammable	Ignition of atmosphere	2 / 4 / Medium	Store securely and separately outdoors
		Adjacent fire	3 / 4 / High 1 / 4 / Medium	Separation / fire suppression / emergency response
		Container failure	3 / 2 / Medium	Use intermediate containers / spill containment
Batteries – lead acid	Corrosive	Container dropped	3 / 2 / Medium	Use intermediate container / procedures and training Do not stack lead acid batteries
Batteries – nickel		Vehicle collision	2 / 4 / Medium	Store away from traffic
cadmium / other		Mixing of incompatible substances	3 / 4 / High	Use intermediate containers Store acids and alkalis separately / procedures
0		Container failure	3 / 2 / Medium	Use intermediate containers / spill containment
Used oils		Vehicle collision	2 / 4 / Medium	Store away from traffic
	Flammable	Ignition of atmosphere	3 / 4 / High	Isolate from ignition / security / ventilate store
Paint – oil based		Adjacent fire	1 / 4 / Medium	Separation / fire suppression / emergency response
9		Container failure	3 / 1 / Low	Use intermediate containers / spill containment
Paint –	Low level ecotoxic	Container dropped	3 / 1 / Low	Spill containment / emergency response
water based		Vehicle collision	2 / 2 / Low	Store away from traffic / environment
Low level radioactive substances	Radioactive – toxic	Container failure	3/1/Low	Use intermediate container
		Container failure	3 / 3 / Medium	Use intermediate containers / spill containment
Fluorescent	Toxic	Container dropped	2 / 3 / Medium	Use intermediate container
tubes and light fittings		Vehicle collision	2 / 4 / Medium	Store away from traffic





Appendix 2.1: CRC risk assessment worksheet

Overview

Organisation	
Location / facility	
Name of assessor	
Date of assessment	
Date to be reassessed	
Specialist advice	
Site description	

Control measures (Existing or required)	
L x S = Risk	
Hazard events	
Hazards	Hazards arising from CRC materials • Compressed gas / flammable • Corrosive • Flammable • Low level ecotoxic • Radioactive – toxic • Toxic



Hazards	Hazard events	L x S = Risk	Control measures (existing or required)
Hazard arising from storage and handling infrastructure			
Structures, plant or equipment used in the storage or handling of materials including:			
 a container (including tank or package) 			
 storage areas, receptacles, or shelves 			
 a spill containment system 			
 a vehicle used for the transport or transfer of materials such as a forklift 			
 firefighting or fire protection system. 			
Systems of work involved in accepting CRC materials from householders, transferring these materials to the storage area, and the regular clearance of the storage area for treatment, recycling or disposal of the materials.			
Chemical reactions that result in a chemical change in one or more of the goods when they come into contact (e.g. an oxidising agent such as pool chlorine coming into contact with an oil such as brake fluid).			
Physical processes include dilution, dissolution, abrasion, phase change, leaching and absorption (e.g. rapid heating generated by acid mixing with water, causing a steam explosion).			

Hazards	Hazard events	L x S = Risk	Control measures (existing or required)
Hazards within the site of the facility			
 Any adjacent dangerous goods storages 			
 The proximity of other work areas, including on-site offices 			
 Plant used or moved on the site (e.g. ignition sources from engines) 			
 Vehicle movements on the site 			
 Deliveries of other dangerous goods 			
 Transfer of CRC materials between containers on the site 			
 Personnel movements in normal and emergency situations 			
 Visitor access, and unauthorised access to the CRC drop-off or 			
storage areas			
 Portable sources of ignition, generation of static electricity 			
Fire hazards including buildings,			
concentrations of combustible material and uncontrolled vegetation			
 Weather conditions such as 			
temperature extremes, wind,			
ngruming, or ramian including the potential for flooding.			



Control measures (existing or required)	
L x S = Risk	
Hazard events	
Hazards	Hazards external to the site of the facility



Control measures (existing or required)	
L x S = Risk	
Hazard events	
Hazards	Hazards indicated by past incidents Accidents, spills, incidents and near misses that involved storage and handling of CRC materials at the facility and at other facilities. Include details of the nature and cause of the incident, and the effectiveness of controls and how they could be improved.



Implementation of controls

Organisation	Action by	Action due





Appendix 2.2: By-catch hazards and controls

Provision is to be made at CRCs for the safe storage of 'by-catch' – the small volume of higher toxicity materials which may be received as orphan or illegally dumped dangerous or hazardous materials. Hazards for these materials are outlined below in **Table A2.2(a)**. Consideration of these hazards guides appropriate storage and handling of these materials.

Table A2.2(a): By-catch materials and their hazards

Material	Hazard
Acids	Corrosive
Aerosols – CFC based / flammable	Flammable gas / gas under pressure
Aerosols – flammable, pesticide	Flammable gas / toxic
Alkalis	Corrosive
Arsenic based products	Toxic
Cyanide	Toxic
Engine coolants and glycols	Flammable / possibly reactive
Fire extinguishers – non-halon	Compressed gas / low oxygen atmosphere
Flammable liquids – hydrocarbons, fuels and solvents	Flammable
Flammable solids	Flammable
Flares	Explosive
General household chemical	Low level toxic / corrosive
Heavy metal compounds / mercury – elemental	Toxic
Organic peroxides	Reactive / flammable
Oxidising agents e.g. pool chlorine	Reactive
Paint – other, including isocyanates and amines	Flammable / toxic
Paint – metal based	Toxic
PCB materials	Toxic
Pesticides – non schedule X (non-organochlorine)	Toxic / flammable
Pesticides – schedule X (organochlorine)	Toxic / flammable / ecotoxic
Solvents – halogenated	Toxic



Figure A2.2: Properties of materials to be considered in hazard identification

Physical state

Compressed gas Gas dissolved under pressure Liquefied gas Cryogenic liquid Mobile liquid Viscous liquid Volatile liquid Liquid with solids in solution or suspension Finely divided solid Granular / flaked solid Caked or undivided solid Physical state as stored / handled if different from above

Flammability

Flashpoint Sustains flame Auto ignition temperature Flammability range LEL – UEL Evolves / produces hazardous combustion products Explosion potential

Toxicity

Exposure limits Toxicity Irritant Carcinogen (known / suspected) Mutagen Sensitiser Biologically active

Reactivity

With air With water With other materials (details) Self reactive

Corrosivity

Skin Metals Other materials

Physical properties

Solubility in water Boiling point / range Melting point / range Odour Electrical conductivity / resistance Relative density Pressure as packed Vapour pressure Polarity pH as stored and handled pH of 1% solution

Instability

Decomposition conditions Hazardous decomposition effects Hazardous decomposition products Polymerisation potential Hazardous polymerisation effects Inhibitor required Phlegmatiser required Blanketing material required Self accelerating decomposition Temperature Control temperature Other special controls required

Ecotoxicity

Atmospheric pollutant Ozone depleter Odorous Visual pollutant Marine pollutant Ground water pollutant Soil pollutant Relevant half life information Special neutralising / absorbent material requirements

Sensitivity

To shock To heat To radiation To moisture To contamination with other materials



Table A2.2(b): Hazards arising from by-catch and possible controls

The table below outlines the hazards arising from by-catch materials that could be received at CRCs and possible risk control measures.

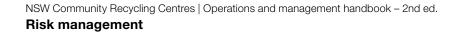
lazal u	Material	Hazard events	L / S / Risk	Possible controls
Corrosive	Acids	Container failure	3 / 2 / Medium	Use intermediate containers / spill containment
	Alkalıs	Container dropped	3 / 2 / Medium	Use intermediate container / procedures and training
		Vehicle collision	2 / 4 / Medium	Store away from traffic
		Shelving corrosion	2 / 2 / Low	Use intermediate containers
		Shelving collapse	2 / 4 / Medium	Do not overload shelves
		Mixing of incompatible substances	3 / 4 / High	Store acids and alkalis separately / procedures
Flammable	Engine coolants and glycols	Container failure in store	3 / 2 / Medium	Use intermediate containers / spill containment
	Flammable liquids – hydrocarbons, fuels and	Vehicle collision	2 / 4 / Medium	Store away from traffic
	solvents Flammable solids	Shelving collapse	2 / 3 / Medium	Ensure adequate shelving design
		Ignition of atmosphere	3 / 4 / High	Isolate from ignition / security / ventilate store
		Adjacent fire	1 / 4 / Medium	Separation / fire suppression / emergency response
Toxic	Arsenic based products	Container failure	3 / 3 / Medium	Use intermediate containers / spill containment
	Cyanide Heavy metal compounds /	Container dropped	2 / 3 / Medium	Use intermediate container
	Mercury – elemental Paint – metal based	Vehicle collision	2 / 4 / Medium	Store away from traffic
	PCB materials Solvents – halogenated	Shelving collapse	2/3/Medium	Ensure adequate shelving design
Compressed gas /	Fire extinguishers –	Container failure	3 / 2 / Medium	Emergency response
Low oxygen atmosphere	non-naion	Container dropped	3 / 2/ Medium	Procedures and training
		Vehicle collision	2 / 4 / Medium	Separation from vehicles
		Shelving collapse	2 / 4 / Medium	Do not stack cylinders



Hazard	Material	Hazard events	L / S / Risk	Possible controls
Explosive	Flares	Explosion and fire	2 / 3 / Medium	Store in segregation device
Flammable / toxic	Paint - other, including	Container failure in store	3 / 2 / Medium	Use intermediate containers / spill containment
	isocyanates and amines	Vehicle collision	2 / 5 / High	Store away from traffic
		Shelving collapse	2 / 3 / Medium	Ensure adequate shelving design
		Ignition of atmosphere	3 / 4 / High	Isolate from ignition / security / ventilate store
		Adjacent fire	1 / 4 / Medium	Separation / fire suppression / emergency response
Flammable gas	Aerosols – CFC based /	Container failure	3/1/Low	Emergency response
	liammable	Ignition of atmosphere	3 / 4 / High	Isolate from ignition / ventilate store
		Adjacent fire	1 / 4 / Medium	Separation / fire suppression / emergency response
Flammable gas / toxic	Aerosols – flammable,	Container failure	3/1/Low	Emergency response
	pesiicide	Ignition of atmosphere	3 / 4 / High	Isolate from ignition / ventilate store
		Adjacent fire	1 / 4 / Medium	Separation / fire suppression / emergency response
Low level toxic / corrosive	General household chemical	Container failure	3/1/Low	Use intermediate containers / spill containment
		Container dropped	3/1/Low	Spill containment / emergency response
		Vehicle collision	2 / 2 / Low	Store away from traffic / environment
		Shelving collapse	2 / 1 / Very low	Ensure adequate shelving design
		Shelving corrosion	2 / 1 / Very low	Use intermediate containers
		Mixing of incompatible substances	2 / 2 / Low	Store acids and alkalis separately
Reactive	Oxidising agents	Container failure	3 / 3 / Medium	Use separate cabinet with internal bunding
	e.g. pool criiorine	Container dropped	3 / 3 / Medium	Use separate cabinet with internal bunding
		Vehicle collision	2 / 4 / Medium	Separate store from traffic
		Mixing of incompatible substances	3 / 4 / High	Use separate cabinet / operating procedures



Hazard	Material	Hazard events	L/ J/ HISK	Possible controls
Reactive / flammable	Organic peroxides	Container failure	3 / 3 / Medium	Use separate cabinet with internal bunding
		Container dropped	3 / 3 / Medium	Use separate cabinet with internal bunding
		Vehicle collision	2 / 4 / Medium	Separate store from traffic
		Mixing of incompatible substances	3 / 4 / High	Use separate cabinet / operating procedures
		Ignition of materials	2 / 4 / Medium	Isolate from ignition
		Adjacent fire	1 / 4 / Medium	Separation / fire suppression / emergency response
Toxic / flammable	Pesticides – non schedule X	Container failure	3 / 3 / Medium	Use intermediate containers / spill containment
	(non-organocniorine)	Container dropped	2 / 3 / Medium	Use intermediate container
		Vehicle collision	2 / 4 / Medium	Store away from traffic
		Shelving collapse	2 / 3 / Medium	Ensure adequate shelving design
		Ignition of atmosphere	2 / 4 / Medium	Isolate from ignition / ventilate store
		Adjacent fire	1 / 4 / Medium	Separation / fire suppression / emergency response
Toxic / flammable /	Pesticides – schedule X	Container failure	3 / 3 / Medium	Use intermediate containers / spill containment
ecotoxic	(organocniorine)	Container dropped	2 / 3 / Medium	Use intermediate container
		Vehicle collision	2 / 4 / Medium	Store away from traffic / environment
		Shelving collapse	2 / 3 / Medium	Ensure adequate shelving design
		Ignition of atmosphere	2 / 4 / Medium	Isolate from ignition / ventilate store
		Adjacent fire	1 / 4 / Medium	Separation / fire suppression / emergency response





3. Operating a Community Recycling Centre



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Operating a Community Recycling Centre



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3.1 Introduction

CRCs are designed and operated to temporarily store household problem wastes safely until they can be recycled or disposed. To support this, CRC operators are required to ensure processes and documented procedures are in place to protect the health and safety of customers and staff at the facility, and for managing the impact of the facility on the environment. This includes having procedures for safe handling of materials, and emergency response.

This section of the Handbook provides core elements of procedures for this purpose that can be used by CRC operators as a resource to update their own existing procedures.

3.1.1 Objectives

The objectives of the procedures are to:

- protect staff and employees
- protect public health
- protect the environment
- facilitate safe disposal or reuse.

Due to the different nature and type of materials that may be received at a CRC, it is important that strict procedures be followed to reduce the risk of substance exposure to employees and members of the public who have access or proximity to the facility.

3.1.2 Scope

The procedure outlined in this section applies to all persons involved in the operation and use of the CRC.

3.1.3 Hazardous properties of CRC materials

Materials received at a CRC may have the following hazardous properties:

- flammability the potential to burn or explode in air when ignited
- **instability** the potential to undergo a spontaneous violent reaction, such as decomposition or polymerization, under certain conditions
- **reactivity** the potential to react with certain other chemicals, with water or other materials
- **toxicity** the immediate, delayed or long term effect on humans or animals through inhalation, skin absorption or ingestion
- ecotoxicity the effect on the environment, in particular on aquatic life
- corrosivity to other materials, in particular packaging, or human skin
- radioactivity spontaneously emitting harmful radiation.



Table 3.1.3: CRC materials have a range of hazardous properties as indicated by the table below.

Material	Hazard
Car batteries	Corrosive
Batteries – nickel cadmium / other	Environmental hazard / toxic / corrosive
Fluorescent tubes and light fittings	Toxic
Gas Cylinders – other / propane	Compressed gas / flammable
Low level radioactive substances – e.g. smoke detectors	Radioactive – toxic
Used oils	Combustible / flammable
Paint – oil based	Flammable
Paint – water based	Low level ecotoxic

Some of the hazards arising from the operation of a CRC therefore include:

- leakage from a container exposing staff, members of the public, or the environment to toxic or corrosive agents
- fire or explosion caused by leaking material coming into contact with an ignition source
- unintentional mixing of incompatible or reactive substances causing a chemical reaction, explosion or fire, and exposure to unknown substances thus generated.



3.2 Public safety

CRCs aim to make it easy for householders to manage their problem waste. A well-managed facility ensures user and operator safety, minimises waste spillage and ensures safe traffic management flow.

The following requirements are to ensure the safety of members of the public, including those who may live near the site, those who are visiting the site for other purposes, and customers who are bringing CRC materials to the site.

Minimum requirements:

- signage at the facility should instruct customers to the drop-off point and advise them where to deposit the respective materials
- signage and the operator should direct customers that children, if present, should remain in the vehicle
- members of the public are not to remove any materials from the drop-off area or any ancillary storage areas
- members of the public are not to enter any ancillary storage area
- members of the public are not to smoke or to use a mobile phone while within the drop-off area (either inside or outside their vehicle), and this should be clearly advised by appropriate signage
- the facility supervisor or manager should be advised of all spills or loss of containment immediately, and appropriate spill and/or emergency response procedures initiated. These should include notification of appropriate authorities and members of the public on and surrounding the site if necessary.



3.3 Workplace health and safety

3.3.1 Risk management

Facility operators need to complete a risk assessment to identify hazards and risks, and implement appropriate controls to ensure the health and safety of workers involved in the operation of CRCs.



Refer to **Section 2** – Risk Management of this Handbook for more guidance on potential hazards, risks and controls associated with the operation of CRCs.

3.3.2 Labelling

Facility operators must ensure that labels appropriate to the material being stored in a particular receptacle are affixed to the receptacle as soon as it is brought into service. These labels will correctly designate the receptacle both for storage and for transport of the material.



The collection contractor supplies both adhesive and magnetic labels for receptacles of CRC materials. CRC operators must ensure these labels are stored safely and available for use as required.

Correct labelling of receptacles as soon as they are brought into service must be included in the SWMSs or SOPs for the CRC. Operations staff at the CRC must be trained in correct labelling procedures.

3.3.3 Safe work method statements

Facility operators need to prepare safe work method statements (SWMSs), also known as safe work procedures or job safety assessments, specifically for the tasks involved in the operation of CRCs. These are to be in addition to any other SWMSs by which the facility operates.

All staff involved in the operation of the CRC must be trained in the use of the SWMSs, sign off as having been trained and agree to undertake the relevant tasks safely in accordance with the SWMSs.

3.3.4 Personal protective equipment

3.3.4.1 Acceptance and storage

The following items of Personal Protective Equipment (PPE) must be worn by operators when unloading materials or moving them between storage receptacles in the drop-off area:

- eye protection safety glasses
- gloves in chloroprene or nitrile rubber
- heavy-duty, chemical resistant footwear with slip reducing soles and steel caps.



Refer to the procedures provided in the collection contractor's training package for more information on appropriate PPE and its use for handling CRC materials.

3.3.4.2 Spill response

In the event of a leak or spill the following items may be required and should be stored in a location quickly and easily accessible to the drop-off and storage area:

- coverall suit
- chemical resistant face shield
- chemical resistant boots.

3.3.4.3 Maintenance of PPE

PPE should be kept separate from normal clothing. After use, all PPE should be maintained and cleaned in accordance with the manufacturer's instructions and the relevant Australian Standard.





3.4 Acceptance and storage

Householders should deposit target materials directly into appropriate designated receptacles. Householders attempting to drop off non-target items such as hazardous toxic chemicals should be asked to retain them and referred to the next Household Chemical CleanOut event.

Waste from commercial sources must not be accepted at the CRC

Problem wastes and hazardous wastes from commercial and industrial sources must not be accepted at the CRC. If commercial and industrial waste is brought to the CRC, the facility operator must make their own arrangements for the acceptance, storage, transport and disposal of these wastes. If problem and hazardous wastes from commercial and industrial sources are accepted, the facility operator must also make appropriate arrangements to ensure that they are kept completely separate from the CRC materials. These arrangements will be audited.

3.4.1 Notification of arrival of CRC materials

The facility should establish a way in which relevant operators can be made aware that a customer is delivering CRC materials. For example, where staff are present in a gatehouse or weighbridge at the entrance to the facility they should ask customers if they are delivering CRC materials and if so advise the relevant operator.

At the time a customer enters the facility they should be asked what CRC materials they are carrying, if the containers all have lids, and if any of them are leaking. The customer must be informed that containers without lids, or that are leaking, cannot be accepted. If any of the materials they are carrying cannot be accepted, the customer must be informed of where they could be taken (e.g. a mobile collection event or alternative facility).

3.4.2 Unloading

The customer should remove containers from their vehicle and place them directly into the designated storage receptacle (e.g. box, cage, pallet). These receptacles will be identified with large format standard signage with a minimum size of 1m x 1m.

Once the materials are safely unloaded the customer should be directed to leave the drop-off area immediately. Under no circumstances should intermediate storage areas be used with a view for later separation as these areas are uncontrolled and materials are uncontained.

3.4.3 Storage of CRC materials



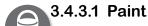
Refer to the procedures provided in the collection contractor's training package for specific information on handling CRC materials safely. This is provided to all staff who complete on site CRC training.



CRC materials are to be stored in the appropriate receptacle into which they are placed when they are unloaded from customer vehicles. Materials should be placed into the correct receptacle immediately. Materials must not be stored for later sorting. Direct placement will reduce the risk of spills and accidents.

Labels for the storage receptacles are provided by the collection contractor when these receptacles are delivered to the CRC. These labels include information necessary to comply with the *Work Health and Safety Act* and Regulation 2011 for storage and transport of dangerous goods and hazardous materials. A label appropriate to the type of receptacle and material to be stored in it must be affixed to the receptacle as soon as it is brought into service. In addition, a program-branded magnetic sign of the material type can be affixed to the receptacle to help customers sort their materials correctly.

More information on acceptance and storage of each specific CRC material is provided below.



Two streams of paint will be collected as part of this program.

Water based paint

Water based paint will be the highest volume material collected. Storage receptacles must be presented to householders in a manner that ensures separation of oil based from water based paint. Water based and oil based paints are readily identified by manufacturers' labels on the cans. Householders need to place their cans of paint directly into the storage receptacles thus eliminating the need for second handling.

Oil (solvent based) paint

Oil paint, lacquers, epoxies and other miscellaneous paint products (not including metalcontaining paint, see below) are to be placed in a similar well-marked storage receptacle by the householder. By separating the water based paint, a large proportion of material collected can be classified and treated as non-flammable.

Other paint

Small quantities of metal based paint (e.g. lead, zinc) may be received at the facility. This material is considered toxic and should be separated into the by-catch stream (see **Section 3.4.4** on the following page).

Aerosol paint

Paint in aerosol cans must be stored in a receptacle that allows appropriate ventilation, but that also fully contains the aerosol cans in case they explode. More guidance is provided in **Section 3.4.3.6**.



3.4.3.2 Used Oils

Two streams of oil will be collected as part of this program - motor oil and other oil.

Motor oil

As used motor oils represent a valuable resource, most facility operators have their own arrangements with recycling contractors for collecting and being reimbursed for it. While used motor oil forms a part of the CRC program and is allocated space at a CRC, it is not collected by the EPA CRC collection contractor.



Motor oil may be decanted by customers into dedicated vessels. This is common practice at many existing sites that become CRCs. In this situation 240 litre bins or similar are provided to deposit the empty delivery containers (if the householder chooses to forfeit them). If a decanting vessel is not provided then the motor oil shall be placed, in the original packaging, into a storage receptacle (provided either by the facility operator or the contractor they engage to collect used motor oil).

Other oil

Other oil such as cooking, heating and transmission oils should be placed into the appropriate storage receptacles in the container in which they are delivered to the facility, and the delivery container forfeited by the householder. Other oils will generally be collected by the collection contractor, unless particular arrangements have been made by the facility operator. Heating oil is actually kerosene and should be stored in the Flammables Dangerous Goods Safety Cabinet.



3.4.3.3 Gas cylinders

The collection contractor will provide transportable cages for gas cylinders. Householders should place their cylinders directly into the cages with no further handling or processing on site. The cylinder valve should be closed when a cylinder is placed in a cage.

SafeWork NSW recommends that CRC operators test gas cylinders for leaks using a simple method like spraying the valve area with a mixture of water and mild detergent and looking for any bubbles. If a leak is detected, the valve can be tightened. If the leak continues the cylinder should be marked, placed in a suitably ventilated area and the collection contractor notified.

Typically two types of cages are used. For standard size bottles a three shelf cage (with door) will be used, and for longer bottles an open top cage will be used. Once the cages are near full the facility operator shall notify the collection contractor to remove the cage and replace it with an empty one.



3.4.3.4 Batteries

Two streams of household batteries will be collected as part of this program.

Lead acid batteries

As the lead inside a lead acid battery represents a valuable, facility operators have their own arrangements with recycling contractors for collecting used lead acid batteries and being reimbursed for them. While lead acid batteries form a part of the CRC program and are allocated space at a CRC, they are not collected by the EPA CRC collection contractor.

Lead acid batteries are to be placed by householders directly onto bunded pallets (provided either by the facility operator or by the contractor they engage to collect them).

Note: as lead acid batteries provide a feasible ignition source it is recommended that the bunded pallet be positioned at the opposite end of the drop-off area to the gas bottle cage, and kept away from oil based paint and used oil.



Household batteries

These are generally single use or rechargeable batteries of several types, such as zinc carbon (the most common), alkaline, nickel cadmium, nickel hydride, mercury and lithium. These are stored at a CRC in purpose-built containers provided by the EPA's collection contractor. It is preferable to separate batteries of different types into individual containers at a CRC, as this removes the need for the contractor to sort through them after they are collected. Special attention must be paid to lithium batteries, which contain certain hazardous properties, as described below.

Lithium ion and lithium metal cells and batteries, and equipment containing these, must be prepared for transport (for disposal and recycling) in accordance with packing instruction P909 of the Australian Dangerous Good Code (Current version is 7.4). Receptacles must be marked 'LITHIUM BATTERIES FOR DISPOSAL' or 'LITHIUM BATTERIES FOR RECYCLING'. The collection contractor will supply labels, receptacles and plastic liners appropriate to this purpose. The CRC operator must line the battery receptacle with the plastic liner prior to its use.

In addition, lithium batteries must be packed to prevent short circuits and the dangerous evolution of heat. This could include, but is not limited to:

- individual protection of the battery terminals, or
- inner packaging to prevent contact between cells and batteries, or
- the use of a non-conductive and non-combustible cushioning material to fill empty space between the cells or batteries in the packaging.

Lithium batteries must also be secured within the outer packaging to prevent excessive movement during transport (e.g. by using a non-combustible and non-conductive cushioning material or through the use of a tightly closed plastic bag).



3.4.3.5 Fluorescent tubes

Fluorescent tubes and globes will be placed in various receptacles designed to minimise breakage and prevent the release of mercury to the environment during storage, handling and transport. The collection contractor will provide these receptacles (e.g. boxes for tubes, bins for globes).

Procedures for the safe handling of fluorescent tubes and globes need to be included in the facility operating procedures and care needs to be exercised at all times to prevent breakage of tubes and globes.



3.4.3.6 Aerosols

Aerosol cans must be stored in a receptacle that allows appropriate ventilation, but that also fully contains the aerosol cans in case they explode. The collection contractor will provide a drum with a ventilated lid for the storage of aerosols.

The lid of the drum must be kept secure, and only opened by a CRC operator when placing aerosols in the drum. Customers are not to open the drum.

Where CRCs are not constantly staffed by a CRC operator, customers can place aerosols in the fire extinguisher cage. They can then be transferred to the drum by a CRC operator. This should take place each day the CRC is open, prior to the end of the day.



3.4.4 Storage of by-catch materials

Irrespective of gate policies and dedicated signage, a small percentage of non-targeted by-catch materials can be expected. Separate dangerous goods safety cabinets (DGSC) compliant with the relevant Australian Standards for flammable, oxidising, toxic and corrosive materials will be provided by the EPA during establishment of the facility.

The procedures for sizing and placement of DGSC are outlined in detail in **Section 1.2.6** of this Handbook.

The facility operator is to ensure that the drop-off area is inspected regularly, and that any containers of by-catch materials are placed in relevant cabinets based on the safety symbol on the container's label.

The facility operator must report the status (percentage full) of each of these cabinets to the EPA using the online reporting system. This is reported on the status screens when a change of status has occurred, for example, when a receptacle of core material is changed over or when a large volume of by-catch is received.



Refer to the procedure provided in the collection contractor's training package for more information on sorting by-catch materials into the appropriate cabinet.

Where more than one cabinet is used for a particular type of by-catch the facility operator should fill one cabinet first, then the others in succession, and report the percentage full status considering the capacity of all the cabinets. For example, where two 250L cabinets are used for flammable liquids, if one cabinet is half full, and the other cabinet empty, the percentage full status should be reported as 25%.

The EPA CRC collection contractor shall empty the cabinets at the same time as the target materials.

3.4.5 Handling of unknowns

Wherever possible the facility operator should prevent the deposit of unknown materials at the facility. Containers are not to be opened on site by either facility staff or householders for the purpose of identification.

Where acceptance cannot be prevented, the facility operator is to immediately seek specialist advice from the collection contractor. A photograph of the container should be emailed to the collection contractor with a request for advice as to how the container should be stored. Refer to the collection contractor's contact information at the front of this Handbook for the relevant email address. Once the response is received, the container should be placed in a resealable container suitable as a segregation device (e.g. a bucket or drum) appropriate to the material, labelled (e.g. with the material designation written on an adhesive label affixed to the container) and placed in the appropriate receptacle or DGSC. Where the material cannot be identified either through the provision of specialist advice, it should be placed in the Toxic DGSC.

A supply of overpackings suitable as segregation devices will be provided by the collection contractor.



3.4.6 Handling of containers that are leaking or without lids

Customers must be informed when they arrive at the facility that leaking containers or containers without lids will not be accepted.

If for some reason a container that is leaking or that doesn't have a lid is delivered to the CRC despite best efforts, it must be placed in a resealable container, that is appropriate to the material type and suitable as a segregation device, along with adequate absorbent material. The outer container must then be labelled according to the material type and then placed in the correct storage unit. Target materials should be placed in the appropriate receptacle and by-catch in the appropriate Dangerous Goods Safety Cabinet.



3.5 Transfer and removal

3.5.1 Sorting of materials

The drop-off area should be checked regularly to ensure that materials dropped off by customers visiting the CRC have been placed in the appropriate storage receptacle. The operator should attempt to identify substances in accordance with training. Should any containers need to be moved, the operator should check that containers are intact, not leaking and unlikely to fail, and use appropriate PPE (safety boots, gloves and safety glasses as a minimum) before attempting to do so.

3.5.2 Transfer of full storage receptacles

Full receptacles in the drop-off area must be transferred to the storage area to prevent receptacles from overflowing and causing hazards. The drop-off area should be checked, and cleared if necessary, at least daily. The storage area should remain locked at all times unless an appropriately trained and qualified operator is present. The storage area should only be opened for the purpose of transferring material from drop-off area into the store or for clearance of the material for disposal or recycling.

3.5.3 Removal of materials

The EPA and/or other funding bodies (e.g. product stewardship schemes) will establish and maintain contracts for the collection and recycling (or disposal) of paint, used oil (other than motor oil), gas cylinders, household batteries, smoke detectors and fluorescent lights, as well as incidental by-catch.

The facility operator will be responsible for arranging the collection and recycling (not disposal) of lead acid batteries and used motor oil. The facility operator must ensure that materials are removed with sufficient frequency to prevent the accumulation beyond the capacity of the storage area.

Collection of materials will be scheduled by the collection contractor by reviewing the information provided by the facility operator via the online reporting system (dropoffwaste.com). The facility operator may also request a collection by contacting the collection contractor directly.





Refer to the procedure provided in the collection contractor's training package for detailed information on requesting the collection of accumulated materials.

Once a collection has been scheduled the collection contractor will notify the facility operator by email. Facility operators must ensure that the collection contractor has the appropriate email address, so that the facility operator can prepare the site for a collection. An example of the email is provided as **Figure 3.5.3(a)**.

Prior to the day of the collection the facility operator must ensure the following:

- 1. All receptacles are packed appropriately
- 2. Site is accessible for the collection truck with no obstructions
- 3. All receptacles are labelled with labels supplied by collection contractor
- 4. All by-catch is sorted and segregated
- 5. All by-catch is placed in by-catch cabinets
- 6. A forklift and driver is on hand for the collection date
- 7. The tablet reporting device is charged so a staff member can enter the required 'Drop Off: Add to Truck' update on collection day.

Figure 3.5.3(a)



Sample notification email for CRC collection

SUBJECT: CRC [location] next collection date: 02/08/2016

TO: [location] CRC,

A truck has now been scheduled to collect materials from [location] Community Recycling Centre on Tuesday 02/08/2016.

Please ensure you add this to your CRC staff work schedule to prepare your site for collection. It is a regulatory requirement that you complete the 'Add to Truck' entry on 'Drop Off' at the time of collection.

A site ready for collection has the following tasks completed:

- 1. All receptacles are packed appropriately
- 2. Site is accessible for the collection truck with no obstructions
- 3. All receptacles are labelled with labels supplied by collection contractor
- 4. All by-catch is sorted and segregated
- 5. All by-catch is placed in by-catch cabinets
- 6. A forklift and driver is on hand for the collection date
- 7. The tablet is charged so a staff member can enter the required 'Drop Off: Add to Truck' update on collection day.

Contact Toxfree directly if you require any further information.

This email has been automatically generated from the Community Recycling Centres Drop Off System. Do not reply to this email.

Toxfree: 9851 4200 - i.parkes@toxfree.com.au

If there are any potential problems with the collection date, contact Toxfree directly.

For Drop Off technical problems, contact the Community Recycling Unit of the NSW EPA: **zac.lambert@epa.nsw.gov.au** or **9995 6346**.



On the day of the collection, the facility operator must ensure that materials are loaded and consigned in accordance with basic requirements for the transport of waste and dangerous goods as indicated by the following procedure. See **Figure 3.5.3(b)**.

Figure 3.5.3(b)

	are for loading and consignment of waste and ous goods
Step 1	When the contractor's truck arrives, ask to see the Waste Transport Certificate (WTC) number and record this number using the Online Reporting System.
Step 2	Unload empty receptacles and load truck with full receptacles using a forklift (the same number of receptacles should be unloaded and loaded). Record the number of receptacles loaded for each type of CRC material using the Online Reporting System.
Step 3	Open the by-catch safety cabinets and observe that the driver collects stored materials. Before the contractor collects the by-catch materials, enter the 'percentage full' individual cabinet amounts into the online database.
Step 4	Check that the truck has placards (hazardous signs) displayed.
Step 5	Check that the driver has completed the Waste Transport and Dangerous Goods Manifest documentation and signed it.
Step 6	Check that driver has secured the load (straps secured over receptacles and cages).
Step 7	Count the total number of the main receptacles held on site and record these using the Online Reporting System.
Step 8	If the site has a weighbridge, record the total weight of materials removed from the site (gross weight of collection vehicle on exit minus gross weight of collection vehicle on entry).



3.6 Emergency situations

3.6.1 Emergency equipment and procedures

3.6.1.1 Emergency equipment

The following safety equipment is to be provided within the CRC:

- Safety shower and eyewash
- Spill response kit
- Fire extinguishers
- Personal Protective Equipment (PPE)
- First aid equipment and supplies

Procedures to be regularly implemented:

- Test the operation of the safety shower and eyewash
- Check and replenish the first aid equipment and supplies
- Check and replenish the PPE
- Check and replenish the spill response equipment.

Spill response equipment should include: adequate quantities of suitable absorbent materials; a sufficient quantity of resealable waste recovery containers compatible with the substances being kept and marked for emergency use only; and shovels brooms and scrubbing brushes. Spill response equipment must be located at both the drop-off area and the storage area.

Dry chemical powder type fire extinguishers are appropriate for all types of CRC materials except for cooking oil, for which a wet chemical type is more appropriate. It is the CRC operator's responsibility to ensure this equipment is on hand. Refer to *AS 2444-2001 Portable fire extinguishers and fire blankets* – Selection and location for guidance on the selection and location of fire extinguishers.

3.6.1.2 Emergency procedures

Procedures must be prepared for emergency incidents involving the CRC such as fire detection and response, spill response, and customer or staff injury or exposure to hazardous chemicals.

All staff involved in the operation of the CRC must be trained in the use of the emergency procedures, sign off as having been trained and agree to undertake the relevant tasks safely in accordance with these procedures.

Refer to **Section 1.3.4.2** for more information on preparing the Emergency Plan and associated procedures.

3.6.2 Specialist advice

The EPA will establish and maintain contracts for the provision of specialist advice and support arrangements in the event of unknown materials being deposited, and other unexpected or emergency situations. The facility operator is to ensure their operating and emergency procedures appropriately reference this specialist advice.



3.6.3 General spill response

In the event of a spill the following initial response should be followed:

- protect yourself by putting on appropriate PPE as required
- protect others, identifying all people in the vicinity including members of the public, and moving them to the designated evacuation point upwind
- stop the leak (e.g. by turning off the tap, righting the drum or container, or placing in an outer container if possible)
- contain the leak by placing appropriate absorbent or bunding material in place (using the spill kits that are available)
- avoid contact with the spilled material
- advise the site supervisor or manager
- if you consider it necessary seek specialist advice and/or spill response, providing details of the chemical if known
- clean up spill
- complete incident response form as soon as possible after the situation has been contained.



Refer to the procedure provided in the collection contractor's training package for more information on general spill response.

3.6.4 Spill clean up procedures

Clean up spills in the following way:

- Contain the spill using the appropriate absorbent material
- Scoop up and recover spilled material and put into a waste container
- Repeat using appropriate absorbent material as many times as necessary in order to remove as much of the spilled material as is practical
- Clean brush and shovel of absorbent material, also placing this into the waste container
- Label waste container with details of contents if known including the absorbent material used
- Place waste container into the appropriate area of the CRC (e.g. applicable to the spilled material)



3.6.5 First aid

If any discomfort is reported, or if a person has inhaled, ingested or been contaminated with a potentially hazardous or toxic substance:

- remove the person to a safe place prior to treatment, if safe to do so. Before doing this, put on PPE appropriate to the nature of the incident
- send for a designated first aid person and, at the same time, obtain the Safety Data Sheet (SDS) for the toxic substance involved. Summon professional medical assistance without delay. If there is any doubt as to the appropriate first aid procedure contact the Poisons Information Centre (see front section of this Handbook for emergency contact numbers)
- if the person has stopped breathing, ensure a clear airway and apply an appropriate method of artificial resuscitation. Note that the appropriate method depends on the substance involved. Oxygen resuscitation or external air resuscitation may be required
- if the eyes are contaminated, wash thoroughly with water from a low-pressure water source for at least 15 minutes
- remove all contaminated clothing and footwear. Wash contaminated area with soap and lukewarm water
- carry out appropriate first aid treatment and if medical assistance has not been summoned, transport the patient to a hospital or doctor
- send the SDS (if available), product label (if available), and all relevant details of the accident, to the hospital or doctor with the patient
- complete incident response form as soon as possible after the incident in accordance with any WHS procedures.



4. Induction and training



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Induction and training

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Induction and training





4.1 Induction

When commencing work in the CRC, operators must be instructed in the following:

- general layout of the drop-off and storage areas, in particular the location of safety equipment such as the Safety Data Sheets, PPE, safety shower, eyewash, first aid cabinet and evacuation points
- administrative procedures for controlling risks, such as permit to work systems
- hazardous areas and restrictions on ignition sources, especially vehicles and portable items
- security measures, signs and procedures
- record keeping, in particular recording the quantity of materials currently on hand
- general emergency procedures for the facility, including the Fire Plan and Emergency Evacuation Procedures.



4.2

Training

Staff involved in the operation of the CRC should be trained and demonstrate competency in the following skills:

- storage and handling of CRC materials including identification, keeping incompatible materials separate, and appropriate spill response
- appropriate fitting and use of PPE.

The EPA will arrange for site operator training to be provided. Each and every staff member involved in the operation of the CRC must attend this training.



 Refer to the collection contractor's training package for more information on the contents of this training.

Records showing who was trained, when they were trained, and by whom, are to be maintained for the following training:

- Site induction
- Site specific risk register
- Training by the collection contractor
- Training in the use of the Safe Work Method Statements (or equivalent).





Appendix 4.1: Induction checklist

Element 1. Site orientation

- 1.1 Drop-off area features and infrastructure
- 1.2 Storage area features and infrastructure
- 1.3 Location of documentation and procedures
- 1.4 Location of records and record keeping equipment
- 1.5 Location of safety equipment and PPE
- 1.6 Location of key security features
- 1.7 Location of emergency response equipment and procedures

2. Site risk assessment

3. Material handling (included in collection contractor training package)

- 3.1 Material types
- 3.2 Hazards
- 3.3 Handling
- 3.4 Controls including PPE

4. Operating procedures

- 4.1 Opening and closing
 - 4.1.1 Signage
 - 4.1.2 Security
 - 4.1.3 Safety
- 4.2 Customer service
 - 4.2.1 Unloading
 - 4.2.2 Sorting and transfer
 - 4.2.3 Record keeping (of basic customer information if required)
- 4.3 Record keeping and reporting
 - 4.3.1 Material inventory
 - 4.3.2 Incidents
 - 4.3.3 Annual reporting
- 4.4 Storage and changeover (included in collection contractor training package)
 - 4.4.1 Storage receptacle transfer
 - 4.4.2 Material removal and storage receptacle replacement
 - 4.4.3 Loading and consignment of dangerous goods
- 4.5 Emergency response
 - 4.5.1 General spill response
 - 4.5.2 Situations requiring first aid
 - 4.5.3 Situations requiring specialist advice





Done?



Appendix 4.2: Training register

Induction

Name	Date training completed	Signature





Appendix 4.3: Collection contractor training

package (Risk management and safe work procedures)

Name	Date training completed	Signature



5. Record keeping and reporting



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Record keeping and reporting

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5.1 Record keeping

CRC operators must create and ensure the safe keeping of the following records.

5.1.1 On-site materials register

The facility should have processes and procedures in place to ensure an accurate register of stored materials is maintained and kept up-to-date, and is easily accessible in the event of an emergency.

5.1.2 Risk register

The risk register and associated risk management plan should be updated annually.

5.1.3 Training register

A record of all staff that have been provided with induction and training in the operations of the CRC should be kept on-site (and updated as staff are trained).

5.1.4 Performance self-assessment

5.1.4.1 Site establishment

Immediately after the CRC is commissioned, facility operators need to complete the site establishment checklist provided at the end of **Section 1** of this Handbook (Establishing a Community Recycling Centre) and provide a copy of the completed checklist to the EPA within 30 days of the commencement of operations.

5.1.4.2 Site operations

Periodically (at least annually), facility operators are to undertake a performance selfassessment of operations of the facility, note any issues, and implement any actions required to ensure the facility is operating safely and efficiently.

This performance self assessment is to include the following:

- 1. Condition of infrastructure:
 - 1.1 roofs and awnings
 - 1.2 road surfaces
 - 1.3 bunding
 - 1.4 security measures
 - 1.5 signage
 - 1.6 safety equipment including spill kits, safety shower, eyewash, first aid supplies, and fire extinguishers
- 2. Encroachment of surrounding activities
- 3. Licencing note any changes in operations that may affect licencing



- 4. Materials storage and handling
 - 4.1 housekeeping
 - 4.2 material accumulation is managed appropriately
 - 4.3 materials are kept in appropriate receptacles and not on the ground around the receptacles
 - 4.4 separation of water based and oil based paint
 - 4.5 storage of by-catch in appropriate cabinets
 - 4.6 appropriate arrangements are in place for recycling of lead acid batteries and motor oils (including evidence that these are not being sent to landfill)
- 5. Customer supervision
- 6. Workplace Health and Safety procedures are understood by staff and implemented.



5.2 Reporting

5.2.1 Material quantities and collection reporting

Records of the quantities of each type of material accepted under this program are to be kept, and reported to the EPA on a weekly basis using the EPA's online reporting system. This should include the number and type of storage receptacles that are removed by the collection contractor for each type of material.

Online reporting must be done on a minimum of a weekly basis. This allows the contractor to plan their next collection in a timely manner, and the EPA to track local demand for the centre. Ongoing reporting of accurate data is a critical CRC task and will influence future program adjustments.

Although removal and disposal of motor oil and lead acid batteries is to be arranged by the facility operator, the quantities received at the facility are to be recorded and reported to EPA with reports on other materials (using dropoffwaste). The means of recycling, this includes processing and end-use must also be reported annually.



5.2.2 Annual reporting

An annual report is to be prepared outlining the following:

- 1. Total quantities of each type of target material received, including by-catch
- 2. An outline of other materials received at the facility in the year, including quantities if this information is available
- 3. A brief commentary on the operation of the facility over the year including highlights of promotional campaigns, customer feedback, staffing, and materials handling
- 4. A progress report on the implementation of recommendations from any CRC audits undertaken for the facility
- 5. An outline of any changes to infrastructure or operations undertaken during the year, and a summary or progress report of future plans (including design and construction).
- 6. A copy of the up-to-date training register for the site
- 7. A copy of the up-to-date risk register, and risk management plan for the site (as relevant to the infrastructure and operations of the CRC)
- 8. A copy of the performance self-assessments completed during the year
- 9. If any incidents have occurred, a list comprising the date, a brief description of the nature of each incident, and any action that has been taken to prevent recurrence of each type of incident.

The annual report is to cover the period 1 July to 30 June, and must be submitted to the EPA by 31 August each year. The EPA will provide the reporting template.

5.2.3 Incident reporting

All incidents, including but not limited to spills, injury to staff or members of the public, or events impacting on the environment are to be captured in the facility operator's incident management system. Any incidents are to be summarised in the annual report to the EPA. Significant incidents should be reported immediately to the local EPA office, the EPA Community Recycling Unit, and any other appropriate agencies.





5.3 Using the online reporting system

There are two required entries that must be completed in the CRC online reporting system, known as dropoffwaste. A CRC status update must be entered every Monday morning and each time a full receptacle is replaced with an empty one. An 'Add to Truck' entry must be completed every time an EPA contractor or Paintback truck collects materials from the CRC. For detailed information about how to use dropoffwaste, contact the Community Recycling Unit to request a user guide.

Dropoffwaste has been designed to work on a touch screen tablet. This allows the operator to walk around the centre and directly upload the status of materials stored, spare storage capacity and volumes dispatched.

Each Monday morning and every time a receptacle of core materials is changed over the operator will log on to dropoffwaste with the CRC user name and password. The CRC 'status update' screen allows reporting of number of full receptacles of core materials and an approximate percentage full of each safety by-catch cabinet. The screen also displays the date the status was last updated and the next scheduled collection date.

From the site menu, the 'Add to Truck pickup' screens will lead the operator to record the Transport Certificate Number (TCN) (this confirms that the transporter is licensed to carry dangerous goods and the load is tracked). The number of receptacles loaded on the truck is recorded on the touch screen. The next phase is to confirm the volumes held in the by-catch cabinets and record that they were collected. The operator will also be asked to confirm that the truck is 'placarded' (hazardous goods signs) front and back, that load has been secured (straps over the receptacles) and that the transport certificate has been signed. These steps cover some of the obligations of a consigner / loader in the Dangerous Goods Code. If the site has a weighbridge installed then the total weight removed from site should also be recorded.

The number of receptacles held on site should then be confirmed and the status screens updated.

Once saved, this data will be accessible by the EPA and the collection contractor.

The contractor will perform detailed weighing and online reporting for each material type from their processing facility. This data will be available to the site manager within a fortnight.

When other materials are dispatched (via other contractors) such as motor oil and lead acid batteries, the total weight, volume or number must be recorded.



6. Establishing and operating mobile services for household problem wastes



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Establishing and operating mobile services for household problem wastes

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6.1 Introduction

The CRC program was designed to become a network of facilities across NSW where householders could take their problem wastes to be safely stored temporarily before collection and recycling or disposal. However, the program also provided interested organisations with the opportunity to propose innovative solutions for the collection and disposal of problem waste. An innovative solution proposed by a number of organisations has been a mobile service.

Several variations of mobile services been proposed (see Figure 6.1 diagram).

- Model 1: The CRC operator collects waste from householders directly. A vehicle or moveable unit (such as a truck or trailer equipped to transport household problem waste) travels to a house where the wastes are accepted from the householder, packed into the vehicle or unit, and then transported to the next house where further problem wastes are collected. The vehicle then travels to a storage facility (usually a standard Community Recycling Centre) where the problem wastes are unloaded from the vehicle and stored until they are collected by the EPA's collection contractor.
- 2. Model 2: The vehicle travels to a location where it remains for a period of time, and is visited by householders. The vehicle may then move to another location where it again remains for a period of time and is visited by householders. After this cycle is repeated any number of times, the vehicle then travels to a storage facility where the problem wastes are unloaded from and stored until they are collected by the EPA's collection contractor.
- **3. Model 3:** Householders bring small quantities of problem wastes to one or more small drop-off points or 'satellites'. The CRC operator then packs the problem waste into a vehicle or moveable unit and transports it to a storage facility where the waste is unloaded and stored until it is collected by the EPA's collection contractor.
- 4. Model 4: The CRC operator goes to a location and collects 'orphan waste' waste that has been left unattended somewhere within the CRC operator's area of operations. The orphan waste is brought back either to a satellite or a storage facility.

Activities that may be involved in providing mobile CRC services include:

- 1. acceptance of problem waste from householders
- 2. packing and storage of problem waste into a suitable transport vehicle
- 3. transport of problem waste to another location
- 4. intermediate or overnight parking of the transport vehicle
- 5. unloading of problem waste materials from transport vehicle into a storage facility
- 6. consolidation into storage receptacles suitable for collection by the collection contractor
- 7. storage of materials in a facility while they are awaiting collection
- 8. collection of materials by the EPA's collection contractor.



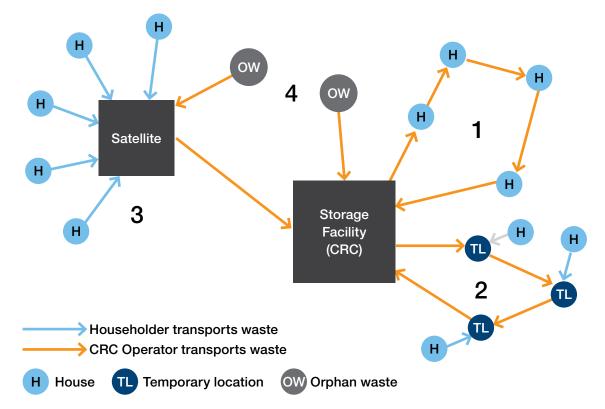


Figure 6.1 – Different models of mobile CRC services

These activities should be carefully considered to ensure the appropriate design, construction and operation of mobile CRC services. The mobile service and any associated storage facility should protect health of staff and members of the public, and minimise the impact on the environment.

This part of the Handbook outlines important considerations and minimum requirements for providing mobile CRC services. A key feature of providing mobile CRC services is the need to safely transport problem wastes that are dangerous goods, in compliance with legislation, and in accordance with waste tracking requirements.

Sections 6.2 – 6.4 provide guidance on the additional hazards and risks that must be considered in the transport of problem wastes by the CRC Operator, and the appropriate controls and legislative requirements that are generally applicable to these activities. **Sections 6.5** and **6.6** provide specific guidance on establishing and operating mobile CRC services, including the appropriate controls and minimum requirements that should be implemented when providing mobile CRC services as part of the EPA's CRC program.





6.2 Risk management approach

A risk management approach is important in effectively providing mobile CRC services. Organisations considering providing mobile CRC services must prepare an initial functional description of how the service(s) will operate, and then undertake a risk assessment to identify the most appropriate controls to incorporate into its design and operation.

It is recommended that this part of the Handbook be read fully prior to undertaking the risk assessment as it first outlines the legislative requirements applicable to the transport of problem wastes, and then provides specific guidance on the minimum requirements for mobile CRC services. This information will inform and assist in undertaking the risk assessment.

The Worksheet provided as **Appendix 2.1** of this Handbook should be used to complete this risk assessment. An example of a completed risk assessment for a mobile CRC service is provided as **Appendix 6.1**.



6.3 Compliance with dangerous goods transport legislation

In NSW the transport of dangerous goods must comply with the *Dangerous Goods* (*Road and Rail Transport*) *Act 2008* and the *Dangerous Goods* (*Road and Rail Transport*) *Regulation 2014*. The Regulation extensively references the Australian Dangerous Goods Code (ADG Code), which classifies the substances that are dangerous goods.

In general, a vehicle transporting problem wastes will carry the following substances that are dangerous goods:

- Gas cylinders (Class 2.1 flammable gas)
- Fire extinguishers (Class 2.2 compressed gas)
- Lead acid batteries (Class 8 corrosive substance)
- Smoke detectors (Class 9 miscellaneous dangerous goods)
- Solvent (oil) based paint (Class 3 flammable liquid)
- Other by-catch materials as determined by the CRC operator.

Operators of mobile CRC services must therefore comply with the requirements of the Act and Regulation. The NSW EPA regulates the on-road transport of dangerous goods and provides an outline of the requirements at **www.epa.nsw.gov.au/dangerousgoods**. A summary of the requirements relevant to mobile CRC services is provided here.

The Act, Regulation and the ADG Code specify the controls that must be implemented to manage the risks associated with the transport of dangerous goods. Different levels of controls apply to different types of loads, depending on the size of the receptacles (containers in which the dangerous goods are packed) and the total quantity of goods transported. **Table 6.1** outlines the three types of loads defined by the legislation, and the controls applicable to each.



6.3.1 Placard load

A placard load is any load containing an aggregate quantity of dangerous goods of 1,000kg or L or more, or individual receptacles greater than 500L capacity or with a net mass greater than 500kg. Where individual receptacles up to 500L capacity or net mass less than 500kg are transported, a placard load is also any of the following:

- Any quantity of Class 6.2 infectious substances Category A
- 10kg or more of Class 6.2 infectious substances Category B
- 250L or kg or more where there is any Division 2.1 flammable gases (not including aerosols) or 2.3 – toxic gases, or any Packing Group I substance.

The legislation requires CRC operators to implement the controls listed in **Table 6.1** that are relevant to the specific design of their mobile CRC service. Many vehicles providing mobile CRC services will be designed to carry more than 250kg or L of gas cylinders, or 1,000kg or L or more of other dangerous goods, in receptacles less than 500L capacity or net mass 500kg. In this case the controls listed in **Table 6.1** for Transport Type 2 would be implemented. However, the CRC program requires CRC operators to implement more stringent controls. Details of what is required are outlined in **Section 6.5** Establishing a mobile CRC service.

Type of Transport	Controls
1. Less than placard load	Transport documents
 Placard load (where receptacles have up to 500L capacity or net mass up to 500kg) 	Placards (Class Labels) Transport documents Emergency information Emergency information holder Double-sided reflectors 30B Fire extinguisher Driver protective equipment Materials stowed correctly Segregation
3. Placard load (where receptacles have greater than 500L capacity or net mass greater than 500kg)	Placards (EIPs and Class Label) Transport documents Emergency information Emergency information holder Double-sided reflectors Additional fire extinguishers Driver protective equipment Materials stowed correctly Segregation Vehicle and driver to be licensed

Table 6.1: Controls applicable to various types of Dangerous Goods loads



6.3.2 Transport documents

Transport documents listing the type and quantity of dangerous goods are required at all times that these goods are transported. The transport document must include the following information in legible English:

- 1. Consignor's name and telephone number
- 2. A description of the dangerous goods including:
 - United Nations number (UN number)
 - the proper shipping name, or the name that appears on the packaging or receptacle
 - the dangerous goods Class or Division
 - the subsidiary risk (if applicable)
 - the packing group (if applicable)
 - a description of each receptacle, e.g. 'drum' or 'intermediate bulk container' (IBC).
- 3. The number of packages or receptacles of each type
- 4. The 'aggregate quantity' of the goods. This is the total quantity in litres and/or kilograms of each separate type of dangerous good being transported. At all times the aggregate quantities shown must reflect the actual quantities currently on the vehicle. It must be updated as dangerous goods are loaded and unloaded from the vehicle.

The driver of the mobile CRC vehicle must ensure their transport documents are carried in the vehicle's cabin, and make them available to any authorised person and emergency services if requested. If the vehicle is transporting a placard load, transport documents must be carried in the emergency information holder.

A template for a transport document suitable for a mobile CRC vehicle is provided as **Appendix 6.2**.

6.3.3 Placards

Information on placarding requirements is provided in **Section 5.3** of the ADG Code. A mobile CRC vehicle carrying a placard load must be placarded with a Mixed Class Placard as more than one Class or Division will be carried in the load. Placards must be: displayed in a substantially vertical plane and securely fixed to the vehicle; or stencilled onto or printed on to it; or placed securely in a frame that is securely fixed to the mobile CRC vehicle. The placard must be durable and weather resistant, have letters and numerals that are legible, and must not be obscured. The part of the mobile CRC vehicle immediately behind the placard must be of a contrasting colour to the colour of the placard unless the border of the placard is of a contrasting colour and design.

Any placard must be capable of being removed. It is an offence to display a placard if there are no dangerous goods in the load.

As a minimum, placards must be installed on the front and rear of the vehicle.



In the case of a trailer the whole unit becomes a combination vehicle. If the whole combination is carrying a placard load, a dangerous goods placard should be placed at the front and at the rear. If any part of the combination vehicle contains more than a placard load on its own, then it requires additional placards on each side. Again a mixed class placard will be required as more than one Class or Division will be carried in the load. For more details on placard requirements, including the particular locations they must be displayed for other combinations, refer to **Section 5.3.6** of the ADG Code.



6.3.4 Emergency information

Emergency information addresses substance hazards, first aid procedures and the protective equipment to use. It explains how to deal with any emergency involving dangerous goods, such as a leak, spill, vehicle rollover or fire. The following are acceptable types of emergency information:

- the Standards Australia HB76 Dangerous Goods Initial Emergency Response Guide (recommended)
- an individual Standards Australia emergency procedure guide (EPG) plus the emergency guide for vehicle fire
- an emergency procedure guide plus a vehicle fire guide that are both substantially the same as the Standards Australia guides
- any other emergency procedure guide plus a vehicle fire guide, which have both been approved by the EPA before the mobile CRC service becomes operational.

A safety data sheet (SDS) is not the same as emergency information and is not acceptable.

Where an operator of a mobile CRC service prepares their own emergency procedure guide, it should be prepared using specialist advice such as from an appropriately qualified and experienced Dangerous Goods Consultant.

In the case of a placard load, emergency information must be carried in an emergency information holder. If less than a placard load is being transported and an emergency information holder is not fitted, emergency information must be in a prominent position in the cabin if it is a vehicle, or if it is a trailer, at the front of the trailer.



6.3.5 Emergency information holder

An emergency information holder must be fitted to a vehicle transporting a placard load of dangerous goods. The holder must be:

- of a size and shape suitable for carrying emergency information and transport documentation
- marked with the words 'emergency procedure guides' or 'emergency information' in red letters at least 10mm high on a white background
- securely placed on a road vehicle in one of these locations:
 - on the inside of a door of the cabin
 - immediately adjacent to a door of the cabin
 - if either of the above is not possible, in a visible and accessible position in the cabin (provided the position of the holder is identified on a notice affixed to the inside of the driver's door).

6.3.6 Safety equipment

The following safety equipment must be carried on a vehicle transporting a placard load of dangerous goods:

- three double-sided reflector signals that comply with AS 3790 and are clean and in good condition
- one 30B dry powder fire extinguisher located in or directly behind the cabin near the driver's door, or at the front of any trailer
- personal protective and safety equipment including thermal insulated gloves, chemical resistant gloves and chemical resistant boots.

Each fire extinguisher must be mounted securely in a quick-release bracket. In cases of combination vehicles, a fire extinguisher must be provided for every separate trailer transporting a placard load. Refer to AS 2444-2001 Portable fire extinguishers and fire blankets – Selection and location for more guidance on the selection and location of fire extinguishers.

Safety equipment requirements depend on the type of dangerous goods being transported. **Table 6.2** (an excerpt from **Table 12.2** in the ADG Code) shows the safety equipment required for transporting each class or division of dangerous goods in a mobile CRC vehicle.



Table 6.2: Personal Protective Equipment required for mobile CRCs

Minimum equipment required		Class of Dangerous Goods (refer to Section 6.3 for material types relevant to classes)						
	2.1	2.2	3	6.1	8	9		
Respiratory protection equipment for escape purposes	No	No	No	[a]	[a]	No		
Face hugging goggles with increased facial seal or full face shield as appropriate	Yes	Yes	No	Yes	Yes	No		
Eye wash kit at least 250ml capacity, filled and ready for use	No	No	Yes	Yes	Yes	Yes		
Chemical resistant gloves or gauntlets	No	No	Yes	Yes	Yes	Yes		
Thermal insulated gloves or gauntlets	Yes	Yes	No	No	No	No		
Chemical resistant suit or coveralls	No	No	No	Yes	Yes	No		
Chemical resistant boots	No	No	No	Yes	Yes	No		
Any electric torch	No	Yes	No	Yes	Yes	Yes		
Electric torch complying with AS/NZS 60079.11 or other recognised Code	Yes	No	Yes	No	No	No		

[a] The minimum requirement is air supplied short term breathing apparatus suitable for escape purposes, except when, even in an emergency, the dangerous goods will not give rise to harmful vapours, gases or dust. Note that where a driver attends to the loading or transfer of goods, self contained breathing apparatus with a duration of greater than 15 minutes may be required by other (e.g. health and safety) legislation.



Minimum requirements for safety equipment are outlined in **Section 6.5.3** Important design elements of a mobile CRC vehicle.

6.3.7 Stowing materials correctly

The mobile CRC vehicle must be strong enough to withstand the rigours of transport. Packages must be stowed and restrained within the vehicle or trailer as outlined in the National Transport Commission's Load Restraint Guide. This includes any intermediate containers into which the materials are loaded. The design and operation of the mobile CRC service must ensure that materials are stowed correctly, and that manual handling by operators is kept to a minimum. Further guidance on the important design elements of a mobile CRC vehicle is provided in **Section 6.5.3**.





Before loading, the interior and exterior of the mobile CRC vehicle must be inspected to ensure there is no damage that could affect its integrity or that of the packages to be loaded in it. Specific loading instructions such as orientation arrows, 'not to be double stacked' 'keep dry' or temperature control requirements must be met. Liquid dangerous goods must be loaded below dry dangerous goods whenever possible. Packaging fitted with a vented closure must be stowed and restrained with the closure at the top.

If the dangerous goods are of a kind that may lead to the formation of flammable, toxic or other harmful atmospheres, they must be stowed so that no harmful atmosphere will accumulate in the vehicle cabin if there is a leak.

Packages that appear to be leaking or damaged, potentially allowing the contents to escape, must be placed in an appropriate container together with appropriate absorbent material, before they are loaded into the mobile CRC vehicle. The container used must be approved for dangerous goods transport, such as the HAZMAT containers used by Fire and Rescue NSW, or pails, drums or kegs that have been approved and provided by the EPA's collection contractor.

For a vehicle that has open or non-rigid sides:

- materials must be stowed and restrained within rigid sides or gates
- no package containing dangerous goods may protrude above the sides or gates by more than 30 per cent of the height of the article or package, and
- no package may protrude horizontally beyond the sides or gates.

A curtain-sided container or vehicle is not regarded as a closed unit and must be fitted with gates. The requirement for rigid sides or gates does not apply to intermediate containers or segregation devices, as long as they are restrained on the vehicle according to the load restraint guide.

6.3.8 Segregation

Segregation rules help minimise the risk of incompatible substances reacting dangerously if they were to come into contact with each other. Such contact might be caused by a leak, spill or vehicle accident. Section 6 of the ADG Code has considerable information covering segregation rules, the types of segregation devices and their design tests, and how to use such devices.

In general, the target materials carried on a mobile CRC vehicle do not need to be segregated. However by-catch materials, if accepted, do need to be segregated. If these materials are to be accepted, specialist advice must be obtained on the appropriate segregation devices to be used and the design of the mobile CRC vehicle.

The mobile CRC vehicle must be designed such that lead acid batteries are not packed immediately adjacent to either motor oil or gas cylinders.



6.3.9 Dangerous goods training and licensing

Mobile CRC vehicles only need to be licensed for dangerous goods transport if they are designed to carry individual receptacles that have a capacity of more than 500L or contain more than 500kg of dangerous goods. Where this is the case, the vehicle must be covered by a dangerous goods vehicle licence and the driver must hold a dangerous goods driver licence.

A licence can be issued for a vehicle that will be loaded with dangerous goods, such as a trailer, rigid vehicle, B-double trailer or a road-train trailer. Prime movers are not able to be licenced. A single licence is issued for each transport organisation and details of each vehicle are included on that licence. The licence is valid for one year and is nationally recognised. Applicants for a vehicle licence must:

- provide information about the vehicle
- advise the class or classes of dangerous goods to be carried
- hold an insurance policy for the vehicle to cover clean-up and emergency services costs incurred in response to, and recovery of, any vehicle(s) and/or goods involved in a dangerous goods incident
- pay the licence application fee (currently \$89)
- provide a rear 3/4 image of the vehicle showing the number plate and vehicle type.

More information on application requirements is available at **www.epa.nsw.gov.au/** dangerousgoods/training.htm.

A current dangerous goods driver licence issued by any state or territory is recognised throughout Australia. Holders of a current interstate dangerous goods driver licence are able to drive a dangerous goods vehicle anywhere in NSW.

Dangerous goods driver training

Before applying for a dangerous goods driver licence, the driver must complete a certified training course in the transport of dangerous goods by road (reference number TLILOC3013A). Information on providers of this training can be found at **www.training.gov.au**. Applicants for a dangerous goods driver licence must:

- complete the required training provided by an appropriate Registered Training Organisation (RTO)
- · be certified as medically fit by a general practitioner
- have a satisfactory driving history
- provide identification (passport-sized photographs and a copy of your vehicle driver licence)
- obtain the RTO's certification on the application form
- submit an application within 6 months of undertaking the training or the medical assessment.

More information on application requirements is available at **www.epa.nsw.gov.au/ dangerousgoods/training.htm**. The requirements for driving history and medical fitness are given in the licence application form.





6.4 Compliance with legislation regarding transport of wastes

The operation of a mobile CRC service involves the transport of waste and is subject to the requirements of the *Protection of the Environment Operations Act 1997* (the Act), and the *Protection of the Environment Operations (Waste) Regulation 2014* (the Regulation). These requirements are outlined below.

6.4.1 Environment protection licence

An environmental protection licence is required to undertake certain activities (scheduled activities) that are not premises-based (Clause 49 of the Act). The transport of more than 200kg of category 1 trackable waste is a scheduled activity (Clause 48 of Schedule 1 of the Act).

Category 1 trackable waste means waste transported within NSW of a type described in Part 1 of Schedule 1 of the Regulation that exhibits any of the characteristics specified in Part 3 of that Schedule. Not all CRC target materials are specifically listed as Category 1 trackable wastes. Only waste paint, waste oil (waste mineral oil, water/oil mixtures), and lead acid batteries (as these contain acid) are listed. Smoke detectors, gas cylinders, fluorescent tubes and globes, and household batteries are not listed as Category 1 trackable waste. **Table 6.1** below shows which household problem wastes are trackable.

Under Part 9 of the Regulation, waste oil and lead acid batteries are exempt from the tracking requirements outlined in Part 4 of the Regulation (notices 2006-E-4 and 2009-E-1, respectively). However, these exemptions only modify the record keeping requirements, they do not remove them.

An environment protection licence is therefore required where a mobile CRC service will transport more than 200kg of paint, oil, or lead acid batteries at a time.

Household Problem Waste	Trackable Waste?
Targeted	
Paint (water based, oil -based, and other paint types)	YES
Used oil (non-hazardous waste hydrocarbon oil)	EXEMPTED BY 2006-E-4
Batteries – lead acid batteries	EXEMPTED BY 2009-E-1
Batteries – other household types	NO
Domestic gas cylinders (typically LPG, but also other types)	NO
Conventional tube type and compact fluorescent lamps, and other types	NO
Smoke detectors	NO
Not targeted but accepted	
By catch (Toxic, Flammable Liquid, Oxidiser, Acid, Alkali)	YES

Table 6.1: Status of household problem wastes as Category 1 trackable wastes



Waste transporter licence application

Applications for this licence must be made using the application form that is available at:

www.epa.nsw.gov.au/resources/licensing/140543-licence-application-waste-transport.doc.

6.4.2 Waste tracking

Part 4 of the POEO (Waste) Regulation 2014 (the Regulation) places certain obligations on consigners, transporters, and receivers of waste to track and record the movement of waste.

The EPA approved an exemption under Part 9 of the Regulation on 12 August 2016, modifying these obligations and simplifying the requirements for operators of CRCs, in particular operators of mobile CRC services.

Where the waste tracking exemption applies

The exemption applies to household problem waste that is trackable waste and that is being transported to a CRC that has been approved and established under the NSW Government's Waste Less, Recycle More Initiative.

The exemption applies to:

- waste delivered by a householder to a CRC; or
- waste collected from a householder, or a temporary location, or a satellite CRC; or
- orphan household waste collected by a mobile, satellite or central storage facility (CRC) operator.

It exempts a consignor, a transporter, and a receiver of waste to which the exemption applies from Part 4 of the Regulation.

Conditions relating to the exemption of transporters

A transporter is exempt only if the transporter complies with these conditions.

For each load of waste transported, the transporter must make a record of the following:

- the name and address of the transporter
- the transporter's environment protection licence number (if the transporter is required to be licensed under the Act)
- the registration number of the vehicle used to transport the waste
- the type and quantity of the waste transported
- · the date on which the waste is delivered to the receiver
- the name and address of the receiver
- the date on which the record was made.

The transporter must:

- retain the record for a period of not less than four years after the date on which the record was made;
- make the record available for inspection by an authorised officer on request; and
- give a copy of the record to the receiver.



Conditions relating to the exemption of receivers

A receiver is exempt only if the receiver complies with the following conditions. The receiver must:

- retain the copy of the record made by the transporter (see above) for a period of not less than 4 years after the time the record was made; and
- make a copy of the record available for inspection by an authorised officer on request.

Dangerous goods requirements

The exemption does not exempt any person or class of person from any requirement under the *Road and Rail Transport (Dangerous Goods) Act 1997* or the Regulations made under that Act.

Definitions

- Householder person who owns, or rents, or lives in a house or tenement, and generates household problem waste.
- Temporary location a location at which a mobile CRC service temporarily collects household problem waste as part of the EPA's Community Recycling Centres Program.
- **Mobile CRC service** a service in which household problem waste is collected from dispersed locations and transported to either a Satellite CRC or a Central CRC.
- Satellite CRC a location at which small quantities (less than minor quantities as defined by AS3833 The Storage and Handling of Mixed Classes of Dangerous Goods) of household problem waste can be deposited and stored temporarily, prior to transport to a Central CRC.
- **Central CRC** a Community Recycling Centre that has been approved and established as such by the EPA.
- Orphan waste household problem waste left abandoned on public land.
- Household problem waste waste generated by householders which CRCs are designed to accept and store including:
 - o paint (water based, oil based and other paint types)
 - o used oil
 - o batteries (including lead acid batteries, and other types of batteries used by households)
 - o domestic gas cylinders (typically LPG, but also other types)
 - o conventional tube type and compact fluorescent lamps, and other types
 - o smoke detectors
 - o other types of hazardous waste originating from household or domestic sources.



Not all household problem waste is trackable waste.



Householders

As a result of the exemption, householders are now exempt from waste tracking requirements where they transport waste to an approved CRC or mobile CRC service.

Operators of a mobile CRC service

Operators of a mobile CRC service transporting household problem waste from a household, a temporary location, a satellite CRC, or collecting orphan waste, are exempted from waste tracking requirements for movements of waste to a central CRC. However, these operators are required to carry a Transport Document listing the waste carried. The required form of Transport Document is provided as **Appendix 6.2**.

Operators of a mobile CRC service must obtain a Waste Transport Licence for movements where applicable (refer to **Section 6.4.1**).

Central CRC operators

Receivers of waste being transported to a central CRC are exempted from waste tracking requirements. However, they are required to keep copies of the transport documents provided to them by transporters delivering waste to the Central CRC for a minimum of four years.

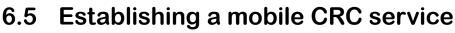
Transport of waste by the collection contractor

The contractor engaged by the EPA to collect waste from CRCs must generate a new transport certificate number (TCN) under a new consignment authorisation (CA) for movements of waste from the central CRC to the collection contractor's receiving facility. The collection contractor generates a CA for the central CRC that is part of a mobile CRC service. The organisation that operates the central CRC (which is a waste facility as defined by the Act) must confirm consignment of the waste by completing the appropriate part of the transport certificate when the waste is collected by the contractor.

When the EPA's contractor collects the target materials (paint, oil, gas bottles, batteries, smoke detectors and fluorescent lights), the CRC operator must lodge this information on the online Drop Off system. The CRC operator must also use this system to capture the transport certificate number, record the number of receptacles collected, confirm that placards were displayed and the load was secured, and enter the total weight collected (if there is a weighbridge on site). This process will ensure the movement of materials from the CRC to the collection contractor's premises is tracked and meets all ADG requirements.

This activity is not exempted. Only transport of household problem waste to a central CRC is exempt.



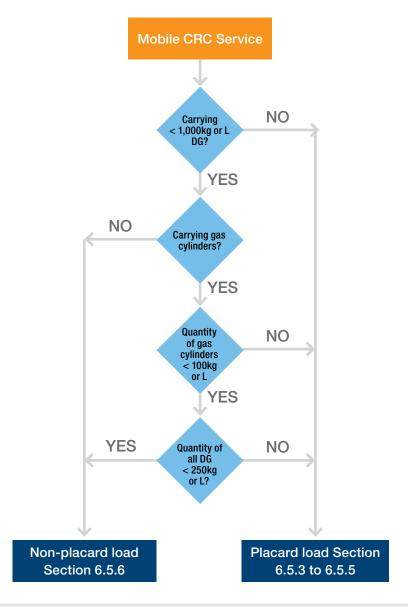


6.5.1 Size and capacity of the mobile CRC service

When considering the establishment of a mobile CRC service, the following factors should to be taken into account.

- The distribution of householders and their willingness and ability to travel to the locations proposed for the service
- The number of locations proposed to be served
- The number of households to be served
- The type and quantity of the different materials that are to be accepted
- The required capacity of the mobile CRC vehicle(s) and storage facility.

The flowchart below provides a simple test to determine whether a mobile CRC must meet the requirements of a placard load under the dangerous goods legislation. It also includes references to relevant sections of the Handbook.





6.5.2 Preparing materials for acceptance

When operating a mobile CRC service, the means for providing clear instruction to householders on what materials are accepted (and what materials are not) and how to present them at the drop-off or pick-up point must be considered. This could include signage on a mobile CRC vehicle at a location visited by householders, or information mailed to householders prior to a pick up from their house. Consideration should also be given to the appropriateness of providing bags for certain types of materials for segregation, and to minimise the manual handling and loss of containment risks.

6.5.3 Important design elements of a mobile CRC vehicle

The design of a mobile CRC vehicle must incorporate the following features.

Sizing

When designing the mobile CRC transport vehicle, ensure that the appropriate weight capacity calculations are undertaken. The material carrying capacity of the vehicle will be net of the weight of all the equipment, shelves, compartments and receptacles to be carried. For example a trailer rated for 3T may only be able to carry 2T of materials once the weight of equipment and compartments is taken into consideration.

Transport receptacles

Materials should be transported in receptacles appropriate to their type. Liquids (e.g. water based and solvent based paint) must be transported in bunded storage receptacles.

Transport receptacles must be fixed or easily secured to prevent movement during transport that could cause damage to the vehicle, receptacle failure, or loss of containment. Transport receptacles and any shelving built into the mobile CRC vehicle to accommodate them must be adequate for the load they will bear. The way in which any shelves are used must minimise overloading.

The transport receptacles must be easily accessible for packing to minimise manual handling difficulty, and prevent operator slips, trips or falls when entering the mobile CRC vehicle that could result in injury or loss of containment.

Transport receptacles should either be able to be unloaded in their entirety by forklift, or be unpacked easily in a way that minimises manual handling difficulty. During packing or unpacking of fixed storage receptacles, the mobile CRC vehicle should allow easy use of intermediate containers such as a box trolley or wheeled receptacle to minimise the risk of loss of containment and impact on public health or environment.

Transport of flammable liquids and gases

Flammable liquids and gases (oil based paint, gas cylinders) must be kept separate from ignition sources (especially lead acid batteries) inside the mobile CRC vehicle. The vehicle must be adequately ventilated to prevent build-up of flammable gases from gas cylinders and flammable liquids, such as solvent based paint. Flammable liquids must be stored in a bunded transport receptacle.



Transport of aerosols

The transport of aerosols, being flammable gases, presents some difficulties and is not recommended. If aerosols are collected and transported as part of a mobile CRC service, the following considerations apply:

- the aerosols must be transported in a cage receptacle that allows adequate ventilation to prevent the build up of dangerous gases and provide protection, should an aerosol can explode.
- The cage receptacle should be transported in a part of the mobile CRC vehicle that is also adequately ventilated and kept separate from ignition sources.

Transport of gas cylinders - flammable and non-flammable

A mobile CRC service should only collect regular household gas cylinders. Other types of gas cylinders such as acetylene, oxygen and medical oxygen, or vehicle LPG tanks require additional controls and add a level of complexity that is outside the scope of the CRC program.

Gas cylinders must not be stacked, but can be placed in a cage with multiple level racks. Gas cylinders must not be stowed near a source of heat. When transporting gas cylinders the main valve must be closed and any regulator removed prior to loading.

When gas cylinders are transported in standard gas industry cylinder pallets (stillages):

- the cylinders must be secured within the frame of the stillage by a lashing system that meets the load restraint guide
- not more than 45 per cent of the height of the cylinders may protrude above the stillage rail
- the stillages must be stowed and restrained according to the load restraint guide.

Where gas cylinders are collected as part of a mobile CRC service, consideration should be given to transporting them separately to all other types of problem wastes collected by the service.

Transport of lead acid batteries

Lead acid batteries are the primary corrosive material accepted by the CRC Program and must not be stacked. They should be able to be secured when packed in an upright position.

Transport of household batteries

Single use household batteries are to be placed in a purpose built collection receptacle supplied by the collection contractor. Household batteries of all types are to be placed in the same container. Special requirements apply to lithium metal and lithium ion batteries.

Lithium ion and lithium metal cells and batteries, and equipment containing such cells and batteries, must be packaged in accordance with instruction P909 of the Australian Dangerous Goods Code (current version is 7.4), when transported for disposal or recycling. Receptacles must be marked 'LITHIUM BATTERIES FOR DISPOSAL' or 'LITHIUM BATTERIES FOR RECYCLING'. The collection contractor will supply labels and receptacles appropriate to this purpose.



In addition, lithium batteries must be packed to prevent short circuits and the dangerous evolution of heat. This could include, but is not limited to:

- individual protection of the battery terminals, or
- inner packaging to prevent contact between cells and batteries, or
- the use of a non-conductive and non-combustible cushioning material to fill empty space between the cells or batteries in the packaging.

Lithium batteries must be secured within the outer packaging to prevent excessive movement during transport (e.g. by using a non-combustible and non-conductive cushioning material or through the use of a tightly closed plastic bag).

Transport of by-catch

If by-catch is accepted, separate transport receptacles that are appropriate segregation devices must be provided for each of the following types of materials: flammable liquids, toxics, oxidisers, acids, and alkalis. Specialist advice on the appropriate type of segregation devices required for each type of material, and their location within the mobile CRC vehicle, must be obtained if it is intended that by-catch be accepted.

Safety and spill response equipment

The following safety equipment must be carried on a mobile CRC vehicle:

- three double-sided reflector signals that comply with AS 3790 and are clean and in good condition
- one 30B dry powder fire extinguisher located in or directly behind the cabin near the driver's door, or at the front of any trailer
- personal protective and safety equipment including thermal insulated gloves, chemical resistant gloves and chemically resistant boots.

Each fire extinguisher must be mounted securely in a quick-release bracket. In cases of combination vehicles, a fire extinguisher must be provided for every separate trailer transporting a placard load. Refer to *AS 2444-2001 Portable fire extinguishers and fire blankets – Selection and location* for more guidance on the selection and location of fire extinguishers.

As a minimum, a mobile. CRC vehicle must have the following personal protective equipment (PPE):

- gas tight goggles or full face shield as appropriate
- eye-wash kit
- chemically resistant gloves or gauntlets
- thermally insulated gloves or gauntlets
- chemically resistant suit or coveralls
- chemically resistant boots
- electric torch complying with AS/NZS 60079.11
- first aid kit

The CRC operator must carry out its own risk assessment and determine any additional safety equipment appropriate to its particular operation. The risk assessment and determination must be recorded and kept for reference.



The mobile CRC vehicle must also carry spill response equipment appropriate to the materials being carried. This includes adequate quantities of absorbent material, a sufficient quantity of resealable waste-recovery containers made of materials compatible with the substances being kept, and marked for emergency use only, and shovels and brooms. Waste recovery containers should be approved for dangerous goods, such as the Hazmat bins used by Fire and Rescue NSW.

Procedures are to be implemented to regularly:

- check and replenish the first aid equipment and supplies
- check and replenish the personal protective equipment (PPE)
- check and replenish the spill response equipment.

PPE should be kept separate from normal clothing, and cleaned and maintained after use in accordance with the manufacturer's instructions and the relevant Australian Standard.

Security

The mobile CRC vehicle must incorporate security features to prevent theft of the vehicle, access to the storage compartment and theft of material.

Signage and labelling

The mobile CRC vehicle must be provided with placards as outlined in Section 6.3.3.

A CRC program branded sign must be installed on the mobile CRC vehicle. Signage acknowledging the NSW EPA and Environmental Trust must also be installed on the vehicle. Please contact the Community Recycling Unit to discuss custom signage. Email **recycling.centres@epa.nsw.gov.au**

Signs with pictorial and text descriptors appropriate to the type of material to be stored must be installed on the receptacles to allow easy sorting and packing by operators. If appropriate, the signage should include how materials are to be packed in the storage receptacles.

The EPA will provide artwork in electronic format to maintain consistent branding across the network and to distinguish CRCs from the Household Chemical CleanOut events. The particular requirements for the mobile CRC service must be discussed with the EPA's Community Recycling Unit, and all artwork for signs must be sent to the Unit for approval prior to purchasing and installing the signs.

6.5.4 Safety and environmental management procedures

Established processes and documented procedures such as Safe Work Method Statements (SWMSs) or Safe Operating Procedures (SOPs) should be in place for both the mobile CRC service and the storage facility to protect the health and safety of customers and staff. These procedures must be based on a risk assessment approach as outlined in **Section 6.2**.

All staff involved in the operation of the mobile CRC service are to be trained in the use of the SWMSs and must sign off as having been trained and agreeing to undertake the relevant tasks safely in accordance with the SWMSs.



6.5.5 Emergency preparedness and response

The equipment and facilities required for emergency situations have already been outlined in previous sections. The mobile CRC vehicle must have reflectors, fire extinguishers, a spill response kit and personal protective equipment on board. The storage facility must have a safety shower and eyewash station, spill response kits, fire extinguishers, personal protective equipment and first aid equipment on site.

An emergency response plan, outlining the initial response in the event of vehicle accident, loss of containment, fire or other incident, must be prepared and carried with the mobile CRC vehicle. Refer to **Section 6.3.4** Emergency Information for details of what is required.

An emergency plan and associated procedures must be prepared for the storage facility, and located near the entrance to the facility. Refer to **Section 1.3.4.2** for more information on preparing the emergency plan and associated procedures. All staff involved in the operation of the mobile CRC service and associated storage facility must be trained to implement the emergency plans and procedures.

The EPA will establish and maintain contracts for the provision of specialist advice and support arrangements in the event of unknown materials being deposited, and other unexpected or emergency situations. The mobile CRC operator is to ensure its operating and emergency procedures appropriately reference this specialist advice.

6.5.6 Specific requirements for transport from a satellite

Whilst the operator of a satellite arrangement will transport dangerous goods and trackable waste from the satellites to the storage facility in a similar way to other models, due to the smaller quantities of materials to be transported, minimum requirements are slightly different.

Dangerous goods quantity limits

If flammable gas cylinders (Class 2.1) are not being transported, loads must be in quantities of less than 1,000kg or L of dangerous goods. If the load contains flammable gas cylinders, then a total quantity of dangerous goods of 250kg or L may be transported, and the quantity of gas cylinders must not exceed 100kg or L. Note that these quantity limits apply to the capacity of the cylinders. No individual transport container must have a capacity of greater than 500kg or L. Note also that water based paint is not a dangerous good and does not need to be included in these quantity limits.

Controls required

Transporting wastes under the dangerous goods quantity limits means that the loads are not placard loads. The only control required by the dangerous goods transport legislation is to carry transport documents. However, operators of a satellite must implement the following controls when transporting any load:

- Carry transport documents showing the quantity of each type of material being transported refer to **Section 6.3.2** for details on the appropriate information to be provided in the documents
- Keep a copy of Standards Australia HB76 Dangerous Goods Initial Emergency Response Guide in the cab of the transport vehicle



- Locate a 30B fire extinguisher at the front of vehicle behind the cab or in an easily accessible position
- Carry a small spill kit appropriate to the quantity of materials being carried, in particular the largest package being carried
- Provide the following protective equipment for the driver: safety glasses, eye-wash kit, chemical resistant gloves, thermal insulated gloves, chemical resistant suit or coveralls, chemical resistant boots, and an electric torch complying with AS/NZS 60079.11 or other recognised Code
- Stow materials safely in accordance with the guidance provided in Sections 6.3.7 and 6.5.2
- If by-catch is transported, provide separate transport receptacles such as pails or boxes that are appropriate segregation devices for each of the following types of materials: flammable liquids, toxics, oxidisers, acids, and alkalis. Specialist advice on the appropriate type of segregation devices required for each type of material, and their location within the transport vehicle must be obtained if it is intended that bycatch be transported.

In addition, packages in which materials have been delivered must be inspected prior to loading to ensure they are in a sound condition and are not leaking. Intermediate containers should be used if necessary. A sufficient supply of appropriate intermediate containers should be kept on the transport vehicle for this purpose.

In order to limit exposure to ignition sources, smoking must not be permitted in and around the satellite, transport vehicle or in the storage facility at any time. Mobile phones should not be used near any material storage areas.

Flammable liquids such as solvent based paint and flammable gas cylinders should be packed separately from lead acid batteries.

Waste tracking

The waste tracking requirements outlined in Section 6.4 must be met.

6.5.7 Specific requirements for the design of satellites

In general satellites will be small sites at which only a small quantity of materials are kept. They should be established and operated as a minor store as outlined in Section 2 of *AS/NZS 3833:2007 The storage and handling of mixed classes of dangerous goods in packages and intermediate bulk containers*. **Table 6.3** outlines the maximum quantities for minor storage.

Where a satellite is operated with quantities greater than those of a minor store, it should meet all the requirements for a regular CRC as outlined in this Handbook.



Table 6.3: Maximum quantities for minor storage

Description	Quantity, kg or L			
Description	Packing Group I	Packing Group II	Packing Group III	
Total quantity of all dangerous goods	25	250	1,000	

Notes:

- 1. It is permissible to store, at the same time and in the same area, the maximum allowance for each of the Packing Groups. For an explanation and examples of Packing Groups, refer to Box 3 in **Section 1.2.6** of this manual.
- 2. Where manufactured product is stored, the quantities of manufactured product may be doubled.
- 3. The maximum quantity of Division 5.2 dangerous goods allowable as minor storage is 10kg or L.
- For the purpose of determining minor storage quantities, Class 2 dangerous goods in retail packages, aerosols, and substances and articles of Class 9 are regarded as Packing Group III.

The following requirements must be implemented for satellites operating as minor stores. Location

- Separated by more than 10m from any other dangerous goods store.
- Not more than one minor store per 500sqm of floor or ground area.

Precautions

- Any materials that are incompatible or might react dangerously, are segregated.
- Storage area shall be away from heating and ignition sources.
- Storage area shall be provided with adequate natural or mechanical ventilation.
- Packages shall be kept closed, and there should be no decanting on site.
- Appropriate spill control measures shall be provided where packages are opened and their contents transferred.
- Any spills or leaks shall be cleaned up immediately and disposed of appropriately. Contaminated, spilled or leaked material shall not be returned to original packaging, except for disposal where it is known that this will not increase the risk.
- The transfer of dangerous goods from the store to transport vehicle shall be carried out in a manner that minimises the possibility of spillage or fire.
- Dangerous goods shall not be stored or handled where they could hinder escape from a building in the event of fire.
- Persons who handle dangerous goods shall be informed and aware of the hazards involved.



- Packages shall be kept in such a manner as to avoid spillage.
- Stores shall be kept clear of combustible matter and refuse.
- Packages shall be kept on surfaces that are resistant to attack by their contents if spilt.
- Appropriate personal protective equipment shall be worn by personnel involved in product transfer or clean-up operations.
- A fire extinguisher of a suitable type shall be installed in each minor store. It shall be located so that it is immediately accessible in an emergency, along an exit route.
- A supply of water shall be available at a nearby location for personal hygiene.

Additional precautions for outdoor minor storage

- The ground around the storage area shall be kept clear of combustible vegetation and refuse by at least 3m.
- Any potential flow of spillage shall be prevented from reaching any protected place, watercourse or boundary by such means as the use of natural ground slope, or the provision of a diversion channel, kerb or bund.
- The store shall be separated from any protected place or property boundary by at least 3m.

Signage

Signage must be provided at the satellite to direct customers where to place their materials safely. CRC program branded signage is required.

6.5.8 Storage facility for a mobile CRC service

Whether or not a storage facility established for a mobile CRC service accepts material directly from customers or not, it must meet all the requirements of a regular CRC as outlined in this Handbook. This includes the design, construction and operation of the facility, emergency preparedness and response, induction and training of all staff involved in the provision of the all parts of the mobile CRC service, and record-keeping and reporting.

6.5.9 Insurance

The operator of a mobile CRC service must maintain adequate property, motor vehicle, comprehensive third party, public liability and workers compensation insurance cover for the mobile CRC vehicle(s), for the various locations of the vehicle whilst it will be accepting materials (if necessary), for satellites if part of the service and for the storage facility.



6.6 Operating a mobile CRC service

A mobile CRC service should be operated to make it easy for householders to manage their own problem waste. A well-managed operation protects the health and safety of customers and staff, protects the environment and the community, and facilitates safe disposal and reuse of problem materials. The following elements must be implemented when operating a mobile CRC service.

6.6.1 Acceptance from householders

Containers must be inspected prior to acceptance to ensure they are in a sound condition and not leaking. Intermediate containers should be used if necessary. A sufficient supply of appropriate intermediate containers should be kept on the mobile CRC for this purpose.

Where applicable, material should be moved from the house to the mobile CRC vehicle in small loads, or in a box trolley to minimise the risk of loss of containment and operator injury from manual handling. Care should be taken not to mix incompatible substances when moving them from the house to the mobile CRC vehicle.

A sign (e.g. A-frame size) should be placed on the footpath when material is being moved from the house to the mobile CRC vehicle to advise members of the public that material is being moved, and to minimise the risk of collision with a pedestrian.

In order to limit exposure to ignition sources, smoking must not be permitted in and around the mobile CRC vehicle at any time, or in the storage facility. Mobile phones and cellular tablet devices should not be used within the storage compartment of the mobile CRC vehicle. Flammable liquids such as oil based paint and flammable gas cylinders should be packed separately from lead acid batteries.

6.6.2 Loading for transport

If materials are packed into transport receptacles, these receptacles must be labelled on the outside and inside to indicate their contents. Operations staff must follow any directions provided in the mobile CRC vehicle indicating how materials should be packed.

In addition, adsorbent material should be added to transport receptacles where they are used to minimise vapour production from flammable liquids, and to minimise the potential for loss of containment and environmental damage.



6.6.3 Transfer to storage facility

In order to minimise the risk of operator injury and loss of containment, it is recommended that materials being unloaded from a mobile CRC vehicle with fixed transport receptacles be moved in an intermediate receptacle on a box (bunded) trolley. Materials should not be carried package by package more than a metre from mobile CRC vehicle to storage facility.

It is recommended that wherever possible, materials of a particular type be moved from the mobile CRC vehicle to the storage facility separately. If the mobile CRC vehicle is designed such that each type of material is transported in a separate moveable transport receptacle, this means only moving receptacles of that type of material at one time. If the mobile CRC vehicle is designed such that materials are packed into fixed receptacles, then only materials of one type should be moved at one time.

6.6.4 Collection of materials from storage facility

The EPA and/or other funding bodies (e.g. product stewardship schemes) will establish and maintain contracts for the collection and disposal (or recycling) of paint, used oil (other than motor oil), gas cylinders, household batteries and fluorescent lights, as well as incidental by-catch. The mobile CRC operator will be responsible for arranging the collection and recycling (not disposal) of lead acid batteries and used motor oil.

The mobile CRC operator must ensure that materials are removed from the storage facility with sufficient frequency to prevent the accumulation beyond the capacity of the facility.

The mobile CRC operator must ensure that materials are loaded and consigned in accordance with basic requirements for the transport of waste and dangerous goods. Refer to the procedure in **Section 3.5.3** of this Handbook for the procedure for loading and consignment of materials from CRCs. Monitoring, record-keeping and reporting of material quantities in the storage facility, and reporting of collections is the same as for a regular CRC as outlined in **Part 5** of this Handbook.

6.6.5 Collecting orphan waste

The collection of orphan waste requires pre-planning and care when undertaking the task. However, operators of mobile CRC services are often the best equipped to do so. The following specific requirements must be met when collecting orphan waste.

Providing appropriate segregation devices

As the type of material is generally not known beforehand, and there could be a number of different types of both target problem wastes and by-catch materials, a quantity of approved segregation devices (e.g. buckets, kegs or drums) should be carried on the mobile CRC vehicle.



Handling unknowns

Containers of unknown materials are not to be opened for the purpose of identification. A photograph of the container should be taken prior to packing. The container should then be placed in a resealable container suitable as a segregation device (e.g. a bucket or drum) appropriate to the material and labelled as unknown (e.g. 'Unknown – to be identified' written on to an adhesive label affixed to the container).

The photograph must then be emailed to the collection contractor with a request for advice as to how the material should be stored. Once a response is received, the identification can be written on the label, and the resealable container can be placed in the appropriate receptacle or Dangerous Goods Safety Cabinet. Where the material cannot be identified through the provision of specialist advice, it should be placed in the Toxic Dangerous Goods Safety Cabinet.

Handling of containers that are leaking or without lids

Similarly, if there are leaking containers or containers without lids, these must be placed in a resealable container appropriate to the material type, suitable as a segregation device, with a suitable amount of adsorbent material. The outer container must then be labelled according to the material type and placed in the appropriate receptacle or Dangerous Goods Safety Cabinet. Appendix 6.1 – Sample mobile CRC risk assessment

Source of risk	Hazards	Risk	Possible Controls
Activities			
Acceptance of problem waste from householder	Manual handling of large containers of problem wastes resulting in operator injury.	3 / 2 Medium	Provide clear instructions to householder prior to acceptance as to how materials should be presented. Use small loads or a box trolley to move the waste. Safe work procedures. Operator training and behaviour.
	Container failure during transfer from house to mobile CRC, resulting in loss of containment and impact on public health or environment.		Use intermediate container such as a bag, bin or box trolley. Take care not to mix incompatible substances.
	Collision with pedestrian at house acceptance point, resulting in operator or pedestrian injury, or loss of containment, and impact on public health or environment.		Set up advisory signs, safe work procedures, and operator awareness.
Packing and storage of	Slips, trips and falls when entering the mobile CRC, resulting in operator injury, or loss of containment.	3 / 2 Medium	Design mobile CRC so that storage receptacles are easily accessible for packing.
problem waste in mobile CRC	Manual handling of containers whilst loading them into storage receptacles, resulting in operator injury.	3 / 2 Medium	Design CRC so that storage receptacles can be packed to minimise manual handling difficulty.
	Mixing of incompatible substances, resulting in reaction causing injury to operator or impact on public health or environment.	2 / 4 Medium	Use approved segregation devices as storage receptacles. Clear signage indicating where materials are to be placed and if appropriate, how they are to be packed. Proper identification of materials, and labelling of storage receptacles. Incident and emergency preparedness, and response procedures.
	Container failure, resulting in loss of containment and impact on public health or environment.	3 / 2 Medium	Inspect container prior to acceptance and use intermediate containers if necessary.
	Shelf or rack failure.	3 / 3 Medium	Design mobile CRC so that shelving and storage receptacles are adequate for the load they will bear, and they will minimise overloading when used. Safe work procedures and operator training to minimise overloading.

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Source of risk	Hazards	Risk	Possible Controls
Transport of problem waste to next location in	Movement of storage receptacles during transport causing damage to vehicle, receptacle failure and loss of containment.	3/3 Medium	Design mobile CRC so that storage receptacles are fixed or can be easily secured.
	Vehicle collision, resulting in loss of containment and impact on public health or environment.	1 / 4 Medium	Driver training and behaviour. Dangerous goods transport licensing. Incident and emergency preparedness, and response procedures.
Intermediate or overnight parking of vehicle	Vehicle is stolen, or storage compartment is accessed and material taken, resulting in loss of containment and impact on public health or environment.	1 / 4 Medium	Ensure mobile CRC can be secured to prevent access to the materials.
Unloading of problem waste materials from	Manual handling when moving containers from mobile CRC to storage area, resulting in operator injury.	3/3 Medium	Design mobile CRC so that storage receptacles can be unloaded in their entirety by forklift, or can be unpacked to minimise manual handling difficulty.
mobile CHC and consolidation into storage receptacles	Container failure, resulting in loss of containment and impact on public health or environment.	3 / 2 Medium	Design mobile CRC so that storage receptacles can be unloaded in their entirety, or use intermediate containers such as a box trolley.
suitable for collection by the collection contractor.	Storage receptacle is dropped during forklift unloading.	3 / 2 Medium	Provide forklift of adequate design and capacity appropriate to storage receptacles being used. Forklift operator trained and licensed.
	Forklift collision with operator or other vehicle on site where storage area is located.	1 / 4 High	Design layout of storage area and truck loading area to (as far as possible) limit intersection of forklift, vehicle and operator movements. Implement procedures to provide an exclusion zone around truck loading area.

Source of risk	Hazards	Risk	Possible Controls
Storage of materials	Storage area is accessed and material taken, resulting in loss of containment and impact on public health or environment.	1 / 4 Medium	Ensure storage area can be secured to prevent access to the materials.
Collection of materials	Vehicle collision, resulting in fire, loss of containment and impact on public health or environment.	1 / 4 Medium	Design storage area so that it is separate from other operations, or implement procedures (such as ceasing other operations during collection), to minimise intersection of vehicles during collection.
Materials			
Compressed gas	Failure of compressed gas cylinder.	3 / 2 Medium	Design mobile CRC so that gas cylinders are not stacked.
- flammable	Gas cylinder is dropped.	3 / 2 Medium	Safe work procedures, operator training and behaviour.
	Ignition of gas.	2/4 High	Design mobile CRC so that it is ventilated to prevent build-up of flammable gases.
Flammable – liquid	Container failure.	3 / 2 Medium	Design mobile CRC so that flammable materials are stored in a receptacle that is bunded and is an appropriate segregation device. Use appropriate PPE when handling materials. Incident and emergency preparedness, and response procedures.
	Ignition of atmosphere.	2 / 4 High	Add adsorbent material to segregation device / storage receptacle to minimise vapour production. Design mobile CRC so that it is ventilated to prevent build-up of flammable gases. Incident and emergency preparedness, and response procedures. Limit exposure to ignition sources: no smoking; separate flammable liquids from lead acid batteries; do not use mobile phone within the storage compartment of the mobile CRC.



Source of risk	Hazards	Risk	Possible Controls
Corrosives	Container failure.	3 / 3 High	Design mobile CRC so that lead acid batteries (primary corrosive material) are not stacked, and can be secured when packed in an upright position. Use appropriate PPE when handling materials. Incident and emergency preparedness, and response procedures.
	Mixing of incompatible substances.	2 / 4 High	Move corrosive materials to mobile CRC separately, or use intermediate container that provides appropriate segregation. Use approved segregation devices as storage receptacles. Proper identification of materials, and labelling of storage receptacles.
Oxidisers	Container failure.	3 / 2 Medium	Do not accept oxidising materials. Design mobile CRC so that oxidisers are not stacked, and can be segregated appropriately. Incident and emergency preparedness, and response procedures.
	Mixing of incompatible substances.	2 / 4 High	Move oxidisers to mobile CRC on their own, or use intermediate container that provides appropriate segregation. Clear signage indicating where materials are to be placed and, if appropriate, how they are to be packed. Proper identification and labelling of materials.
Toxics (fluoro tubes)	Lamp breakage, release of mercury to the atmosphere, operator injury from broken glass.	2 / 2 Low	Move lamps to the mobile CRC in an separate intermediate container. Consider supply of suitable container or bag to householder prior to collection. Pack lamps in an appropriate storage receptacle that minimises lamp breakage during transport.



Appendix 6.2 – Sample transport document

Transporter:	Receiver:
Mobile CRC Operator	Central CRC name
Street Address	Street Address
Suburb State Postcode	Suburb NSW Postcode
Contact Number (02) xxxx xxxx	Contact Number (02) xxxx xxxx
Vehicle Registration:	Date waste delivered:
Waste Transport Licence Number:	Date this record was made:

UN Number	Proper Shipping Name	Class / Division	Packing Group	Container Type	Number of Containers	Aggregate Quantity
1263	Paint-related material (solvent based paint)	3	III			
1263	Paint-related material (solvent based paint)	3	Π			
2794	Batteries, wet filled with acid (lead acid batteries)	8	-	Battery		
1075	Petroleum gas, liquefied (gas cylinders)	2.1	-	Bottle (9kg) Bottle (3kg)		
1044	Fire extinguishers	2.2	-	Extinguisher (4 kg)		
	Fluorescent tubes and lamps	Non DG		Tube Lamp box		
	Water-based paint	Non DG				
	Other materials					
					TOTAL	





Appendix 6.3 – Checklist for mobile CRC vehicles

This checklist is to be used for vehicles involved in providing a mobile CRC service that are designed to carry placard loads with individual receptacles with a capacity of less than 500kg or L.

Asp	ect	Element
1	Design of the service	
1.1	Type of mobile service	 What type of mobile CRC service is being provided? What type of vehicle is being used to transport problem wastes? What type of materials is the service designed to collect? Has a risk assessment of the mobile CRC service been undertaken and documented?
1.2	Preparing materials for acceptance	 What information are householders given about what materials are accepted and how they are to be presented? What supplies, if any (e.g. bags), are householders provided with prior to collection?
2	Dangerous goods transpo	ort requirements
2.1	Transport documents	 Are procedures in place to ensure transport documents, as required for the transport of dangerous goods, are carried on the vehicle? Are the transport documents carried in the vehicle's cabin in an emergency information holder?
2.2	Emergency information	 Has emergency information required for the transport of dangerous goods been prepared and is this information carried appropriately on the vehicle? Is the emergency information carried in an appropriately marked and located emergency information holder?
2.3	Placards and signage	 Does the vehicle have the appropriate placards? Does the vehicle have CRC program branded signage? Are signs with pictorial and text descriptors provided on the mobile CRC and on receptacles to allow easy sorting and packing? Do signs include how materials are to be packed in receptacles?
2.4	Safety and spill response equipment	 Does the vehicle have the following safety equipment: three double-sided reflector signals that comply with AS 3790 that are clean and in good condition one 30B dry powder fire extinguisher located in or directly behind the cabin, near the driver's door, or at the front of any trailer first aid kit spill response kit appropriate to the materials being carried





Aspe	ect	Element
2.5	Personal protective equipment (PPE)	 Does the vehicle carry the following PPE: gas tight goggles or full face shield eye-wash kit chemical resistant gloves or gauntlets thermal insulated gloves or gauntlets chemical resistant suit or coveralls chemical resistant boots electric torch complying with AS/NZS 60079.11 or other recognised code.
2.6	Other safety equipment	• What other safety equipment is carried on the vehicle, and has this been informed by a documented risk assessment?
2.7	Maintenance of safety equipment	• Are procedures in place to check and replenish the first aid kit, PPE and spill response equipment?
3	Transport receptacles and	I material stowage
3.1	General	 Are materials transported in receptacles appropriate to their type (e.g. bunded receptacles for liquids, cages for gases)? Is the capacity of individual receptacles less than 500kg or L? Are receptacles fixed or easily secured to prevent movement during transport? Are receptacles and shelving in the vehicle adequate for the load? Are shelves used in a way that minimises over-loading? Are receptacles easily accessible for packing to minimise manual handling difficulty? Does the access to the vehicle and the arrangement of receptacles minimise manual handling difficulty, and the potential for slips trips and falls? Can receptacles be removed in their entirety or be unpacked without manual handling difficulty? Are intermediate storage containers used when packing and unpacking the receptacles in the vehicle? What type?
3.2	Flammable liquids	Are flammable liquids kept separate from ignition sources?Is the material storage area of the vehicle adequately ventilated?Are flammable liquids stored in a bunded receptacle?
3.3	Gas cylinders	 Are gas cylinders stored in a ventilated area, not stacked, away from sources of heat and other ignition sources? Are procedures in place to ensure the main valve is closed and any regulator is removed prior to loading a gas cylinder? Has due consideration been given to transporting gas cylinders separately?



Asp	ect	Element	
3.4	Aerosols	 Where aerosols are carried, are they transported in a cage receptacle that is adequately ventilated and is able to contain exploding cans? Where aerosols are carried, is the receptacle transported in a part of the vehicle that is adequately ventilated and separated from ignition sources? 	
3.5	Lead acid batteries	• Are lead acid batteries packed in an upright position in a bunded area of the vehicle, secured and not stacked?	
3.6	Household batteries	 Are arrangements in place to ensure lithium batteries are packed to prevent short circuits and the dangerous evolution of heat? Are lithium batteries packed with other household battery types? Are household battery receptacles containing lithium batteries labelled appropriately? 	
3.7	By-catch	 Are appropriate receptacles, that are approved segregation devices, available for the transport of by-catch materials? Are there separate receptacles for flammable liquids, toxics, oxidising agents, acids and alkalis? Are these receptacles secured appropriately for transport? Are these receptacles appropriately labelled? 	
4	Procedures and training		
4.1	Operating procedures	• Are safe operating procedures, based on the risk assessment, in place for the mobile CRC service?	
4.1 4.2	Operating procedures Training		
		in place for the mobile CRC service?Have all staff involved in the operation of the mobile CRC service	
4.2	Training	in place for the mobile CRC service?Have all staff involved in the operation of the mobile CRC service	
4.2 5	Training Waste tracking Waste transporter	in place for the mobile CRC service?Have all staff involved in the operation of the mobile CRC service been trained in the use of the safe operating procedures?	
4.2 5 5.1	Training Waste tracking Waste transporter licence	 in place for the mobile CRC service? Have all staff involved in the operation of the mobile CRC service been trained in the use of the safe operating procedures? Has a waste transporter licence been obtained? Are arrangements in place to record the locations from which the waste was collected, the waste type and quantity, and date and 	
4.2 5 5.1 5.2	Training Waste tracking Waste transporter licence Record keeping	 in place for the mobile CRC service? Have all staff involved in the operation of the mobile CRC service been trained in the use of the safe operating procedures? Has a waste transporter licence been obtained? Are arrangements in place to record the locations from which the waste was collected, the waste type and quantity, and date and 	





Appendix 6.4 – Checklist for vehicles transporting from a satellite

This checklist is to be used for vehicles involved in transporting small quantities of problem wastes from satellites to a central storage facility, where these vehicles are designed to carry less than placard loads.

Aspect		Element	
1	Design of the service		
1.1	Type of mobile service	 What type of vehicle is being used to transport problem wastes? What type of materials is the service designed to collect? Has a risk assessment of the mobile CRC service been undertaken and documented? 	
1.2	Preparing materials for acceptance	 Are procedures in place to only transport less than 1,000kg or L of dangerous goods, where no flammable gases are transported? Are procedures in place to ensure that where flammable gases (e.g. gas cylinders or aerosols) are transported, the total quantity of dangerous goods is limited to 250kg or L, and the quantity of flammable gases (gas cylinders plus aerosols, measured by capacity rather than contents) does not exceed 100kg or L? Do all individual transport containers have a capacity of less than 500kg or L? 	
2	Dangerous goods transport requirements		
2.1	Transport documents	 Are procedures in place to ensure transport documents, as required for the transport of dangerous goods, are carried on the vehicle? Are the transport documents carried in the vehicle's cabin? 	
2.2	Emergency information	• Has emergency information required for the transport of dangerous goods been prepared and is this information carried appropriately on the vehicle?	
2.3	Placards and signage	 Does the vehicle have CRC program branded signage? Are signs with pictorial and text descriptors provided in the mobile CRC and on receptacles to allow easy sorting and packing? Do signs include how materials are to be packed in receptacles? 	
2.4	Safety and spill response equipment	 Does the vehicle have the following safety equipment: one 30B dry powder fire extinguisher located in or directly behind the cabin near the driver's door, or at the front of any trailer first aid kit spill response kit appropriate to the materials being carried 	



Aspect	Element		
2.5 Personal protective equipment (PPE)	 Does the vehicle carry the following PPE: safety glasses eye-wash kit chemical resistant gloves or gauntlets thermal insulated gloves or gauntlets chemical resistant suit or coveralls chemical resistant boots electric torch complying with AS/NZS 60079.11 or other recognised code. 		
2.6 Other safety equipment	• What other safety equipment is carried on the vehicle, and has this been informed by a documented risk assessment?		
2.7 Maintenance of safety equipment	• Are procedures in place to check and replenish the first aid kit, PPE and spill response equipment?		
3 Transport receptacles an	Transport receptacles and material stowage		
3.1 General	 Are materials transported in receptacles appropriate to their type (e.g. bunded receptacles for liquids, cages for gases)? Are receptacles fixed or easily secured to prevent movement during transport? Are receptacles adequate for the load? Are receptacles easily accessible for packing to minimise manual handling difficulty? Does the access to the vehicle and the arrangement of receptacles minimise manual handling difficulty and the potential for slips, trips and falls? Can receptacles be removed in their entirety or be unpacked without manual handling difficulty? Are intermediate storage containers used when packing and unpacking the receptacles in the vehicle? What type? 		
3.2 Flammable liquids	 Are flammable liquids kept separate from ignition sources? Is the material storage area of the vehicle adequately ventilated? Are flammable liquids stored in a bunded receptacle? 		
3.3 Gas cylinders	 Are gas cylinders stored in a ventilated area, not stacked, away from sources of heat and other ignition sources? Are procedures in place to ensure the main valve is closed and any regulator is removed prior to loading a gas cylinder? Has due consideration been given to transporting gas cylinders separately? 		
3.4 Aerosols	 Where aerosols are carried, are they transported in a cage receptacle that is adequately ventilated and is able to contain exploding cans? Where aerosols are carried, is the receptacle transported in a part of the vehicle that is adequately ventilated and separated from ignition sources? 		





Aspe	ct	Element	
3.5	Lead acid batteries	• Are lead acid batteries packed in an upright position in a bunded area of the vehicle, secured, and not stacked?	
3.6	Household batteries	 Are arrangements in place to ensure lithium batteries are packed to prevent short circuits and the dangerous evolution of heat? Are lithium batteries packed with other household battery types? Are household battery receptacles containing lithium batteries labelled appropriately? 	
3.7	By-catch	 Are appropriate receptacles, that are approved segregation devices, available for the transport of by-catch materials? Are there separate receptacles for flammable liquids, toxics, oxidising agents, acids and alkalis? Are these receptacles secured appropriately for transport? Are these receptacles appropriately labelled? 	
4	Procedures and training		
4.1	Operating procedures	• Are safe operating procedures, based on the risk assessment, in place for the transport of problem wastes using the vehicle?	
4.2	Training	• Have all staff involved in using the vehicle to transport problem wastes been trained in the use of the safe operating procedures?	
5	Waste tracking		
	Waste transporter licence	Has a waste transporter licence been obtained?	
5.2	Record keeping	• Are arrangements in place to record the locations from which the waste was collected, the waste type and and quantity, and date and time of collection?	
6	Security and insurance		
6.1	Security	• Does the vehicle incorporate security features to prevent theft of the vehicle, access to the storage compartment and theft of material?	
6.2	Insurance	Has appropriate insurance cover been obtained for the mobile CRC service?	





Appendix 6.5 – Checklist for satellites

This checklist is to be used for satellite drop-off points that are operated as a minor store. Refer to **Section 6.5.7** for the definition of a minor store.

Aspect	Element
Location	 Is the storage area separated by more than 10 metres from any other dangerous goods store? Is there not more than one minor store per 500 square metres of floor or ground area?
Precautions	 Are materials that are are incompatible, or that might react dangerously, segregated? Is the storage area located away from heating and ignition sources? Is the storage area provided with adequate natural or mechanical ventilation? Are all packages kept closed and there is no decanting on site? Are appropriate spill control measures in place where packages are opened and their contents transferred? Are procedures in place to ensure spills or leaks shall be cleaned up immediately and disposed of appropriately? Contaminated, spilled or leaked material shall not be returned to original packaging, except for disposal where it is known that this will not increase the risk. Are procedures in place to ensure that the transfer of dangerous goods from the store to the transport vehicle are carried out in a manner that minimises the possibility of spillage or fire? Are packages stored in a way that avoids spillage? Is the store kept clear of combustible matter and refuse? Are packages kept on surfaces that are resistant to attack by their contents if spilt? Is a propriate PPE provided and worn by personnel involved in movement or clean-up of materials? Is a fire extinguisher of a suitable type installed in the store, located so that it is immediately accessible in an emergency, along an exit route?
Additional precautions for outdoor minor storage	 Is the ground around the storage area clear of combustible vegetation and refuse by at least 3m? Is any potential flow of spillage prevented from reaching any protected place, watercourse or boundary by such means as the use of natural ground slope, or the provision of a diversion channel, kerb or bund? Is the store separated from any protected place or property boundary by at least 3m?



7. Important references



NSW Government agencies and legislation



Standards

EPA2016/0557 ISBN 978-1-76039-493-6

Important references

7.1	NSW Government agencies and legislation	2
	7.1.1 NSW EPA	2
	7.1.2 SafeWork NSW	
7.2	2 Australian standards	3
	7.2.1 Guide to standards – Dangerous goods	3
	7.2.2 Relevant standards	4





7.1 NSW Government agencies and legislation

7.1.1 NSW EPA

7.1.1.1 Contact details

Website: www.epa.nsw.gov.au

- Phone: 131 555 (or (02) 9995 5555 from outside NSW)
- Email: info@environment.nsw.gov.au
- Post: EPA Head Office, PO Box A290, Sydney South NSW 1232
- Fax: (02) 9995 5999

7.1.1.2 Local offices: www.epa.nsw.gov.au/contact/Locations.htm

7.1.1.3 Contact details: EPA Community Recycling Unit

Email: recycling.centres@epa.nsw.gov.au

Post: Community Recycling Unit, PO Box 668, Parramatta NSW 2124

7.1.1.4 Relevant legislation

Available from www.legislation.nsw.gov.au.

- Protection of the Environment Operations Act 1997
- Waste Avoidance and Resource Recovery Act 2001
- Protection of the Environment Operations (Waste) Regulation 2014
- Protection of the Environment Operations (General) Regulation 2009

7.1.1.5 Guide to licensing

The guide to licensing will help you determine whether you require an environment protection licence and it provides other licensing information about:

- how and where to apply for a licence
- how much a licence costs
- what you may need to do even if you don't need a licence

Available at www.epa.nsw.gov.au/licensing/licenceguide.htm.

7.1.1.6 Handbook for rural and regional transfer stations

The handbook for the design and operation of rural and regional transfer stations helps rural councils understand the challenges, opportunities and unique issues associated with rural transfer station operations. It showcases some of the innovative and practical solutions adopted by rural and regional councils and the experiences of numerous councils in responding to waste management needs.

Available at www.epa.nsw.gov.au/warrlocal/rural-regional.htm



7.1.2 SafeWork NSW

7.1.2.1 Managing risks of hazardous chemicals in the workplace code of practice

This code provides practical guidance on how to manage health and safety risks associated chemicals and is for persons conducting a business or undertaking that uses chemicals. The code applies to:

- substances, mixtures and articles used, handled, generated or stored at the workplace, which are defined as hazardous chemicals under the WHS Regulations
- the generation of hazardous chemicals from work processes, for example toxic fumes released during welding.

Available from www.safework.nsw.gov.au/__data/assets/pdf_file/0018/52155/ managing-risks-hazardous-chemicals-code-3837.pdf.

7.1.2.2 Placarding for storage of hazardous chemicals

A fact sheet on placarding for storage of hazardous chemicals is available from www.safework.nsw.gov.au/media/publications/health-and-safety/placarding-for-storage-of-hazardous-chemicals

7.1.2.3 Contact details

Website: www.workcover.nsw.gov.auPhone: 13 10 50Email: contact@workcover.nsw.gov.auObtain publications online or call 1300 799 003.

7.1.2.4 Relevant legislation

Available from **www.legislation.nsw.gov.au**.

- Work Health and Safety Act 2011
- Work Health and Safety Regulation 2011



7.2 Australian standards

7.2.1 Guide to standards – Dangerous goods

This document provides information on standards and other industry specific information (including the Australian Dangerous Goods Code) that may be of interest to anyone working with different types of dangerous goods, including manufacturers, importers, suppliers, installers and users.

The publications outlined in this guide cover requirements (including storage and handling) for dangerous goods transported by road and rail in relation to the 7th edition of the Australian Dangerous Goods Code (ADG7).



7.2.1.1 HB76:2010, Dangerous Goods – Initial emergency response guide

This handbook provides information on dealing with accidents, spills, leaks, hazards or fires involving dangerous goods, and the protective clothing to be worn in emergency procedures.

Available from Standards Australia at www.saiglobal.com/store.

7.2.1.2 Australian Dangerous Goods Code

The Australian Code for the Transport of Dangerous Goods by Road and Rail, also often referred to as the Australian Dangerous Goods Code (ADGC), sets out the requirements for transporting dangerous goods by road or rail. The current version of the code is edition 7.4, amended 30 June 2016.

Available from www.ntc.gov.au/heavy-vehicles/safety/australian-dangerous-goods-code/.

7.2.1.3 Load restraint guide

The load restraint guide (published by the National Transport Commission) details the performance standard for securing loads on vehicles.

Available from www.ntc.gov.au/heavy-vehicles/safety/load-restraint-guide/.

7.2.2 Relevant standards

The following Australian Standards are of particular interest in establishing and operating Community Recycling Centres.

Available from Standards Australia at www.saiglobal.com/store.

General information

• AS/NZS 3833:2007 The storage and handling of mixed classes of dangerous goods in packages and intermediate bulk containers

Specific classes of dangerous goods

- AS/NZS 1596:2014 The storage and handling of LP Gas
- AS 1940-2004 The storage and handling of flammable and combustible liquids
- AS 3780-2008 The storage and handling of corrosive substances
- AS 4332-2004 The storage and handling of gases in cylinders
- AS/NZS 4452:1997 The storage and handling of toxic substances

Equipment and facilities

- AS 1216-2006 Class labels for dangerous goods
- AS 1319-1994 Safety signs for the occupational environment
- AS 1603 Automatic fire detection and alarm systems
- AS 1670 Fire detection, warning, control and intercom systems
- AS 2444-2001 Portable fire extinguishers and fire blankets: selection and location
- AS 4775-2007 Emergency eyewash and shower equipment



8. Safety data sheets



Provides safety data sheets for the hazardous materials received at a Community Recycling Centre

EPA2016/0557 ISBN 978-1-76039-493-6

Safety data sheet for: ACIDS



1. Material and supplier identification

The most common acid dropped off by householders at Community Recycling Centres (CRCs) is **hydrochloric acid** (also known as muriatic acid).

Less often, sulphuric acid, nitric acid and / or phosphoric acid may be dropped off.

These acids have many properties in common, and this is a combined Safety Data Sheet for the common acids presented at CRCs. Since materials delivered by householders to Community Recycling Centres are discarded ("waste") products and may have originated from a variety of manufacturers, full identification or hazard information is not available for each package. In the absence of full identification or hazard information, a precautionary approach must be taken by persons handling or storing the material.

Original suppliers may have included:

- Orica Ltd (now Ixom Operations Pty Ltd) | 1 Nicholson Street, Melbourne VIC 3000 |
 Tel: 03 9665 7111 | Emergency Tel: 1800 033 111
- Ajax Finechem | 17/21 Bay Road, Taren Point NSW 2229 | Emergency Tel: 1800 638 556
- Chem-Supply Pty Ltd | 38-50 Bedford Street, Gillman SA 5013 | Tel: **08 8440 2000** and many others.



2. Composition information

Common **acids** dropped off at Community Recycling Centres may contain the following chemicals:

	CHEMICAL ENTITY	CAS No
	Hydrochloric acid	7647-01-0
OR	Nitric acid	7697-37-2
OR	Sulphuric acid	7664-93-9
OR	Phosphoric acid	7664-38-2



3. Hazards identification

Emergency Overview HAZARDOUS CHEMICAL | DANGEROUS GOODS

Acids typically have the following hazardous classifications:

Hazardous Classification	Hazardous chemicals
Australian Dangerous Goods (ADG) Classification	Class 8 Corrosive Substances
SUSMP Classification (Standard for the Uniform Scheduling of Medicines and Poisons or "Poisons Schedule")	Schedule 6
UN No	Hydrochloric acid – 1789 Sulphuric acid >51% – 1830 Sulphuric acid <51% – 2796 Sulphuric acid – fuming (unlikely to be brought in) – 1831 Nitric acid – 1796 Phosphoric acid – 1805
Globally Harmonized System of Classification and Labelling of Chemicals (GHS) Classification	
Signal word	Danger
Signal word Hazard Classification	Danger Corrosive to Metals – Category 1 Skin Corrosion – Category 1A or 1B Eye damage – Category 1 Specific Target Organ Toxicity – Category 3



Prevention Precautionary Statements	P234 P260 P264 P280	Keep only in the original container Do not breathe mist / vapours / spray Wash hands thoroughly after handling Wear protective gloves / protective clothing / eye protection
Response Precautionary Statements	P304+P340 P303+P361+P353 P305+P351+P338 P301+P330+P331 P310	If inhaled, remove person to fresh air and keep comfortable for breathing If on skin, take off immediately all contaminated clothing. Rinse skin with water / shower If in eyes, rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing If swallowed, rinse mouth. DO NOT induce vomiting Immediately call a poison centre or a doctor / physician
Storage Precautionary Statements	P405 P403+P233 P406	Store locked up Store on a well-ventilated place. Keep container tightly closed Store in a corrosive resistant container



4. First aid measures

If poisoning occurs, contact a doctor or Poisons Information Centre (Tel: 13 11 26).

b () 2 2	Remove victim from area of exposure – avoid becoming a casualty. Remove contaminated clothing and loosen remaining clothing. Allow patient to assume most comfortable position and keep warm. Keep at rest until fully recovered. If patient finds breathing difficult and develops a bluish discolouration of the skin (which suggests a lack of oxygen in the blood – cyanosis), ensure airways are clear of any obstruction and have a qualified person give oxygen through a face mask. Apply artificial respiration if patient is not breathing. Seek immediate medical advice.	
•	mmediately rinse mouth with water. If swallowed, do NOT induce <i>i</i> omiting. Give a glass of water. Seek immediate medical assistance.	
r F	f spilt on large areas of skin or hair, immediately drench with running water and remove clothing. Continue to wash skin and nair with plenty of water until advised to stop by the Poisons nformation Centre or a doctor.	

Eye contact	Hold eyelids apart and flush the eye continuously with running water. Continue flushing until advised to stop by a Poisons Information Centre or a doctor, or for at least 15 minutes. Continue to wash with large amounts of water until medical help is available.
Note to physician	Treat symptomatically.



5. Fire fighting measures

Specific hazards	Non combustible, but decomposes on heating, emitting toxic fumes.
Suitable extinguishing media	Non combustible, but if involved in a fire, use fine water spray, normal foam or a dry agent (carbon dioxide, dry chemical powder).
Hazards from combustion products	Decomposes on heating, emitting toxic fumes.
Precautions for fire fighters and special protective equipment	Decomposes on heating emitting toxic fumes. Fire fighters to wear self-contained breathing apparatus and suitable protective clothing if risk of exposure to products of decomposition. Heating can cause expansion or decomposition of the material, which can lead to the containers exploding. If safe to do so, remove containers from the path of fire.
Hazchem Code:	2R



6. Accidental Release Measures

Wear protective equipment to prevent skin and eye contamination. Alert others in the spill area. Do not touch or walk through the spilled material and avoid breathing vapours. As quickly as possible, dike the spilled liquid to prevent spreading. Use spill pillows, pads or a non-combustible absorbent for this purpose. Do not use sawdust. Neutralise the acid with sodium bicarbonate, lime or soda ash in excess. Add the neutraliser slowly, working from the edges to the centre of the spill. Use caution, as reaction can cause splattering. Sweep up the powder and wash the area gently with water. Use vermiculite to absorb any remaining liquid.

Prevent run-off into waterways or drains. If entry into waterways occurs, inform appropriate authorities.



7. Handling and storage

Handling	Wear appropriate Personal Protective Equipment. Eating, drinking and smoking should be prohibited in areas where this material is handled. Avoid skin or eye contact or inhalation of vapours from any spilled material. Clean up spills immediately (see Section 6 above).
Storage	Follow the storage conditions recommended in the EPA's Operations and Management Handbook for Community Recycling Centres.



8. Acknowledgement

This Safety Data Sheet contains some material from Safety Data Sheets for acids from several manufacturers that are available in the public domain, particularly those by Ixom Operations and Chem-Supply Pty Ltd, whose authorship of that material is acknowledged.

Section 6 on Accidental Release Measures has been adapted from material published by the University of Iowa. Sections 6 and 7 contain material supplied by the current collection contractor for Community Recycling Centres, Toxfree Australia Pty Ltd.

Safety data sheet for: ALKALIS

1. Material and supplier identification

The most common alkali (base) materials dropped off by householders at Community Recycling Centres (CRCs) include household cleaners such as **bleaches**, **ammonia solution** and **drain clearing agents** (which may contain **sodium and / or potassium hydroxide**). Alkaline materials dropped off at CRCs may be liquid or solid. They have many properties in common, and this is a combined Safety Data Sheet for the common alkalis presented at CRCs.

Since materials delivered by householders to Community Recycling Centres are discarded ("waste") products and may have originated from a variety of manufacturers, full identification or hazard information is not available for each package. In the absence of full identification or hazard information, a precautionary approach must be taken by persons handling or storing the material.

Original suppliers may have included:

- Orica Ltd (now Ixom Operations Pty Ltd) | 1 Nicholson Street, Melbourne VIC 3000 |
 Tel: 03 9665 7111 | Emergency Tel: 1800 033 111
- S C Johnson and Son Pty Ltd | 160 Epping Road, Lane Cove NSW 2066 | Tel: 02 9428 9111
- Kleenco Australia Pty Ltd 25 Moxon Road, Punchbowl NSW 2196 Tel: 02 9707 3333
- Pental Products Pty Ltd | 390 St Kilda Road, Melbourne VIC 3000 | Tel: **03 9251 2311** and many others.



2. Composition information

Common **alkalis** dropped off at Community Recycling Centres may contain the following chemicals:

	CHEMICAL ENTITY	CAS No
	Sodium hydroxide	1310-73-2
AND / OR	Potassium hydroxide	1310-58-3
OR	Ammonia, aqueous solution	1336-21-6



3. Hazards identification

Emergency Overview HAZARDOUS CHEMICAL | DANGEROUS GOODS

Alkalis typically have the following hazardous classifications:

Hazardous Classification	Some of the packages of alkaline materials dropped off at Community Recycling Centres are not classified as Hazardous Substances or Dangerous Goods, some are classified as Hazardous Substances but not Dangerous Goods. Some, particularly solid drain cleaners , are classified as both. The precautionary approach is to consider all such materials as Hazardous Substances and Dangerous Goods.
Australian Dangerous Goods (ADG) Classification	Class 8 – Corrosive Substances
SUSMP Classification (Standard for the Uniform Scheduling of Medicines and Poisons or "Poisons Schedule")	Schedule 6
UN No	Sodium hydroxide – solid – 1823 Sodium hydroxide – solution – 1824 Potassium hydroxide – solid – 1813 Potassium hydroxide – solution – 1814 Ammonia aqueous solution with not more than 35% ammonia – 2672
Globally Harmonized System of Classification and Labelling of Chemicals (GHS) Classification	
Signal word	Danger
Hazard Classification	Corrosive to Metals – Category 1 Skin Corrosion – Category 1A or 1C Eye damage – Category 1 Acute Aquatic Toxicity – Category 1



Hazard Statements	H290 H314 H335 H400	May be corrosive to metals Causes severe skin burns and eye damage May cause respiratory irritation Very toxic to aquatic life
Prevention Precautionary Statements	P234 P260 P264 P280 P273	Keep only in the original container Do not breathe dust / fume / mist / vapours / spray Wash hands thoroughly after handling Wear protective gloves / protective clothing / eye protection, face protection Avoid release to the environment
Response Precautionary Statements	P304+P340 P303+P361+P353 P305+P351+P338 P301+P330+P331 P310 P363 P390	If inhaled, remove person to fresh air and keep comfortable for breathing If on skin, take off immediately all contaminated clothing. Rinse skin with water / shower If in eyes, rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing If swallowed, rinse mouth. DO NOT induce vomiting Immediately call a poison centre or a doctor / physician Wash contaminated clothing before re-use Absorb spillage to prevent material damage
Storage Precautionary Statements	P405 P403+P233 P406	Store locked up Store on a well-ventilated place. Keep container tightly closed Store in a corrosive resistant container



4. First aid measures

If poisoning occurs, contact a doctor or Poisons Information Centre (Tel: 13 11 26).

Inhalation Remove victim from area of exposure. Remove contaminated clothing and loosen remaining clothing. Allow patient to assume most comfortable position and keep warm. Keep at rest until fully recovered. If patient finds breathing difficult and develops a bluish discolouration of the skin (which suggests a lack of oxygen in the blood – cyanosis), ensure airways are clear of any obstruction and have a qualified person give oxygen through a face mask. Apply artificial respiration if patient is not breathing. Seek immediate medical advice.

NSW Community Recycling Centres | Operations and management handbook Safety data sheet for: ALKALIS

Ingestion	Immediately rinse mouth with water. If swallowed, do NOT induce vomiting. Give a glass of water. Seek immediate medical assistance.
Skin contact	If spilt on large areas of skin or hair, immediately drench with running water and remove clothing. Continue to wash skin and hair with plenty of water until advised to stop by the Poisons Information Centre or a doctor.
Eye contact	Immediately wash in and around the eye area with large amounts of water for at least 15 minutes. Eyelids to be held apart. Remove clothing if contaminated and wash skin. Urgently seek medical assistance. Transport promptly to hospital or medical centre.
Note to physician	Treat symptomatically. Can cause corneal burns.



5. Fire fighting measures

Specific hazards	Non combustible. However, containers of aqueous ammonia, if heated, may rupture and release ammonia vapour. Ammonia may decompose into flammable hydrogen gas, forming flammable mixtures with air.
Suitable extinguishing media	Non combustible, but if involved in a fire, use fine water spray, normal foam or a dry agent (carbon dioxide, dry chemical powder).
Hazards from combustion products	Aqueous ammonia may decompose, forming flammable mixtures with air.
Precautions for fire fighters and special protective equipment	Fire fighters to wear self-contained breathing apparatus and suitable protective clothing if risk of exposure to products of decomposition. Heating can cause expansion or decomposition of the material, which can lead to the containers exploding. If safe to do so, remove containers from the path of fire.
Hazchem Code:	2R



6. Accidental Release Measures

Wear protective equipment to prevent skin and eye contamination. Alert others in the spill area. Do not touch or walk through the spilled material and avoid breathing vapours. Prevent run-off into waterways or drains. Use absorbent material (soil, sand or other inert material). Neutralise spill with dilute acid. Collect neutralised material into labelled containers for appropriate disposal. If entry into waterways occurs, inform appropriate authorities.



7. Handling and storage

Handling	Wear appropriate Personal Protective Equipment. Eating, drinking and smoking should be prohibited in areas where this material is handled. Avoid skin or eye contact or inhalation of vapours from any spilled material. Clean up spills immediately (see Section 6 above).
Storage	Follow the storage conditions recommended in the EPA's Operations and Management Handbook for Community Recycling Centres.



8. Acknowledgement

This Safety Data Sheet contains some material from Safety Data Sheets for alkaline materials from several manufacturers that are available in the public domain, particularly those by Ixom Operations Pty Ltd, whose authorship of that material is acknowledged.

Section 6 on Accidental Release Measures has been adapted from material published by the University of Iowa.



Safety data sheet for: FLAMMABLE LIQUIDS (other than solvent based paint)

1. Material and supplier identification

The most common flammable liquids (other than solvent-based paint, for which a separate Safety Data Sheet exists) that are dropped off by householders at Community Recycling Centres (CRCs) include petrol, kerosene, methylated spirits, paint thinners (such as mineral turpentine) and hydrocarbon solvents (such as acetone). These materials have many properties in common, and this is a combined Safety Data Sheet for the common flammable liquids presented at CRCs.

Since materials delivered by householders to Community Recycling Centres are discarded ("waste") products and may have originated from a variety of manufacturers, full identification or hazard information is not available for each package. In the absence of full identification or hazard information, a precautionary approach must be taken by persons handling or storing the material.

Original suppliers may have included:

- Shell Company of Australia Ltd (Now Viva Energy Australia Pty Ltd) 720 Bourke Street, Docklands VIC 3008 Tel: 03 882 34444 Emergency Tel: 1800 651 818
- Mobil Oil Australia Pty Ltd | 12 Riverside Quay, Southbank VIC 3006 | Tel: 03 8633 8444 | Emergency Tel: 1800 023 005
- Recochem Inc | 1809 Lytton Road, Lytton QLD 4178 | Tel: 07 3308 5200 | Emergency Tel: 1300 131 001
- Orica Ltd (now Ixom Operations Pty Ltd) | 1 Nicholson Street, Melbourne VIC 3000 | Tel: 03 9665 7111 | Emergency Tel: 1800 033 111
- CSR Distilleries Operations Pty Ltd | 265 Whitehall Street, Yarraville VIC 3013 | Tel: **1800 819 618** and many others.



2. Composition information

Flammable liquids dropped off at Community Recycling Centres may contain the following ingredients:

	CHEMICAL ENTITY	CAS No
	Gasoline	86290-81-5
OR	Kerosene	8008-20-6
OR	Ethanol	64-17-5
OR	Acetone	67-64-1



3. Hazards identification

Emergency Overview HAZARDOUS CHEMICAL | DANGEROUS GOODS

Flammable liquids dropped off by householders at CRCs typically have the following hazardous classifications:

Australian Dangerous Goods (ADG) Classification Class 3 Flammable Liquids SUSMP Classification (Standard for the Uniform Scheduling of Medicines and Poisons or "Poisons Schedule") Schedule 5 UN No Gasoline – 1203 Kerosene – 1223 Ethanol – 1170 Acetone – 1090 Globally Harmonized System of Classification and Labelling of Chemicals (GHS) Classification Image: Flammable liquid – Category 1 Skin Irritation – Category 2 Eye Irritation – Category 28 Germ Cell Mutagen – Category 1B Carcinogen – Category 1B Specific Target Organ Toxicant (central nervous system)		
(ADG) Classification Liquids SUSMP Classification Schedule 5 (Standard for the Uniform Schedule 5 Scheduling of Medicines and Poisons or "Poisons Schedule") UN No Gasoline – 1203 Kerosene – 1223 Ethanol – 1170 Acetone – 1090 Acetone – 1090 Globally Harmonized System of Classification and Labelling of Chemicals (GHS) Calestification Signal word Danger Hazard Classification Flammable liquid – Category 1 Skin Irritation – Category 2 Eye Irritation – Category 1B Carcinogen – Category 1B Specific Target Organ Toxicant (central nervous system)	Hazardous Classification	Hazardous chemicals
(Standard for the Uniform Scheduling of Medicines and Poisons or "Poisons Schedule")Gasoline – 1203 Kerosene – 1223 Ethanol – 1170 Acetone – 1090Globally Harmonized System of Classification and Labelling of Chemicals (GHS) ClassificationImage: Classification (GHS) DangerSignal wordDangerHazard ClassificationFlammable liquid – Category 1 Skin Irritation – Category 2 Eye Irritation – Category 1B Carcinogen – Category 1B Specific Target Organ Toxicant (central nervous system)	-	Liquids
Kerosene - 1223 Ethanol - 1170 Acetone - 1090 Globally Harmonized System of Classification and Labelling of Chemicals (GHS) Classification Danger Hazard Classification Flammable liquid - Category 1 Skin Irritation - Category 2 Eye Irritation - Category 1B Carcinogen - Category 1B Specific Target Organ Toxicant (central nervous system)	(Standard for the Uniform Scheduling of Medicines and	Schedule 5
System of Classification and Labelling of Chemicals (GHS) ClassificationImage: ClassificationSignal wordDangerHazard ClassificationFlammable liquid – Category 1 Skin Irritation – Category 2 Eye Irritation – Category 2A Germ Cell Mutagen – Category 1B Carcinogen – Category 1B Specific Target Organ Toxicant (central nervous system)	UN No	Kerosene – 1223 Ethanol – 1170
Hazard Classification Flammable liquid – Category 1 Skin Irritation – Category 2 Eye Irritation – Category 2A Germ Cell Mutagen – Category 1B Carcinogen – Category 1B Specific Target Organ Toxicant (central nervous system)	System of Classification and Labelling of Chemicals (GHS)	
Skin Irritation – Category 2 Eye Irritation – Category 2A Germ Cell Mutagen – Category 1B Carcinogen – Category 1B Specific Target Organ Toxicant (central nervous system)	Signal word	Danger
Aspiration Toxicant – Category 1 Chronic Aquatic Toxicity – Category 2	Hazard Classification	Skin Irritation – Category 2 Eye Irritation – Category 2A Germ Cell Mutagen – Category 1B Carcinogen – Category 1B Specific Target Organ Toxicant (central nervous system) – Category 3 Aspiration Toxicant – Category 1

	1.100.1	
Hazard Statements	H224	Extremely flammable liquid and vapour
	H304	May be fatal if swallowed and enters airways
	H315	Causes skin irritation
	H319	Causes serious eye irritation
	H336	May cause drowsiness or dizziness
	H340	May cause genetic defects
	H350	May cause cancer
	H361	Suspected of damaging the unborn child
	H411	Toxic to aquatic life with long lasting effects
Prevention Precautionary	P210	Keep away from heat / sparks / open flames / hot surfaces – No smoking
Statements	P233	Keep container tightly closed
	P243	Take precautionary measures against static discharge
	P261	Avoid breathing mist / vapours
	P264	Wash skin thoroughly after handling
	P273	Avoid release to the environment
	P280	Wear protective gloves / protective clothing / eye protection / face protection
Response Precautionary	P304+P340	If inhaled, remove person to fresh air and keep comfortable for breathing
-	P304+P340 P302+P352	•
Precautionary		keep comfortable for breathing If on skin – wash with plenty of soap
Precautionary	P302+P352	keep comfortable for breathing If on skin – wash with plenty of soap and water If on skin, take off immediately all contaminated clothing. Rinse skin with
Precautionary	P302+P352 P303+P361+P353	 keep comfortable for breathing If on skin – wash with plenty of soap and water If on skin, take off immediately all contaminated clothing. Rinse skin with water / shower If in eyes, rinse cautiously with water for several minutes. Remove contact lenses if
Precautionary	P302+P352 P303+P361+P353 P305+P351+P338	 keep comfortable for breathing If on skin – wash with plenty of soap and water If on skin, take off immediately all contaminated clothing. Rinse skin with water / shower If in eyes, rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing If swallowed – Immediately call a Poisons
Precautionary	P302+P352 P303+P361+P353 P305+P351+P338 P301+P310	 keep comfortable for breathing If on skin – wash with plenty of soap and water If on skin, take off immediately all contaminated clothing. Rinse skin with water / shower If in eyes, rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing If swallowed – Immediately call a Poisons Centre or doctor / physician If exposed or concerned – Get medical
Precautionary	P302+P352 P303+P361+P353 P305+P351+P338 P301+P310 P308+P313	 keep comfortable for breathing If on skin – wash with plenty of soap and water If on skin, take off immediately all contaminated clothing. Rinse skin with water / shower If in eyes, rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing If swallowed – Immediately call a Poisons Centre or doctor / physician If exposed or concerned – Get medical advice / attention
Precautionary	P302+P352 P303+P361+P353 P305+P351+P338 P301+P310 P308+P313 P363	 keep comfortable for breathing If on skin – wash with plenty of soap and water If on skin, take off immediately all contaminated clothing. Rinse skin with water / shower If in eyes, rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing If swallowed – Immediately call a Poisons Centre or doctor / physician If exposed or concerned – Get medical advice / attention Wash contaminated clothing before re-use Call a Poisons Centre or doctor / physician

NSW Community Recycling Centres | Operations and management handbook Safety data sheet for: FLAMMABLE LIQUIDS (other than solvent based paint)

Response Precautionary	P332+P313	If skin irritation occurs, get medical advice / attention
Statements (continued)	P362+P364	Take off contaminated clothing and wash before re-use
	P370+P378	In case of fire, use water fog, foam, dry chemical or carbon dioxide (CO_2) to extinguish
	P391	Collect spillage
Storage Precautionary	P405	Store locked up
Statements	P403+P235	Store on a well-ventilated place. Keep cool



4. First aid measures

If poisoning occurs, contact a doctor or Poisons Information Centre (Tel: 13 11 26).

Inhalation	Immediately remove from further exposure. Get immediate medical assistance. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. Give supplemental oxygen, if available. If breathing has stopped, assist ventilation with a mechanical device.
Ingestion	Seek immediate medical assistance. Do NOT induce vomiting.
Skin contact	Wash contact areas with soap and water. Remove contaminated clothing. Launder contaminated clothing before reuse.
Eye contact	Hold eyelids apart and flush the eye continuously with running water. Continue flushing until advised to stop by a Poisons Centre or a doctor, or at least for 15 minutes. If irritation occurs, get medical assistance.
Note to physician	Treat symptomatically.



5. Fire fighting measures

Specific hazards	Extremely flammable. Vapour is flammable and heavier than air. Vapour may travel across the ground and reach remote ignition sources, causing a flashback.
Suitable extinguishing media	Water fog, foam, dry chemical or carbon dioxide (CO ₂). DO NOT USE STRAIGHT STREAMS OF WATER.
Hazards from combustion products	May emit aldehydes, products of incomplete combustion, oxides of carbon, sulphur dioxide, smoke, fumes.
Precautions for fire fighters and special protective equipment	Evacuate area. If a leak or spill has not ignited, use water spray to disperse the vapours and to protect personnel attempting to stop a leak. Prevent run-off from fire control or dilution from entering streams, sewers or drinking water supply. Fire-fighters should use standard protective equipment and in enclosed spaces, self- contained breathing apparatus (SCBA).
Hazchem Code:	3[Y]E



6. Accidental Release Measures

Warn or evacuate occupants in surrounding and downwind areas if required, due to toxicity or flammability of the material. Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop leak if you can do so without risk. All equipment used when handling the product must be grounded. Do not touch or walk through spilled material. Prevent entry into waterways, sewer, basements or confined areas. Vapour-suppressing foam may be used to reduce vapour. Absorb or cover with dry earth, sand or other non-combustible material and transfer to labelled containers. Use clean non-sparking tools to collect absorbed material. If entry into waterways occurs, inform appropriate authorities.



7. Handling and storage

Handling	Avoid all personal contact. Wash skin thoroughly after handling. Do not eat, drink or smoke in the area. Prevent exposure to ignition sources. Electrostatic charges may be generated during transfer and cause fire. Do not use electronic devices (mobile telephones, pagers, calculators) when handling the material, unless the devices are certified as intrinsically safe.
Storage	Follow the storage conditions recommended in the EPA's Operations and Management Handbook for Community Recycling Centres.



8. Acknowledgement

This Safety Data Sheet contains some material from Safety Data Sheets for flammable liquids from several manufacturers that are available in the public domain, particularly those by Mobil Oil Australia Pty Ltd (petrol), Recochem Inc (kerosene and methylated spirits) and Ixom Operations Pty Ltd (acetone). Their authorship of that material is acknowledged.



Safety data sheet for: FLUORESCENT LAMPS (tubular and compact)



1. Material and supplier identification

Since materials delivered by householders to Community Recycling Centres are discarded ("waste") products and may have originated from a variety of manufacturers, full identification or hazard information is not available for each item. In the absence of full identification or hazard information, a precautionary approach must be taken by persons handling or storing the material.

Original suppliers may have included:

- GE Lighting Australia Ltd 32 Phillip Street, Parramatta NSW 2150 Tel: 1300 762 852
- Philips Lighting | Locked Bag 30, North Ryde NSW 2113 | Tel: 1300 304404

and many others.



2. Composition information

Tubular and compact-type fluorescent lamps typically contain very small quantities (20 milligrams per lamp or less) of the following materials:

CHEMICAL ENTITY	CAS No
Mercury	7439-97-6
"Phosphor" (e.g. calcium chloro-fluoro-phosphate, the mineral apatite)	-



3. Hazards identification

Emergency Overview HAZARDOUS CHEMICAL | DANGEROUS GOODS

Hazardous Classification	Intact tubular and compact-type fluorescent lamps are NOT classified as Hazardous Substances or Dangerous Goods under applicable Australian standards or regulations. However, when broken, they are classified as Mercury Compounds N.O.S., Class 6 Division 6.1 Toxic Substances.
Australian Dangerous Goods (ADG) Classification	Division 6.1
SUSMP Classification (Standard for the Uniform Scheduling of Medicines and Poisons or "Poisons Schedule")	Schedule 7
UN No	2025
Globally Harmonized System of Classification and Labelling of Chemicals (GHS) Classification	The information below is taken from the GHS Hazardous Chemical Information List for inorganic compounds of mercury . It must be emphasised that, since most fluorescent lamps delivered to and / or stored at Community Recycling Centres are intact (and even if broken, the amounts of mercury compounds present are very small), these statements must be considered as being extremely conservative .
Signal word	Danger

Hazard Classification	Acute Toxicity – Category 1 Acute Toxicity – Category 2 Specific Target Organ Toxicity (repeated exposure) – Category 2 Hazardous to the Aquatic Environment (acute) – Category 1 Hazardous to the Aquatic Environment (chronic) – Category 1	
Hazard Statements	H310 H330 H373 H410	Fatal in contact with skin Fatal if inhaled May cause damage to organs through prolonged or repeated exposure Very toxic to aquatic life with long-lasting effects
Prevention Precautionary Statements	P262 P264 P280 P260 P284 P273	Do not get in eyes, on skin or on clothing Wash hands thoroughly after handling Wear protective gloves / protective clothing Do not breathe dust In case of inadequate ventilation, wear respiratory protection Avoid release to the environment
Response Precautionary Statements	P302+P352 P304+P340 P314 P391	If on skin, wash with plenty of water If inhaled, remove person to fresh air and keep comfortable for breathing Get medical advice if you feel unwell Collect spillage
Storage Precautionary Statements	P405 P403	Store locked up Store on a well-ventilated place



4. First aid measures

The measures below are for **broken or damaged** fluorescent lamps, not for intact ones. If poisoning occurs, contact a doctor or Poisons Information Centre (Tel: **13 11 26**).

Inhalation	Get medical aid immediately. Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. Do NOT use mouth-to-mouth resuscitation. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.
Ingestion	This is considered unlikely.

NSW Community Recycling Centres | Operations and management handbook Safety data sheet for: FLUORESCENT LAMPS (tubular and compact)

Skin contact	Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Destroy contaminated shoes. Apply normal first aid for glass cuts if such should occur through lamp breakage.
Eye contact	Get medical aid. Do NOT allow victim to rub eyes or keep eyes closed. Irrigate extensively with water (at least 30 minutes).
Note to physician	The concentration of mercury in whole blood is a reasonable measure of the body-burden of mercury and thus is used for monitoring purposes. Treat symptomatically. Persons with kidney disease, chronic respiratory disease, liver disease, or skin disease may be at increased risk from exposure to this substance.



5. Fire fighting measures

Specific hazards	Intact fluorescent tubes and compact lamps are non-combustible. If subjected to extreme heat, the glass, and plastic (if present), components of the lamp may crack or melt and may emit toxic fumes.
Suitable extinguishing media	Use extinguishing media appropriate for combustibles in the area.
Hazards from combustion products	If caught in a surrounding fire, lamps may crack and emit toxic fumes, including minor quantities of mercury compounds.
Precautions for fire fighters and special protective equipment	Fire fighters to wear self-contained breathing apparatus and suitable protective clothing if there is a risk of exposure to vapours.
Hazchem Code:	2X



6. Accidental Release Measures

Clean up spills immediately. Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable labelled container for appropriate disposal. Avoid runoff into storm sewers and ditches which lead to waterways.



7. Handling and storage

Handling	Wear protective equipment to prevent skin and eye contamination. Wash hands thoroughly after handling. If any lamps are broken, remove contaminated clothing and wash it before reuse. Minimize dust generation and accumulation. Do not get on skin or in eyes. Do not ingest or inhale.
Storage	Follow the storage conditions recommended in the EPA's Operations and Management Handbook for Community Recycling Centres.



8. Acknowledgement

This Safety Data Sheet contains some material published by GE Consumer and Industrial Lighting (USA) and Philips Lighting Co (USA) available in the public domain, and their authorship of that material is acknowledged.

Community Recycling Centres

Safety data sheet for: LEAD-ACID BATTERIES



1. Material and supplier identification

Other names: Batteries wet filled with acid, Car batteries, Automotive batteries

Since materials delivered by householders to Community Recycling Centres are discarded ("waste") products and may have originated from a variety of manufacturers, full identification or hazard information is not available for each item. In the absence of full identification or hazard information, a precautionary approach must be taken by persons handling or storing the material.

Original suppliers may have included:

- Century Yuasa Batteries | 49–65 Cobalt Street, Carole Park QLD 4300 | Tel: 07 3361 6161 | Emergency | Tel: 07 3361 6707
- Marshall Power Australia Pty Ltd | 1–5 Winterton Road, Clayton VIC 3168 | Tel: 1300 695 717 | Emergency Tel: 1800 039 008

and many others.



2. Composition information

Lead-acid batteries typically contain the following materials:

CHEMICAL ENTITY	CAS No
Lead	7439-92-1
Lead oxide	1317-36-8
Sulphuric acid	7664-93-9
Non-hazardous components	-



3. Hazards identification

Emergency Overview HAZARDOUS CHEMICAL | DANGEROUS GOODS

Hazardous Classification	Chemic being li	cid batteries are classified as a Hazardous cal in the NSW WHS Regulation 2011 by virtue of sted in Part 7.1 Clause 328 as "Any dangerous other than those listed above".
Australian Dangerous Goods (ADG) Classification	Class 8 Substa	Corrosive nces
SUSMP Classification (Standard for the Uniform Scheduling of Medicines and Poisons or "Poisons Schedule")	but sulp	cid batteries <i>per se</i> are exempted in SUSMP, bhuric acid is a Schedule 6 poison and "lead unds" are also Schedule 6.
UN No	2794	
Globally Harmonized System of Classification and Labelling of Chemicals (GHS) Classification	Lead-acid batteries <i>per se</i> are not listed in the GHS Hazardous Chemical Information List. The information below is for sulphuric acid.	
Signal word	Danger	
Hazard Classification	Skin Co	prrosion – Category 1A
Hazard Statements	H314	Causes severe skin burns and eye damage
Prevention Precautionary Statements	P260 P264 P280	Do not breathe mist / vapours / spray Wash hands thoroughly after handling Wear protective gloves / protective clothing / eye protection



Response Precautionary Statements	P304+P340	If inhaled, remove person to fresh air and keep comfortable for breathing
	P303+P361+P353	If on skin, take off immediately all contaminated clothing. Rinse skin with water / shower
	P305+P351+P338	If in eyes, rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing,
	P301+P330+P331	If swallowed, rinse mouth. DO NOT induce vomiting
	P310	Immediately call a poison centre or a doctor / physician
	P363	Wash contaminated clothing before reuse
Storage Precautionary Statements	P405	Store locked up



4. First aid measures

If poisoning occurs, contact a doctor or Poisons Information Centre (Tel: 13 11 26).

Inhalation	If fumes of combustion products are inhaled, lay the patient down, keep warm and rested. Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures. Apply artificial respiration if not breathing. Transport to hospital, or doctor without delay.
Ingestion	Urgent hospital treatment is likely to be needed. If swallowed do NOT induce vomiting. If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration. Observe the patient carefully. Give water to rinse out mouth, then provide liquid slowly and as much as the patient can comfortably drink. Transport to hospital or doctor without delay.
Skin contact	Immediately flush body and clothes with large amounts of water, using safety shower if available. Quickly remove all contaminated clothing, including footwear. Wash skin and hair with running water. Continue flushing with water until advised to stop by the Poisons Information Centre.

NSW Community Recycling Centres | Operations and management handbook Safety data sheet for: LEAD-ACID BATTERIES

Eye contact	Immediately hold eyelids apart and flush the eye continuously with running water. Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids. Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes. Transport to hospital or doctor without delay. Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.
Note to physician	Treat symptomatically for acute or short term exposure to strong acids.



5. Fire fighting measures

Specific hazards	Lead-acid batteries are non-combustible and are not considered to be a significant fire risk. However, heating may cause expansion or decomposition leading to violent rupture of containers. Acids may react with metals to produce hydrogen, a highly flammable and explosive gas.
Suitable extinguishing media	Water spray or fog, Foam, Dry chemical powder, Carbon dioxide.
Hazards from combustion products	Heating may cause expansion or decomposition leading to violent rupture of containers. Acids may react with metals to produce hydrogen, a highly flammable and explosive gas.
Precautions for fire fighters and special protective equipment	Fire fighters to wear breathing apparatus and protective gloves. Prevent spillage or run-off from entering drains or water courses. DO NOT approach batteries suspected to be hot. Cool fire- exposed containers with water spray from a protected location. If safe to do so, remove containers from path of fire. Equipment should be thoroughly decontaminated after use.
Hazchem Code:	2R



6. Accidental Release Measures

Wear protective equipment to prevent skin and eye contamination. Alert others in the spill area. Do not touch or walk through the spilled material and avoid breathing vapours. Shut off ignition sources. As quickly as possible, dike the spilled liquid to prevent spreading. Use spill pillows, pads or a non-combustible absorbent for this purpose. Neutralise the acid with sodium bicarbonate in excess. Add the neutraliser slowly, working from the edges to the centre of the spill. Use caution, as reaction can cause splattering. Sweep up the powder and wash the area gently with water. Use vermiculite to absorb any remaining liquid.

Environmental precautions

Contain the spill to prevent entry into drains or waterways. If entry into waterways occurs, inform appropriate authorities.



7. Handling and storage

Handling	Wear appropriate Personal Protective Equipment. Eating, drinking and smoking should be prohibited in areas where this material is handled. Avoid skin or eye contact or inhalation of vapours from any spilled material. Clean up spills immediately (see Section 6 above).
	Lead acid batteries should always be handled and stacked in an upright position. Stacking should be no more than two-high, with a sheet of cardboard placed between the first and second layers. Avoid dropping. As some batteries may be "live", there is potential for sparking if dropped or if conducting material is placed across the terminals.
Storage	Follow the storage conditions recommended in the EPA's Operations and Management Handbook for Community Recycling Centres.



8. Acknowledgement

This Safety Data Sheet contains some material from Safety Data Sheets for lead acid batteries from several manufacturers that are available in the public domain, particularly those by Century Yuasa Batteries and Marshall Power Australia Pty Ltd, whose authorship of that material is acknowledged.

Section 6 on Accidental Release Measures has been adapted from material published by the University of Iowa. Sections 6 and 7 contain material supplied by the current collection contractor for Community Recycling Centres, Toxfree Australia Pty Ltd.

Community Recycling Centres

Safety data sheet for: DOMESTIC LPG CYLINDERS



1. Material and supplier identification

Other names: Propane cylinders, Propane / butane cylinders, Domestic gas bottles, BBQ gas cylinders.

Since materials delivered by householders to Community Recycling Centres are discarded ("waste") products and may have originated from a variety of manufacturers, full identification or hazard information is not available for each cylinder. In the absence of full identification or hazard information, a precautionary approach must be taken by persons handling or storing the material. LPG cylinders delivered by householders to Community Recycling Centres are usually empty; however, as part of the precautionary approach, they are treated as still containing LPG.

Original suppliers may have included:

- Elgas Ltd | 10 Julius Avenue, North Ryde NSW 2113 | Tel: 02 8094 3200 | Emergency Tel: 1800 819 783
- Origin Energy | 264–278 George Street, Sydney NSW 2000 | Tel: 02 8345 5000 | Emergency Tel: 1800 808 526
- Supagas NSW | 5 Benson Road, Ingleburn NSW 2565 | Tel: 02 8788 4444 | Emergency Tel: 1300 651 106

and many others.



2. Composition information

Domestic LPG cylinders may typically contain one or more of the following chemical compounds in varying proportions:

CHEMICAL ENTITY	CAS No
Propane	74-98-6
Propene	115-07-1
n-Butane	106-97-8
Iso-Butane	75-28-5
Ethane	74-84-0
Odorant: Ethyl Mercaptan	75-08-1



3. Hazards identification

Emergency Overview HAZARDOUS CHEMICAL | DANGEROUS GOODS

Hazardous Classification	Hazardous (NSW WHS	Chemical S Regulation 2011 Part 7.1 Clause 328)
Australian Dangerous Goods (ADG) Classification	Class 2 Div – Flammab	
SUSMP Classification (Standard for the Uniform Scheduling of Medicines and Poisons or "Poisons Schedule")	Not classifi	ed
UN No	1075	
Globally Harmonized System of Classification and Labelling of Chemicals (GHS) Classification		
Signal word	Danger	
Hazard Classification		Gases – Category 1 Ier Pressure – Liquefied Gas
Hazard Statements	-	flammable gas as under pressure – may explode if heated
Prevention Precautionary Statements	P210	Keep away from heat / sparks / open flames / hot surfaces. No smoking
Response Precautionary Statements	P377 P381	Leaking gas fire. Do not extinguish, unless leak can be stopped safely Eliminate all ignition sources if safe to do so



Storage Precautionary Statements	P410+P403	Protect from sunlight. Store in a well- ventilated place
Other hazards	-	entrations may cause asphyxiation. Contact with use cold burns / frostbite

4. First aid measures

Inhalation	LPG is an asphyxiant. Remove victim to fresh air. Be aware of possible explosive atmospheres. Keep person warm and at rest. If not breathing, or breathing is irregular, provide artificial respiration or oxygen by a trained person.
Ingestion	Due to the volatile nature of the product, this is considered unlikely.
Skin contact	Cold burns: remove contaminated clothing and gently wash affected areas with warm (30°C) water for 15 minutes. Apply non-adhesive sterile dressing and treat as for a thermal burn. For large burns, immerse in warm water for 15 minutes. Seek medical attention.
Eye contact	Cold burns: immediately flush with tepid water or with sterile saline solution. Seek medical advice.
Note to physician	Treat symptomatically.



5. Fire fighting measures

Specific hazards	Extremely flammable gas. May form flammable mixtures with air. Gas may travel considerable distance to a source of ignition. If ignition has occurred, this may weaken cylinder metal from the heat, resulting in an explosion.
Suitable extinguishing media	Evacuate the area, remove all ignition sources. Stop flow of gas if safe to do so, by closing the cylinder valve. DO NOT EXTINGUISH THE FLAME, as this may lead to re-ignition and explosion. If extinguishing the flame is absolutely necessary, use only a dry powder extinguisher. Keep cylinders cool by spraying with fine water spray from a safe distance. Do not move cylinders for at least 24 hours after the fire and avoid shocks to cylinders that have been in a fire.

Hazchem Code:	2YE
Precautions for fire fighters and special protective equipment	Do not approach cylinders suspected of being hot.
Hazards from combustion products	On burning, may emit toxic fumes, including oxides of carbon and nitrogen, smoke, and products of incomplete combustion.



6. Accidental Release Measures

Any leak or spill is a fire and / or explosion hazard. If a leak has not ignited, stop gas flow if safe to do so, remove sources of ignition and evacuate personnel. Liquid leaks generate heavier-than-air flammable vapour, which may travel a considerable distance (e.g. through drains) to find a source of ignition. Vapour may collect in confined spaces. Where appropriate, use water spray to disperse the gas or vapour.

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7. Handling and storage

Handling	Avoid inhalation of vapour. Avoid contact with liquid and cold storage containers. When handling cylinders wear protective footwear and suitable gloves.	
Storage	Follow the storage conditions recommended in the EPA's Operations and Management Handbook for Community Recycling Centres.	



8. Acknowledgement

This Safety Data Sheet contains some material from Safety Data Sheets for LPG cylinders from several suppliers that are available in the public domain, particularly those by Elgas Ltd, Origin Energy and Supagas NSW, whose authorship of that material is acknowledged.

Community Recycling Centres

Safety data sheet for: OXIDISING MATERIALS



1. Material and supplier identification

The most common oxidising material dropped off by householders at Community Recycling Centres (CRCs) is the swimming pool chemical **calcium hypochlorite**, which is a granular solid¹. Other, less common, oxidising materials occasionally presented at CRCs are **potassium permanganate** ("Condy's crystals") and **hydrogen peroxide** (which is only available in solution of varying strengths). These materials have some properties in common, and this is a combined Safety Data Sheet for oxidising materials, which are occasionally presented at CRCs.

Since materials delivered by householders to Community Recycling Centres are discarded ("waste") products and may have originated from a variety of manufacturers, full identification or hazard information is not available for each package. In the absence of full identification or hazard information, a precautionary approach must be taken by persons handling or storing the material.

Original suppliers may have included:

- Kleenco Australia Pty Ltd | 25 Moxon Road, Punchbowl NSW 2196 | Tel: 02 9707 3333 (for calcium hypochlorite)
- Pool Pro Products | 10-12 Cairns Street, Loganholme QLD 4129 | Tel: 07 3209 7884 | Emergency Tel: 1800 033 111 (for calcium hypochlorite)
- Biotech Pharmaceuticals Pty Ltd | 83 Cherry Lane, Laverton North VIC 3026 | Tel: **03 9278 7555** (for potassium permanganate)
- Orica Ltd (now Ixom Operations Pty Ltd) | 1 Nicholson Street, Melbourne VIC 3000 |
 Tel: 03 9665 7111 | Emergency Tel: 1800 033 111 (for hydrogen peroxide)

and many others.



2. Composition information

Oxidising materials dropped off at Community Recycling Centres may contain the following chemicals:

	CHEMICAL ENTITY	CAS No
	Calcium hypochlorite	7778-54-3
OR	Potassium permanganate	7722-64-7
OR	Hydrogen peroxide	7722-84-1

¹Another common swimming pool chemical, sodium hypochlorite, (which is only available in solution and is often colloquially, but incorrectly, referred to as "liquid chlorine") is not classified as an oxidising material, but as a corrosive material.



Emergency Overview HAZARDOUS CHEMICAL | DANGEROUS GOODS

Oxidising materials dropped off by householders at CRCs typically have the following hazardous characteristics:

Hazardous Classification	Hazardous chemicals
Australian Dangerous Goods (ADG) Classification	Class 5 Division 5.1 Oxidising Substances
SUSMP Classification (Standard for the Uniform Scheduling of Medicines and Poisons or "Poisons Schedule")	Schedule 6
UN No	Calcium hypochlorite – 1748 Potassium permanganate – 1490 Hydrogen peroxide – 8 to 20% – 2984 Hydrogen peroxide – 20 to 60% – 2014 Hydrogen peroxide – above 60% – unlikely to be delivered
Globally Harmonized System of Classification and Labelling of Chemicals (GHS) Classification	
Signal word	Danger
Hazard Classification	Oxidising solid – Category 2 (for calcium hypochlorite and solid potassium permanganate) OR Oxidising liquid – Category 2 (for hydrogen peroxide) Skin corrosion – Category 1B Acute toxicity – Category 4 Aquatic Toxicity – Category 1



	Hazard	H272	May intensify fire: oxidiser
	Statements	H302	Harmful if swallowed
		H314	Causes severe skin burns and eye damage
		H335	May cause respiratory irritation
		H400	Very toxic to aquatic life
	Prevention Precautionary	P221	Take any precaution to avoid mixing with combustibles
	Statements	P210	Keep away from heat / sparks / open flames / hot surfaces. No smoking
		P220	Keep / store away from clothing / combustible materials
		P273	Avoid release to the environment
		P260	Do not breathe dust / fume / gas / mist / vapours / spray
		P280	Wear protective gloves / protective clothing / eye protection / face protection
	Response Precautionary	P304+P340	If inhaled, remove person to fresh air and keep comfortable for breathing
	Statements	P303+P361+P353	If on skin, take off immediately all contaminated clothing. Rinse skin with water / shower
		P305+P351+P338	If in eyes, rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing
		P301+P310	If swallowed – Immediately call a Poisons Centre or doctor / physician
		P363	Wash contaminated clothing before re-use
		P312	Call a Poisons Centre or doctor / physician if you feel unwell
		P331	Do NOT induce vomiting
		P332+P313	If skin irritation occurs, get medical advice / attention
		P370+P378	In case of fire, use water fog, foam, dry chemical or carbon dioxide (CO_2) to extinguish
		P391	Collect spillage
	Storage	P405	Store locked up
	Precautionary Statements	P403+P233	Store on a well-ventilated place Keep container tightly closed



4. First aid measures

Inhalation	Remove person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Seek immediate medical attention.	
Ingestion	Do NOT induce vomiting. Immediately rinse mouth with water. Give a glass of water. Never give anything by mouth to an unconscious person. Seek immediate medical attention.	
Skin contact	Remove contaminated clothing and wash affected areas with soap and water. Seek immediate medical attention. Launder clothing before reuse. Skin burns: cover with a clean, dry dressing until medical help is available.	
Eye contact	Check for and remove any contact lenses. Immediately irrigate eyes with plenty of running water for at least 15 minutes, keeping eyelids open. Seek immediate medical attention.	
Note to physician	Treat symptomatically. Can cause corneal burns. Delayed effects from exposure to chlorine can include shortness of breath, headache, oedema and pneumonia.	



5. Fire fighting measures

Specific hazards	Non combustible, but will support combustion of other materials. Calcium hypochlorite is a powerful oxidising agent and decomposes violently upon heating, liberating oxygen and toxic chlorine gas.	
Suitable extinguishing media	Water spray (large quantities), foam, dry chemical or carbon dioxide (CO_2).	
Hazards from combustion products	Calcium hypochlorite may emit toxic chlorine gas.	
Precautions for fire fighters and special protective equipment	Fire-fighters should wear, self-contained breathing apparatus (SCBA) and protective clothing.	
Hazchem Code:	1W	



6. Accidental Release Measures

Wear self-contained breathing apparatus and full protective clothing. Evacuate all non-essential personnel from affected area. Ensure adequate ventilation. Do not breathe dust or fumes. Prevent spillage from entering drains or water courses. For solid oxidisers (calcium hypochlorite and crystalline potassium permanganate) - sweep up the spill, avoiding generation of dust. Immediately spread as a thin layer in uncontaminated, dry, open area to reduce the possibility of forming local hot spots. Do not return spilled material to original container. Do not add small amounts of water to calcium hypochlorite. Where a spill has occurred in a confined space or an inadequately ventilated enclosure and the material is damp and evolving chlorine, the rate of chlorine evolution can be reduced by covering the thinly spread solid with soda ash (sodium carbonate).

For liquid oxidisers – dilute / flood area with water, taking care to prevent entry of contaminated water into stormwater drains or water courses. Contain the spill using non-flammable inorganic materials until decomposition is completed naturally. If entry into drains or watercourses has occurred, inform appropriate authorities.



7. Handling and storage

Handling	Avoid skin and eye contact and breathing in vapour, mists and aerosols. Do not return unused product to original container. Always wash hands before smoking, eating, drinking or using the toilet. Wash contaminated clothing and other protective equipment before storage or re-use.
Storage	Follow the storage conditions recommended in the EPA's Operations and Management Handbook for Community Recycling Centres.



8. Acknowledgement

This Safety Data Sheet contains some material from Safety Data Sheets for oxidising materials from several suppliers that are available in the public domain, particularly those by POPS Group Pty Ltd (suppliers of Pool Pro brand of granular calcium hypochlorite) and Ixom Operations Pty Ltd (hydrogen peroxide). Their authorship of that material is acknowledged.

Community Recycling Centres

Safety data sheet for: SOLVENT-BASED PAINT (Oil-based paint)



1. Material and supplier identification

Containers of this paint can generally be identified by having the Flammable Liquids Dangerous Goods sign on them and / or by the text: "Wash brushes and equipment in mineral turpentine" (or similar).



Since materials delivered by householders to Community Recycling Centres are discarded ("waste") products and may have originated from a variety of manufacturers, full identification or hazard information is not available for each package. In the absence of full identification or hazard information, a precautionary approach must be taken by persons handling or storing the material.

Original suppliers may have included:

- Dulux Australia | 1956 Dandenong Road, Clayton VIC 3168 | Tel: 13 25 25 | Emergency Tel: 1800 033 111
- Taubmans Paints (now PPG Architectural Coatings) 9 Birmingham Avenue, Villawood NSW 2163 Tel: 02 9794 1200 Emergency Tel: 1800 883 254
- Wattyl (now Valspar Australia Pty Ltd) | Level 4, 2 Burbank Place, Baulkham Hills NSW 2153 | Tel: 02 8867 3333 | Emergency Tel: 1800 039 008

and many others.



2. Composition information

Solvent-based ("oil-based") paint may typically contain one or more of the following solvents in total concentrations of up to 90% by mass, the balance consisting of non-hazardous materials:

CHEMICAL ENTITY	CAS No
White spirit	8052-41-3
Mineral turpentine	-
Kerosene	64742-81-0
Xylene, mixture of isomers	1330-20-7
Toluene	108-88-3
1,2,4-trimethyl benzene	95-63-6
Naphtha (petroleum) light aromatic	64742-95-6
Naphtha (petroleum) medium aliphatic	64742-88-7



Emergency Overview HAZARDOUS CHEMICAL | DANGEROUS GOODS

Hazardous Classification	Hazardous (Safe Work Australia)
Australian Dangerous Goods (ADG) Classification	Class 3 – Flammable Liquids Note 1: Some solvent-based paints presented at a CRC may be Packaging Group II and some may be Packaging Group III Note 2: Some solvent-based paints presented at a CRC may contain toxic metals, such as lead; these paints should be stored separately with Class 6 Division 6.1 Toxic Substances
SUSMP Classification (Standard for the Uniform Scheduling of Medicines and Poisons or "Poisons Schedule")	Schedule 5
UN No	1263
Globally Harmonized System of Classification and Labelling of Chemicals (GHS) Classification	
Signal word	Warning
Hazard Classification	Flammable Liquid – Category 3 Aspiration Hazard – Category 2 Sensitisation – Skin – Category 1A Specific Target Organ Toxicity (Single Exposure) – Category 1A
Hazard Statements	 H226 Flammable liquid and vapour H305 May be harmful if swallowed and enters airways H317 May cause an allergic skin reaction H336 May cause drowsiness or dizziness



Prevention Precautionary Statements	P102 P210 P233 P243 P261 P272 P280	 Keep out of reach of children Keep away from all sources of ignition – No smoking Keep container tightly closed Take precautionary measures against static discharge Avoid breathing in mist / vapours Contaminated clothing should not be allowed Wear protective clothing, gloves, eye / face protection and suitable respirator as required
Response Precautionary Statements	P101 P304+P340	If medical advice is needed, have product container or label at hand If inhaled, remove person to fresh air and keep
		comfortable for breathing
	P303+P361+P353	If on skin, take off immediately all contaminated clothing. Rinse skin with water / shower
	P301+P310	If swallowed – Immediately call a Poisons Centre or doctor / physician
	P331	Do NOT induce vomiting
	P312	Call a Poisons centre or a doctor / physician if you feel unwell
	P363	Wash contaminated clothing before reuse
	P333+P313	If skin irritation or a rash occurs, get medical advice / attention
	P370+P378	In case of fire, use alcohol-resistant foam for extinction
Storage	P405	Store locked up
Precautionary Statements	P403+P235	Store on a well-ventilated place. Keep cool

4. First aid measures

If poisoning occurs, contact a doctor or Poisons Information Centre (Tel: 13 11 26).

Inhalation	Remove victim to fresh air. Remove contaminated clothing and loosen remaining clothing. Keep person warm and at rest. If not breathing, or breathing is irregular, provide artificial respiration or oxygen by a trained person.
Ingestion	Seek medical advice immediately and show the container or label. Keep person warm and at rest. Do NOT induce vomiting. Rinse mouth with water and give a glass of water to drink. If vomiting occurs, give further water.
Skin contact	Remove contaminated clothing and shoes. Wash skin thoroughly with soap and water or use recognised skin cleanser. Do NOT use solvents or thinners.
Eye contact	Remove contact lenses, irrigate eyes copiously with clean, fresh water, holding the eyelids apart for at least 10 minutes and seek immediate medical advice.
Note to physician	Treat symptomatically.



5. Fire fighting measures

Specific hazards	Flammable liquid. May form flammable vapour mixtures with air. Vapour may travel considerable distance to a source of ignition. Heating can cause expansion or decomposition, leading to violent rupture of containers.
Suitable extinguishing media	Dry chemical, CO ₂ or foam. Water fog may be used to keep fire-exposed containers cool. DO NOT USE WATER JET.
Hazards from combustion products	On burning, may emit toxic fumes, including oxides of carbon, nitrogen and metals, and products of incomplete combustion.
Precautions for fire fighters and special protective equipment	Fire fighters to wear self-contained breathing apparatus and suitable protective clothing if there is a risk of exposure to vapours or combustion products.
Hazchem Code:	3Y or 3YE



6. Accidental Release Measures

Small spills	Wear protective equipment to prevent skin and eye contamination. Soak up with absorbent. Allow absorbent to dry before collecting it for appropriate disposal.	
Larger spills	Wear protective equipment to prevent skin and eye contamination. Wear appropriate respirator if ventilation is inadequate. Shut off all possible sources of ignition. Clear area of all unprotected personnel. Prevent further leakage or spillage if able to do so safely. Contain the spill to prevent its spread or entry into drains or waterways. Soak up using absorbent and allow absorbent to dry before collecting it into labelled containers for appropriate disposal.	
Environmental precautions	Contain the spill to prevent entry into drains or waterways. If entry into waterways occurs, inform appropriate authorities.	



7. Handling and storage

Handling	Wear appropriate Personal Protective Equipment. Eating, drinking and smoking should be prohibited in areas where this material is handled. Avoid skin or eye contact or inhalation of vapours from any spilled material. Clean up spills immediately (see Section 6 above).
Storage	Follow the storage conditions recommended in the EPA's Operations and Management Handbook for Community Recycling Centres.



8. Acknowledgement

This Safety Data Sheet contains some material from Safety Data Sheets for solvent based paints from several manufacturers that are available in the public domain, particularly those by Dulux Australia and PPG Architectural Coatings, whose authorship of that material is acknowledged.



Safety data sheet for: TOXIC SUBSTANCES



1. Material and supplier identification

Toxic substances (Class 6 Division 6.1 in the Australian Code for the Transport of Goods by Road and Rail) are not included among the materials targeted by the CRC Program. However, small quantities of such materials may be occasionally dropped off at CRCs by householders, despite not being targeted (so-called "by-catch"), and all CRCs have provisions for storing them safely until they are collected for disposal. By far the most common such toxic substances are **garden chemicals** – a wide variety of insecticides, weed killers, **rat and mice poisons**, and other pesticides, current or outdated. These vary widely in their toxicity, and may be solid or in solution or suspension in water or a hydrocarbon. Very occasionally they may include strong poisons (such as cyanides or arsenic), or so-called "Schedule X" chemicals, which are persistent organochlorine compounds that are no longer permitted to be used in Australia. Very occasionally, other "historic" poisons, such as strychnine, may be brought in.

Since materials delivered by householders to Community Recycling Centres are discarded ("waste") products and may have originated from a variety of manufacturers, full identification or hazard information is not available for each package. In the absence of full identification or hazard information, a precautionary approach must be taken by persons handling or storing the material.

Given the wide variety of possible toxic substances that may be dropped off by householders at CRCs, the difficulty of producing a single Safety Data Sheet for them, and as part of the precautionary approach required by the NSW WHS Regulation, this Safety Data Sheet has been prepared for some of the most toxic materials that may be encountered at a CRC.

Original suppliers of toxic substances are too numerous to mention.



2. Composition information

Some examples of constituents that may be present in **toxic substances** dropped off at Community Recycling Centres are:

	CHEMICAL ENTITY	CAS No
	Sodium cyanide	143-33-9
OR	Potassium cyanide	151-50-8
OR	Arsenic trioxide	1327-53-3
OR	Dimethoate (an organophosphate), active ingredient in "Rogor" pesticide	60-51-5
OR	DDT (1,1,1-trichloro-2,2-bis (4-chlorophenyl) ethane)	50-29-3
OR	Strychnine	57-24-9



Emergency Overview HAZARDOUS CHEMICAL | DANGEROUS GOODS

Hazardous Classification	Hazardous chemicals		
Australian Dangerous Goods (ADG) Classification	Generally – Class 6 Division 6.1 Toxic Substances Some pesticides, which are in solution or suspension in a hydrocarbon liquid, are Class 3 Flammable Liquids, with Class 6 Division 6.1 being given as a Subsidiary Risk.		
SUSMP Classification (Standard for the Uniform Scheduling of Medicines and Poisons or "Poisons Schedule")	Schedule 7(cyanides, arsenic, DDT, strychnine)Schedule 6(dimethoate and some other organophosphate pesticides)		
UN No	Sodium cyanide – 1689 Arsenic trioxide – 1562 Organophosphorus pesticides – liquid, flammable, toxic – 2784 Organophosphate pesticide – liquid, toxic, flammable – 3017 Organochlorine pesticide – solid, toxic – 2761 Strychnine – 1692		
Globally Harmonized System of Classification and Labelling of Chemicals (GHS) Classification	Some of the more toxic substances that may occasionally be dropped off at a CRC have the following GHS classification:		
Signal word	Danger		

Community Recycling Centres

Hazard Classification	Acute toxicity		 Category 1 or 2 (cyanides, strychnine) Category 2 or 3 (arsenic trioxide) Category 2, 3 or 4 (organophosphates) Category 3 (DDT)
	Carcinogenicity		– Category 1A (arsenic trioxide) – Category 2 (DDT)
	Germ ce	ell mutagenicity	– Category 2 (arsenic trioxide)
	Skin coi	rrosion	- Category 1 (arsenic trioxide)
	-	target organ toxicity d exposure)	 Category 1 (arsenic trioxide, organophosphates)
	Skin ser	nsitizer	- Category 1 (organophosphates)
	Flamma	ble liquid	 Category 3 (pesticides, when in hydrocarbons)
	Hazardous to the aquatic environment (acute)		- Category 1
		ous to the aquatic ment (chronic)	- Category 1
	Hazard H330 Fatal if inhaled (cya		
Hazard	H330	Fatal if inhaled (cyani	ides)
Hazard Statements	H330 H331	Fatal if inhaled (cyani Toxic if inhaled (arse	
			nic trioxide)
	H331	Toxic if inhaled (arse Harmful if inhaled (or	nic trioxide)
	H331 H332	Toxic if inhaled (arser Harmful if inhaled (or Fatal in contact with	nic trioxide) rganophosphates)
	H331 H332 H310	Toxic if inhaled (arsen Harmful if inhaled (or Fatal in contact with Toxic in contact with	nic trioxide) rganophosphates) skin (cyanides, strychnine) skin (organophosphates) yanides, arsenic trioxide, some
	H331 H332 H310 H311	Toxic if inhaled (arser Harmful if inhaled (or Fatal in contact with Toxic in contact with Fatal if swallowed (cy	nic trioxide) rganophosphates) skin (cyanides, strychnine) skin (organophosphates) yanides, arsenic trioxide, some strychnine)
	H331 H332 H310 H311 H300	Toxic if inhaled (arsen Harmful if inhaled (or Fatal in contact with Toxic in contact with Fatal if swallowed (cy organophosphates, a	nic trioxide) rganophosphates) skin (cyanides, strychnine) skin (organophosphates) yanides, arsenic trioxide, some strychnine)
	H331 H332 H310 H311 H300 H301	Toxic if inhaled (arsen Harmful if inhaled (or Fatal in contact with Toxic in contact with Fatal if swallowed (cy organophosphates, Toxic if swallowed (C	nic trioxide) rganophosphates) skin (cyanides, strychnine) skin (organophosphates) vanides, arsenic trioxide, some strychnine) DDT) arsenic trioxide)
	H331 H332 H310 H311 H300 H301 H350	Toxic if inhaled (arser Harmful if inhaled (or Fatal in contact with Toxic in contact with Fatal if swallowed (cy organophosphates, Toxic if swallowed (D May cause cancer (a Suspected of causin	nic trioxide) rganophosphates) skin (cyanides, strychnine) skin (organophosphates) vanides, arsenic trioxide, some strychnine) DDT) arsenic trioxide)
	H331 H332 H310 H311 H300 H301 H350 H351	Toxic if inhaled (arser Harmful if inhaled (or Fatal in contact with Toxic in contact with Fatal if swallowed (cy organophosphates, Toxic if swallowed (D May cause cancer (a Suspected of causin Suspected of causin	nic trioxide) rganophosphates) skin (cyanides, strychnine) skin (organophosphates) vanides, arsenic trioxide, some strychnine) DDT) arsenic trioxide) ag cancer (DDT)
	H331 H332 H310 H311 H300 H301 H350 H351 H341	Toxic if inhaled (arser Harmful if inhaled (or Fatal in contact with Toxic in contact with Fatal if swallowed (cy organophosphates, a Toxic if swallowed (C May cause cancer (a Suspected of causin Suspected of causin Causes severe skin b	nic trioxide) rganophosphates) skin (cyanides, strychnine) skin (organophosphates) yanides, arsenic trioxide, some strychnine) DDT) arsenic trioxide) ng cancer (DDT) ng genetic defects (arsenic trioxide)
	H331 H332 H310 H311 H300 H301 H350 H351 H341 H314	Toxic if inhaled (arser Harmful if inhaled (or Fatal in contact with Toxic in contact with Fatal if swallowed (cy organophosphates, Toxic if swallowed (C May cause cancer (a Suspected of causin Suspected of causin Causes severe skin b Causes damage to c exposure (arsenic tric	nic trioxide) rganophosphates) skin (cyanides, strychnine) skin (organophosphates) yanides, arsenic trioxide, some strychnine) DDT) arsenic trioxide) ng cancer (DDT) ng genetic defects (arsenic trioxide) burns and eye damage (arsenic trioxide) prgans through prolonged or repeated
	H331 H332 H310 H311 H300 H301 H351 H351 H314 H314 H372	Toxic if inhaled (arser Harmful if inhaled (or Fatal in contact with Toxic in contact with Fatal if swallowed (cy organophosphates, Toxic if swallowed (C May cause cancer (a Suspected of causin Causes severe skin Causes damage to c exposure (arsenic tric	nic trioxide) rganophosphates) skin (cyanides, strychnine) skin (organophosphates) yanides, arsenic trioxide, some strychnine) DDT) arsenic trioxide) rg cancer (DDT) rg genetic defects (arsenic trioxide) burns and eye damage (arsenic trioxide) burns and eye damage (arsenic trioxide) organs through prolonged or repeated oxide, organophosphates, DDT) c skin reaction (organophosphates) d vapour (pesticides in solution /
	H331 H332 H310 H311 H300 H301 H351 H341 H314 H372 H317	Toxic if inhaled (arser Harmful if inhaled (or Fatal in contact with Toxic in contact with Fatal if swallowed (cy organophosphates, Toxic if swallowed (C May cause cancer (a Suspected of causin Causes severe skin Causes damage to c exposure (arsenic tric May cause an allergi Flammable liquid and suspension in hydrod	nic trioxide) rganophosphates) skin (cyanides, strychnine) skin (organophosphates) yanides, arsenic trioxide, some strychnine) DDT) arsenic trioxide) rg cancer (DDT) rg genetic defects (arsenic trioxide) burns and eye damage (arsenic trioxide) burns and eye damage (arsenic trioxide) organs through prolonged or repeated oxide, organophosphates, DDT) c skin reaction (organophosphates) d vapour (pesticides in solution /

Prevention Precautionary Statements	P260 P264 P280	Do not breathe dust / fume / gas / mist / vapours / spray Wash hands thoroughly after handling Wear protective gloves / protective clothing / eye protection / face protection
	P210 (for pesticides dissolved or suspended in hydrocarbons – generally, but not always, labelled with the Flammable Liquids sign):	Keep away from heat / sparks / open flames / hot surfaces – No smoking
	P233	Keep container tightly closed
	P243	Take precautionary measures against static discharge
Response Precautionary	P301+P310	If swallowed, immediately call a Poisons Centre or a doctor / physician
Statements	P330	Rinse mouth
	P304+P310	If inhaled, immediately call a Poisons Centre or a doctor / physician
	P304+P340	If inhaled, remove person to fresh air and keep comfortable for breathing
	P302+P352	If on skin, wash with plenty of water
	P305+P351+P338	If in eyes, rinse copiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.
	P308+P353 (DDT, arsenic trioxide)	If exposed or concerned, get medical advice / attention
	P363	Wash contaminated clothing before reuse
	P332+P313 (organophosphates)	If skin irritation occurs, get medical advice / attention
Storage	P405	Store locked up
Precautionary Statements	P403+P233	Store on a well-ventilated place. Keep container tightly closed

4. First aid measures

If poisoning occurs, contact a doctor or Poisons Information Centre (Tel: 13 11 26).

First aid measures for toxic substances other than cyanide:

Inhalation	Remove person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, oxygen may be beneficial, if administered by a trained person, preferably on a doctor's advice. Do not allow the person to move about unnecessarily. In some cases, symptoms of pulmonary oedema may be delayed up to 48 hours after exposure. Seek immediate medical attention.
Ingestion	Do NOT induce vomiting. Immediately rinse mouth with water. Never give anything by mouth to an unconscious person. Seek immediate medical attention. Make every effort to prevent vomit from entering the lungs by careful placement of the patient.
Skin contact	Remove contaminated clothing and wash affected areas with soap and water. Seek immediate medical attention. Launder clothing before reuse.
Eye contact	Check for and remove any contact lenses. Immediately irrigate eyes with plenty of running water for at least 20 minutes, keeping eyelids open. Take care not to rinse contaminated water into unaffected eye or on face. Seek immediate medical attention.

First aid measures for cyanide are provided on the following page.

FIRST AID MEASURES FOR CYANIDE POISONING

This is a special section on cyanide poisoning, since it is extremely serious and requires a somewhat different approach from other forms of poisoning.

To be effective, first aid must be prompt. Sodium and potassium cyanide are poisonous by ingestion and by inhalation of their dust. Contact with skin and eyes may cause irritation of the skin and eyes and poisoning symptoms similar to those for ingestion.

Of prime importance is the protection of the rescuer. No attempt at rescue should be performed until an appropriate hazard assessment of the exposure site is made and appropriate personal protection equipment and personnel are in place.

First aid procedures, equipment, medication and training should be in place BEFORE there is any possibility of exposure. First aid personnel should be aware of the nearest hospitals, which are familiar with the treatment of cyanide exposure.

Equipment and medication in place should be:

- Safety shower and eyewash station immediately accessible
- Fresh, clean, cool drinking water
- Resuscitation bag and mask (or Oxy-Viva)
- Cyanide emergency kit containing amyl nitrite pearls; hydroxycobalamine and sodium thiosulphate
- "Space" or thermal blankets for treating patients for shock

First aid personnel should observe the following precautions:

- Wear protective gloves
- Wear protective goggles
- Wear suitable respiratory protection

IF SWALLOWED

- Remove patient from the source of contamination
- If the patient is not breathing, DO NOT use mouth-to-mouth or mouth-to-nose ventilation, instead use resuscitation bag and mask (Oxy-Viva)
- If pulse is absent, start external cardiac massage and follow standard Advanced Cardiovascular Support guidelines
- Give 100% oxygen by mask (Oxy-Viva) if available
- Remove all contaminated clothing and footwear into a sealable collection bag – launder contaminated clothing thoroughly and wash the affected areas with soap and copious amounts of water
- Arrange for urgent transfer of the patient, accompanied by an attendant with the Cyanide Emergency Kit, to medical professionals
- Persons designated as competent may open the Cyanide Emergency Kit and commence use of amyl nitrite pearls

IF IN EYES

 Immediately irrigate eyes with copious amounts of water, while holding eyelids open, for at least 15 minutes. Seek medical assistance immediately.

IF ON SKIN

 Wash affected area with copious amounts of water for at least
 15 minutes. Remove contaminated clothing and launder before reuse.
 Seek medical assistance.

IF INHALED

• Proceed as in "IF SWALLOWED" above



5. Fire fighting measures

Specific hazards	Toxic substances that may be encountered at a CRC vary widely in their combustion characteristics and behaviour in a fire. Some (e.g. cyanides, arsenic trioxide) are not combustible, while others, particularly pesticides suspended or dissolved in hydrocarbons, are flammable liquids. The precautionary approach would be to treat all toxic substances as flammable.		
Suitable extinguishing media	Water fog, foam or dry chemical. Carbon dioxide (CO ₂) is not recommended if cyanides are involved in a fire. DO NOT USE STRAIGHT STREAMS OF WATER		
Hazards from combustion products	Sodium cyanide, when heated, may emit highly toxic hydrogen cyanide gas. Other toxic substances may also emit toxic decomposition products when involved in a fire.		
Precautions for fire fighters and special protective equipment	Fire-fighters should wear self-contained breathing apparatus (SCBA) and protective clothing.		
Hazchem Codes:	2X 2Z 3WE 3W	Cyanides, solid organophosphorus pesticides, organochlorine pesticides, strychnine Arsenic trioxide Liquid flammable organophosphorus pesticides Liquid toxic organophosphorus pesticides	



6. Accidental Release Measures

Observe the following general principles in containing and cleaning up a spill

- Evacuate all non-essential and unprotected personnel
- Wear appropriate personal protective equipment, including respiratory protection
- Eliminate all ignition sources (as some of the spilled materials may be flammable)
- Contain the spill by bunding it with sand, soil or vermiculite to prevent it from spreading and / or entering into drains and / or waterways. If entry into a waterway has occurred, ensure that appropriate authorities are notified
- Absorb the spill in an appropriate material that does not interact with the spill material.
- Collect the spill and contaminated absorbent into appropriately labelled containers for subsequent disposal. Use non-sparking tools.
- Clean the surface(s) that have been affected by the spill.

ADDITIONAL STEPS FOR A CYANIDE SPILL

Because of their extremely high toxicity, cyanide spills require some additional steps. After the spill and the absorbent material have been scooped up, the remaining material should be covered with lime or soda ash, then ferrous sulphate added on top, and mixed in well. After standing for about 30 minutes, the remaining material may be scooped up and placed into labelled containers. The surface should finally be cleaned with a dilute solution of calcium or sodium hypochlorite, to remove the last traces of free cyanide.



7. Handling and storage

Handling	Wear appropriate Personal Protective Equipment. Eating, drinking and smoking should be prohibited in areas where these materials are handled. Avoid skin or eye contact or inhalation of vapours from any spilled material. Clean up spills immediately (see Section 6 above).
Storage	Follow the storage conditions recommended in the EPA's Operations and Management Handbook for Community Recycling Centres.



8. Acknowledgement

This Safety Data Sheet contains some material from Safety Data Sheets for a number of toxic substances from several suppliers that are available in the public domain, particularly those by CSBP Limited (sodium cyanide), ALDI GC Pty Ltd (arsenic trioxide) and FMC Australasia Pty Ltd, Nufarm Australia Ltd and Sipcam Pacific Australia Pty Ltd (organophosphate pesticides). Their authorship of that material is acknowledged.



Safety data sheet for: WATER-BASED PAINT



1. Material and supplier identification

Other names: Aqueous paint, acrylic paint, latex paint.

Containers of water-based paint can generally be identified by the text "Wash brushes and equipment in water".

Since materials delivered by householders to Community Recycling Centres are discarded ("waste") products and may have originated from a variety of manufacturers, full identification or hazard information is not available for each package. In the absence of full identification or hazard information, a precautionary approach must be taken by persons handling or storing the material.

Original suppliers may have included:

- Dulux Australia | 1956 Dandenong Road, Clayton VIC 3168 | Tel: 13 25 25 | Emergency Tel: 1800 033 111
- Taubmans Paints (now PPG Architectural Coatings) 9 Birmingham Avenue, Villawood NSW 2163 Tel: 02 9794 1200 Emergency Tel: 1800 883 254
- Wattyl (now Valspar Australia Pty Ltd) | Level 4, 2 Burbank Place, Baulkham Hills NSW 2153 | Tel: 02 8867 3333 | Emergency Tel: 1800 039 008

and many others.



2. Composition information

CHEMICAL ENTITY	CAS No	Proportion
Ingredients determined to be non-hazardous	-	100%



Emergency Overview NON-HAZARDOUS SUBSTANCE | NON-DANGEROUS GOODS

Hazardous Classification	Based on available information, water-based paints are not classified as hazardous according to criteria of Safe Work Australia.
Australian Dangerous Goods (ADG) Classification	Non-Dangerous Goods (i.e. not classified)
SUSMP Classification (Standard for the Uniform Scheduling of Medicines and Poisons or "Poisons Schedule")	Not classified
UN No	Not classified
Globally Harmonized System of Classification and Labelling of Chemicals (GHS) Classification	Not classified



4. First aid measures

If poisoning occurs, contact a doctor or Poisons Information Centre (Tel: 13 11 26).

Inhalation	Remove victim to fresh air. Remove contaminated clothing and loosen remaining clothing. Keep person warm and at rest. If not breathing, or breathing is irregular, provide artificial respiration or oxygen by a trained person.
Ingestion	Seek medical advice and show the container or label. Keep person warm and at rest. Do NOT induce vomiting. Rinse mouth with water and give a glass of water to drink. If vomiting occurs, give further water.
Skin contact	Remove contaminated clothing and shoes. Wash skin thoroughly with soap and water or use recognised skin cleanser. Do NOT use solvents or thinners.
Eye contact	Remove contact lenses, irrigate eyes copiously with clean, fresh water, holding the eyelids apart for at least 10 minutes and seek medical advice.
Note to physician	Treat symptomatically.



5. Fire fighting measures

Specific hazards	Non-combustible material. However, if the product is caught in a surrounding fire, residual materials may ignite following evaporation of aqueous components.
Suitable extinguishing media	Use an extinguishing agent suitable for the surrounding fire. Use water fog to keep containers cool.
Hazards from combustion products	If residual materials are ignited after evaporation of the aqueous component, fumes may include smoke, oxides of carbon and metals and products of incomplete combustion.
Precautions for fire fighters and special protective equipment	Fire fighters to wear self-contained breathing apparatus and suitable protective clothing if there is a risk of exposure to vapours or decomposition products.
Hazchem Code:	Not applicable



6. Accidental Release Measures

Small spills	Wear protective equipment to prevent skin and eye contamination. Soak up with absorbent. Place contaminated absorbent in an appropriate waste disposal container and dispose of appropriately.
Larger spills	Wear protective equipment to prevent skin and eye contamination. Slippery when spilt. Move containers from spill area. Clear area of all unprotected personnel. Prevent further leakage or spillage if able to do so safely. Contain the spill to prevent its spread or entry into drains or waterways. Soak up using absorbent and place contaminated absorbent it into labelled containers for appropriate disposal.
Environmental precautions	Contain the spill to prevent entry into drains or waterways. If entry into waterways occurs, inform appropriate authorities.



7. Handling and storage

Handling	Wear appropriate personal protection equipment to prevent skin or eye contact or inhalation of vapours from any spilled material.
Storage	Follow the storage conditions recommended in the EPA's Operations and Management Handbook for Community Recycling Centres.



8. Acknowledgement

This Safety Data Sheet contains some material from Safety Data Sheets for water based paints from several manufacturers that are available in the public domain, particularly those by Dulux Australia and PPG Architectural Coatings, whose authorship of that material is acknowledged.