

Landfill Environmental Management Plan for Goulburn Waste Management Centre

2011

Goulburn Mulwaree Council



Goulburn Mulwaree Council Goulburn Waste Management Centre

- All persons enter this facility at their own risk.
- Always ensure that a receipt is provided for tipping fees.
 - The directions of staff must be obeyed at all times.
- Arrangements for disposal of Asbestos or burial of documents must be made separately. **RING 02 4823 4465**
- Non payment of full tipping fees is an offence and may result in Prosecution.



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GLOSSARY

Building & Demolition Waste	Waste derived from building and demolition activities						
Centre (the)	Goulburn Waste Management Centre						
Clean-up Waste	Household rubbish that is too large to fit in garbage bins. Typically collection of items from a clean-up						
CPRS	Carbon Pollution Reduction Scheme						
Compost Bins	Large containers, usually made from plastic, for home composting of organic material						
Commercial / Industrial Waste	Waste derived from commercial and industrial activities						
OEH	Office of Environment and Heritage within the NSW Premier's Department (formerly the Department of Environment, Climate Change and Water), and includes reference to the Environment Protection Authority						
DNR	Department of Natural Resources						
Domestic Waste	All waste generated by people at home but usually refers especially to those waste removed from householders' property by the local council's waste collection service, ie. garbage, recyclables, clean-up, white goods and garden waste						
Drop-off Centre	A public facility for delivery and storage of recyclables or other materials that can be segregated from the garbage stream						
EPL	Environment Protection Licence						
Excluded Waste	Unless the waste satisfies the OEH's industrial waste disposal criteria, the following materials are considered Excluded Waste: <ul style="list-style-type: none">▪ liquid waste of any description;▪ radioactive material;▪ any inflammable liquid or material derived from grease, oil, tar, petroleum, shale or coal;▪ any sludge material (unless it can be shown to be innocuous and harmless) being the waste from any industrial process carried on in:<ul style="list-style-type: none">a) any tanning or leather processing plant;b) any petroleum or petrochemical plant;c) any chemical plant;d) any paint manufacturing plant;e) any metal treatment plant;f) any vegetable oil or mineral oil plant; org) any pharmaceutical or drum manufacturing plant.▪ any material containing arsenic, cyanide and/or sulphide;▪ any toxic salt of the following:<table><tr><td>barium</td><td>copper</td><td>selenium</td></tr><tr><td>boron</td><td>lead</td><td>silver</td></tr></table>	barium	copper	selenium	boron	lead	silver
barium	copper	selenium					
boron	lead	silver					

	cadmium	manganese	zinc
	chromium	mercury	
		<ul style="list-style-type: none"> ▪ any pesticide or weedicide and in particular: <ul style="list-style-type: none"> a) chlorinated hydrocarbons; b) fluorinated hydrocarbons; c) organophosphates; and d) phenols. ▪ any soluble acid or alkali or acidic or basic compounds. 	
Extended Regulated Area	Comprises all local government areas within the Sydney Metropolitan Area and outer local government areas to the limits of Cessnock, Port Stephens, Shoalhaven and Wingecarribee		
Garden Waste	Organic waste from gardens (such as clippings, grass, etc.)		
Green Waste	Organic waste including garden waste, food and wood waste		
Guidelines	Environmental Guidelines: Solid Waste Landfill, <i>NSW Environment Protection Authority, January 1996</i>		
HDPE	High density polyethylene plastic		
Landfill	Facility where wastes are buried for disposal		
Landfill Gas	Gaseous emissions resulting from the decomposition of organic matter within the landfill. The gas typically comprises 60% methane and 40% carbon dioxide		
Leachate	Water that has percolated / migrated through landfilled waste and generally contains contaminants absorbed from the waste material		
Legacy Emissions	Future Landfill Gas emissions resulting from the decomposition of organic wastes already interred in the landfill.		
LGA	Local government area		
LRRA	Litter & Recycling Research Association		
Permitted Waste	Permitted Waste are wastes not defined as Excluded Waste, including putrescible and non-putrescible waste from domestic, commercial and industrial sources within the Goulburn Mulwaree Shire		
PET	Polyethylene Terephthalate plastic, such as for drink bottles		
POEO Act	<i>Protection of the Environment Operations Act 1997</i>		
Problematic Waste	Problematic Wastes include but are not limited to: <ul style="list-style-type: none"> ▪ animal carcasses; ▪ contaminated waste/material; ▪ lowly contaminated soils and other waste; ▪ security or confidential documents or disposals on behalf of the Collector of Customs; ▪ waste with the potential to incur significant control problems in terms of wind blow debris such as sawdust, 		

	grain dust etc.; and
	<ul style="list-style-type: none">▪ approved Special Waste subject to individual disposal requirements and regulations, e.g. asbestos.
Scavenging	Recovery of waste materials from the active tipping face of the Centre
Special Waste	Special Wastes include: <ul style="list-style-type: none">▪ clinical and related waste;▪ asbestos waste; and▪ waste tyres.
Trade Waste	Liquid waste delivered into the municipal sewer system and covered by a formal Trade Waste Approval
VENM	Virgin Excavated Natural Material
WARR Strategy	NSW Government's <i>Waste Reduction and Resource Recovery Strategy 2007</i>
White Goods	Household white goods including refrigerators, washing machines, hot water systems and other materials with a high metal content that makes the items attractive to scrap metal merchants

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1 Introduction

1.1 History

Goulburn Mulwaree Council (Council) operates the Goulburn Waste Management Centre (the Centre) at Sinclair Street, Goulburn. In early 1995, the original Plan of Management (the Plan) was prepared after a review of the Centre's operations in accordance with regulatory requirements and best practice landfilling procedures at that time. However, since its preparation, legislation, available technologies and current practices have undergone significant changes.

Council subsequently commissioned Ecowise Environmental (Ecowise) in association with Phil Hawley & Associates (PHA) during 2005 to audit the Centre's operations against the Plan. The audit results revealed that a large number of alterations to the Plan were required to reflect the positive changes that have occurred at the Centre and to ensure it meets all its statutory, health, safety and environmental obligations. This resulted in an updated version of the Plan being presented to Council during early 2007 (the 2007 Plan).

However, with changing legislation and management, it became clear that the 2007 Plan required further minor updating and PHA was accordingly engaged to undertake that minor revision. This 2009 edition of the Plan is the result.

1.2 Objectives

This Plan of Management has been prepared based on the *Environmental Guidelines: Solid Waste Landfill 1996*¹ (the Guidelines) issued by the former New South Wales Environment Protection Authority (EPA) and now the Department of Environment, Climate Change and Water (OEH), and describes the Centre's operation in some detail. The Plan specifies aspects of routine and emergency operations of the Centre and the level of performance required by Council in developing, operating and rehabilitating the Centre.

Specifically the Plan addresses:

- statutory requirements;
- a description of the existing site;
- the design and operation of the landfill;
- environmental management measures implemented at the site;
- environmental monitoring undertaken at the site;
- site rehabilitation and post closure management; and,
- reporting requirements.

Council is responsible for ensuring that all staff members employed at the Centre are familiar with the requirements and operational procedures described in this document. To assist in this process operational staff are referred to the Goulburn Waste Management Centre Operations Manual, which is a companion volume to this document.

¹ Environmental Guidelines: Solid Waste Landfill, *NSW Environment Protection Authority, January 1996*

Further, Council shall ensure that the Centre operates in strict accordance with all statutory requirements as specified in Section 2.

The Plan has been developed to facilitate the safe and efficient operation of the Centre, to maximise the life of the site and ensure that the environment and nearby communities are safeguarded from pollution and off-site effects such as odour, litter, dust and noise.

1.2.1 Emergency Procedures

Emergency procedures and detailed contact lists are contained in the Operations Manual Vol 1

1.3 Limitations

This 2011 revision of the Plan is a minor update and accordingly mostly draws on the information contained within the 2007 plan.

Baseline data has not been updated except where it is readily available and relevant. The majority of the amendments to the Plan are as a result of legislative and planning changes and foreshadowed legislative changes e.g. the impending carbon tax.

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2 Statutory Requirements

2.1 NSW Department of Environment, Climate Change and Water

2.1.1 Licensing

The regulation of landfills used to be governed by the *Waste Minimisation and Management Act 1995*. However, in 2001, it was repealed and replaced by the *Waste Avoidance and Resource Recovery Act 2001*, which no longer deals with the regulation of landfills. Waste facilities are now governed by the *Protection of the Environment Operations Act 1997* (POEO Act) and associated regulations, which provides the legislative framework for regulation of solid waste landfilling within NSW. These regulations include the *Protection of the Environment Operations (Waste) Regulation 2005* and the *Protection of the Environment Operations Amendment (Schedule Activities and Waste) Regulation 2008* which particularly impact the operation of the Centre.

Under the POEO Act, the Centre is classified as a scheduled activity that requires an Environment Protection Licence (EPL) from the OEH. This licence (Licence No 6780) sets out the Council's obligations with respect to operational, monitoring and reporting conditions (see Appendix A).

2.1.2 Guidelines

The OEH's *Environmental Guidelines: Solid Waste Landfill 1996* (the Guidelines) outlines a performance-based approach to achieving environmental outcomes. The priority for existing landfills is to ensure that the facilities are operated in a manner that minimises environmental impact, and achieves effective site remediation. Within this performance based approach, a number of environmental goals were set for which landfill design, monitoring, management and remediation must comply with. These goals are geared towards:

- preventing water pollution;
- preventing air pollution;
- promoting responsible land management and conservation; and
- preventing hazards and loss of amenity.

Therefore, the Guidelines do not set down specific design criteria such as liner thickness or the types of leachate collection system or gas collection system. Instead, they put forward benchmark techniques which provide guidance on possible solutions for effectively achieving the primary goals outlined above. There are 39 Benchmark techniques outlined in the Guidelines which relate to the leachate barrier and collection system, surface water and groundwater, gas drainage, fire prevention, site closure, recycling, monitoring incoming waste, noise, dust and many others.

The mechanism for OEH regulation of landfilling operations is based around licensing those facilities which have the greatest potential to cause environmental impact. **All licensed landfills are required to have a detailed Landfill Environmental Management Plan (LEMP), which describes the strategy and measures for managing the landfilling operation and achieving the environmental goals as defined in the Guidelines. Operation of the landfill must then comply with the LEMP, and operators are required to report annually to the OEH, who checks the performance of the operation against the commitments made in the LEMP.**

This LEMP has been prepared taking into account the requirements of these Guidelines.

2.1.3 Resource Recovery

The Waste Avoidance and Resource Recovery Act 2001 imposes on the NSW Government an obligation to develop a state-wide waste strategy. This strategy (the WARR strategy), which is to be reviewed every two-years, is binding on councils in NSW, including GMC.

The 2007 WARR strategy revision contains targets for recycling, particularly for commercial and industrial (C&I) wastes and construction and demolition (C&D) wastes. Although there are no specific directives with respect to Council, it would be prudent for Council to actively support the WARR strategic direction. A positive benefit to Council will be the extension of the operational life of the Centre.

2.1.4 Landfill Environmental Goals

A summary of the environmental goals as defined in the Guidelines and where to find the proposed measures to achieve these goals in this Plan is provided in Table 2-1.

Table 2-1 Environmental goals and proposed control measures

Environmental Goal	Relevant Section of LEMP
1. Water Pollution	
1.1 Preventing pollution of water by leachate	4.7, 4.10, 5.1
1.2. Detecting water pollution	6.1, 6.2, 6.3,
1.3. Remediating water pollution	6.2, 6.3,
2. Air Pollution	
2.1 Preventing landfill gas emissions	4.10, 5.3
2.2 Detecting landfill gas emissions	6.4
2.3 Remediating landfill gas emissions	5.3
3. Land Management and Conservation	
3.1 Assuring quality of design, construction and operation	4.21
3.2 Assuring quality of incoming waste	4.8
3.3 Recording of wastes received	4.2, 4.8
3.4 Minimising landfill space used	4.9
3.5 Maximising Resource Recovery	4.3
3.6 Remediating landfill after closure	7.1, 7.2, 7.3,
4. Hazards and Loss of Amenity	
4.1 Preventing unauthorised entry	4.15
4.2 Preventing degradation of local amenity	5.5, 5.6, 5.7, 5.8
4.3 Preventing noise pollution	5.9
4.4 Adequate fire fighting capacity	4.19
4.5 Adequate staffing and training	4.11, 4.12, 4.16

2.2 Federal Obligations

2.2.1 Carbon Pollution Reduction Scheme

As at the time of preparing this 2009 revision to the Plan, the Commonwealth Government was preparing legislation for the introduction of the Carbon Pollution Reduction Scheme (CPRS) from 1 July 2011.

The White Paper² on carbon trading indicated that the Government will require owners of landfills that emit more than 25,000 tonnes of CO₂ equivalent greenhouse gas per annum (CO₂-e) to purchase pollution permits for the emissions from these facilities. Initial indications are that the Centre is close to this threshold. Facilities located close together (say within 80 km) will have a 10,000 t CO₂-e threshold, but this does not include those facilities that have already been closed.

It is currently unclear whether any of the facilities operated by Council will be “captured” by the new legislation. If the Centre is captured, then Council will have a major incentive to aggressively reduce waste to landfill and in particular organic waste, as well as seek to recover landfill gas. It will also have to factor the cost of carbon permits into its gate fees, including for the cost of legacy emissions (i.e. those emissions that result from the decomposition of organic material already interred in the landfill).

2.3 Other

Council will comply with all relevant requirements of:

- Acts of the Commonwealth;
- Acts and ordinances of the State of New South Wales;
- WorkCover Authority of NSW;
- Relevant Government Departments and Statutory Authorities, and in particular the NSW OEH;
- any ordinances, regulations, by-laws, orders and proclamations in force in NSW; and
- persons exercising statutory powers enabling them to give directions affecting the operation of the landfill.

² Carbon Pollution Reduction Scheme – Australia’s Low Pollution Future
Commonwealth of Australia White Paper 15 December 2008

3 EXISTING SITE

3.1 Location

The Centre is located at 100 Sinclair Street on the eastern edge of the City. Figure 3-2 shows the location of the Centre.

3.2 Land Use and Planning

The Centre is zoned as Zone SP2 Infrastructure, by the *Goulburn Local Environmental Plan (LEP) 2009*. Figure 3-3 shows the use of the land as "Waste Management Facility" and the land adjacent to the site is zoned as B6 Enterprise Corridor, RE1 Public Recreation and E2 Environmental Conservation. There are a small number of rural residences to the west of the site, the closest being about 1500 m west of the site boundary. The closest area zoned as urban residential is on the western side of the main southern railway and located approximately 1500m north and west of the site. There are limited long distance views of the site at present from rural residences to the northwest of the site. The Centre will become more visible as it is raised and could become prominent from higher ground to the west of the Goulburn urban area.

The reserve for the landfill was declared on 29 September, 1900. The Centre received the products from the sanitary pan services up until approximately 1950, after which time the pans were emptied at a sewer dump point. Completion of the sewerage system by 1992 has meant that domestic pan services no longer exist in the area.

3.3 Land Ownership

The Centre is located on a parcel of land known as Portion 265, a reserve (R31513) for sanitary purposes. The land is owned by the Crown. Council is the trustee of the site while it is being used for the landfill operation, having been appointed as Corporate Trust Manager pursuant to Section 95 of the *Crown Lands Act 1989*. Once the operation has ceased and the site no longer poses an environmental threat, the land will come under the administration of the Department of Natural Resources (DNR).

3.4 Topography

The site is at the foot of the Mount Gray complex and its topography is shown in

Figure 3-4. The site forms a slight saddle between two hills. The majority of the site slopes downwards in a north-westerly direction. The southern end of the site falls to the south-west. The topography of the site has been, and will continue to be, altered by the landfilling operation.

3.5 Geology and Hydrogeology

The site comprises a foot slope of the Mount Gray complex. The predominant geology of the site comprises highly sheared, late Silurian age rocks of volcanic origin. Other geology consists of rock deposited during the late Devonian period. This rock material consists of sandstones and siltstones, metamorphosed to phyllite, slate and quartzite on site. Outcrops of quartzite occur at points through the site as either solid rock outcrops or individual areas of rock, identified as single

boulders. In some areas this rock is highly fractured and subject to deep weathering. There are major depositions of sands with minor clays in the southern sector of the site (Reme Soils, 1990).

Groundwater is quite deep below the site. Figure 3-1 shows the location of the groundwater monitoring bores. Depths to groundwater, measured in the bores on 20th November 1995, are contained in Table 3-1. The report outlining groundwater bore construction and groundwater monitoring program details is contained in Appendix B.

Table 3-1 Depth to groundwater

Groundwater Bore	Approximate Surface Level (m)	Depth to Groundwater (m)
BH1	694.5	11.2
BH2	695.5	33.0
BH3	679.0	18.2

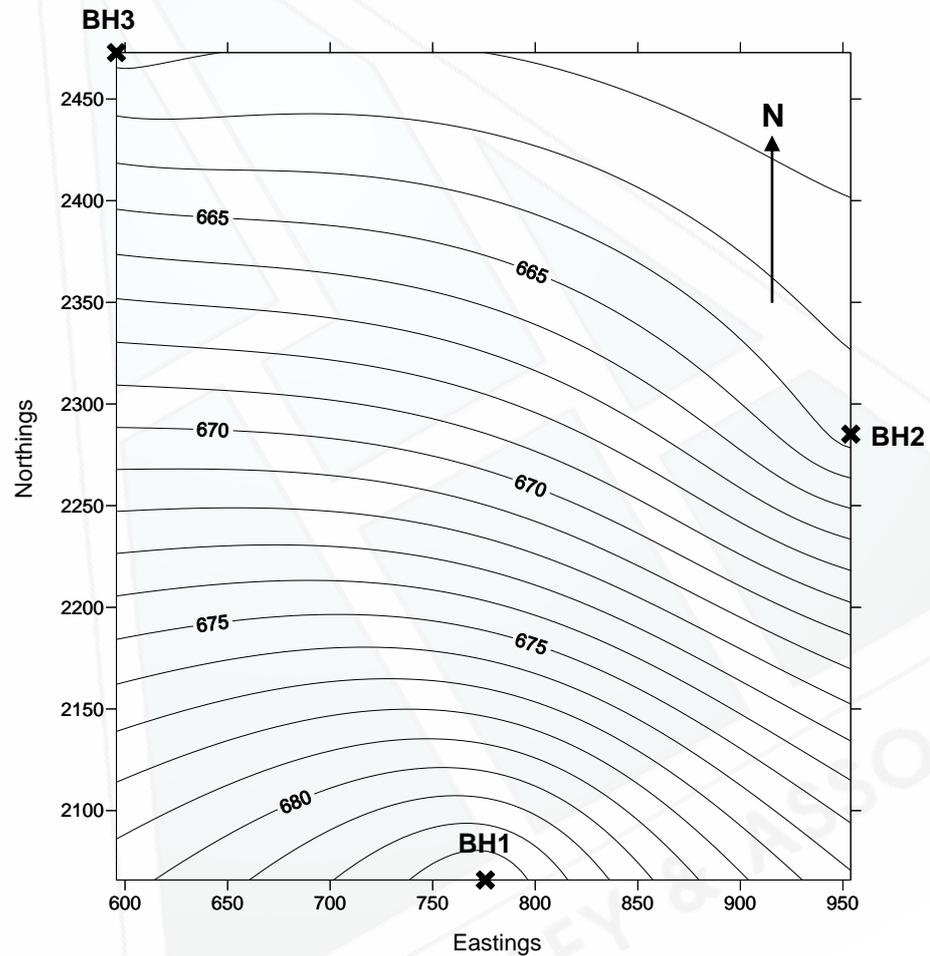


Figure 3-1: Contours of groundwater levels (RL-AHD) in metres based on levels from BH1, 2 and 3

Groundwater flows from the higher groundwater level to the lower groundwater level. Based on this and the above groundwater measurements, groundwater is generally flowing in a northerly direction.

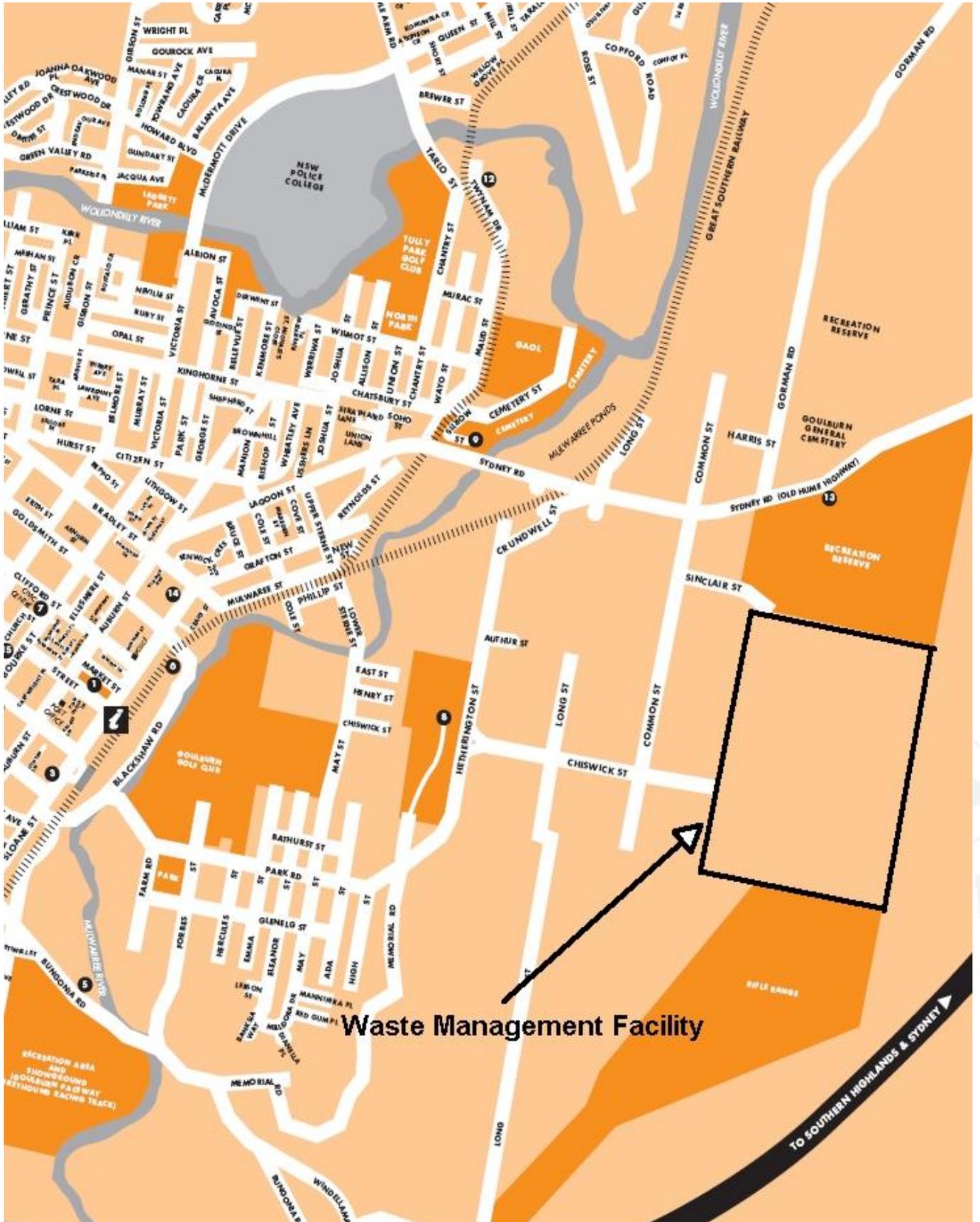


Figure 3-2: Goulburn landfill location relative to town

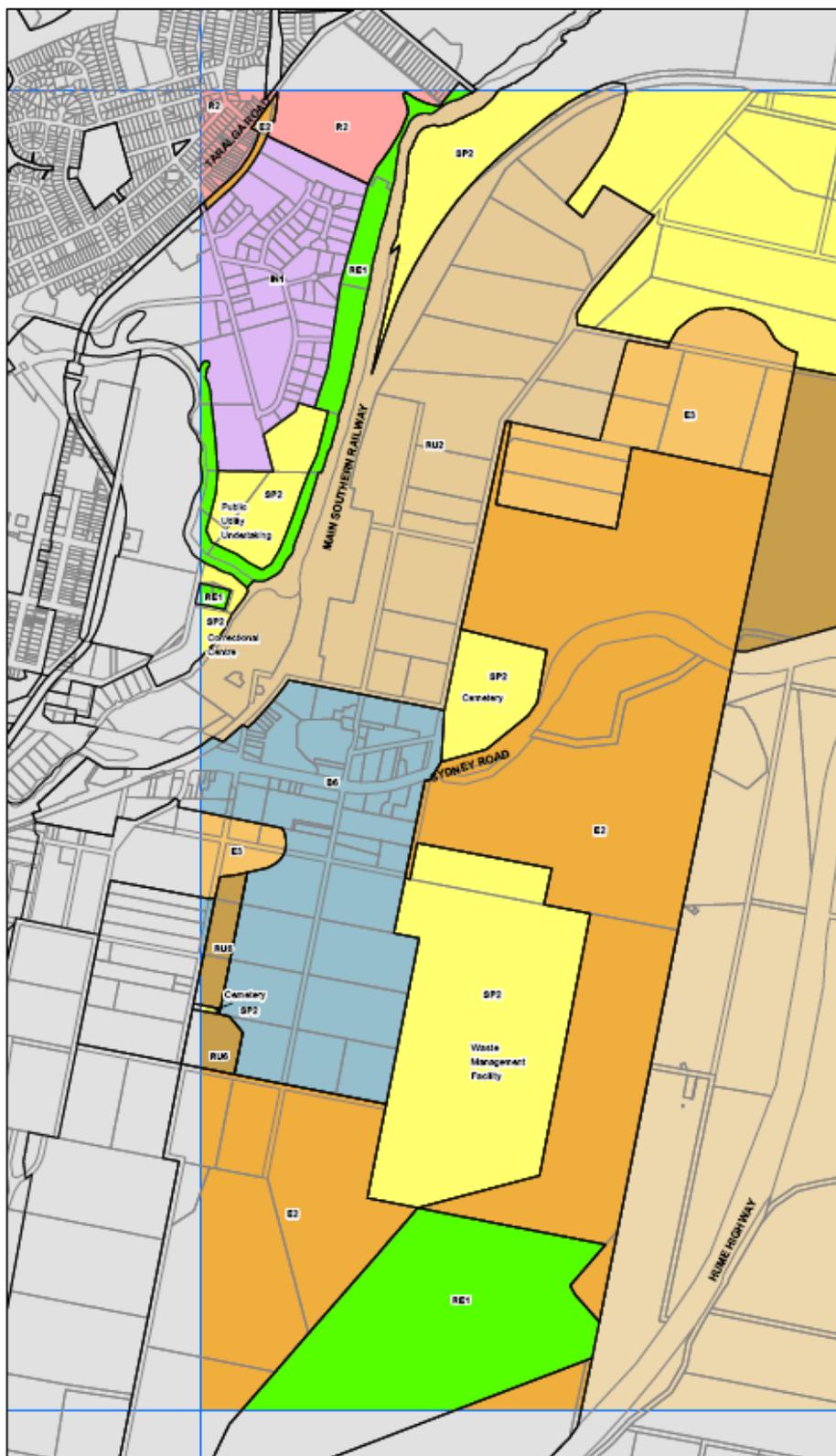
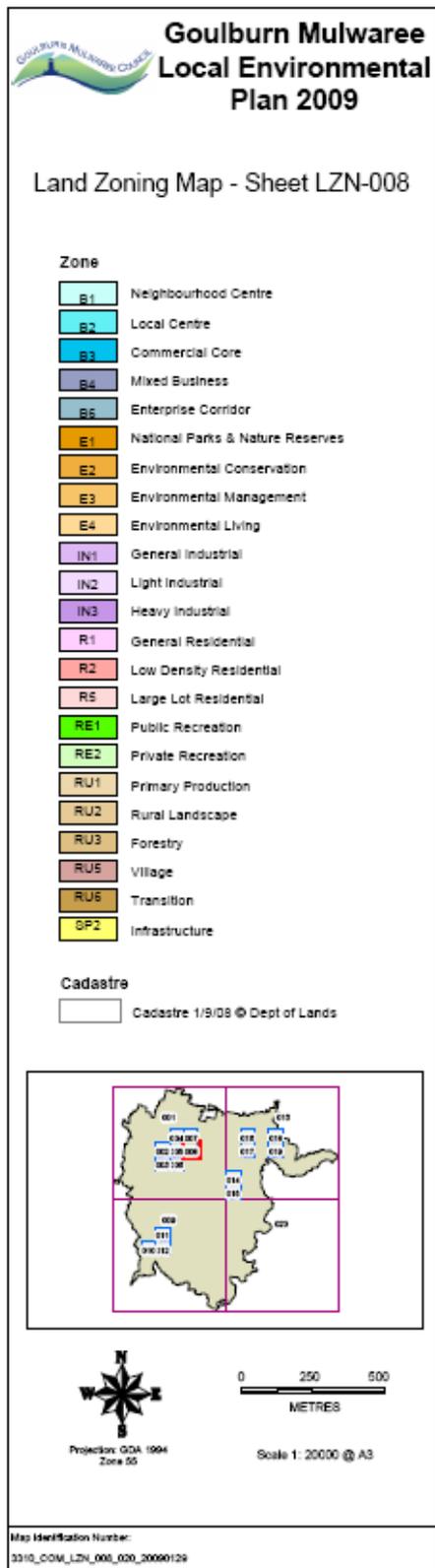


Figure 3-3: Zoning Map

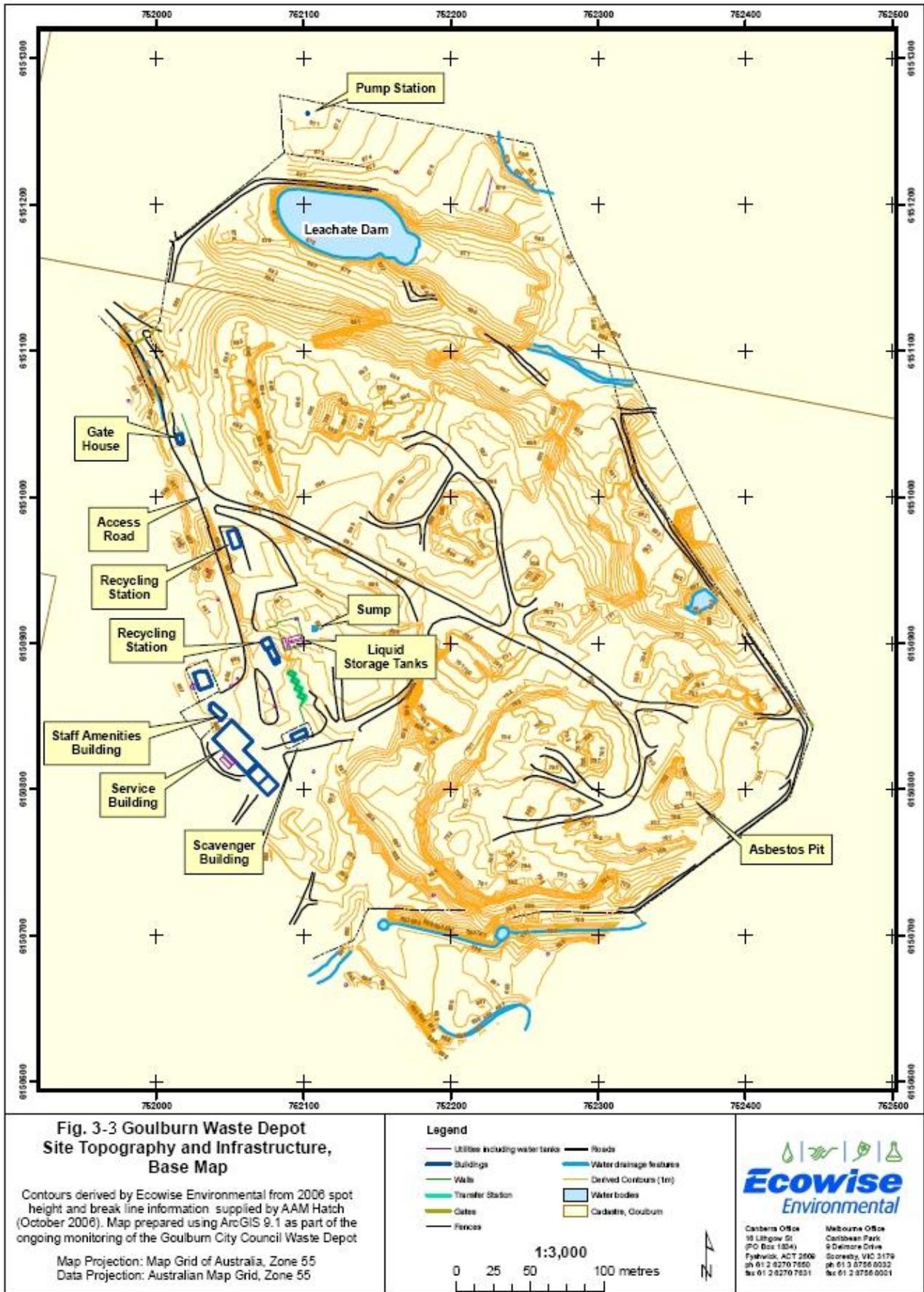


Figure 3-4: Basemap

3.6 Soils

The soils on site are sandy in nature and of variable depth and fertility. There are very small areas of clay on the site, mainly being confined to the lower slopes or small depositions in the soil. The soil on site is generally of high permeability and so unsuitable for site sealing (Reme Soils, 1990).

Soils at the site show some acidification, which reflects a general trend in the region. Further acidification may occur with the application of nitrogen to the soils if irrigated with leachate. The acidification may be ameliorated in the long term by growing vegetation. The acidity of the soil has led to the build-up of aluminium and manganese in the soil to levels that may adversely impact on plant growth (Reme Soil, 1990).

3.7 Hydrology

Currently stormwater runoff from upstream of the site would flow down from the north-eastern edge of the site. The runoff would either be intercepted by the surface catch drain running along the eastern boundary or would flow onto the site. The majority of runoff from the site flows in a northerly direction. Again, most of it is intercepted by the surface catch drain or flows directly into the leachate dam. The catch drain also flows into the leachate dam. A small portion of runoff would currently flow off-site at the northern boundary but in the future this will be intercepted by the proposed perimeter toe drain. Any overflows from the leachate dam will runoff from the northern boundary into a small intermittent watercourse approximately 100 metres north of the site. A small portion of the southern end of the site flows to the south east. Figure 3-6 illustrates the direction of overland flow on the site.

There is evidence of perched water tables and preferred drainage lines indicating that the drainage characteristics of the soils are highly variable (Reme Soils, 1990). Generally, however, the soils are permeable.

3.8 Climate

Average daily maximum temperatures in Goulburn range from 27.5°C in January to 11.5°C in July, while average minimum temperatures range from 13.4°C in January to 1.3°C in July. See Table 3-2 for temperature distribution throughout the year.

Table 3-2 Climatic data

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Average max daily temperature (°C)	27.5	26.5	24.0	20.1	16.0	12.4	11.5	13.1	16.2	19.3	22.2	25.8	-
Average min daily temperature (°C)	13.4	13.6	11.1	7.8	4.8	2.4	1.3	2.0	4.6	6.7	9.1	11.6	-
Mean monthly rainfall (mm)	60.7	59.1	55.6	51.1	47.8	45.7	44.6	57.7	50.2	56.6	66.0	54.4	649.5
Mean daily evaporation	6.3	5.5	4.1	2.6	1.6	1.1	1.2	1.9	2.8	3.8	5	6.2	-

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
(mm)													
Monthly pan evaporation (mm)	197	154	128	78	49	34	39	57	81	118	155	201	1291

Note: Climatic data was sourced from the Bureau of Meteorology Station: 070263 Goulburn (Progress St), records commenced 1971, last record 2004.

Rainfall is evenly distributed throughout the year with all months averaging more than 44 mm of rainfall. See Table 3-2 for rainfall distribution throughout the year.

Table 3-2 contains mean monthly pan evaporation rates for Goulburn. From September to May, mean monthly pan evaporation exceeds mean monthly rainfall. Mean annual rainfall is 650 mm while the mean annual pan evaporation is 1,290 mm. Assuming an average pan factor of 0.7, actual annual mean evaporation is approximately 846 mm.

Surface wind readings taken from Goulburn indicate that westerly winds predominate in the morning and afternoons from autumn through to spring. Westerly winds are still common in summer, particularly in the morning. However, easterly and north easterlies predominate in summer, particularly in the afternoon.

3.9 Flora and Fauna

The site has been used for waste disposal since 1906 and so has undergone considerable disturbance. Due to its disturbed nature, exotic species of flora and fauna predominate on the site. Feral cats, foxes and European rats have been seen on the site. Ibis and seagulls are common at the active tipping face, as they scavenge through the waste. Kangaroos have been reported to enter the site, particularly at dawn, and have been known to drink from the leachate dam. Several wombat burrows have been observed near the site.

A number of noxious weed species are present on-site including African Lovegrass, Thistle, Patterson's Curse, Serrated Tussock and Blackberry. Their extent is controlled by a noxious weed control program (see Section 5.10.2). The area adjacent to the site supports a dry sclerophyll bushland system. Some native trees and shrubs are still present around the site borders.



Figure 3-5: Monitoring locations

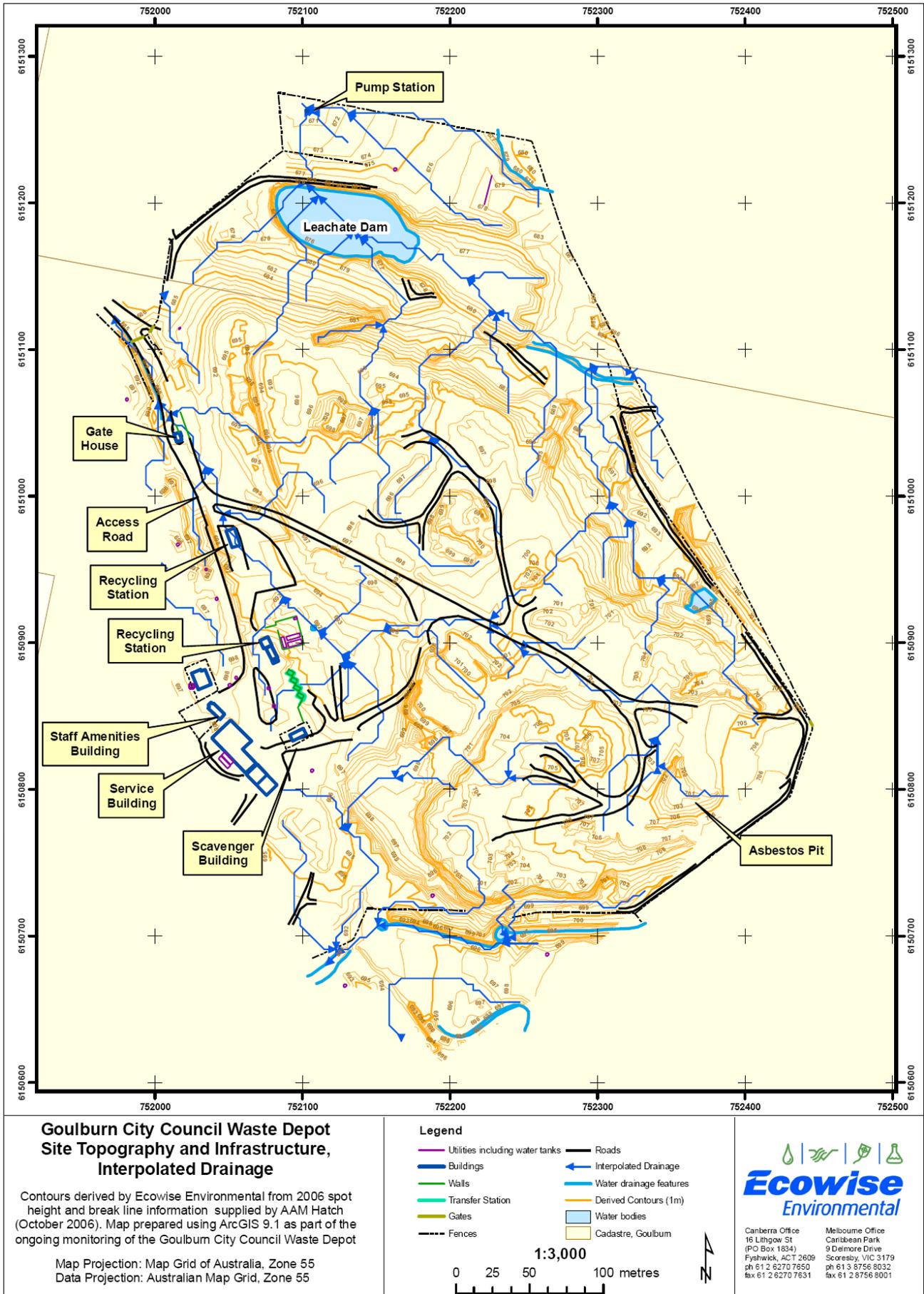


Figure 3-6: Interpolated Drainage

4 Landfill Design, Construction and Operation

4.1 General

The existing Goulburn Waste Management Centre has been operating since 1906 and has received all types of solid waste for landfilling. The required standards for the construction and operation of landfills have changed significantly with the release of the Guidelines. Given that the Centre has been operational for many years, implementation of some of the “benchmark techniques” suggested in the Guidelines is not practical or possible (eg clay liner under existing waste). However, the Council is committed to minimising the environmental impact of the Centre and will implement all practical measures to achieve the specified environmental goals for a Class 1 Solid Waste Landfill. With the advent of carbon trading, it will also have to review the operational practices to minimise the release of greenhouse gases to the atmosphere. This will include:

- a rigorous waste screening and inspection program;
- a leachate containment and on-site management system;
- stormwater management which aims to minimise the generation of contaminated waters and ensure no detrimental impact on surrounding waterways;
- appropriate site management and staffing to ensure an effective and efficient landfilling operation;
- recovery of organic materials;
- landfill techniques which minimise leachate and landfill gas generation/migration and nuisance eg litter, odour, dust, noise or vermin;
- a landfill gas management system if required; and
- a comprehensive environmental monitoring and reporting programme.

The following sections describe the design and operation of the landfill. The operational practices described are those required for the future and are not necessarily current practice. In many cases GMSC will have to develop a plan to transition from the current practices to those required by this LEMP.

4.2 Quantities of Solid Waste

4.2.1 Current

Table 4-1 shows the amount of waste that has been accepted into the landfill between 1990 and 1995 along with the corresponding populations. The figures were derived from Council estimates of the mass of waste accepted at the Centre. As can be seen, the amount of waste accepted during the period is relatively static.

Table 4-1 Waste quantities accepted at the Centre

Year	1990	1991	1992	1993	1994	1995
Population	21,350	21,451	21,500	21,575	22,150	22,170
Garbage (t)	17,500	16,828	16,418	16,721	17,789	20,197

In September 1994, Council implemented a kerbside recycling service. Paper, cardboard, aluminium cans, tin cans, plastic and cardboard milk containers and PET, HDPE, PVC and polypropylene plastics are collected. Council also commenced in 2008 a kerbside garden organics collection service that is diverting 1200 tonnes per annum of greenwaste from landfill. It is currently trialling options for processing and recycling this garden waste. The likely advent of carbon trading makes this initiative more vital.

Endeavour industries recycles 6,500 t/a of paper and cardboard, 208 t/a of glass and 26 t/a of cans.

Another factor that will affect the quantity of waste received at the Centre is the move toward shire-wide waste management. In July 2005, Council replaced the rural waste transfer bin system for disposing of household waste in rural areas with a new waste voucher system. Rural residents are given vouchers to deposit their household waste at three locations, one of which is the Centre.

Further, the former Goulburn Municipal Council and parts of the former Mulwaree Shire Council were amalgamated in 2004 to form the new Goulburn Mulwaree Council. As a result, facilities that existed in parts of the old Mulwaree Shire, such as the Taralga landfill, have been transferred to other local government areas. The Centre is now the major facility within the new Council area. Consequently, waste receipts at the Centre are expected to increase as residents adapt their habits to suit the facilities now available to them and outlying landfills are rationalised.

During 2007/08 there were 20,449 tonnes of waste received at the Centre, together with a further 8,000 tonnes of clean fill that was generally used as cover material. It should be noted that a weighbridge was installed during 2004, which has resulted in greater accuracy in recording incoming wastes. Caution should therefore be exercised in drawing comparisons between this figure and waste quantities during previous years as shown in Table 4-1 as the quantities in Table 4-1 are estimates based on standard waste volumes for different categories of vehicles.

4.2.2

Future

The growth rate in Goulburn is currently very low. Table 4-2 presents the census figures for the City of Goulburn and associated growth rates (the amalgamated shire populations have been used for the last 2 censuses in the series). Council estimates a projected conservative growth rate of approximately 1% for the next ten years. Except for the most recent 2 censuses, the population in the area has marginally decreased. Thus, it is believed that waste generation in the City of Goulburn is likely to at least remain relatively static, although waste quantities accepted at the Centre may decrease due to the impact of recycling programs and other waste minimisation initiatives.

Table 4-2 Census data for Goulburn City³

Year	1981	1986	1991	1996	2001	2006
Population	21,775	21,552	21,451	21,293	21,427 (25785) [#]	26086*
Annual growth rate from	-0.25%	-0.21%	-0.09%	-0.15%	0.13%	0.23%

³ Data from SGS Economics & Planning, 2003, *Goulburn and Mulwaree Demographic Profile and Projections*, Goulburn & Mulwaree Local Government Authorities. 2006 data from Australian Bureau of Statistics

previous census						
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#includes total population for previous Mulwaree Shire and Goulburn City Council
*includes total shire population following amalgamation.

Table 4-3 shows the projected solid waste generation for Goulburn, based on current waste generation rate up until 1996 and forecast population growth. It should be noted that the figures in Table 4-3 do not take into account the impact of the recycling service on reducing the amount of waste going to landfill, other possible future waste minimisation measures or the impact of the weighbridge installation. However, it is expected that as recycling expands and becomes more effective the amount of waste going to landfill will be reduced below the projected levels. The actual waste generation for 2008 indicates that waste generation is increasing faster than the projections but is probably a result of the weighbridge installation. When all incoming material is weighed this will likely increase even more.

Table 4-3 Projected waste generation in Goulburn

Year	1996	2001	2006	2011	2016	2020
Population	21,293	21,427	21,140	21,270	21,530	22,410
Garbage (t)	20,197	19,970	19,820	20,040	20,230	20,420

4.3 Waste Minimisation

4.3.1 WARR Strategy

The NSW Government during 2007 released its Waste Reduction and Resource Recovery Strategy 2007 (the WARR Strategy), which sets targets in a number of key result areas. Broadly, these targets are:

Preventing and avoiding waste	To hold level the total waste generated for 5 years from the release of Waste Strategy 2003.
Increased recovery and use of secondary resources	By 2014, to: Increase recovery and use of materials from the municipal waste stream, from 26% (in 2000) to 66% Increase recovery and use of materials from the commercial and industrial waste stream, from 28% (in 2000) to 63% and Increase recovery and use of materials from the construction and demolition sector, from 65% (in 2000) to 76%.
Reducing toxic substances in products and materials	By 2014 or earlier: To phase out priority substances in identified products as a first choice or, if not possible, to achieve maximum recovery for re-use.
Reduce litter and illegal dumping	Reduce total amount of litter reported annually. Reduction in total tonnages of illegally dumped material reported by regulatory agencies and RID squads annually.

Table 4-4 WARR Strategy Targets

These targets provide a framework for the development of Council's waste minimisation strategy. Council has already taken steps toward achieving the targets through implementation of the kerbside recycling service.

Another step that is currently being investigated is garden waste processing e.g. shredding and composting.

4.3.2 General

In order to maximise the life of the landfill and to conserve resources, recyclable materials will be separated from the incoming waste stream. The recycling station at the Centre shall be maintained to allow for the drop-off of recyclables and should operate in conjunction with the small vehicle transfer station. A sign listing the recyclable materials that can be left at the station shall be displayed. A kerbside recycling scheme was initiated in September 1994 (see Section 4.2.1). This contributes significantly to the reduction of waste going to landfill.

4.3.3 Domestic Waste Materials

Recycling of the following materials shall be maintained where economical and expanded if practical:

- paper and cardboard;
- glass;
- firewood;
- garden organics (green waste)
- batteries;
- aluminium cans;
- gas cylinders;
- non-ferrous metals;
- ferrous metals;
- white goods;
- used automotive and cooking oils;
- PET, HDPE, uPVC; and,
- Polypropylene plastics.

The marketing of the recyclable materials is done by a tender process and the successful recycling company awarded a seven (7) year contract.

Target quantities per annum for the above materials when recycling commenced were:

- Paper and cardboard 25 tonnes p.a.
- Steel 40 tonnes p.a.
- Glass 60 tonnes p.a.
- Batteries 250 units p.a.
- Plastics 800 kg p.a.
- Nonferrous metals 5 tonnes p.a.
- Aluminium cans 700 kg p.a.

These quantities are in addition to the materials recovered from the kerbside recycling collections service and should be revised with subsequent recycling contracts to increase the resource recovery targets

and reduce waste to landfill in accordance with the NSW Government's WARR Strategy.

4.3.4 Green/Garden Wastes

Green/garden waste is segregated at the Centre and is currently stockpiled until there is a sufficient quantity to warrant shredding the material. It is then used to dress the batter banks of the landfill.

Annual expressions of interest are invited for contractors to undertake sorting and shredding of the stockpiled organic waste.

Council is participating in a trial composting process at the Centre under what is known as Groundswell. Under the POEO Act, a composting facility becomes a scheduled activity if:

- it processes over 200 tonnes/year of putrescible organics such as animal and food wastes, sludge or biosolids, or
- it processes over 5,000 tonnes/year of non-putrescible organics such as wood and garden waste or natural fibrous material; or,

Based on current projections, it is unlikely that a composting facility at the Centre will require a separate licence unless significant quantities of animal or food wastes or biosolids are processed at the facility.

4.3.5 Commercial/Industrial (C&I) Waste Materials

Car bodies and waste oils are accepted at the Centre and recycled. The contract for the recycling of these materials is awarded every five (5) years after a tender process. There are further opportunities that can be explored to source separate and recover C&I materials and to work with this sector of the community to reduce C&I wastes.

4.3.6 Construction and Demolition (C&D) Materials

Concrete, bricks, tiles, rubble and recovered road materials are accepted at the Centre and pricing preference is given to materials that are already separated. These materials are generally utilised as road making material within the Centre but there is scope to process and resell them.

4.3.7 Scavenging

Scavenging or removal of waste from the landfill is not permitted. Only Council approved scavenging contractors and Centre site staff members are allowed to scavenge or remove waste from the Centre. Scavenging or removal of waste by approved personnel shall be allowed at the active landfill face only while no equipment is operating at the face. Compaction and covering of the waste shall not be delayed to allow for scavenging.

4.4 Site Layout

The site layout is shown in Figure 3-4. Access to the site is via Sinclair Street from the north western boundary. The small vehicle transfer station, service building, staff amenities building and recycling station are on the south-western boundary of the site. The leachate dam is situated at the northern end of the site. The asbestos disposal sites and the liquid waste disposal sites are located adjacent to each other near the south-eastern boundary. Future extension of the landfilling operation onto the south of the site is planned.

4.5 Plan of Filling

Filling of the Centre shall proceed generally as shown on the filling plan in Figure 4-1, to achieve the final landform. The proposed final landform levels are shown on Figure 4-2 and Figure 4-3. As far as is practical, filling of each waste disposal cell shall continue until the final landform is reached. Filling shall then commence in the next numbered waste disposal cell. Where it is absolutely essential that filling commence in a second (or third) waste disposal cell prior to completion of an active waste disposal cell, then an intermediate covering layer shall be applied to the cell which shall remain inactive for a period of time. Notwithstanding this, no more than two waste disposal cells shall, at any one time, be at some stage of development or rehabilitation.

Council shall then update the filling plan when each cell is started or completed or when directed by the OEH. The filling plan will identify the type of waste placed in each cell and the location of any special burials such as asbestos and contaminated soil.

The updated plan shall also show the location of the haul roads and planned roads to service the next cell.

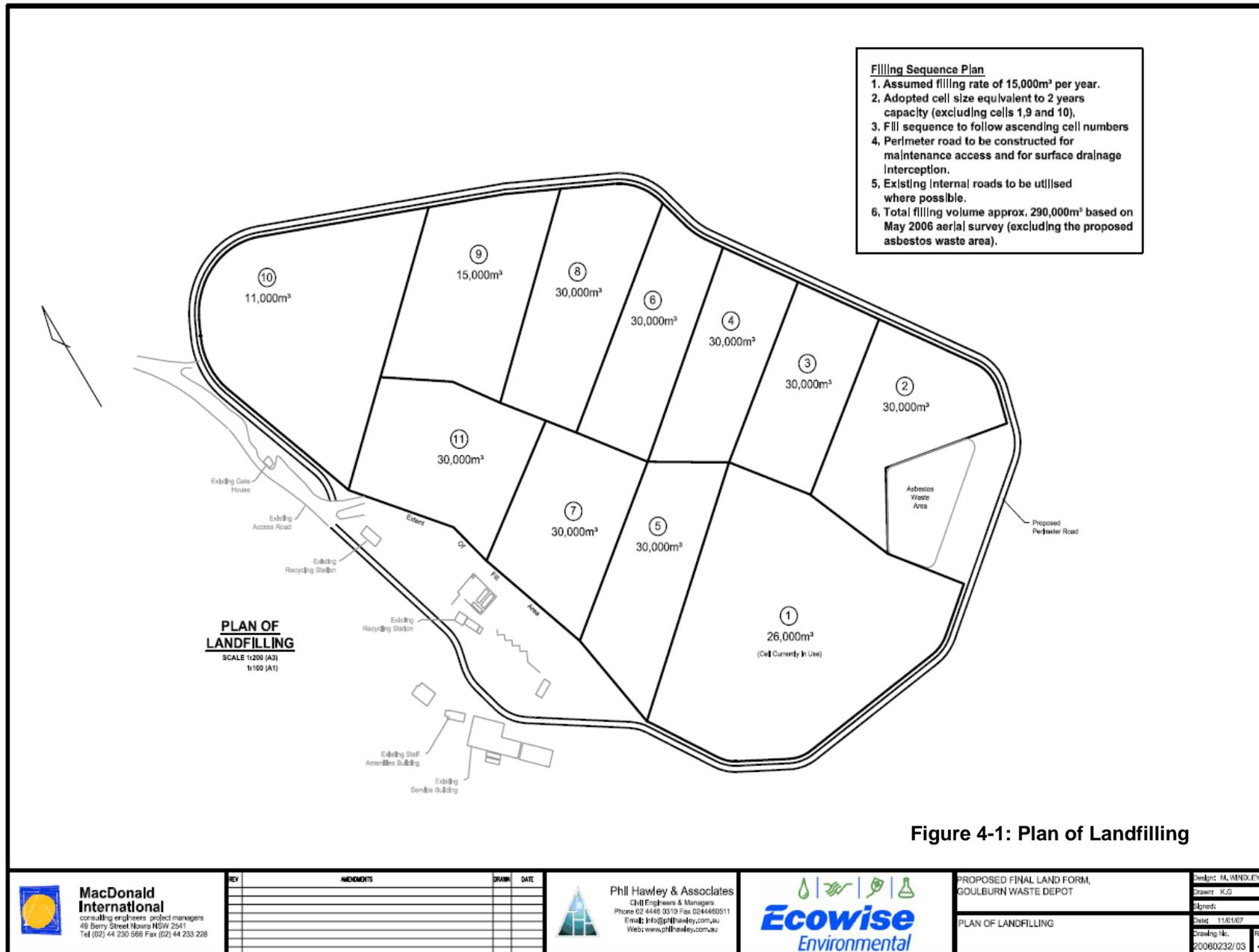
A survey (either aerial or terrestrial) of the landfill shall be undertaken at least every 12 months by a surveyor to identify the extent of landfilling and estimate the quantity of landfill space consumed. If a close correlation can be established with the volumes recorded by the weighbridge, then the survey intervals can be reviewed.

4.6 Final Landform and Life of the Site

The proposed final landform levels shall be as shown in Figure 4-2. Notwithstanding the levels shown in Figure 4-2, the final landform shall be sloped at a minimum 2.5% grade to minimise infiltration. Council shall engage a surveyor to undertake a land or aerial survey of the waste disposal area and prepare a contour plan (0.5 m contours), every 12 months. If a close correlation can be established with the volumes recorded by the weighbridge, then the survey intervals can be reviewed. In addition, adequate survey supervision is to be applied to ensure that filling proceeds and cells are closed off in accordance with the surface contours shown in Figure 4-2.

The available volume in the landfill (to the proposed final landform) as of May 2006 (when the most recent aerial survey of the site was undertaken), was approximately 290,000 m³.

The life of the existing site will be dependent on the rate of waste receipt, which will be dependent on population trends, the success of the recycling service and other waste reduction initiatives, as well as the possibility of the Centre becoming a regional facility. It will also be dependent on the waste deposition practices and compaction ratios achieved at the Centre. However, based on the projected waste tonnages (shown in Table 4-3), and assuming an effective compacted waste density of 600 kg of waste per m³ of landfill space is achieved, the life of the existing site would be of the order of 20 years i.e. until 2026. If waste reduction and recycling initiatives are successful or better site management practices attained the life of the site will be extended.



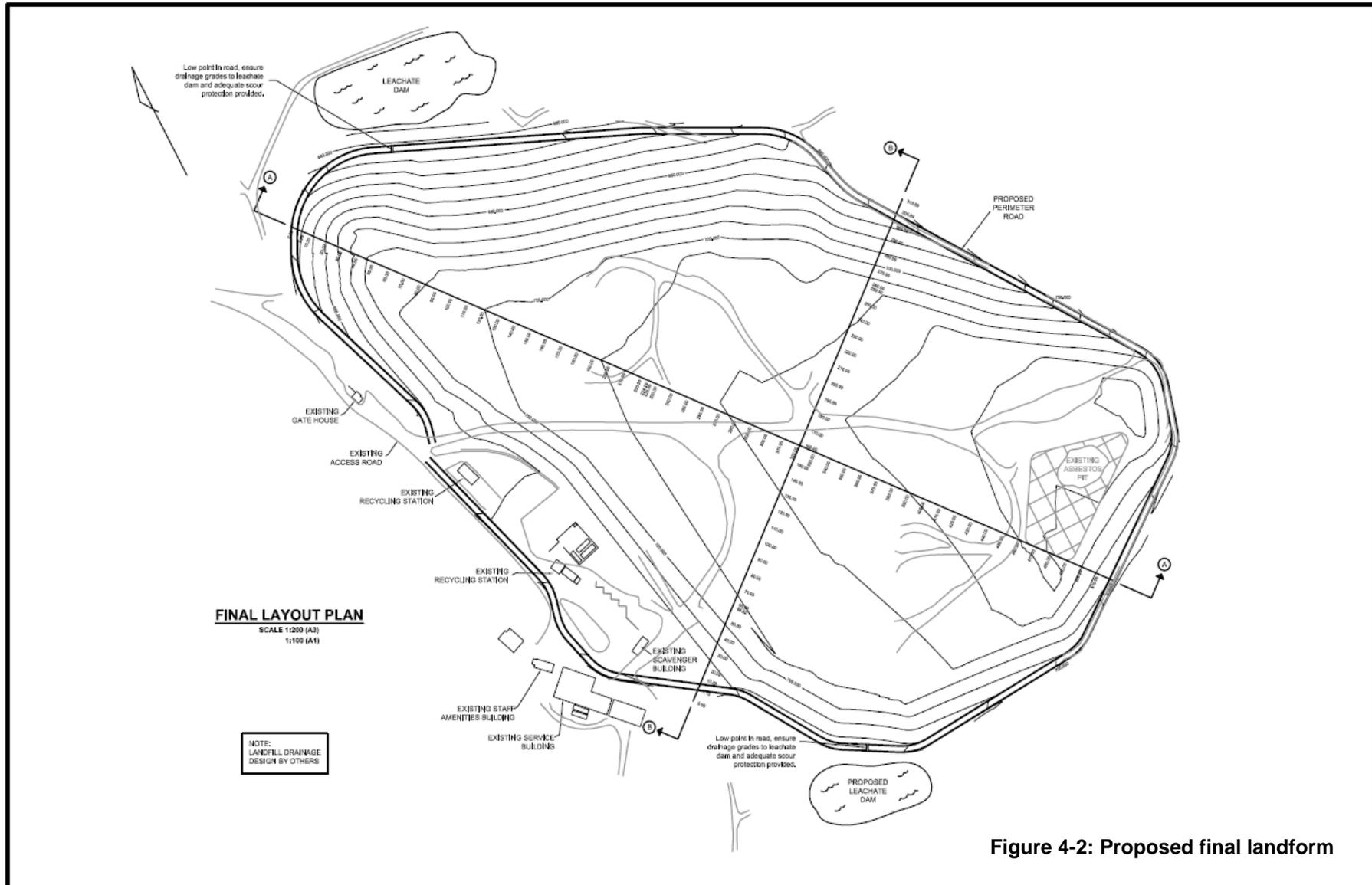


Figure 4-2: Proposed final landform

 <p>MacDonald International consulting engineers project managers 49 Berry Street Nowra NSW 2541 Tel (02) 44 230 956 Fax (02) 44 233 228</p>	<table border="1"> <thead> <tr> <th>REV</th> <th>AMENDMENTS</th> <th>DRAWN</th> <th>DATE</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>	REV	AMENDMENTS	DRAWN	DATE																	 <p>Phil Hawley & Associates CH Engineers & Managers Phone 02 4446 0310 Fax 0244496511 Email: info@philhawley.com.au Web: www.philhawley.com.au</p>		PROPOSED FINAL LAND FORM, GOULBURN WASTE DEPOT	Designer: M. WINDLEY Drawn: KJS Checked:
	REV	AMENDMENTS	DRAWN	DATE																					
DETAIL / CONTOUR PLAN	Date: 11/01/07 Drawing No: 20060232/01																								

4.7 Waste Disposal Cell Preparation

4.7.1 General

The following sections generally describe the preparation works required for establishing the waste disposal cells.

4.7.2 External Cell Wall Construction

Prior to placing waste within a cell, Council shall construct the first layers of the external walls or earth berms of the waste disposal cells to a minimum thickness of 900 mm of compacted clay or otherwise impermeable material having an in situ coefficient of permeability of not less than 10^{-9} ms^{-1} . The maximum height of each individual earthen berm/wall shall not exceed 2 m in height above the height of the waste being filled in the cell.

The walls or berms shall be progressively raised ahead of the received waste as the cell is filled.

4.7.3 Intermediate Clay Capping Layer

Pending further investigations of groundwater contamination and discussions with the OEH, there may be a need to construct an intermediate clay capping layer over all existing landfilled areas, prior to continued landfilling. The purpose of the intermediate capping layer is to prevent further rainfall infiltration into the existing landfilled waste and consequent leachate generation. It will also serve to arrest the dispersion of landfill gas.

4.7.4 Leachate Drainage System

A perimeter road is proposed which will allow the capture of stormwater and surface leachate to be directed into either the northern or southern leachate dams (see Figure 4-2).

The installation of the internal leachate collection pipe work is pending further investigations into leachate contamination of the groundwater and discussions with the OEH.

4.8 Waste Reveal

4.8.1 General

All vehicles entering the Centre must do so across the weighbridge and the entry of **all** vehicles, including visitors to the site, shall be recorded. At the current time small vehicles are not weighed but are recorded in the computerised weighbridge management system using the weight conversion factors as set out in Section 7 of the OEH Yearly Waste Data Report (see Appendix C). In the future all vehicles should be weighed both into and out of the Centre. The attendant will undertake routine inspections of waste entering the Centre to ensure that only permitted wastes are received (see Section 4.8.3) and should also ask every driver to declare if there are any Special Wastes such as asbestos, clinical waste or tyres within the load. All small vehicles shall be directed to the on-site transfer station except for garden waste deliveries which will be directed to an area designated to receive garden waste. Large vehicles capable of tipping shall be directed to the active landfilling face.

4.8.2 Weighbridge

In August 2004 a weighbridge was installed. In accordance with the Guidelines, the Centre has a valid Instrument Certificate from the Department of Fair Trading which must be re-verified every 24 months.

The weighbridge will be operated at all times that the landfill is available for the receipt or processing of waste. Should the weighbridge be inoperative, the occupier should notify the OEH immediately and ensure that it is repaired as soon as practicable. While the weighbridge is inoperable, all vehicles will be recorded and tonnages calculated from the truck factors provided in the last page of Appendix C.

In September 2004, cameras were installed at the gatehouse to facilitate the Centre's employees to inspect the contents of incoming vehicles and for security.

4.8.3 Permitted and Excluded Wastes

Only Permitted Wastes shall be accepted for disposal at the Centre. Permitted Wastes are those not defined as Excluded Wastes and include putrescible and non-putrescible wastes from domestic, commercial and industrial sources within the City of Goulburn.

All waste from commercial and industrial sources must be in a solid form and shall comply with the OEH requirements for landfill disposal of restricted solid wastes (as at late 2008 the OEH has not classified any wastes as restricted solid wastes).

With the exception of those wastes satisfying the OEH's restricted solid waste disposal criteria, the following wastes are deemed Excluded Wastes and shall be specifically excluded from disposal at the Centre:

- liquid wastes of any description;
- radioactive material;
- any inflammable liquid or material derived from grease, oil, tar, petroleum, shale or coal;
- any sludge or material (unless it can be shown to be innocuous and harmless) being the waste from any industrial process carried on in:
 - any tanning or leather processing plant;
 - any petroleum or petrochemical plant;
 - any chemical plant;
 - any paint manufacturing plant;
 - any metal treatment plant;
 - any vegetable oil or mineral oil plant; and
 - any pharmaceutical or drum manufacturing plant.
- any material containing arsenic, cyanide and/or sulphide;
- any toxic salt of the following:

barium	copper	selenium	boron
lead	silver	cadmium	manganese
zinc	chromium	mercury	
- any pesticide or weedicide and in particular:

- chlorinated hydrocarbons;
 - fluorinated hydrocarbons;
 - organophosphates; and
 - phenols.
- any soluble acid or alkali or acidic or basic compounds.

4.8.4 Problematic Wastes

Problematic wastes include, but are not limited to:

- animal carcasses;
- contaminated waste/material;
- lowly contaminated soils and other wastes;
- security or confidential documents or disposals on behalf of the Collector of Customs;
- wastes with the potential to incur significant control problems in terms of wind blown debris such as sawdust, grain dust, etc, and
- approved Special Waste subject to individual disposal requirements and regulation, etc asbestos.

Council may add to this list as necessary.

Council shall record details of all Problematic Waste deliveries in the operators' daily log, including type of waste, source of waste and approximate location of disposal. The approximate level (in Australian Height Datum) of the deposited Problematic Waste shall also be recorded.

In the case of special wastes these shall be deposited only in the designated area for that particular special waste.

4.8.5 Special Wastes

All special wastes shall be disposed on in accordance with OH&S and OEH requirements and directions. Typically, this may involve supervised burial away from the active tipping face and immediate covering with approved cover material to the required depth.

4.8.5.1 Asbestos

In accordance with clause 42 of the *Protection of the Environment Operations (Waste) Regulation 2005* (as amended by the *Protection of the Environment Operations Amendment (Scheduled Activities and Waste) Regulation 2008*), the following requirements, with respect to asbestos wastes received at the Centre, will be adhered to:

- when unloading and disposing of asbestos waste, the waste must be unloaded and disposed of in such a manner as to prevent the generation of dust or the stirring up of dust;
- the asbestos waste must be covered with VENM:
 - initially at the time of disposal to a depth of at least 0.15m, and
 - at the end of each day's operation, to a depth of at least 0.5m, and
 - finally, to a depth of at least 1 metre (in the case of bonded asbestos waste or asbestos-contaminated soils)

or 3 metres (in the case of friable asbestos material)
beneath the final surface of the landfill

- it must be buried to the initial depth beneath the planned final land surface of the landfill site on the same day it is received at the landfill site;
- it must not be compacted before it is covered;
- it must not come in contact with earthmoving equipment at any time; and,
- it must not be used in any road-making material.

All asbestos shall be buried in the area shown as “Asbestos Waste Area” on Figure 4-1. Since cells 1 and 2 (see Figure 4-1) will be higher than the “Asbestos Waste Area”, access shall be via the perimeter road shown on the drawings.

4.8.5.2

Clinical Waste

In accordance with clause 43 of the *Protection of the Environment Operations (Waste) Regulation 2005* (as amended by the *Protection of the Environment Operations Amendment (Scheduled Activities and Waste) Regulation 2008*), the following requirements, with respect to clinical and related wastes received at the Centre, will be adhered to:

- the written approval of the Council is required before the waste is brought to the Centre and a copy of that approval shall be sighted before access is given to dispose of the waste at the Centre;
- waste from within the Extended Regulated Area will not be accepted under any circumstances;
- the waste must not contain any recognisable body parts, sharps waste, cytotoxic waste or radioactive waste;
- the waste must be packaged in accordance with the requirements set out in the document entitled *NSW Health: Waste Management Guidelines for Health Care Facilities* issued by the Department of Health and dated August 1998. This document can be accessed from http://www.health.nsw.gov.au/policies/PD/2005/pdf/PD2005_132.pdf;
- the waste must not be disposed of in amounts that exceed 40 kilograms at any time; and,
- the waste must be buried, or be immediately contained, in a manner that prevents the waste coming into contact with any person or animal.

4.8.5.3

Tyres

In accordance with Schedule 1 to the POEO Act and Clauses L5.2 and L5.3 of the EPL, the following requirements with respect to waste tyres received at the Centre will be adhered to:

- no more than 50 tonnes of waste tyres or 5,000 waste tyres are to be stored at the Centre for disposal or recycling at any time; and
- tyres from the Sydney Metropolitan Area must not be received at the Centre unless:
 - ◇ they have been shredded into pieces measuring no more than 250mm in any direction; or
 - ◇ they have had their walls removed; or

- ✧ at the time of receipt the tyres can be recycled or reprocessed into a saleable product (including retreading); or
- ✧ the tyres can be shredded at the Centre or the walls removed from the tyres; or
- ✧ the tyres are from a domestic load containing no more than 5 tyres having a diameter of less than 1.2 metres.

Tyres should be recovered for recycling and in no circumstances interred in the landfill.

4.8.6 Waste Control and Inspection

Public access to the Centre shall only be permitted during opening hours. Outside opening hours all access gates shall be locked and Council is responsible for maintaining the security of the site. Keys are not to be provided to any person not associated with the management and operation of the Centre. However, this does not preclude the issue of keys to emergency personnel such as the fire brigade who may require out-of-hours access to the site.

Council shall conduct a waste control program to ensure that only Permitted Wastes are accepted for disposal at the Centre. The waste control program shall comprise of:

- placing prominent signage at the entrance to the Centre defining Permitted and Excluded Wastes and identifying the penalties for the deposition of Excluded Wastes;
- recording the mass of each vehicle entering the Centre using the weighbridge;
- recording the mass of each vehicle leaving the Centre using the weighbridge;
- monitoring incoming loads through the surveillance camera at the gatehouse;
- inquiry of the driver of incoming vehicles as to whether there are any special wastes included in the load
- routine inspection of vehicles entering the Centre;
- routine monitoring and inspection of wastes as they are discharged from vehicles at the waste disposal area;
- monitoring of the deposited waste during spreading, compaction and covering. All waste suspected of being an Excluded Waste shall be segregated and checked as to its acceptability e.g. by detailed inspection and/or testing, as deemed appropriate by the Council;
- documents of all wastes and waste sludge that are controlled under a tracking system shall be checked before acceptance at the site; and,
- record all incidences of identification of Excluded Wastes in the daily operators log. The record shall include:
 - details of the waste, e.g. type; and,
 - source of the waste e.g. identification, driver identification and, generator of the waste.

All vehicles suspected of containing Excluded Waste shall be denied permission to deposit waste until the waste is verified as being

acceptable. Council shall require and collect appropriate evidence from the driver of the vehicle, e.g. test certificate, as appropriate, to substantiate that the waste is not an Excluded Waste.

In the event that Excluded Waste is identified in an incoming vehicle the vehicle shall be refused entry and details of the incident recorded as described above. Council shall advise the driver of the vehicle to contact the OEH for advice on proper disposal of the Excluded Waste.

All waste deposited at the Centre and suspected of being an Excluded Waste shall be segregated and checked as to its acceptability, e.g. by detailed inspection and/or testing, as deemed appropriate by the Council.

In the event that Excluded Waste is identified during deposition by a vehicle, Council shall immediately segregate and contain the waste away from the active tipping face. The details of the waste, such as type, the source, and the vehicle and driver identification, shall be recorded by the Council. Council shall advise the driver of the vehicle that the waste is not acceptable and shall load the waste back onto the vehicle where practical and safe to do so. The vehicle shall then be escorted from the Centre by the Council. Council shall advise the driver of the vehicle to contact the OEH for advice on the proper disposal of the Excluded Waste. Should this not be possible and the proper management of the Excluded Waste becomes an expense to the Council then the Council shall pass this expense to the driver of the vehicle.

In the event that Excluded Waste is identified during the spreading and compaction of deposited waste Council shall segregate and contain the waste away from the active waste disposal area. Council shall make all practical efforts to identify the source of the waste, including:

- inspecting the waste for possible identification labels on containers;
- identifying the type of waste and consequently the possible sources in Goulburn or the surrounding areas.

Council shall contact the OEH to determine the proper acceptable disposal options and shall dispose of the Excluded Waste in accordance with the OEH's requirements.

4.9 Waste Deposition

4.9.1 General Solid Waste (Putrescible and Non-Putrescible)

Waste shall be placed into the cells commencing adjacent to the most recently filled cell(s) and working out toward the outer edge of the landfill and away from the completed cells. The edge of the cell where it abuts the adjacent unfilled cell(s) is to be battered down to the existing level and covered with a temporary capping layer as described in 4.10.2.

The total length of the active landfilling face shall not exceed 40 m. All wastes shall be deposited, spread and compacted in layers within the defined waste disposal cells. Each layer shall have a maximum compacted depth of 600 mm. Council shall place and compact the deposited waste to achieve a minimum effective density of 650 kg of waste per cubic metre of landfill air space (or 1.54 m³ of landfill space per tonne of waste). The compactor shall make three to five passes over the waste and shall not operate on slopes exceeding 25% (1:4) due to reduced compaction and operational safety considerations.

At the end of every working day the deposited waste shall be covered with a minimum of 150 mm of approved cover material to eliminate wind borne litter, control odours, discourage scavenging by fauna and prevent access to the waste material by vectors. Alternatively, a chemical film type daily cover may be applied. The maximum lift height (of waste) after which a daily cover layer will be applied, is 1.85 m.

No waste shall be deposited into water. Each active waste disposal cell shall be maintained in a dry condition during the life of the cell. All water removed from the active waste disposal cell shall be disposed of to the leachate management system.

Every layer of waste deposited in the landfill shall be evenly and properly compacted by a steel wheel landfill compactor to achieve the specified effective waste density. Alternatively, Council may want to give consideration to baling the waste and stacking the bales into the cells. Large bulky wastes such as refrigerators, washing machines, and furniture and tree trunks shall be preferably removed from the waste for recovery or be thoroughly broken up before covering. Such bulky wastes shall not be deposited in the final lift of a waste disposal cell since settlement of the fill may result in these large items piercing the landfill cap.

All weather access from the sealed access road to the active tipping face must be provided and maintained within the waste disposal cell for all user vehicles.

4.10 Covering Layers

4.10.1 Daily Cover

At the end of each working day, all exposed waste surfaces, shall be completely covered with a layer of compacted soil or other suitable *inert* material not less than 150 mm in depth. The daily cover layer shall be graded at a minimum 1% slope to prevent ponding of water.

Waste may be covered throughout the working day, as well as at the end of the day if necessary to prevent environmental impacts such as litter or odour.

The material used for covering of waste shall be sourced from off-site and incoming waste material or from excavation for new cells. Only inert, non-combustible material may be used.

Alternatively, the waste can be covered with artificial materials such as expanded foam or purpose-made plastic sheeting.

Council shall ensure there is, at all times, sufficient cover material on site for daily covering of the deposited waste.

The rate of importation of material shall at all times exceed the total requirements for development and operation of the Centre. All excess imported material shall be placed in stockpiles at locations within the Centre. Silt fences and other approved sediment erosion control measures shall be provided around the stockpiles as required.

In addition, cover material used for daily covering shall be stockpiled at a point convenient to the active waste disposal area. The stockpile shall be maintained to provide at least two (2) weeks supply of cover material.

4.10.2 Intermediate Cover

Where a filled area has not reached the final landform level but due to the staging of filling will remain inactive for a period greater than three (3) months an intermediate covering layer shall be applied. The intermediate covering layer shall comprise 300 mm of compacted daily cover material over the original daily cover layer. The area shall be graded at a minimum 1% slope to promote runoff and shall be seeded with a suitable grass seed/fertiliser mixture as soon as practical after application of the intermediate cover layer.

4.10.3 Final Cover

The final covering layer shall be progressively constructed as soon as practical after reaching the final landform levels. Notwithstanding this, the construction of the final covering layer shall commence with one (1) month of completion of waste disposal operations within a cell, weather permitting. It shall be completed within three (3) months of the date of commencement. Figure 4-3 shows the proposed final cover layer. Material used to seal the landfill shall have an in situ coefficient of permeability of not less than 10^{-9} ms^{-1} .

4.11 Site Supervision and Control

The Centre shall be supervised at all times when open for the receipt of wastes. The Centre shall be operated to ensure the following tasks are undertaken:

- Overall supervision of the Centre's operation by a person experienced in the operation of a sanitary landfill.
- Supervision of the active tipping face of the waste disposal areas and small vehicle transfer station.
- Daily spreading, compaction and covering of the deposited waste using a specialised landfill compactor.
- Recording of all incoming and outgoing vehicles.

Council shall ensure the effective supervision and control of traffic within the Centre and in particular at the weighbridge, the active tipping face of the waste disposal area and at the transfer station.

Council shall ensure that equipment engaged in the movement, spreading, compaction and covering of deposited waste in the vicinity of the active tipping face is not operated in such a way as to constitute a risk to employees, persons disposing of waste or the delivery of the waste.

Council shall be responsible for the supply and placing of barricades and/or signs, in order that the above requirements are maintained at all times.

Council shall keep an operators daily log book for recording activities and incidents that occur during the operation of the Centre. Information to be recorded is described elsewhere in this document.

Burning of waste can only be carried out with written permission of the OEH, and must be in accordance with OEH guidelines. The Environment Protection Licence currently in force for the Centre does not make provision for burning off. The following materials may not be burnt in any event:

- hazardous wastes

- chemical containers
- domestic garbage
- food wastes
- paint and paint containers
- petroleum, oil or bitumen
- plastics or rubber (including tyres)
- wet materials
- chemically treated timbers
- clinical wastes.

4.12 Staffing

Council shall ensure that the Centre is appropriately staffed by a sufficient number of qualified and experienced personnel. An absolute minimum of two (2) personnel shall be in attendance at the Centre at all times. When the Centre is open the gatehouse shall always be manned and the active landfill face and the transfer station supervised.

At a minimum staff training shall be undertaken to ensure that:

- all operators of compaction or earthmoving equipment are appropriately qualified and skilled at undertaking all tasks required of them;
- all those that operate gas testing, water sampling or water testing apparatus are familiar with required testing and sample retention protocols to a standard approved by the OEH;
- all those that are to inspect incoming wastes are skilled at identifying wastes that are unacceptable and at accurate data recording.

4.13 Hours of Operation

Currently the Waste Centre is open to the public between 8:00 am and 4:45 pm, seven days per week. The Centre is closed on Good Friday and Christmas Day. Council may consider earlier closing times in winter.

Council closes the Waste Centre at 4.45 pm each day, to allow the operators sufficient time to completely cover the waste prior to finishing up for the day (at 5.00 pm).

In the event of unforeseen public emergencies which require the need for immediate disposal of wastes, the Centre may be opened to allow for disposal of wastes.

All access to the Waste Centre outside the above specified operating hours is subject to the approval of the Council.

All variations in hours of operation of the Waste Centre shall be recorded in the operators daily log book.

Typically, heavy earthmoving and landfilling equipment shall only operate between 7.00 am and 6.00 pm Monday to Friday and 8.00 am to 6.00 pm Saturday, Sunday and Public Holidays. In the event of an urgent need to facilitate burial of wastes or rectify a problem, heavy earthmoving and

landfilling equipment may operate outside the above hours with due regard to OH&S requirements.

4.14 Equipment

Council shall maintain and/or engage sufficient and appropriate machinery, plant and equipment to meet the requirements of this Management Plan. This shall include, but is not limited to equipment for:

- winning and/or retrieving of cover material;
- spreading, compaction and covering of deposited waste;
- compacting, trimming, shaping, grading and levelling of cover layers;
- dust suppression;
- leachate and stormwater management;
- fire control and fire fighting; and,
- any other operation required for the proper and efficient operation of the Centre.

Council must provide the additional plant and equipment necessary to allow construction of new waste disposal cells/areas, when required, so as not to cause adverse impact on the waste disposal operation in regard to meeting the requirements of this Management Plan.

Notwithstanding the above, the minimum plant requirements at the Centre, at all times, shall be:

- a landfill compactor for spreading, compacting and covering deposited waste
- a dozer/loader to assist in the waste disposal operations, and
- a water cart for dust suppression and fire fighting.

All plant and equipment shall conform to the relevant Australian Standards and statutory obligations.

All machinery, equipment, and plant shall be maintained in proper working order in accordance with the manufacturer's requirements. In the event of equipment or plant failure the Council shall organise replacement plant or equipment as soon as practical to ensure the requirements of this Plan of Management are fully complied with at all times.

In order to extend the life of the GWMC Council is reviewing current compaction of waste. Findings reveal that the current compaction equipment is not providing desired compaction ratios as the converted loader currently used does not provide adequate weight and power to compact waste at the desired compaction rate.

Resulting from the review of compaction methods Council is planning to undertake trials using equipment and methods designed to enhance compaction of waste and extend landfill life

4.15 Security

The site will be fenced, and outside opening hours all access gates will be locked and Council will maintain the security of the site.

Adequate regard will be had for the safety of personnel handling cash in the weighbridge office. In particular, systems are required to be in place to mitigate the risk of theft (armed hold up) and fraud.

4.16 Health and Safety Procedures

Council shall take all necessary precautions to ensure the safety of all personnel engaged at the Centre and all public visiting the site. Council has a legal responsibility for such precautions and for any damage or injury to employees, contractors or the general public using the Centre.

Council shall be responsible for ensuring that all employees are instructed concerning potential hazards at the Centre and that safe working practices are observed.

Council shall provide, equip and maintain a first aid treatment station at the Centre and shall have on site a person trained in first aid at all times the Centre is open for the receipt of wastes.

It is the Council's responsibility to be familiar with the provisions of the *Occupational Health and Safety Act 2000* and the associated Regulations. The duties and all other obligations that the Act places on an employer shall be properly discharged by Council.

Council shall ensure that all hazard assessments are completed and risk controls implemented. It shall also ensure that all necessary protective clothing and safety equipment is available and/or issued to all employees, is maintained in good order and condition and used where necessary.

4.17 Wet Weather Operation

Council shall ensure the Centre is able to accept Permitted Waste under all weather conditions without compromising the environmental management of the Centre. In the event that wet weather prevents access to and/or operation of the waste disposal area the small vehicle transfer station shall be used if able. If the transfer station cannot be used Council shall provide an alternative temporary waste disposal mechanism.

4.18 Access Road Maintenance

Temporary internal access roads within the waste disposal areas shall be constructed so as not to cause damage to vehicles using the roads and shall provide effective access across the waste disposal areas. Materials suitable for the construction of such roads include C&D rubble, which shall be stockpiled for use when required. Access roads shall be sufficiently wide to safely permit two-way traffic by all vehicles using the Centre or arranged to permit one way flow of traffic.

The use of steel wheel compactors and other heavy earth moving machinery on site access roads shall be avoided.

4.19 Fire Control

Council shall comply with all requirements of the POEO Act.

No waste shall be burnt at the site and no fires shall be deliberately lit on the site, without the express permission of the OEH.

Incoming wastes which are found during inspection to be hot or on fire prior to deposition shall be directed away from the active landfilling areas

to a location where the material can/may be extinguished without risk of causing a fire on site.

In the event of a fire occurring at the site Council shall take prompt action to extinguish the fire. The local Fire Brigade shall be immediately notified of all fires irrespective of the extent of the fire and whether or not it has been controlled.

In addition the OEHL must immediately be notified by phone on **131 555** and in writing within 7 days of the date on which the fire occurred.

The following details must be recorded for all fire events and for each day that the fire is burning:

- the time and date when the fire started;
- whether the fire was authorised and if not, the circumstances which ignited the fire;
- the time and date that the fire burnt out or was extinguished;
- the location of the fire (e.g. clean timber stockpile, putrescible garbage cell, etc);
- prevailing weather conditions at the time of the fire;
- observations made in regard to smoke direction and dispersion;
- the amount of waste that was combusted by the fire;
- action taken to extinguish the fire; and
- action taken to prevent a reoccurrence.

In the event of a surface fire occurring at the site, water and/or earth shall be used as appropriate to extinguish the fire. Underground fires shall be treated on a case by case basis, but it will normally be necessary to excavate and spread the smouldering material and then smother it with earth or water.

Council shall co-operate fully with the Fire Brigade in fighting fires on the site.

A firebreak, not less than 5 m wide and cleared of all flammable material shall be provided and maintained around the boundaries of the waste disposal area. All sections of the firebreak shall be maintained to allow access for fire fighting vehicles in accordance with the requirements of the Fire Brigade. Council shall liaise with the Fire Brigade to establish and maintain these requirements.

All employees shall receive fire protection/fighting training and training in emergency procedures, including for plant operators the use of breathing apparatus. Assistance in training shall be sought from the Fire Protection section of the NSW Fire Brigade.

A water tanker capable of being used for fire fighting as well as dust suppression shall be provided on site at all times and maintained in proper working order.

Council shall develop a fire management plan and shall regularly review this plan with staff, ensure that their training is up to date and that every employee is conscious of the fire safety standard required and the continued need to operate safely.

The fire management plan shall detail at least the following:

- hazard assessment for fire fighting, the procedure to follow, persons responsible and equipment to be used in the event of a fire;
- maintenance schedules for all fire fighting equipment and facilities. This will, at a minimum, include all equipment and facilities being checked for damage on a weekly basis, and test operated every three months;
- details of all fire fighting equipment at site buildings;
- how all fire fighting equipment will be clearly signposted and access ensured at all times;
- how appropriate firebreaks are to be constructed and maintained; and,
- staff training in fire fighting techniques.

The fire management plan shall be prepared in consultation with a person competent to prepare such a plan

4.20 Record Keeping

All vehicles entering the Centre shall be recorded and the tonnage of waste carried determined by weighing the vehicle both into and out of the Centre. All data collected on the amount, type and source of waste must be reported to the OEH by Council on an annual basis (see Section 8.2). The format of the data shall be as suggested by the OEH, which is contained in Appendix C.

Council shall have a registered surveyor undertake a survey of the site on an annual basis to confirm the amount of landfill space consumed in the past twelve months (by either aerial or terrestrial survey) and the volume of remaining disposal capacity. The remaining disposal capacity shall be included in the annual report to the OEH (see Section 8.2). The results of the survey shall be reconciled with the monthly waste acceptance reports to determine the compaction density being achieved.

Council shall establish controls to prevent vehicles entering the Centre without being recorded.

4.21 Quality Assurance

The following measures will be undertaken to assure the quality of the design, construction and operation of the landfill:

- design and document the landfill development under a quality system that meets the requirements of AS/NZS/ISO 9001:2008;
- construct the landfill under a quality system that meets the requirements of AS/NZS/ISO 9001:2008;

Goulburn Mulwaree Council would also consider preparing an Environmental Management System for the facility in accordance with the requirements of AS/NZS/ISO 14000, if required by the OEH.

5 Environmental Management

5.1 Surface Water

Existing stormwater management controls comprise a catch drain running along the eastern side of the site. The catch drain intercepts water flowing from the landfill area and flows into the leachate dam in the north. See Figure 3-6 for the position of the existing drain paths. Water from the leachate dam not lost through evaporation is discharged to sewer.

Diversion drains in the south of the landfill direct any water into the two minor leachate dams. This water is lost through evaporation.

Runoff from the landfill is also collected in an underground sump behind the bunded storage tank area. This water drains into the northern leachate dam.

A perimeter access road has been built around the base of the entire landfill, which incorporates a catch drain to collect any surface water discharging off the landfill area except at the western side. This water is conveyed to the existing leachate dams (see Figure 4-2).

All stormwater drainage works shall be maintained in proper functioning order so as to prevent flooding of the Centre. Maintenance shall include, but is not limited to:

- regular cleaning of drains/pipes/pits and removal of accumulated sediments;
- regular trimming of overgrown vegetation; and,
- stabilisation of eroded drains.

Council shall design, construct and maintain all temporary stormwater drains required to prevent stormwater runoff from entering the active waste disposal area.

All temporary drains shall generally be earthen drains constructed at grades no steeper than 1%, to minimise scouring. Where steeper grades are required which result in flow velocities that may cause scour, the drains shall be lined with appropriate scour protection, e.g. jute mesh, rock pitching or features designed to control the flow velocity. Notwithstanding this, all earthen drains shall be grassed to minimise erosion.

All stormwater drains shall be sized to carry runoff generated during the 10 year average recurrence interval storm event.

All temporary stormwater drainage works shall discharge into the permanent stormwater drainage system, which flows to the leachate dams.

Council is responsible for maintaining the leachate dams in proper and effective working order. Such maintenance shall include, but is not limited to:

- maintaining the active volume of the ponds by periodic cleaning and removal of accumulated sediment and excess vegetation growth;
- maintaining the outlets free of debris, sediment and excess vegetation growth; and,

- maintaining the integrity of the pond embankments.

In designing, constructing and maintaining the stormwater drainage works Council shall comply with all the requirements of the OEH.

5.2

Leachate

Leachate is deemed to include all water that has come into contact with waste, including surface runoff. All measures practicable shall be taken to minimise the volume of leachate generated by:

- minimising infiltration of surface water into the landfilled waste by providing the specified covering layers and grading these covering layers to promote runoff;
- minimising the contamination of surface water runoff by undertaking proper covering of the deposited waste, by grading filled areas to direct surface water runoff away from the active waste disposal area and by minimising exposed areas at the Centre; and,
- progressive rehabilitation of the site, including revegetation.

Leachate management at the site shall comprise:

- collection of all leachate contaminated surface water via catch drains; and,
- disposal of all collected leachate on site by irrigating over inactive landfilled areas.

A perimeter road is under construction which will allow the capture of stormwater and surface leachate to be directed into either the northern or southern leachate dams (see Figure 4-2).

Goulburn Mulwaree Council will also consider the need to construct an intermediate clay capping layer and an internal leachate drainage network (within the landfilled waste), pending results of groundwater monitoring and discussions with the OEH.

Council shall ensure that all surface generated leachate is collected and discharged to the leachate management system. Temporary earth catch drains shall be constructed as required to collect surface occurring leachate. The temporary earth drains shall be constructed in accordance with the requirements of the Department of Housing's publication *Managing Urban Stormwater: Soils and Construction 2004* and the OEH.

The leachate drainage system shall be maintained in an operable and effective condition at all times. Care shall be taken to ensure the leachate drainage pipes are not damaged by waste disposal or other operational activities. Council shall undertake periodic inspection and maintenance of leachate catch drains, where able, to ensure the collection system remains effective in collecting and draining leachate from the landfilled waste.

The leachate sump is to be considered a hazardous area and must not be entered unless all requirements of the *Occupational Health and Safety Regulations 2001* with respect to working in confined spaces have been satisfied. Man proof covers shall always be in place and signs placed on the cover indicating the hazard present.

All employees, subcontractors or agents of Council operating at the Centre shall be informed on the hazard present in this sump as part of their general site induction.

All collected leachate shall be stored on-site in the leachate dams. The main dam is located north of the landfill site and a smaller one is proposed to be situated south of the landfill site. The leachate dams shall be maintained to ensure no leakage of impounded leachate through the bed or banks of the ponds. The dams shall be operated during dry weather to maintain an adequate freeboard depth to prevent overflow from them during wet weather and must not be allowed to overflow into the environment during less than a 1:25 years 24 hours duration rainfall event.

5.3 Trade Waste

A cut-off trench is located on the north side of the northern leachate dam. Any leachate collected in the trench is collected in a wet well from where it is pumped into the Council's sewerage system. This discharge is the subject of a Trade Waste Approval issued by Goulburn Mulwaree Council as the responsible authority for the receipt and treatment of liquid wastes in the sewerage system. A trade waste Contingency Plan and a Due Diligence Programme have been developed as required by the Trade Waste Approval and are attached at Appendix E: Trade Waste Contingency Plan and Appendix F: Trade Waste Due-Diligence Plan respectively. Ultimately, the leachate should be returned to the leachate dam, which will in turn be pumped back over the landfill thereby treating all leachate on the site and obviating the need for it to enter the sewerage system.

At the time of preparing this LEMP the current Trade Waste Approval has lapsed and a renewed Approval is pending. Once issued the approval is to be inserted into this LEMP as an additional Appendix and compliance with that approval will become a requirement of this LEMP.

5.4 Landfill Gas

In accordance with the Centre's EPL (see Appendix A), methane is monitored every six months in the areas where intermediate or final cover has been placed and inside all buildings within 250 m of deposited waste. The results are reported to the OEH annually.

In the event that landfill gas is detected, the Council shall investigate the need to install a gas collection and control system. However, this should be reviewed in the light of impending CPRS legislation and future cells constructed with the concentration and capture of landfill gas in mind. In this way Council will be able to offset any liability to purchase carbon pollution permits.

However, given the way that the Centre has been developed in the past it is going to be extremely difficult and probably not cost effective to collect and incinerate the landfill gas.

5.5 Odour

The Centre shall be operated to minimise the generation and impact of odours arising from the waste disposal operation on properties in the area.

All practicable measures shall be taken to contain any odours within the boundaries of the site.

Odours can be significantly reduced by operating the site in accordance with sanitary landfilling methods and good site management.

Odours shall be minimised by:

- generally filling from the high end of the waste disposal cells towards the lower end, ensuring minimal surface water runoff water becomes entrapped in the waste during filling operations;
- not depositing waste in standing water;
- depositing wastes in thin layers to optimise compaction;
- covering all exposed waste at the end of each working day with at least 150 mm of daily cover material;
- the use of deodorising sprays when required;
- minimising disturbance of previously filled areas; and
- a record of complaints regarding odours shall be kept in the daily log book.

5.6 Litter

All practicable measures shall be taken to confine litter arising from the operation of the Centre, within the boundaries of the site.

Movable litter screens shall be used as necessary at the active waste disposal area to control windblown waste.

Regular litter patrols shall be undertaken along the boundary of the Centre and along roads leading to the Centre. In the event of windblown litter being discharged from the site Council shall, as soon as practicable but no later than 24 hours after the event, collect and dispose of the escaped litter.

All litter screens, litter fencing, and all other site fencing shall be cleared of litter on a weekly basis.

All loads entering the Centre shall be covered. Council shall enforce load covering to prevent litter.

5.7 Vermin

Council may seek to implement a vermin control program during operation of the Centre if required. Vermin includes insects, rodents, foxes, birds, feral cats and other pests.

The vermin control program may include:

- the use of insecticides and pesticides;
- baiting; and,
- the use of scarecrows and bird scares.

The need for such a control program shall be minimised by utilising effective sanitary landfilling methods including good compaction and covering of deposited waste, including compaction of the covering layers.

Care shall be taken to ensure that pesticides do not enter stormwater or leachate or pose an airborne pollution hazard or nuisance.

Council shall ensure that the leachate and sedimentation ponds are kept free of mosquito larvae and that water does not pond in any other location which may propagate mosquito breeding.

5.8 Dust

All practicable measures shall be taken by Council to minimise dust emissions arising from the operations at the Centre. These include:

- minimising vehicle access to the landfill face by directing all small vehicles to the transfer station;
- immediate burial and covering of dusty loads; and,
- use of a water cart as required.

An operational water cart shall be maintained on site at all times.

In accordance with the Centre's EPL, dust is monitored every month for ash, combustible solids and insoluble solids approximately 60 m south-southeast of the gatehouse. The results are reported to the OEH annually.

5.9 Noise

All practicable measures shall be taken to minimise noise emissions arising from the operations at the Centre. It is Council's responsibility to ensure that the operational noise levels at any residence outside the boundary of the Council's land do not exceed the permitted levels as specified in the POEO Act and associated Regulations.

The impact of noise arising from the landfill operations on all surrounding residential areas shall be minimised by implementing the following measures:

- maintaining all landfill plant and machinery in proper working order;
- locating all internal access roads and fixed plant as far as is practicable from residential areas;
- all vehicles accessing the site shall use the designated access roadways; and,
- construction of temporary earth bunding/vegetation screening as required to attenuate noise emissions.

Council shall implement such measures as are necessary to satisfy all OEH requirements relating to noise pollution.

5.10 Other

5.10.1 Vehicle Cleaning

Shaker grids for cleaning the wheels and undersides of the vehicles leaving the site shall be provided. This is to minimise the potential impact on local amenity and stormwater runoff that could occur by vehicles carrying mud and litter off site. Signs shall be displayed advising users of the Centre that it is their responsibility to ensure that remnants of their loads or material stuck to the underside of their vehicle does not litter public roads.

5.10.2 Noxious Weed Control Program

Noxious weeds that occur on the site shall be controlled by a program of spraying with herbicides (as currently occurs), and it is Council's intention to continue to control weeds and prevent their spread to the adjoining nature reserve. The requirements of the spraying program are determined by Council's Noxious Weed Officer, however, as a minimum the Officer shall visit the Centre at least once a month to assess any problems with noxious weeds and to carry out any required spraying. More frequent visits shall be made if required. Table 5-1 lists the herbicides used to control various weed species.

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Table 5-1 Herbicides used to control noxious weeds

Noxious Weed	Herbicides Used
Patterson's Curse	NCPA Dycamba
Thistles	NCPA Dycamba
Blackberry	Brushoff
Serrated Tussock	Taskforce
African Lovegrass	Taskforce

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6 Environmental Monitoring

6.1 General

Council shall undertake regular monitoring of ground water, surface water, leachate, landfill gas and dust to ensure the operation of the Centre is not causing a detrimental environmental impact. In addition, every 12 months the operation of the Centre will be reviewed to assess the compliance of the Centre's operation with the Centre's EPL and this Plan of Management.

All analyses of samples will be performed by a laboratory accredited by the National Association of Testing Authorities (NATA) to undertake the analyses specified. Minimum field quality control shall comprise:

- testing of field blanks, these must represent 5% or at least one blank where less than 20 samples are analysed in a batch. A documented investigation report is required if the blanks exceed the required detection limits;
- testing of field spikes, these must represent 5% or at least one spike where less than 20 samples are analysed in a batch. A documented investigation report is required if spike recovery is outside the 80 to 120% range; and,
- testing of duplicated field samples, these must represent 5% or at least one duplicate where less than 20 samples are analysed in a batch. A documented investigation report is required if the variation between duplicates exceeds 20% difference.

Sampling shall be carried out in accordance with OEH acceptable procedures, as described in the Guidelines and the EPL.

6.2 Leachate and Stormwater

The objective of leachate and stormwater monitoring is to identify and characterise the quality of the surface water generated on-site and assess any impacts of the discharge of the surface water.

The number and location of surface water monitoring locations is shown in Figure 3-5.

In accordance with the Centre's EPL, Council shall monitor the quality of surface water discharged from the site every three (3) months, or more regularly at Council's discretion. If at all possible sampling shall take place during or immediately after wet weather. If no discharge occurs from the site, or it was not possible to sample a discharge event in any given three month period, then samples shall be taken from the leachate dams. Samples may also be taken from surface catch drains, sedimentation ponds and natural watercourses (both upstream and downstream of the site), as required to monitor the impact of the Centre.

The two specific sites are:

- the natural watercourse downstream of the main leachate dam (SW1); and,
- just outside the chain wire fence and to the south of the lesser leachate dam (SW3).

The samples of surface water shall be analysed for the parameters shown in Table 6-1.

Table 6-1 Water monitoring parameters

Field Measurements	Units used in Analysis	Limits for Irrigation*
Electrical conductivity	(μ S/cm)	800
Dissolved oxygen	(mg/L)	-
pH	(pH units)	between 6.5 to 8.5
Temperature	($^{\circ}$ C)	-
Laboratory Analysis	Units used in Analysis	Limits for Irrigation
Alkalinity (as calcium carbonate)	(mg/L)	-
Ammonia - nitrogen	(mg/L)	-
Biological oxygen demand (BOD)	(mg/L)	40 kg/ha/day
Calcium	(mg/L)	see SAR
Chloride	(mg/L)	0.5
Filterable iron	(mg/L)	1
Fluoride	(mg/L)	1
Magnesium	(mg/L)	see SAR
Manganese	(mg/L)	0.2
Nitrate	(mg/L)	10
Potassium**	(mg/L)	-
Sodium**	(mg/L)	see SAR
Sodium adsorption ratio (SAR)		6
	(mg/L)	-
Total organic carbon	(mg/L)	-
Total phenolics	(mg/L)	-
Total suspended solids	(mg/L)	-

* These limits have been sourced from Environment ACT's *Environmental Protection Policy: ACT Wastewater Reuse For Irrigation, 1999*. Limit units are the same as those used in analysis except for BOD.

** These parameters are not required for samples taken from the just outside the chain wire fence and to the south of the lesser leachate dam.

In addition, samples shall be taken from the leachate dams at least every three (3) month to:

- characterise the leachate being generated by the landfilled waste, in terms of quality and quantity; and,
- verify the leachate quality against the limits in Table 6-1 to determine its suitability for irrigation onto completed areas of the landfill .

The volume of leachate generated will be determined by estimating the volume of leachate disposed of via irrigation and the volume of dam overflow (if any).

Additionally, to allow initial characterisation of the leachate the first four quarterly samples collected from the leachate dams will also be analysed for aromatics, volatiles, halocarbons and base, neutral and acid

extractable organic contaminants. This shall include screening for monocyclic aromatics, halogenated hydrocarbons, phenols, organochlorinated pesticides (OCP's), organophosphate pesticides (OPP's), PCB's and PAH's. The results from previous testing are in

Appendix D.

Statistical analysis of results shall be used where appropriate to determine if there is any significant change in the indicator parameters.

6.3 Groundwater

The number and location of groundwater monitoring bores are shown in Figure 3-5.

The objective of ground water monitoring is to identify and characterise the impact of leachate on the ground water system.

The Council shall monitor the quality of ground water from all monitoring bores every three (3) months, or more regularly at Council's discretion. Monitoring shall comprise of:

- the measurement of depth to the ground water table; and,
- analysis of groundwater for the same parameters as for surface water (see Table 6-1).

All analysis of results shall use statistical procedures where appropriate to determine if there has been any significant change in the concentration of parameters.

6.4 Landfill Gas

Landfill gas (methane) shall be monitored every six (6) months at two locations:

- areas where intermediate or final cover has been placed; and,
- inside all buildings within 250 m of deposited waste.

The objective of the landfill gas monitoring program is to identify and characterise landfill gas generation for the following reasons:

- to detect lateral migration of landfill gas off site; and,
- to monitor levels of landfill gas in the atmosphere and to assess potential risks.

6.5 Dust

In accordance with the Centre's EPL, a dust gauge has been installed in accordance with Australian Standard 3580.10.1-1991 approximately 60 m south-southeast of the gatehouse.

Monitoring of the dust gauges shall be undertaken monthly for ash, combustible solids and insoluble solids. Sampling and testing shall be done by a suitably qualified person and a NATA registered laboratory.

6.6 Complaints

Council shall maintain a register on-site for recording the details of all complaints. The register shall contain details of the nature of the complaint, a description of the actions taken and the effectiveness of the actions in resolving the complaint.

In addition a telephone complaints line must be operated by the Council during the hours of operation of the Centre for the purpose of receiving any complaints from members of the public in relation to activities conducted at the Centre. The Council is obligated by the Centre's EPL to notify the public of the complaints line number and that fact that it is a complaints line. To this end Council shall ensure that signage located at the entrance to the site displays this number and that it is visible from outside the Centre gates.

6.7 Remaining Disposal Capacity

Council shall annually determine the remaining waste disposal capacity of the Centre in cubic metres as described in Section 4.20. It is a requirement of the Centre's EPL that this information be included in the Annual Return to the OEHL.

6.8 Retention of Records

All monitoring records required by Section 5 of the Centre's EPL are required to be kept for a period of at least 4 years from the date of monitoring and must also be made available in a legible form to any authorised officer of the OEHL who demands to see them.

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7 Site Rehabilitation and Post Closure Management

7.1 Future Landuse

The site shall be established as a bushland reserve or open space recreation after the landfill is closed and the site rehabilitated. Whilst the landfill is stabilising Council will retain responsibility for the site. Once the site is stabilised and no longer poses a threat to the environment, then responsibility for the site shall pass to the NSW Department of Natural Resources (DNR). It is intended then that the future land uses and zoning of the site will be subject to discussions with the DNR.

7.2 Landscaping and Revegetation

Upon completion of the final covering layer the landfilled area shall be landscaped and revegetated. Initially, while the landfill is still stabilising, shallow rooted, high transpiration rate grasses shall be planted on the landfilled areas. Trees and shrubs shall be planted around the boundary of the site. Once the site is stabilised more detailed landscaping and revegetation plans will be prepared. The plans will be prepared in consultation with the DNR and the general public. All plant, equipment and site buildings shall also be removed from site.

7.3 Closure Plan

Within three months prior to the last load of waste being landfilled, a closure plan in accordance with Section 76 of the POEO Act is to be submitted to the OEH.

7.4 Post Closure Management

7.4.1 Environmental Management

Council will ensure that all leachate collection, gas collection, stormwater controls and reporting practices are maintained at the same level employed during the operational life of the landfill. The environmental management measures shall continue until Council can demonstrate that the landfill does not pose a threat to the environment.

Council will ensure that waste materials are not received for disposal at the site after the landfilling operations cease. Any waste materials that are intended for use in the rehabilitation must be documented and reported in the same fashion as for the operating Centre.

7.4.2 Environmental Monitoring

Council will maintain the same monitoring program as used throughout the operation of the site and described in Section 6, except for dust monitoring which will be discontinued. Monitoring shall continue until Council can demonstrate that the landfill no longer poses a threat to the environment. Council shall ensure that all neighbouring residents are advised of contact persons to discuss any problems (e.g. odour emissions). Any complaints that are received shall be recorded in the operators log book.

7.4.3 Maintenance

Regular maintenance of the final landform and landscape shall be undertaken. This will comprise:

- filling of any cracks that may occur in the final cover layer;
- filling of depressions created by settlement of the landfilled waste (to ensure shedding of surface water runoff);
- replacement of vegetation affected by landfill gas, if necessary, to maintain the integrity of the vegetation cover; and,
- repair of any erosion scours.

The above activities would continue until the landfill has been stabilised and are no longer required.

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8 Reporting

8.1 Incident Reporting

Any incident that causes or threatens material harm to the environment shall be communicated to the OEHL as soon as practicable after first becoming aware of the incident. Initial contact will be via the 24 hour **OEHL Pollution Hotline (131 555)**. Written notice shall follow within 7 days. Examples of incidences which require reporting may include but are not limited to:

- identification of non-domestic quantities (200 mL or g) of hazardous waste mixed amongst solid waste;
- fires at the landfill;
- mixing of leachate and stormwater or waste and stormwater;
- identification of any failure of an environmental protection system;
- identification of a significant difference in groundwater indicator parameters;
- detection of subsurface gas migration in a perimeter gas well at greater than 5% (v/v) methane;
- any other incident or observation that could potentially pose an immediate environmental hazard outside normal operating conditions; and,

The occurrence of any such incident shall also be recorded in the operator's daily log book.

8.2 Annual Reporting

Each year, an Annual Return accompanied by an Annual Report shall be provided to the OEHL in accordance with the Centre's EPL. These documents must be supplied to the OEHL by registered post no later than 60 days after the licence anniversary date (15th of April) of each year.

The Annual Return shall be in the form provided annually by the OEHL, a sample copy of which is attached at Appendix C.

The Annual Report shall include the following:

- tabulated results of all monitoring data required by the Centre's EPL collected over the year. This will include all of the items listed within Section 5 of the Centre's EPL;
- a graphical presentation of all monitoring data from at least the last three years in order to show variability/and or trends. Any statistically significant variations or anomalies should be highlighted or explained;
- an analysis and interpretation of all monitoring data;
- an analysis and response to any complaints received;
- identification of any deficiencies in environmental performance identified by the monitoring data, trends or incidents and or remedial action taken or proposed to be taken to address these deficiencies; and
- recommendations on improving the environmental performance of the facility.

9 Continuous Improvement

9.1 Action Plan

It is important that an Action Plan, which is periodically reviewed and updated, is established to ensure best practise is being applied to the operation of the landfill.

The following items are suggested to ensure that the facility meets its environmental and other statutory obligations, makes best use of the available landfill space and does so at minimum cost to the community. As these items are reviewed other continuous improvement opportunities may be identified:

- Ensure that a copy of the EPL is maintained within the Centre;
- prepare an operations plan to guide staff in day to day operations and in meeting their obligations under this LEMP;
- train staff in their obligations and duties with respect to the operations plan and this LEMP;
- review the adequacy of staffing levels to meet the requirements of this LEMP, including environmental and OH&S obligations and site security;
- review adequacy of the existing plant;
- ensure adequate financial provision to meet future capital works obligations e.g. plant replacement/upgrades, cell preparation, interim capping, closure plan etc;
- review charging policies to balance maximising income with resource recovery;
- prepare a programme for obtaining the required approvals for eventual extension of the site to the south east. The extended site may then provide a source of future cover material;
- consider charging all loads except rural card entitlements by mass. This would involve weighing all vehicles into and out of the Centre;
- ensure all loads are recorded. This includes clean fill and small vehicles;
- upgrade weighbridge facility to record both inbound and outbound traffic;
- modify entry arrangement to monitor and record both inbound and outbound traffic;
- review resource recovery strategies to maximise the life of the landfill;
- provide adequate staffing resources to manage the landfill operation in accordance with the requirements of this LEMP;
- provide adequate plant resources to manage the landfill operation in accordance with the requirements of this LEMP;
- monitor potential impacts of the CPRS and develop appropriate strategies to minimise these;
- provide a sign prominently at the Centre gate listing the recyclable materials allowed at the Centre;
- install a collection area for recyclable plastics;
- acquire and utilise portable litter screens;
- prepare a fire management plan;
- erect signage and fencing around the area where asbestos is buried;

- install shaker grids at landfill exit;
- install signage at the front gate to advise customers of their responsibility to ensure material stuck to the underside of the vehicle or wheels does not litter public roads;
- install signage visible from outside the Centre listing the complaints telephone number and the hours during which this number is monitored;
- place sign at the leachate sump to warn people that it is considered to be a confined space;
- prepare due diligence and contingency plans to manage overflow or contamination of overflows into the sewer; and
- install a flowmeter on the overflow of the leachate pond to the sewer to comply with the requirement of the Trade Waste Agreement.

9.2 Management Plan Review

To ensure that the Plan is up to date and relevant, it is necessary for the Manager of Facilities to review the Plan annually by utilising the checklist in Appendix .

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10 Appendices

Appendix A: Goulburn Waste Management Centre Environment Protection Licence

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Environment Protection Licence

Department of Environment & Climate Change NSW



Licence Details

Number:	6780
Anniversary Date:	15-April
Review Due Date:	27-Nov-2013

Licensee

GOULBURN MULWAREE COUNCIL
LOCKED BAG 22
GOULBURN NSW 2580

Licence Type

Premises

Premises

GOULBURN MULWAREE COUNCIL
100 SINCLAIR STREET
GOULBURN NSW 2580

Scheduled Activity

Waste disposal (application to land)

Fee Based Activity

Waste disposal (application to land)

Scale

0 - All

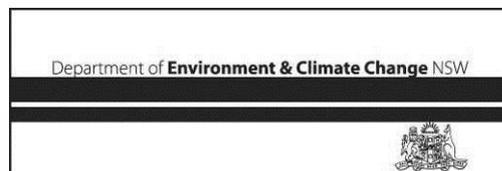
Region

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

PO Box 622 QUEANBEYAN
NSW 2620

Environment Protection Licence

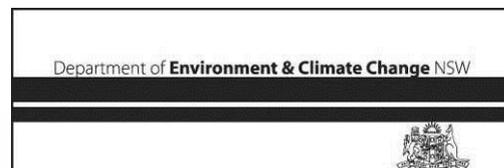
Licence -6780



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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);
- and
- 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).

The EPA publication "A Guide to Licensing" contains information about how to calculate your licence fees.

Environment Protection Licence

Licence - 6780



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
LOCKED BAG 22
GOULBURN NSW 2580

subject to the conditions which follow.

Administrative conditions

A1 What the licence authorises and regulates

A1.1 Not applicable.

A1.2 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.

Environment Protection Licence



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
Waste disposal (application to land)

Fee Based Activity	Scale
Waste disposal (application to land)	0 - All

A1.3 Not applicable.

A2 Premises to which this licence applies

A2.1 The licence applies to the following premises:

Premises Details
GOULBURN MULWAREE COUNCIL
100 SINCLAIR STREET
GOULBURN
NSW
2580
LOT 30-32 DP750050 LOT 100 DP132937

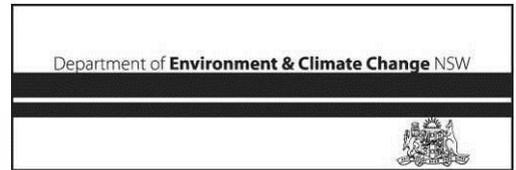
A3 Other activities

A3.1 Not applicable.

A4 Information supplied to the EPA

Environment Protection Licence

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A4.1 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.

A4.2 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.

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 Identification no.	Type of Monitoring Point	Type of Discharge Point	Description of Location
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 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.

P1.3 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.

*Water and land*

EPA identification no.	Type of monitoring point	Type of discharge point	Description of location
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 Monitoring		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.

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 Load limits

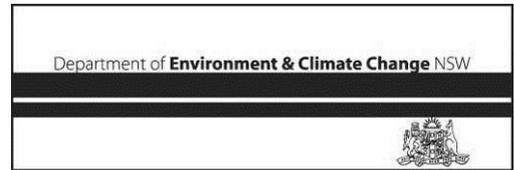
L2.1 Not applicable.

L2.2 Not applicable.

L3 Concentration limits

Environment Protection Licence

Licence -6780



L3.1 Not applicable.

L3.2 Not applicable.

L3.3 Not applicable.

L3.4 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.

L3.5 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.

L4 Volume and mass limits

L4.1 Not applicable.

L5 Waste

L5.1 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. Condition L5.1 does not limit any other conditions in this licence.

Code	Waste	Description	Activity	Other Limits
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		Any waste received on site that is		NA



below licensing thresholds in
Schedule 1 of the POEO Act, as in
force from time to time

L5.2 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.

L5.3 Tyres from the Sydney Metropolitan Area must not be received at the premises unless: (a) they have been shredded into pieces measuring no more than 250mm in any direction; or (b) they have had their walls removed; or (c) the facility has the capacity, at the time of receiving the tyres, to recycle or process the tyres into a saleable product (including retreading the tyres); or (d) the facility has the capacity, at the time of receiving the tyres, to shred the tyres or remove the walls from the tyres; or (e) the tyres are from a domestic load containing no more than 5 tyres having a diameter of less than 1.2 metres.

L6 Noise Limits

L6.1 Not applicable.

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.

O2 Maintenance of plant and equipment

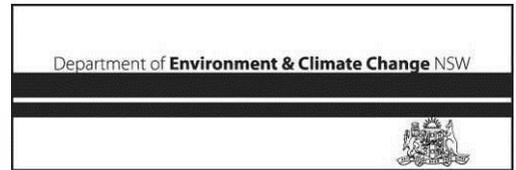
O2.1

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; and (b) must be operated in a proper and efficient manner.

O3 Dust Control

Environment Protection Licence

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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 Closure plan

O4.1 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.

O5 Screening of waste

O5.1 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 Unauthorised entry

O6.1 The licensee must take all practicable steps to control entry to the premises.

O6.2 The licensee must ensure that all gates are locked whenever the landfill is unattended.

O7 Fire extinguishment

O7.1 The licensee must extinguish fires at the premises as soon as possible.

O7.2 The licensee must have adequate fire prevention 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.

O8 Staff training

O8.1 The licensee must ensure that adequately trained staff are available at the premises in order to administer the requirements of this licence.

O9 Tyre Storage

O9.1 The total quantity of used, rejected or unwanted tyres (including shredded tyres and tyre pieces) stockpiled at the premises must not exceed 50 tonnes.

O9.2 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.

O9.3 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.



O9.4 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.

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:



POINT 4

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
Potassium	milligrams per litre	Quarterly	Grab sample
Sodium	milligrams per litre	Quarterly	Grab sample
Sulfate	milligrams per litre	Quarterly	Grab sample
TSS	milligrams per litre	Quarterly	Grab sample
Temperature	degrees Celsius	Quarterly	Grab sample
Total Phenolics	milligrams per litre	Quarterly	Grab sample
Total organic carbon	milligrams per litre	Quarterly	Grab sample
pH	pH	Quarterly	Grab sample

POINT 6

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
TSS	milligrams per litre	Quarterly	Grab sample
Temperature	degrees Celsius	Quarterly	Grab sample
Total Phenolics	milligrams per litre	Quarterly	Grab sample
Total organic carbon	milligrams per litre	Quarterly	Grab sample
pH	pH	Quarterly	Grab sample



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
Sodium	milligrams per litre	Quarterly	Grab sample
Sulfate	milligrams per litre	Quarterly	Grab sample
TSS	milligrams per litre	Quarterly	Grab sample
Temperature	degrees Celsius	Quarterly	Grab sample
Total Phenolics	milligrams per litre	Quarterly	Grab sample
Total organic carbon	milligrams per litre	Quarterly	Grab sample
pH	pH	Quarterly	Grab sample

POINT 8

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
Potassium	milligrams per litre	Quarterly	Grab sample
Sodium	milligrams per litre	Quarterly	Grab sample
Sulfate	milligrams per litre	Quarterly	Grab sample
TSS	milligrams per litre	Quarterly	Grab sample
Temperature	degrees Celsius	Quarterly	Grab sample
Total Phenolics	milligrams per litre	Quarterly	Grab sample
Total organic carbon	milligrams per litre	Quarterly	Grab sample
pH	pH	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
Potassium	milligrams per litre	Quarterly	Grab sample
Sodium	milligrams per litre	Quarterly	Grab sample
Sulfate	milligrams per litre	Quarterly	Grab sample
TSS	milligrams per litre	Quarterly	Grab sample
Temperature	degrees Celsius	Quarterly	Grab sample
Total Phenolics	milligrams per litre	Quarterly	Grab sample
Total organic carbon	milligrams per litre	Quarterly	Grab sample
pH	pH	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

POINT 11

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
Potassium	milligrams per litre	Quarterly	Grab sample
Sodium	milligrams per litre	Quarterly	Grab sample
Sulfate	milligrams per litre	Quarterly	Grab sample
TSS	milligrams per litre	Quarterly	Grab sample
Temperature	degrees Celsius	Quarterly	Grab sample
Total Phenolics	milligrams per litre	Quarterly	Grab sample
Total organic carbon	milligrams per litre	Quarterly	Grab sample
pH	pH	Quarterly	Grab sample

POINTS 13,14

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



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
Potassium	milligrams per litre	Quarterly	Grab sample
Sodium	milligrams per litre	Quarterly	Grab sample
Sulfate	milligrams per litre	Quarterly	Grab sample
TSS	milligrams per litre	Quarterly	Grab sample
Temperature	degrees Celsius	Quarterly	Grab sample
Total Phenolics	milligrams per litre	Quarterly	Grab sample
Total organic carbon	milligrams per litre	Quarterly	Grab sample
pH	pH	Quarterly	Grab sample

Special Method 1 means using a calibrated methane gas detector

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:

- (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.

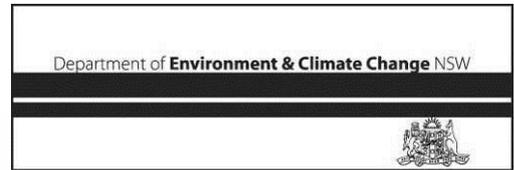
Note: The Protection of the Environment Operations (Clean Air) Regulation 2002 requires testing for certain purposes to be conducted in accordance with test methods contained in the publication "Approved Methods for the Sampling and Analysis of Air Pollutants in NSW".

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.

M4 Recording of pollution complaints

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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 Conditions M5.1 and M5.2 do not apply until 3 months after:

- (a) the date of the issue of this licence or
- (b) if this licence is a replacement licence within the meaning of the Protection of the Environment Operations (Savings and Transitional) Regulation 1998, the date on which a copy of the licence was served on the licensee under clause 10 of that regulation.

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 Monitoring remaining landfill capacity

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

Reporting conditions

R1 Annual return documents

What documents must an Annual Return contain?

R1.1 The licensee must complete and supply to the EPA an Annual Return in the approved form comprising:

- (a) a Statement of Compliance; and
- (b) a Monitoring and Complaints Summary. A copy of the form in which the Annual Return must be supplied to the EPA accompanies this licence. Before 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.

Period covered by Annual Return

R1.2 An Annual Return must be prepared in respect of each reporting period, except as provided below.

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.

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.

Note: An application to transfer a licence must be made in the approved form for this purpose.

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 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.

Deadline for Annual Return

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

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than 60 days after the date the transfer was granted (the 'due date').

Notification where actual load can not be calculated

R1.6 Not applicable.

Licensee must retain copy of Annual Return

R1.7 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.

Certifying of Statement of Compliance and signing of Monitoring and Complaints Summary

R1.8 Within the Annual Return, the Statement 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.

R1.9 A person who has been given written approval to certify a certificate of compliance under a licence issued under the Pollution Control Act 1970 is taken to be approved for the purpose of this condition until the date of first review of this licence.

Annual Report

R1.10 The Annual Return must be accompanied by/or include an Annual Report which must contain an assessment of environmental performance relevant to licence conditions including:

- a) tabulated results of all monitoring data required to be collected by this licence;
- b) a graphical presentation of data from at least the last three years (if available) in order to show variability/and or trends. Any statistically significant variations or anomalies should be highlighted and explained;
- c) an analysis and interpretation of all monitoring data;
- d) an analysis of and response to any complaints received;
- e) identification of any deficiencies in environmental performance identified by the monitoring data, trends or incidents and of remedial action taken or proposed to be taken to address these deficiencies; and
- f) recommendations on improving the environmental performance of the facility.

R2 Notification of environmental harm

Note: The licensee or its employees must notify the EPA of incidents causing or threatening material harm to the environment as soon as practicable after the person becomes aware of the incident in accordance with the requirements of Part 5.7 of the Act.

R2.1 Notifications must be made by telephoning the EPA's Pollution 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.



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;
- (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 Recording of fires

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.



General conditions

G1 Copy of licence kept at the premises

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.

Pollution studies and reduction programs

Completed PRPs

PRP ID	Description	Completed date
4	Leachate Management Aim of PRP is to protect the Sydney Drinking Water Catchment by connecting the leachate dam to sewer	30 April 2002
5	Stormwater Management Aim of PRP is to reduce the volume of leachate generated and to ensure leachate contaminated stormwater does not leave the site by preparing a report which assesses whether the current water management strategies are adequate and examines options for ensuring the water streams are kept separate	30 June 2002
6	Liquid Waste Disposal Aim of PRP is to ensure only general solid waste (non-putrescible) and general solid waste (putrescible) are disposed of at the premises by decommissioning the liquid waste disposal area.	31 March 2001
7	Materials Storage Aim of PRP is to ensure materials are stored at the premises in a way which contains leaks or spills and minimises odour generation.	31 January 2002
8	Materials Storage Capital Works Program Aim of PRP is to oversee the implementation of capital works to ensure materials are stored at the premises in a way which contains leaks or spills and minimises odour generation.	14 March 2003
9	Stormwater Management Works The aim of this PRP is to reduce the volume of	30 November 2003



	leachate generated and to ensure leachate contaminated stormwater does not leave the site by implementing the recommendations of the report prepared in accordance with PRP 4.	
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Special conditions

E1 Not applicable.

Dictionary

General Dictionary

In this licence, unless the contrary is indicated, the terms below have the following meanings:

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 1998
AM	Together with a number, means an ambient air monitoring method of that number prescribed by the <i>Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales</i> .
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 1998
assessable pollutants	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 1998
BOD	Means biochemical oxygen demand
CEM	Together with a number, means a continuous emission monitoring method of that number prescribed by the <i>Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales</i> .
COD	Means chemical oxygen demand
composite sample	Unless otherwise specifically approved in writing by the EPA, a sample consisting of 24 individual samples

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	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 1998.
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 (non-putrescible)	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
general solid waste (putrescible)	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment 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 1998
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

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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
TM	Together with a number, means a test method of that number prescribed by the <i>Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales</i> .
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

“dry weather” means less than ten millimetres of rain falling within a 24 hour period.

Ms Debbie Maddison

Environment Protection Authority

(By Delegation)

Date of this edition - 27-Mar-2009



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.

PHIL HAWLEY & ASSOCIATE



Appendix B: Report on the Installation of Groundwater Bores and Monitoring Program



PHIL HAWLEY & ASSOCIATE

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GOULBURN CITY COUNCIL

GOULBURN WASTE DEPOT

REPORT ON

INSTALLATION OF GROUNDWATER BORES

AND MONITORING

DECEMBER 1995

Prepared by
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**GOULBURN WASTE DEPOT
REPORT ON INSTALLATION OF GROUNDWATER
BORES AND MONITORING**

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FIGURES

APPENDIX A - Groundwater Monitoring Bore Logs

2.0 REVIEW OF GEOLOGY AND HYDROGEOLOGY

Goulburn Waste Depot is located at the eastern end of Goulburn, south of the Old Hume Highway and at the base of Mount Gray. An open pond down-gradient of the landfill is used to collect and store leachate from the landfill.

The Depot slopes down to the north-west towards the Mulwaree River. The elevation at the Depot varies from approximately 675 m AHD (Australian Height Datum) at the northern boundary to 705 m at the south-eastern boundary.

According to geological plans, the Goulburn area (particularly in the vicinity of the Depot) comprises highly sheared, late Silurian age rocks of volcanic origin. This rock material consists of sandstones and siltstones, slate and quartzite. During the site inspection and drilling process outcrops of quartzite were evident at several locations at the Depot. Although the bores primarily consisted of sandstone and quartzite rock, there was also sandy topsoil and small bands of sandy clay.

A search of the groundwater bore data-base maintained by DL&WC indicated the following:

- Three groundwater bores are located approximately 1.4 km, 1.4 km and 1.7 km to the west of the Site.
- One of these boreholes (1.7 km away) is considerably closer to the Mulwaree River than the Site and much lower in elevation. The geological and hydrological information for this bore may not be representative of the ground conditions at the Depot.
- The two bores closer to the Site and are believed to be at similar elevations to the Depot. These bores were drilled to depths of 61.0 m and 53.3 m and the soil logs indicate the presence of sand, clay, sandstone, coal, shale and slate. The depth to groundwater at the deeper bore location was noted as 53.6 m.

3.0 INSTALLATION OF GROUNDWATER MONITORING BORES

Three groundwater bores were installed at the Waste Depot from the 7 to 10 November 1995. One bore was located upgradient of the landfill and two located downgradient. The proposed locations and depths of the groundwater bores were designed to establish the potential impacts of the landfill operations on groundwater quality. The bore locations are shown in Figure 1.

The groundwater monitoring bores were drilled using a reverse circulation (RC) hammer drill of 100 mm diameter (air is used to transport the cuttings to the surface). During drilling, the soil/rock profiles were logged on-site by an experienced field engineer. Due to the disturbance of the soil/rock blown to the surface during the drilling process, only an approximate description of the underlying strata was possible. The recorded bore logs are included in Appendix A.

Each monitoring bore was constructed using 50 mm Class 18 PVC pipe with a 6 m length of PVC screen (slot size 0.5 mm), a 1.0 m to 1.5 m sump at the bottom, PVC cap and lockable steel mount at the top. The top of the steel mount is approximately 0.5 to 1.0 m above the natural surface level. The bores were constructed in accordance with CMPS&F QA documentation for bore installation (available upon request).

Bore development was undertaken using air lift methods to promote the removal of residual drill cuttings and to allow fresh groundwater to enter the bore. Development was continued for approximately 20 minutes per bore.

4.0 GROUNDWATER SAMPLING

Groundwater sampling was undertaken approximately 1 week after installation and development of the bores. Prior to sampling, each of the bores were purged to allow inflow of more fresh groundwater. During purging, water extracted from the bores was monitored for temperature, pH, electrical conductivity, salinity and redox potential using a Hydrolab (H20G) water quality probe. The Hydrolab probe was calibrated prior to use in accordance with the manufacturer's instruction manual. The bores were purged until there was a degree of consistency between successive pH and redox potential readings i.e. within 0.1 pH unit and 10% respectively.

All sampling equipment was decontaminated between use in each bore. This involved successive washing in tap water containing Decon-90 detergent, washing in tap water and a final rinse with distilled water.

Groundwater samples were collected using a Grundfos pump and stainless steel bailer. The sample containers were pre-dosed, by the laboratory, with appropriate preservatives based on Australian Standard 2031.1 (Selection of Containers and Preservation of Water Samples for Chemical and Microbial Analysis), and labelled with a water proof xylene-free marker pen.

Immediately after collection the samples were placed in an esky containing ice and despatched on the same day to the laboratory for analysis. A Chain of Custody Form containing sample numbers and analytical requirements was forwarded with the samples to the laboratory.

5.0 GROUNDWATER MONITORING RESULTS

5.1 FIELD TESTS

Several field tests were conducted at each of the bores using the Hydrolab probe and depth meter. Those parameters measured include:

- pH
- Temperature
- Electrical conductivity
- Redox
- Salinity
- Depth to groundwater

The results are shown in Table 1.

TABLE 1: FIELD MEASUREMENTS

PARAMETER	BH1	BH2	BH3
pH	4.87	4.31	5.09
Temperature (°C)	14.6	14.9	15.9
Electrical Conductivity ($\mu\text{S}/\text{cm}$)	3250	1142	2570
Redox (mV)	356	410	374
Salinity (‰)	1.75	0.6	1.4
Depth to Groundwater (m)	33	11	18

5.2 LABORATORY ANALYSIS RESULTS

A total of 3 groundwater samples were sent to Australian Laboratory Services (ALS) who are NATA registered. Results of the chemical analyses on the groundwater samples are presented in Table 2.

TABLE 2: CHEMICAL ANALYSES OF GROUNDWATER SAMPLES

PARAMETER	MINIMUM DETECTION LIMIT (mg/L)	BH1 (mg/L)	BH2 (mg/L)	BH3 (mg/L)
pH	-	4.27	3.76	4.35
Alkalinity	1.0	<1	<1	<1
Total Dissolved Solids	-	1640	890	1660
Suspended Solids	1.0	102	26700	216
Biological Oxygen Demand	2.0	7	<2	3
Total Organic Carbon	0.05	14	4	10
Ammonia - Nitrogen	0.05	1.2	1.3	0.2
Absorbable Organic Halogens	0.01	0.190	0.420	0.405
Calcium	5.0	14	6	12
Chloride	5.0	760	320	710
Copper	0.01	0.05	0.05	0.04
Fluoride	0.5	0.3	0.4	0.3
Iron	0.3	25.7	8.9	12.4
Magnesium	5.0	58	24	44
Manganese	0.05	2.01	0.30	1.00
Nitrate	0.1	3.79	1.47	4.30
Potassium	5.0	4	2	7
Sodium	5.0	349	150	382
Sulphate	5.0	6	3	63
Total Phenolics	0.05	<2	<2	<2
Zinc	0.01	0.41	0.16	0.36

5.3 DISCUSSION AND RECOMMENDATIONS

There are no specific guidelines for groundwater quality in NSW. The position of the Department of Land and Water Conservation, which is responsible for managing groundwater in NSW, is that an assessment of impacts on groundwater quality should take into account background groundwater quality and the potential beneficial uses of the groundwater. It is likely that there is some discharge of groundwater that passes through the site to the Mulwaree River and there is the potential for some beneficial users of groundwater hydraulically down gradient of the site.

Assessment of the groundwater levels at the time of sampling revealed that BH2 is the upstream bore with groundwater generally flowing in a westerly direction. Therefore, BH2 is assumed to represent background conditions as it is hydraulically upstream of the site. Further confirmation of background concentrations could be performed by sampling from the existing groundwater bores in the area.

Comparison of the results from the first round of sampling shows:

- Field testing showed an increase in electrical conductivity in the two downstream bores (BH1 and BH3);
- There are elevated levels of TDS, iron, manganese, zinc, nitrogen, BOD and TOC in the downstream bores.

Further sampling is required to determine if the elevated levels are indicating leachate contamination. If there is evidence of leachate contamination in further sampling, the impact of the contamination on the beneficial uses of the groundwater needs to be assessed.

FIGURES

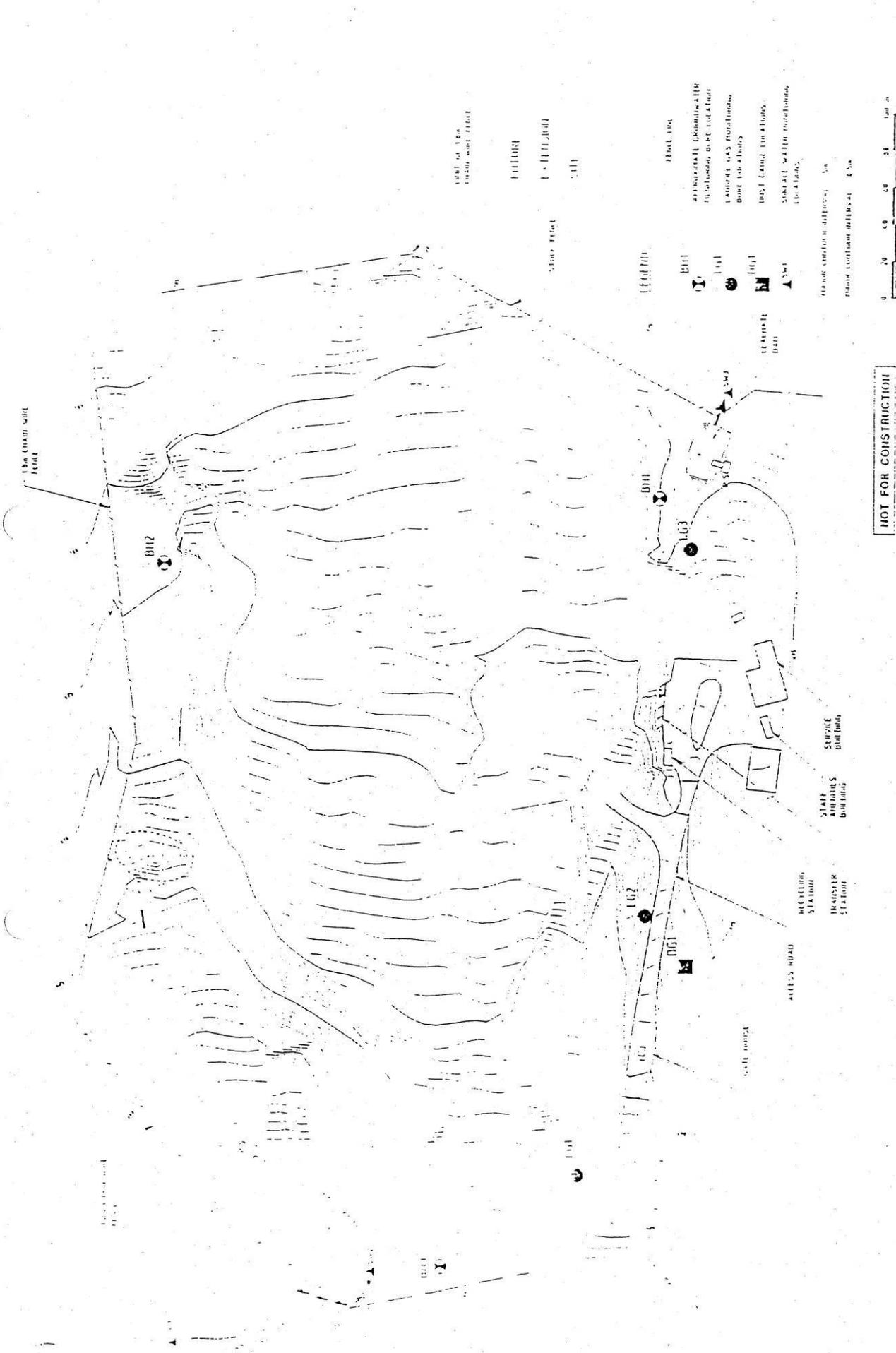


FIGURE 1 LOCATION OF ON SITE GROUNDWATER BORES

NOT FOR CONSTRUCTION

PROJECT: **GOUBOURN WASTE DEPOL**

DATE: **ENVIRONMENTAL MONITORING LOCATIONS**

DRAWN BY: **AS**

SCALE: **1:500**

PROJECT NO: **ES341-009**

DATE	DESCRIPTION	BY	DATE	DESCRIPTION	BY
	PREPARED			APPROVED	
	CHECKED			APPROVED	
	PROJECT MANAGER			APPROVED	
	PROJECT ENGINEER			APPROVED	
	PROJECT CHECKER			APPROVED	
	PROJECT BANNER			APPROVED	

GOUBOURN CITY COUNCIL

CAPSAF

CAPSAF PROJECT NO: **11/01/01**

CAPSAF DRAWING NO: **11/01/01**

CAPSAF SCALE: **1:500**

CAPSAF PROJECT NO: **11/01/01**

CAPSAF DRAWING NO: **11/01/01**

CAPSAF SCALE: **1:500**

CAPSAF PROJECT NO: **11/01/01**

CAPSAF DRAWING NO: **11/01/01**

CAPSAF SCALE: **1:500**

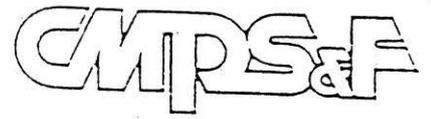
CAPSAF PROJECT NO: **11/01/01**

CAPSAF DRAWING NO: **11/01/01**

CAPSAF SCALE: **1:500**

APPENDIX A
Groundwater Monitoring Bore Logs

BOREHOLE LOG REPORT

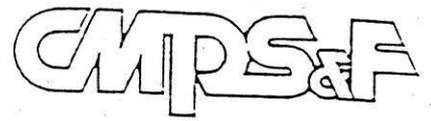


Client: GOULBURN CITY COUNCIL
 Job Name: GOULBURN WASTE DEPOT
 Job Number: EE5-13

Bore hole location: B-1 Borehole depth: 57m Drilling: Reverse Circ.
 Date hole commenced: 17/1/95 P.L. casing: Drilling fluid: A 2
 Date hole completed: 21/1/95 R.L. surface: Logged by: C. KENN
 Datum: Checked by:

Drilling Method	Water Encountered	T.P. Depth Metres	Graphic Log	Material Description	Bore Construction	Other
REVERSE AIR CIRCULATION		0		Sandy clay fragmental sandstone		Ordinary Backfill
		5		Sandstone		
		10		Some thin sandy clay beds		
		15		Sand		
		20		Sandstone and Quartzite		
		25				
		30				
		35				
		40				
		45				
50				Bentonite		
55				Gravel Screen		
57				Screen		
				1.5m casing		
		57		Bore terminated at depth 57m		

BOREHOLE LOG REPORT

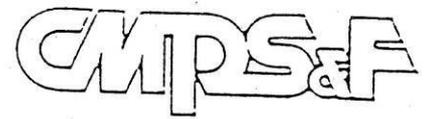


Client: Goulburn City Council
 Job Name: Goulburn Waste Depot
 Job Number: EE5013

Bore hole location: 0-1 Borehole depth: 3m Drill rig: Reverse Circ.
 Date hole commenced: 2/10/07 P.L. casing: _____ Drilling fluid: Air
 Date hole completed: 2/10/07 P.L. surface: _____ Logged by: C. Klein
 Datum: _____ Checked by: _____

Drilling Method	Water Encountered	P.L. Depth metres	Graphic Log	Material Description	Bore Construction	Other
REVERSE AIR CIRCULATION		2		Clay becoming sandy with depth.		Ordinary Backfill
		4		Sandstone		
		6		Sandstone / Quartzite		Bentonite
		8				
		10				
		12				
		14				Gravel Screen
		16				Screen
		18				Sump
		20		Bore Terminated at 19m Depth		

BOREHOLE LOG REPORT



Client: Goulburn City Council
 Job Name: Goulburn Waste Depot
 Job Number: EE 34 B

Bore hole location: B 1 B Borehole depth: 33 m Drilling: Surface Core
 Date hole commenced: 9/11/01 R.L. casing: Drilling fluid: Water
 Date hole completed: 10/11/01 R.L. surface: Logged by: D. Klein
 Datum: Checked by:

Drilling Method	Water Encountered	Depth metres	Graphic Log	Material Description	Bore Construction	Other	
REVERSE AIR CIRCULATION		0		Sandy Clay			
		2		Sandstone with several clay seams.			
		4					Ordinary Backfill
		6		Sand			
		8		Sandstone / Quartzite			
		10					
		12					
		14					Bentonite
		16					Gravel Screen
		18					Screen
		20					Screen
		Bore terminated at depth 33 m					

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Appendix C: OEH Yearly Waste Data Report



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PHIL HAWLEY & ASSOCIATE

Yearly Waste Data Report

For landfills not required to pay the waste and environment levy under s. 88 of the *Protection of the Environment Operations Act 1997*

Please note that the Department of Environment and Climate Change NSW (OEH) exercises certain statutory functions and powers in the name of the Environment Protection Authority (EPA) including administration of the contribution (waste and environment levy) under s. 88 of the *Protection of the Environment Operations Act 1997*.

☞ The requirement to report yearly is provided under Clause 47(5) of the Protection of the Environment Operations (Waste) Regulation 2005 which specifies: 'Within 60 days after the end of each subsequent financial year, the occupier of a landfill site to which this clause applies must provide, in the approved form, the EPA with such information as the EPA requires in respect of the landfill site. Maximum penalty: 200 penalty units in the case of a corporation, 100 penalty units in the case of an individual.'

☞ You must keep records to substantiate information provided in this form in accordance with the Protection of the Environment Operations (Waste) Regulation 2005. Substantial penalties apply for failing to keep records or providing false or misleading information about waste.

☞ You must complete the yearly report by completing this form. The EPA will accept no other form.

☞ See '5. Definitions' for a definition of terms used in this form.

☞ See '6. Methods of measuring quantities of waste' for acceptable methods for measuring waste.

☞ Enter all waste amounts in metric tonnes **to two decimal places**.

☞ If you need more space, please photocopy the relevant page and provide the additional details.

☞ You need to complete this form for each financial year, **even if you do not receive any waste in a financial year**.

☞ If you need more information, please contact OEH's Waste Data Team on 9995 5641.

Return this completed report to: **Waste Data Team, Waste Management Section, Department of Environment and Climate Change, PO Box A290, Sydney South NSW 1232** or fax it to **02 9995 5930**.

This form is also available at www.environment.nsw.gov.au/wr/paperforms.htm.

1. Details

1A Facility details

Reporting period	1 July [insert year] _____ to 30 June [insert year] _____		
EPA licence number (if applicable)			
Name of occupier/licensee			
Name of facility			
Facility address			
		Postcode:	
Lot/deposit plan number			
	Parish:		County:
Where is the facility located (see 5. Definitions)? [Please tick one box]	<input type="checkbox"/> SMA <input type="checkbox"/> ERA <input type="checkbox"/> Rest of NSW		

1B Contact details of occupier

Name of contact person			
Telephone number			
Mobile phone number			
Fax number			
Postal address			
		Postcode:	
Email address			

1C Landfill owner details (if different from occupier)

Name of landfill owner			
Name of contact person			
Telephone number			
Mobile phone number			
Fax number			
Postal address			
		Postcode:	
Email address			

2B Waste received from **commercial and industrial** sources

Weighed waste received from commercial and industrial (C&I) sources , including small vehicles where contents are weighed	
Material composition code. If 'Other' please describe. (see '5. Definitions').	Quantity to 2 decimal places (tonnes)
VENM Only record VENM under construction and demolition waste in part 2C	
Total quantity received from C&I sources – weighed	

Unweighed waste received from C&I sources (see '6. Methods of measuring quantities of waste')	
Material composition code. If 'Other' please describe (see '5. Definitions').	Quantity to 2 decimal places (tonnes). Use appropriate conversion method to determine quantities (see '6. Methods of measuring quantities of waste').
VENM Only record VENM under construction and demolition waste in part 2C	
Total quantity received from C&I sources – unweighed	
Total quantity received from C&I sources – TOTAL B	

2C Waste received from **construction and demolition** sources

Include VENM from all construction, excavation and earthwork activities, including council works.

Weighed waste received from construction and demolition (C&D) sources , including small vehicles where contents are weighed	
Material composition code. If 'Other' please describe (see '5. Definitions').	Quantity to 2 decimal places (tonnes).
VENM	
Total quantity received from C&D sources – weighed	

Unweighed waste received from C&D sources (see '6. Methods of measuring quantities of waste')	
Material composition code. If 'Other' please describe (see '5. Definitions').	Quantity to 2 decimal places (tonnes). Use appropriate conversion method to determine quantities (see '6. Methods of measuring quantities of waste').
VENM	
Total quantity received from C&D sources – unweighed	
Total quantity received from C&D sources – TOTAL C	

3. Transported waste

Transported waste is waste that has been removed from your facility and either sent to another facility for lawful processing or recycling, or sent to another place for lawful use (3A). It also includes waste that has been sent to another facility for lawful disposal (3B).

3A Transported waste – processed, recovered, recycled or re-used

Transported waste – recovery or re-use		
Name of customer or facility waste was exported or sold to	Material composition code. If 'Other' please describe (see '5. Definitions')	Quantity to 2 decimal places (tonnes).
Total transported for recovery/re-use – TOTAL E		

3B Transported waste – disposal

Transported waste – disposal			
Name of facility waste was transported to for disposal	Waste stream – municipal, C&I, C&D, or other waste facilities	Material composition code. If 'Other' please describe (see '5. Definitions').	Quantity to 2 decimal places (tonnes).
Total transported for disposal – TOTAL F			
Total waste transported Add totals E and F			

4. Certification

You MUST complete the certification at **either 4A or 4B** below for this report to be valid.

4A Complete if you are the occupier of the landfill or are signing this report on behalf of the occupier

I [full name of person making this declaration] certify that the information provided in this report to the EPA about the landfill located at:.....

.....
 for the reporting period [insert month and year] is true and correct as required by the Protection of the Environment Operations (Waste) Regulation 2005.

Signature:

Date: Please tick one box:

<input type="checkbox"/>	I am the occupier
<input type="checkbox"/>	I am the Chief Executive Officer of the corporation that is the occupier
<input type="checkbox"/>	I am the General Manager of the council that is the occupier
<input type="checkbox"/>	I am a person delegated to sign on the occupier's behalf and am approved by the EPA in writing to sign this report

4B Complete if the occupier of the landfill is a corporation and the corporation's seal is to be affixed to this report

The information provided to the EPA in this report in respect of the landfill located at:

.....
 for the reporting period [insert month and year] is certified as being true and correct as required by the Protection of the Environment Operations (Waste) Regulation 2005.

In the case of a public authority/local authority, the affixing of the seal must be witnessed in accordance with the relevant legislation and any necessary changes should be made to the details below.

The seal of [insert corporation name]:

[insert seal]

was affixed to this report by the authority of the Board of Directors in the presence of

Name [print full name].....

Signature[Director]

Date

Name [print full name]

Signature [Director/Secretary]

Date

You are not required to submit Part 5. Detach this part from your yearly report.

5. Definitions

Act: the *Protection of the Environment Operations Act 1997*.

Approved: approved by the EPA from time to time.

Commercial and industrial (C&I) waste: waste generated by businesses and industries including shopping centres, restaurants and offices, and institutions such as schools, hospitals and government offices, excluding construction and demolition waste and municipal waste.

Construction and demolition (C&D) waste: waste sourced from construction and demolition works, which includes building and demolition waste, asphalt waste and excavated natural material.

Waste and environment levy: the amount payable by licensed waste facilities to the EPA for all waste received at the facility. The requirement to pay contributions is provided for in s. 88 of the *Protection of the Environment Operations Act 1997*. Also known as the waste levy.

OEH: the Department of Environment and Climate Change.

Domestic waste: all household waste placed on the kerbside for regular collection by the council or council contractors, that is, weekly or fortnightly kerbside collection of garbage and recyclables. Note: domestic garden and vegetation wastes should be recorded as 'Garden organics'.

EPA: the Environment Protection Authority as constituted under the *Protection of the Environment Administration Act 1991*. In September 2003, the EPA became part of the Department of Environment and Climate Change NSW (OEH).

Extended regulated area (ERA): the area comprising the local government areas listed under ERA (see table 1).

Table 1: Local government areas

Local government areas					
Sydney Metropolitan Area (SMA)					
Ashfield	Camden	Hunters Hill	Manly	Randwick	Waverley
Auburn	Campbelltown	Hurstville	Marrickville	Rockdale	Willoughby
Bankstown	Canada Bay	Kogarah	Mosman	Ryde	Woollahra
Baulkham Hills	Canterbury	Ku-ring-gai	North Sydney	Strathfield	
Blacktown	Fairfield	Lane Cove	Parramatta	Sutherland	
Botany Bay	Holroyd	Leichhardt	Penrith	Sydney	
Burwood	Hornsby	Liverpool	Pittwater	Warringah	
Extended regulated area (ERA)					
Cessnock	Kiama	Maitland	Port Stephens	Shoalhaven	Wollongong
Gosford	Lake Macquarie	Newcastle	Shellharbour	Wingecarribee	Wyong
Hawkesbury					
Rest of NSW					
Albury	Byron	Eurobadalla	Junee	Narromine	Unincorporated
Armidale Dumaresq	Cabonne	Forbes	Kempsey	Oberon	Upper Lachlan
Ballina	Carrathool	Gilgandra	Kyogle	Orange	Uralla
Balranald	Central Darling	Glen Innes– Severn	Lachlan	Palerang	Urana
Bathurst Regional	Clarence Valley	Gloucester	Leeton	Parkes	Wagga Wagga
Bega Valley	Cobar	Goulburn– Mulwaree	Lismore	Port Macquarie– Hastings	Wakool
Bellingen	Coffs Harbour	Great Lakes	Lithgow	Queanbeyan	Walcha
Berrigan	Conargo	Greater Hume	Liverpool Plains	Richmond Valley	Walgett

Bland	Coolamon	Greater Taree	Jerilderie	Narrandera	Upper Hunter
Blayney	Cooma– Monaro	Griffith	Lockhart	Singleton	Warren
Blue Mountains	Coonamble	Gundagai	Mid-Western Regional	Snowy River	Warrumbungle
Bogan	Cootamundra	Gunnedah	Moree Plains	Tamworth Regional	Weddin
Bombala	Corowa	Guyra	Murray	Temora	Wellington
Boorowa	Cowra	Gwydir	Murrumbidgee	Tenterfield	Wentworth
Bourke	Deniliquin	Harden	Muswellbrook	Tumbarumba	Wollondilly
Brewarrina	Dubbo	Hay	Nambucca	Tumut	Yass Valley
Broken Hill	Dungog	Inverell	Narrabri	Tweed	Young

Garden organics: waste comprising the following: grass, leaves, plants, loppings, branches, trees(including stumps), composts and mulches.

Local government area (LGA): Each local government area is defined as being in the Sydney metropolitan area, in the extended regulatory area, or in the rest of NSW (see table 1).

Material composition code: See table 2

Table 2: Material composition codes

Description	Code
Aggregate, roadbase or ballast	AGG
Aluminium (non-ferrous)	AL
Asbestos	ASB
Ash	ASH
Batteries	BATT
Bricks or concrete	BC
Biosolids or manures	BIO
Car bodies (ferrous)	CAR
Carpet	CARPET
Ceramics, tiles, pottery	CER
Commingled recyclables	COMM
Composts or mulches	COMP
Contaminated soil	CONT
Dredging spoil	DSP
Ferrous (iron or steel)	FE
Food or kitchen	FOOD
Glass	GLASS
Mixed waste	MIX
Non-ferrous (metals not AL or FE)	NFE
Oil	OIL
Paper or cardboard	PAPER
Plasterboard	PB
Pharmacy or clinical	PHARM
Plastic	PL
Residues or rejects	RES
Soil – not contaminated or VENM	SOIL
Textiles, rags	TEXT
Tyres	TYRE
Vegetation or garden	VEG
Virgin excavated natural material	VENM
Veterinary waste	VET
Wood, trees or timber	WOOD
Other (specify)	OTH/...

Municipal waste: wastes arising from the four waste sub-streams: domestic waste, other domestic waste, other council waste and garden organics, as defined here. Note: for the purposes of completing a yearly report, garden and vegetation wastes derived from municipal sources should be recorded as 'Garden organics'.

Other council waste: waste collected by the council or council contractors from the clean-up of municipal parks and gardens, street sweepings, council tidy bins and drop off centres and from large events within the council's jurisdiction (e.g. Opera in the Park). Note: for the purpose of completing a yearly report, council garden and vegetation wastes should be recorded as 'Garden organics'. Further, other wastes generated by council should be recorded in the appropriate waste stream table in the yearly report. For example, wastes from council engineering works should be recorded in '2C Waste received from construction and demolition sources'.

Other domestic waste: domestic clean-up waste collected from residential kerbsides by the council or council contractors or waste transported by residents directly to a landfill or waste facility. Note: for the purpose of completing a yearly report, domestic garden and vegetation wastes should be recorded as 'Garden organics'.

Regulation: the Protection of the Environment Operations (Waste) Regulation 2005.

Rest of NSW: all NSW local government areas not listed under Sydney metropolitan area (SMA) and extended regulated area (ERA) (see table 1).

Scheduled waste facility: a waste facility required to be licensed under the Act.

Sydney metropolitan area (SMA): the area comprising the local government areas listed under the SMA (see table 1).

Vegetation or garden waste: grass, leaves, plants, loppings, branches, tree trunks and stumps, and any combination of those materials.

Virgin excavated natural material (VENM): a waste material such as clay, gravel, sand, soil and rock, that is not mixed with any other type of waste and that:

- (a) has been excavated from areas of land that are not contaminated with manufactured chemicals, as the result of industrial, commercial, mining or agricultural activities, and that does not contain sulphidic ores or soils, or
- (b) consists of excavated natural materials that meet such criteria as may be approved by the EPA.

Waste: includes:

- (a) any substance (whether solid, liquid or gaseous) that is discharged, emitted or deposited in the environment in such volume, constituency or manner as to cause an alteration in the environment, or
- (b) any discarded, rejected, unwanted, surplus or abandoned substance, or
- (c) any otherwise discarded, rejected, unwanted, surplus or abandoned substance intended for sale or for recycling, processing, recovery or purification by a separate operation from that which produced the substance, or
- (d) any processed, recycled, re-used or recovered substance produced wholly or partly from waste that is applied to land, or used as fuel, but only in the circumstances prescribed by the regulations, or
- (e) any substance prescribed by the Regulation to be waste for the purposes of the *Protection of the Environment Operations Act 1997*.

A substance is not precluded from being waste for the purposes of the Act merely because it is or may be processed, recycled, re-used or recovered.

Waste facility: any premises used for the storage, treatment, processing, sorting or disposal of waste.

6. Methods of measuring quantities of waste

The measurement of waste quantities must be conducted using the most appropriate of the following four methods:

1 Landfills with weighbridges

If the landfill has a weighbridge installed, waste quantities in tonnes must be derived from the computer system or weighbridge dockets.

2 Landfills with staffed gate (the vehicle count method)

If the landfill does not have a weighbridge but is staffed at the gate, record the number of vehicles entering and transporting wastes from the premises on a daily basis. Record the vehicles according to:

- vehicle type (see '7. Weight conversion factors')
- waste stream (that is, municipal, commercial and industrial, construction and demolition or 'other waste facility')
- material composition code(s) (see table 2 in '5. Definitions').

At the end of each day, multiply the number of each vehicle type by the relevant weight factor (see '7. Weight conversion factors') to assess tonnage of waste received and transported that day. Successively add each day's waste for each waste stream to an annual tonnage of waste received and transported.

3 Landfills with no staff at the gate (the vehicle survey method)

If the landfill is not staffed at the gate, conduct a survey of vehicles entering and transporting waste from the landfill site. The survey is to be divided into four one-week surveys, conducted each quarter (that is, one week (7 days) in the following periods: 1 July–30 September, 1 October–31 December, 1 January–31 March and 1 April–30 June).

To conduct each survey, count the number of vehicles entering and transporting waste from the premises every day for a week. Record the vehicles according to:

- vehicle type (see '7. Weight conversion factors')
- waste stream (that is, municipal, commercial and industrial, construction and demolition or other waste facility)
- material composition code(s) (see table 2 in '5. Definitions').

At the end of the week, multiply the number of each vehicle type by the relevant weight factor (see '7. Weight conversion factors') to assess tonnage of waste received and transported that week. Add all four weeks data together for each waste stream, and multiply by 13 to estimate the annual amount of waste received and transported for each waste stream.

4 Landfills with a total capacity of <1,000 tonnes or disposing of <300 tonnes of waste and no staff at the gate (the waste survey method)

'Landfill void space consumed' means the cumulative total landfill volume (airspace in cubic metres) consumed in the last financial year. The waste survey method requires measuring the void space consumed during the reporting year and then converting the volume to tonnes.

The steps are:

- 1 Void space consumed during the reporting year must be determined by volumetric survey undertaken by a registered surveyor or a qualified local government employee. Void space is determined by subtracting the void space remaining at the end of the reporting year from the void space remaining at the beginning of the reporting year. The void space remaining at the beginning of the year can be determined by volumetric survey or by keeping a running total of void space consumed, and subtracting this each year from an earlier volumetric survey or the initial capacity of the landfill.
- 2 Estimate the proportion of waste from each waste stream (that is, municipal, commercial and industrial, construction and demolition or 'other waste facility') by visually inspecting waste received at the landfill during the reporting year.
- 3 Using the following conversion factors (derived from Perry 1984, *Chemical engineer's handbook*, sixth edition) convert the void space used during the reporting year to tonnes:

Waste stream description	Density factor (tonnes/m³)
Municipal	0.13
Commercial and industrial	0.2
Construction and demolition	0.7

If void space information is not available, method 3 (vehicle survey method) must be used.

7. Weight conversion factors

Where a facility does not have a weighbridge installed, or where the waste arrives at a facility via a small vehicle such as a car or ute, the weight conversion factors set out below should be used to record the amounts of waste that enter or leave a facility.

Vehicle type	Description	Weight factor
Small vehicle		All mixed waste
A	Car/station wagon	0.06
B	Van/ute/trailer	0.30

Vehicle type	Description	Weight factor		
		Municipal, commercial and industrial waste	Construction and demolition waste	Virgin excavated natural materials
Open truck				
C	Single rear axle with two rear wheels or four small rear wheels	0.62	0.98	2.47
D	Single rear axle with four normal size wheels	1.16	2.76	5.58
E	Tandem rear axle (bogie drive)	3.74	7.14	10.97
F	Twin steer with twin rear axles	5.57	7.61	10.97
G	Tipping semi-trailer	5.79	15.00	15.00

Vehicle type	Description	Weight factor
Enclosed truck and compactor		All mixed waste
H	Single steer with single rear axle	2.72
I	Single steer with tandem rear axle	6.38
J	Twin steer with tandem rear axle	7.96
K	Waste transfer truck	19.89

Example: on 5 December 2006, Landfill X receives a ute full of mixed waste. Landfill X uses OEH's weight conversion factors to calculate the amount of waste received:

$$1 \text{ ute of waste} \times 0.30 = 0.30 \text{ tonnes}$$

(vehicle type B)

In its records, Landfill X records that on 5/12/06 it received 0.30 tonnes of mixed waste (material composition code: MIX) from vehicle registration number ZIG 433, which was placed in stockpile 1. Depending on the origin of the waste, it should be recorded as waste from the municipal, commercial and industrial, construction and demolition or other waste facility category.

Published by:

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Appendix D: Leachate Dam Water Quality

The table of results from testing conducted during 2010 is reproduced overleaf.



PHIL HAWLEY & ASSOCIATES

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PHIL HAWLEY & ASSOCIATE



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ABN 68 074 205 780

Report Authorised by:
C. Boatwright
for Manager Ecowise Environmental

Goulburn Mulwaree Council		Results Authorised by:			
Locked Bag 22 GOULBURN NSW 2580 Attn: Andrew Gallard FINAL REPORT		T. Vimalasiri (Metals) C Boatwright (Manager) Customer Ref: email Customer Fax: 0248 234477 Sample Temp. on receipt = 14.7 C Rep. Details: Email Excel and Mail These samples were taken in accordance with method LOP 400.05			
Job Name:	L010_10_16927	NATA accreditation number 992. Tests marked # are not NATA accredited			
Job Desc:	Goulburn LUF Leachate	Results listed as Total Metals are actually Total Recoverable Metals			
Report Date:	30-JUN-2010	Results relate only to the samples tested			
Email:	andrew.galland@goulburn.nsw.gov.au				
	Sample: 760514	760515	760516		
	Sample Point: XSITE	XSITE	XSITE		
	Description: Reser Water	Pump Station	Leachate Pond		
	Sampled: 9-JUN-2010	9-JUN-2010	9-JUN-2010		
	Ext. Ref: 10:00	10:30	11:00		
Method	Test	Unit			
210	pH	pH units	7.2	7.1	7.8
35	Chloride	mg/L		2700	2500
35	Sulphate	mg/L SO4	330		
65	Conductivity	uS/cm	8800	8600	8400
260	Susp. Solids	mg/L	<2	4	17
260	T. Diss Solids	mg/L	5500		
Phenols					
215	Phenol	ug/L	<1.0		
215	2-Chlorophenol	ug/L	<1.0		
215	2-Methylphenol	ug/L	<1.0		
215	2,4-Dichlorophenol	ug/L	<1.0		
215	3- & 4-Methylphenols	ug/L	<1.0		
215	2,4-Dimethylphenol	ug/L	<1.0		
215	2,6-Dichlorophenol	ug/L	<1.0		
215	2-Nitrophenol	ug/L	<1.0		
215	4-Chloro-3-methylphe	ug/L	<1.0		
215	2,4,6-Trichlorophenol	ug/L	<1.0		
215	4-Nitrophenol	ug/L	<1.0		
215	2,4,5-Trichlorophenol	ug/L	<1.0		
215	2,3,4,6-Tetrachloroph	ug/L	<1.0		
215	Pentachlorophenol	ug/L	<1.0		
190	BOD	mg/L	<2		
273	Sulphide	mg/L S	<-0.02		
274	Sulphite	mg/L	4.9		
201	Chem Oxy Demand	mg/L	140	170	230
	Pet. Hyd.				
NM	C6 - C9	mg/L	<25		
NM	C10 - C14	mg/L	<25		
NM	C15 - C28	mg/L	<100		
NM	C29 - C36	mg/L	<100		
Total Metals					
121	Silver	ug/L	<1	<1	<1
121	Aluminium	ug/L	<9	240	77
121	Arsenic	ug/L	5	4	5
121	Barium	ug/L	200	270	260
121	Beryllium	ug/L	<0.1	0.2	<0.1
121	Cadmium	ug/L	0.08	0.08	0.30
121	Cobalt	ug/L	1.3	1.9	2.0
121	Chromium	ug/L	<2	<2	<2
121	Copper	ug/L	3	3	6
121	Manganese	ug/L	96	24	100
121	Molybdenum	ug/L	<1	<1	1
121	Nickel	ug/L	11	11	12
121	Lead	ug/L	<0.2	0.6	1.1
121	Antimony	ug/L	<3	<3	<3
121	Selenium	ug/L	<2	<2	<2
121	Zinc	ug/L	30	42	28
32	Ammonia (asN)	mg/L N	0.17		
150	T.Oxid N (asN)	mg/L N	1.6		
112#	T.Kel.N (calc)	mg/L N	1.9		
114	Total Nitrogen	mg/L N	3.5		
220	Orth. Phosp (asP)	mg/L P	<0.01		
OC Pesticides					
NM	HCB	ug/L	<0.01		
NM	Lindane	ug/L	<0.01		
NM	Heptachlor	ug/L	<0.01		
NM	Aldrin	ug/L	<0.01		
NM	BHC_Totals	ug/L	<0.01		
NM	Heptachlor_Epoxide	ug/L	<0.01		
NM	Chlordane	ug/L	<0.01		
NM	DDE	ug/L	<0.01		
NM	Dieldrin	ug/L	<0.01		
NM	Endrin	ug/L	<0.01		
NM	DDD	ug/L	<0.01		
NM	DDT	ug/L	<0.01		
NM	Methoxychlor	ug/L	<0.01		
NM	Endosulfan_Totals	ug/L	<0.01		
NM	Surrogate_Rec	%	114		
Herbicides					
NM	Atrazine	ug/L	<0.1		
NM	Diuron	ug/L	<0.1		
NM	Hexazinone	ug/L	<0.1		
NM	Linuron	ug/L	<0.1		
NM	Metolachlor	ug/L	<0.1		
NM	Molinate	ug/L	<0.1		
NM	Simazine	ug/L	<0.1		
NM	Trifluralin	ug/L	<0.1		
NM	Oxyfluorfen	ug/L	<0.1		
NM	Pendimethalin	ug/L	<0.1		
OP Pesticides					
205	Chlorpyrifos	ug/L	<0.1		
205	Malathion	ug/L	<0.1		
205	Azinphos-methyl	ug/L	<0.1		
205	Chlorpyrifos - Methyl	ug/L	<0.1		
205	Diazinon	ug/L	<0.1		
205	Ethion	ug/L	<0.1		
205	Pyrimifos - Methyl	ug/L	<0.1		
205	Dichlorvos	ug/L	<0.1		
205	Dimethoate	ug/L	<0.1		
205	Fenthion	ug/L	<0.1		
205	Chlorfenvinphos (E)	ug/L	<0.1		
205	Chlorfenvinphos (Z)	ug/L	<0.1		
205	Fenitrothion	ug/L	<0.1		
205	Pyrimifos - Ethyl	ug/L	<0.1		
205	Parathion Ethyl	ug/L	<0.1		
205	Parathion Methyl	ug/L	<0.1		
205	Dementon-S-Methyl	ug/L	<0.1		
205	Azinphos Ethyl	ug/L	<0.1		

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PHIL HAWLEY & ASSOCIATE

Appendix E: Trade Waste Contingency Plan

This contingency plan establishes the procedures that GMC will follow in the event that an incident occurs that could affect the quality of the liquid trade waste discharged from the GWMC pump station (PS) into the sewerage system.

The plan also encompasses procedures to protect the environment from accidental and unauthorised discharges to watercourses from liquid trade waste discharges.

It should be noted that this PS handles trade waste from the landfill only and does not receive discharges from domestic sources.

It should also be noted that the Water and Sewerage Branch of GMC has agreed to accept responsibility for routine inspection and heavy maintenance of the PS on a commercial basis on behalf of the Waste & Aquatic Manager (WAM). This will eliminate the need to train GWMC staff in the maintenance and operation of the PS apart from starting and stopping pumps. Routine inspections of the PS will ordinarily be undertaken by the Trade Waste Officer attached to the Water and Sewerage Branch.

These procedures should be read in conjunction with the requirements and standard operating procedures of the Waster Association of Australia (WSAA). Where the procedures here are at variance with WSAA procedures then the WSAA procedure shall take precedence.

1. Visual and Audible Alarms

The PS is fitted with a visual alarm that flashes a light on the outside top of the control cabinet whenever a critical alarm is triggered e.g. a high level of effluent in the pump-well. The GWMC staff are expected to observe the control cabinet on a daily basis to ensure that this high level alarm indicator is not lit. If the indicator is lit then the staff are to immediately advise the GWMC Site Supervisor.

Further, the PS is to be connected to a 3rd party monitoring organisation through the mobile phone network. This monitoring will take place continuously and will provide:

- Record of pump operations (starts, stops, run times)
- Pulse count from flow meter (or daily total)
- Well level
- High level alert via SMS/email or similar.
- Email log to a nominated email address on a monthly basis

The high level alert will be set to send an SMS alert to the GWMC Site Supervisor's mobile phone who will allocate the resources to investigate the cause of the alarm. A copy of the alarm will also be emailed to the WAM for records and follow-up if necessary.

2. Preventing Overflows to the Sewerage System in the Event of an Emergency

Should the capacity of the municipal sewer be insufficient to cater for the discharge from the PS for any reason (e.g. heavy rain, power or equipment failure), it will be the responsibility of the sewage treatment plant operator to advise the WAM who will arrange for the pumps to be switched off.

In the event that the pump well is likely to fill before approval can be given to restart pumping then a portable pump is to be used to pump the well contents into the adjacent leachate dam. If that dam is also full then the leachate recirculation pump is also to be started to reduce the level of the pond.

In an extreme event during which there is an extended power outage, it may be necessary to hire a portable diesel pump to lower the level of the leachate pond. As part of this Contingency Plan GMC will ensure that a suitable pump is normally available within the district and can be hired at short notice.

3. Logbook

The GWMC Supervisor shall maintain a logbook, into which the details of every incident will be entered including date, time, remedial action, other relevant facts and the name of the person making the entry.

This logbook will be separate to the other site records maintained at the GWMC and will relate to incidents relating to the discharge of trade waste only.

An incident is any alarm condition, overflow, spill, breakdown, power outage, extreme wet weather event, OH&S incident or need to use a standby pump to lower the well level in the PS.

4. Emergency Procedures

4.1. Accidents

Emergency procedures for the management of accidents at the PS are as set out in GWC's OHS Management Plan.

4.2. Spills

Minor spills at the PS are unlikely to pose a serious threat to the environment. However, all spills, whether major or minor, must be managed so as to minimise the potential for environmental harm. It must also be borne in mind that the GWMC is within the upper reaches of the Sydney drinking water catchment.

Minor Spills: either clean up manually ensuring suitable PPE is worn (gloves, disposable overalls, eye protection, waterproof boots), or use an absorbent to soak up the spillage and then dispose to the landfill under the direction of the supervisor at the GWMC.

Major Spills: place earth or artificial barriers or otherwise create a depression so as to allow the spillage to pond. Pump the leakage into the adjacent leachate pond. If necessary absorb any residual and handle as above for minor spills. Do not allow spillage to flow off the site.

In the event that spillage migrates off the site, activate the environmental reporting procedures as set out in Section 8.1 of the GWMC LEMP.

In the event of prohibited materials being disposed of at the landfill site or the spillage of similar materials, the frequency of monitoring of leachate quality will be increased. Depending on the nature and magnitude of the leachate pollution, the following measures could be employed:

- Increased leachate spraying to enhance the decomposition of the material using landfill processes.
- Batch testing and release of leachate to the sewerage system once testing has confirmed compliance with discharge limits.
- Removal of polluted materials by liquid waste tanker to an appropriately licensed liquid waste treatment facility.

5. Breakdown

The PS contains 2 pumps so it is unlikely that there will be a total pump failure. However, in the event that both pumps are out of commission, the pump well is to be monitored and in the event that the level rises sufficiently to activate the high level alarm, the contents are to be pumped by portable submersible pump to the adjacent leachate pond.

Under no circumstances are any personnel to enter the pump well except for authorised personnel under controlled confined-space entry conditions.

6. Power Failure

GMSC will install a generator connection onto the PS control cabinet. This will allow connection of a generator in the event of a power failure. Use of the generator is to be arranged through the Water and Sewerage Engineer.

However, it should be noted that this PS is at the top of the sewer catchment and in the event of a district-wide power outage, it will be unacceptable for this PS to remain in operation so as to minimise the loading on the sewerage system. Further, the available generator(s) will likely be required for critical duties and hence not be available for this PS. In this even it will be necessary to utilise a diesel or petrol powered submersible pump as set out in Sections 2 and 5 above.

When the generator connector is installed it will be necessary to also improve the access road into the PS so that the generator can be physically brought to the site with safety.

7. Emergency Contacts

Organisation	Role	Phone No
Ambulance	Emergency Response	000
Fire Brigade	Emergency Response	000
OEH (EPA)	Pollution Hotline	131 555
GMC	Waste & Aquatic Manager	4823 4417 or 04 2748 9928
GMC	GWMC Leading Hand	04 1723 9302
GMC	After Hours Duty Officer	04 0816 9454
GMC	Trade Waste Officer or A/H Duty Officer	04 2960 0760 or 04 0816 9454
GMC	Sewage Treatment Plant Operator	4822 4816 or 04 1943 0693
TBA	PS Monitoring	TBA
TBA	Pump Hire	TBA

Appendix F: Trade Waste Due-Diligence Plan

1. Introduction:

Goulburn Mulwaree Council (GMC) operates its Goulburn Waste Management Centre at Sinclair Road Goulburn.

Leachate and stormwater running off the landfill cells are discharged to a holding pond on the low (north western) side of the landfill.

A sub-surface cut-off drain has been installed downslope of the holding pond wall. Water collected in this drain is conveyed to a pump well from where it is discharged to the municipal sewerage system for treatment and disposal.

A Trade Waste Agreement (TWA) is in place for this discharge. It is a requirement of the TWA that this Due Diligence Programme be prepared and maintained.

This Due Diligence Programme is designed to ensure that the discharge to sewer at all times complies with the requirements of the TWA, that GMC has in the place the resources and systems to demonstrate this compliance and to ensure the ability to appropriately respond to any reasonably foreseeable circumstances.

2. Hazards/Non-compliance Identification

Following are the hazards or potentially hazardous or potentially non-compliant situations which it is considered could occur:

OH&S Hazards

- Electrocution
- Confined space entry
- Explosive gases
- Manual handling
- Environmental (e.g. contact with effluent, uneven ground, fauna, sunstroke, dehydration)

Environmental Issues

- Extreme rainfall
- Discharge exceeds approved limits
- Power failure
- Pump failure

Systemic Issues

- Operator competency
- Supervision
- Monitoring (systemic and environmental)
- Procedures
- Record keeping

3. Controls

3.1. OH&S Hazards

The PS is relatively isolated from other areas of the GWMC and out of sight of the site and weighbridge offices. Accordingly, all personnel attending the PS on their own either inside or outside normal working hours must ensure that they:

- Inform another person (on site during working hours or a responsible entity outside of working hours) of their intention to visit the PS and report back on their return
- Carry a mobile phone and ensure that it has a signal. If a signal can't be obtained then a 2-way portable radio must be carried

Electrocution

- The rear of the control cabinet is to be opened and any work within the cabinet undertaken by authorised trained personnel only. Electrical work must only be undertaken by a licensed electrician. Low voltage instrumentation may only be maintained by a Class B or higher licensed electrician.
- The cabinet is to be isolated and tagged prior to conducting any work within the cabinet other than operating the pump controls. The cabinet is to be similarly isolated and tagged prior to removing or reinstalling the pumps

Confined Space Entry, Explosive gases

- Only persons who hold a current WorkCover authority to enter confined spaces are to enter the wet well. Such entry is to be in accordance with established confined space procedures, including the recording of each entry.
- Gases of an explosive nature (such as methane) may be present as a result of leachate decomposition. Confined space entry procedures are to include the use of gas detection equipment.

Manual Handling

- All manual handling is to be undertaken in accordance with the procedures laid down in GMSC's OH&S Management System, including task assessment and the adoption of appropriate controls

Environmental

- Persons attending the PS must assess and manage environmental OH&S hazards on a case-by-case basis as different hazards may be present at different times. Depending on the time of year or preceding weather events, these hazards could include but are not limited to:
 - Snakes and spiders
 - Wombat burrows
 - Slippery ground
 - Uneven ground
 - Sun exposure
 - Exposure to cold
 - Dehydration
 - Grass seeds or pollens
- All staff attending the PS should be trained in the actions to be taken in the event that they come into contact with effluent and the precautions to be taken to prevent such contact. These precautions will include the use of appropriate PPE and avoiding unnecessary activity in the vicinity of effluent.

3.2. Environmental Management

Extreme Rainfall

Extreme rainfall will lead to a heavy demand on the PS to discharge effluent. This is likely to occur when the downstream sewerage reticulation and treatment system is already at or above capacity. In these circumstances the STP Operator will require that the PS be switched off until such time as the STP Operator advises that the sewerage system has the capacity to handle the discharge from the PS. Alternatively, the STP Operator may require that PS operation be limited to a specified number of minutes per hour until such time as normal operations can be reviewed.

In this event the procedures set out in Section 2 of the Trade Waste Contingency Plan are to be implemented.

Discharge Exceeds Approved Limits

Given the nature of the effluent, it is unlikely that the discharge will exceed approved limits unless there has a major spill or deposition of unauthorised material at the landfill. In this case it should be possible to predict the impact on the effluent through regular monitoring of the leachate pond and take appropriate preventative action.

However, in the event that discharges exceed approved limits, switch off the PS and implement the procedures set out in Section 2 of the Trade Waste Contingency Plan to prevent further discharge occurring. This should continue until testing demonstrates that the effluent is again within approved limits.

Power Failure

In the event of power failure implement the procedures set out in Section 6 of the Trade Waste Contingency Plan.

In the event of a switchboard failure (such as a fire) the pump station can be wired using temporary measures according to standard sewage pumping station designs.

Pump Failure

Given that there is a standby pump in the well, the likelihood of total pump failure is low. However, in the event that both pumps fail implement the procedures set out in Section 6 of the Trade Waste Contingency Plan.

3.3. Systemic Management

Operator Competency

Routine inspections of the PS will be undertaken by GWMC's Trade Waste Officer, who is competent to manually operate the pump station.

The only other non-maintenance personnel required to attend the PS should be the staff at the GWMC who may be required to manually operate the pump controls at various times and to respond to any alarms.

These personnel shall be given training in the routine operation of the PS. A register of this training including the staff member's name, the trainer's name, competencies achieved and the date shall be legibly kept with the logbook referred to in Section 3 of the Trade Waste Contingency Plan. The register shall be made available to any person with the statutory authority to sight it.

Ideally, this training should be provided by the Trade Waste Officer or other competent personnel within the Water and Sewerage Branch so that the operational procedures for the PS are consistent with that of Council's other PS within the sewerage system.

Operator competency shall be reviewed annually as part of Council's performance review programme.

Supervision

The Water and Sewerage Branch will arrange scheduled and breakdown maintenance on the PS on a commercial basis on behalf of the WAM. This maintenance will be conducted utilising the procedures in place for the other PS operated by the Water and Sewerage Branch, including supervisory practices. The Water and Sewerage Branch is considered to have the requisite skills and competence to manage the maintenance requirements.

GWMC staff accessing the PS shall do so only with the knowledge and consent of the site supervisor, emergencies excepted (an alarm indication does not constitute an emergency). The site supervisor shall be responsible to the WAM for GWMC activities with respect to the PS.

Monitoring

Monitoring is required to ensure that both the PS is operating satisfactorily and that the effluent conforms to the physical, chemical and biological limits prescribed by the Trade Waste Agreement.

- Alarms shall be electronically monitored via the mobile telephone network. The monitoring may be undertaken either in-house or by an external service provider. An alarm will generate a SMS to the WAM's and the GWMC site supervisor's mobile phone. The latter shall determine the course of action to be initially taken
- The alarm system will be tested daily using a time-based alarm (eg time clock operating a normally closed relay, or electronic equivalent). A failure to receive the alarm by SMS and/or email will prompt an investigation.
- The monitoring system will be provided with a battery back-up providing at least 12 hours supply. The monitoring system will generate alarms at the initial power outage and again at low battery voltage.
- The electronic monitoring will also include:
 - Record of pump operations (starts, stops, run times)
 - Pulse count from flow meter (or daily total)
 - Well level
 - High level alert via SMS/email or similar.
 - Email log to a nominated email address on a monthly basis
- Routine maintenance shall be provided by the Water and Sewerage Branch on a commercial basis on behalf of the WAM. As part of this service the Trade Waste Officer or other nominee shall undertake routine inspections of the PS at a frequency not less than monthly
- GMSC has in place a contract with a commercial testing laboratory to sample and test various environmental factors from each of its waste facilities. As part of this arrangement the laboratory also samples and tests both the leachate contained within the pond and the influent to the PS at the GWMC. These tests are conducted quarterly for a routine range of analytes. In addition, a comprehensive list of analytes is tested annually.

Quarterly sampling and testing includes for:

BOD₅, COD, TSS, pH, Total Oil & Grease, Metals Scan, Ammonia (as Nitrogen), TKN, Total Phosphorus and Sulphates

Annual sampling and testing includes for:

BOD₅, COD, TSS, pH, Total Oil & Grease, Metals scan, Ammonia (as Nitrogen), TKN, Total Phosphorus, Sulphates, Cyanide, PCBs, Sulphides, Formaldehyde, Polycyclic Aromatic Hydrocarbons, Phenolics, Organochlorins, Organophosphates, Chlorinated Phenolics and Total Petroleum Hydrocarbons

This testing is required by both the environmental protection licence in operation for the GWMC and the trade waste agreement. Hence, a contract is to be maintained with a laboratory certified by NATA for the analyses required at all times.

Testing results are to be provided to the WAM. The results are to also be forwarded by the WAM to the NSW Office of Water (Level 17, 227 Elizabeth St, SYDNEY NSW 2001).

Should testing indicate that the leachate or PS influent is outside the approved limits, then investigations are to be immediately conducted to ascertain the reason for the non-conformance and to identify appropriate remedial action (note that there are likely to be implications for the groundwater system as well). As indicated above, it may be necessary to implement the procedures set out in Section 2 of the Trade Waste Contingency Plan to prevent further discharge occurring until such time as further testing demonstrates that the effluent is again within approved limits.

Procedures

All operations with respect to the PS shall be conducted in accordance with established procedures to ensure consistency in approach and that work is carried out safely and in accordance with the relevant standards. This shall include for routine and heavy maintenance, sampling and testing and day to day operation of the PS.

Inspection and maintenance procedures shall be those in use by the Water & Sewerage Branch for its regular operations. The relevant Branch procedures shall also establish the competency standards in the day to day operation of the PS (i.e. systems to start and stop the pumps, responding to alarms) required to be attained by GWMC operational staff during their training.

Sampling and testing is to be conducted by a NATA certified laboratory and in accordance with the procedures laid down by NATA or relevant Australian Standard.

Record Keeping

The following records are to be kept with respect to the PS:

- By the WAM:
 - Results of quarterly and annual sampling
 - Monthly pump monitoring log, including record of pump operations (starts, stops, run times), pulse count from flow meter (or daily total) and alarm indications
- By the Trade Waste Officer:
 - Routine inspections including inspection results
 - Maintenance schedule
 - Scheduled maintenance undertaken, including cleaning
 - Non-scheduled maintenance undertaken
- By the GWMC Leading Hand
 - Logbook as per Section 3 of the Trade Waste Contingency Plan
 - Diary entry of daily PS inspection results
 - Diary entry of pump manual start and stops, including hours run

Appendix G: Management Plan Review Form



PHIL HAWLEY & ASSOCIATE

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PHIL HAWLEY & ASSOCIATE

Goulburn Mulwaree Council

Goulburn Waste Management Centre: Management Plan Review

Person completing checklist:

Date:

Council Signoff:

PRINT NAME

SIGNATURE

DATE

Questions	Yes	No	Actions	Responsibility
Have there been changes to the following?				
▪ statutory requirements				
▪ landfill site (ie land ownership, land boundaries)				
▪ waste types received				
▪ filling of the landfill				
▪ leachate management system				
▪ stormwater management system				
▪ other environmental management systems				
▪ monitoring program				
Is there close correlation between the volumes calculated from the surveys and those from the weighbridge?				
Has the current licence been included?				
Have any of the actions in the Action Plan been completed?				
Questions	Yes	No	Actions	Responsibility

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PHIL HAWLEY & ASSOCIATE

Appendix H: Capital Works Sequence and Estimates

This appendix contains suggested priorities for undertaking the capital works required to meet the obligations contained in this LEMP, together with an estimate of cost for carrying out these works. It also contains preliminary activities and estimated costs associated with the expansion of the current landfill into the area to the south and east.

The estimates are preliminary in nature and are included here to assist in the preparation of the Council's corporate plan/forward capital works programme. They should not be relied upon as pre-construction estimates.

Once concept designs are prepared then the capital works should be re-estimated.

PRIORITY	PROJECT	WHEN REQUIRED	PRELIMINARY ESTIMATED COST*
1.	Investigation and review of options for improved landfill compaction, including trials of alternate technology, equipment and compaction assessment %	Immediate	\$10,000 (Impact on operational costs)
2.	Review of options for improved transfer of materials on site, including trials of alternate technology or equipment	Immediate	\$5,000
3.	Provision of diesel leachate pump and spray equipment	Immediate	\$25,000
4.	Installation of shaker grids	Immediate	\$5,000
5.	Preparation of new cells: 30,000m ³ @ \$9/m ³ #	Approx every 2 years	\$270,000
6.	Progressive rehabilitation of cells as they are closed (approx 6,250 m ² @ \$63/m ² ^)	Approx every 2 years	\$395,000
7.	Install second weighbridge and upgrade software	2011/12	\$180,000
8.	Upgrade recycling area	2011/12	\$100,000
9.	Prepare closure plan	2025/26	\$80,000
10.	Post closure care & maintenance (annual allocation)	2027/28 – 2042/43	\$50,000
11.	EIS/environmental studies	2018/19	\$150,000
12.	Approvals process	2019/20	\$100,000
13.	Detailed design	2020/21	\$150,000
14.	Procurement	2024/25	\$60,000

* Estimates are preliminary only, subject to design and estimated in 2009 dollars

% Compaction rates are thought to be well below industry best practice and this is borne out by anecdotal evidence. The current landfill compactor is a modified wheel loader and not designed for handling the volumes of material received at GWMC. Urgent investigation and an options review is required to identify the most effective means of improving compaction rates and maximise the remaining life of the current site.

This rate is based on preparation of cells to current environmental standards including impervious clay lining and leachate drainage

^ Actual area to be rehabilitated will depend on the actual size of the preceding cell being closed off. Allowance has been made for placement of final capping over each cell once it has been filled.