BATAVIA REGIONAL ORGANISATION OF COUNCILS

Strategic Waste Management Plan

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Version 1	August 2008	Robert Sim	RMS	William Marchbank	WM
Version 2	September 2008	Robert Sim		William Marchbank	

EXECUTIVE SUMMARY

Background

The Waste Management Board (WMB) in its efforts to reduce the amount to waste being generated in Western Australia announced a Zero Waste Management Plan Development Scheme (ZWPDS) in 2006. The ZWPDS is intended to assist Local Government in Western Australia with the preparation of Strategic Waste Management Plans (SWMP) in order to facilitate enhanced planning for municipal waste management and recycling. It is intended that the plans will assist Local Governments in aligning their activities with the State's vision of 'Towards Zero Waste'.

The City of Geraldton-Greenough and Shires of Chapman Valley, Irwin and Northampton have joined together to form a regional group for the ZWPDS. For the purposes of this plan the region is known as the Batavia Regional Organisation of Council's (BROC). The formation of these Local Government Authorities (LGA's) will enable the development of a Strategic Waste Management Plan (SWMP) that identifies the specific needs of individual LGA's whilst identifying opportunities for regional collaboration.

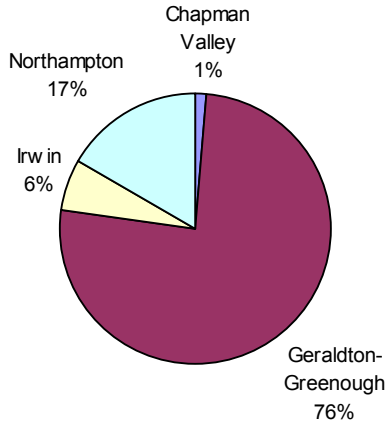
The ZWPDS is designed in two phases. The initial data gathering phase (Phase I) was conducted via an online survey to establish baseline characteristics for Local Governments. The second phase (Phase II) involved the development of a SWMP incorporating and analysing Phase I data and providing recommendations (including DEC recommendations) for improved waste management in the BROC.

Cardno WA Pty Ltd (Cardno) has been appointed by the BROC to complete this analysis of the region's current activities and develop a SWMP that encompass the goals and objectives set by the DEC and the BROC.

Data Analysis

The total amount of Municipal Solid Waste (MSW) generated in the BROC during the 2006/07 financial year was approximately 41,260 tonnes. The greatest amount of MSW is generated in the City of Geraldton-Greenough (31,330 tonnes) followed by Shire of Northampton (6,930 tonnes), Shire of Irwin (2,470 tonnes) and Shire of Chapman Valley (530 tonnes). This is graphically represented in **Figure E1** below.

Figure E1: Overall share of waste generated in the region by LGA (2006/07)



The generation of MSW by each LGA is largely dependant on its population size (and tourism). The recovery or reuse of material is more dependent on available collection / drop off infrastructure and the economics of transporting the recyclable material to an appropriate market. A breakdown of the estimated tonnage of material disposed / recycled

through different collection mechanisms is outlined in **Table E1**. The tonnages are based on totals reported through the Phase I data collection phase as part of the ZWPDS.

Table E1: Total amount of MSW generated in each LGA during 2006/07

Municipal	Chapman Valley	Geraldton-Greenough	Irwin	Northampton	TOTAL
Municipal Waste Collected	*529*	*31,333*	*2,470*	*6,928*	***41,260***
Municipal Waste Recycled / Reused	*9*	*7,904*	*450*	*1,952*	***10,315***
Municipal Waste to Landfill	*520*	*23,429*	*2,020*	*4,976*	***30,945***
Kerbside					
Total Kerbside Waste Collected	170	13,857	1,300	4,826	***20,153***
Total Kerbside Waste to Landfill	170	13,857	1,300	4,826	***20,153***
Recyclables					
Aluminium Cans	1	1	2	3	***7***
Newspaper	0	320	22	3	***345***
Cardboard	0	462	14	8	***484***
Ferrous	4	1,746	164	350	***2,264***
Non-Ferrous	3	154	14	6	***177***
Greenwaste	N/A	1,175	59	1,500	***2,734***
Wood/Timber Offcuts	1	N/A	5	1	***7***
Total Recyclables	9	3,858	280	1,871	***6,018***
Drop Off					
Collected	250	9,195	720	150	***10,315***
Drop-Off Landfill	250	9,195	720	150	***10,315***
Vergside / Drop Off					
Total Greenwaste Individual Collected		1,229	100	15	***1,344***
Total Hardwaste Individual Collected		1,043	70	66	***1,179***
Total Green / Hard Combined Collected	100	2,151			***2,251***
Total Green / Hard Combined Recovered	0	1,774			***1,774***
Total Green / Hard Combined Landfilled	100	377			***477***

Note: A high amount of commercial waste would be hidden in the MSW tonnages due to both waste streams being collected by the same waste contractor
Note: Shires of Mingenew, Coorow and Mullewa also disposed of waste at Meru during 2006/07 (not included in any totals in Table 3.3).
Source: Submitted data under Phase I of the Zero Waste Plan Development Scheme (DEC 2008b)

A waste audit of 216 240L Mobile Garbage Bins (MGB) in the City of Geraldton-Greenough in 2000 suggests that approximately 29% of all material disposed into the bin can be recycled and 43% composted (Spartel 2000). Ideally only 28% of material would be required to be sent to landfill. It can be assumed this waste composition would be consistent across the BROC.

There are likely to be some inaccuracies in relation to the Commercial and Industrial (C&I) and Construction and Demolition (C&D) tonnages data due to recording procedures at landfills, a number of landfills / transfer stations being unmanned, C&I being intermixed with municipal waste stream and Phase I targeting the municipal waste stream.

Collection services available across the BROC vary depending on population distribution and population size. Urban nodes have kerbside collection services available, whereas isolated communities require their waste to be dropped off at landfills or transfer stations. A verge side collection service is available for the City of Geraldton-Greenough and Shire of Chapman Valley (in selected urban nodes) and has recently begun for Kalbarri and Northampton township residents.

Population in the region has fluctuated over the past five years, with strong growth between 2005 and 2006, especially in the City of Geraldton-Greenough. This population fluctuation therefore makes in difficult to project waste volumes into the future. Conservative estimates suggest that the City of Geraldton-Greenough (31,300 tonnes in 2006/07) will generate an additional 3,000 - 5,000 tonnes of MSW by 2013. The surrounding Shires are likely to generate an additional 500 – 1,000 tonnes of MSW between them by 2013.

Significant infrastructure projects such as the Oakajee Port have the potential to generate significant amounts of waste especially C&D material during construction and C&I and MSW post construction depending on landuse planning. Construction could begin as early as 2009 with completion in 2012. Therefore, the BROC will need to accommodate a significant increase in waste volumes over the coming years.

Issues / Recommendations

As part of the ZWPDS, Phase I data was analysed by the DEC and recommendations provided for each LGA and the BROC as a whole. Issues identified included data gaps, direct and indirect environmental impacts and monitoring and reporting. Additional recommendations in consultation with the BROC were also developed for the plan. A summary of issues, DEC / Cardno recommendations, responsibility, implementation actions, timeline, estimated costs and potential source of funding is outlined in **Table E3.**

The Meru Waste Disposal Facility (City of Geraldton-Greenough) and Kalbarri Landfill (Shire of Northampton) are the only landfills that currently have capacity to accept waste in the medium to long term (>25 years), whereas the Nabawa and Yuna (Shire of Chapman Valley) and Port Gregory and Binnu (Shire of Northampton) landfills have short life expectancies (<15 years). Due to this limited capacity in the BROC and environmental impacts landfills exhibit, it is recommended that waste infrastructure and waste flows in the region be modified. Ideally the region would move towards two strategic landfills instead of the six landfills currently in operation. The Meru Waste Disposal Facility and Kalbarri landfill currently have the capacity and the resources to accept the waste currently being generated from surrounding areas.

Strategically, there may also be the need for a landfill at Oakajee for the Oakajee Port Project. This requires further investigation by the BROC.

The landfills at Binnu, Port Gregory, Yuna and Nabawa should be closed and converted into transfer stations. It is envisaged the sites will operate in a similar manner as they currently do, however waste will be disposed into large bins and transported to the larger / central / regional strategic landfills instead of being landfilled on site.

Conversion of these landfills into transfer stations has a number of economic, social and environmental benefits for the local area and also reduces the need to comply with a number of DEC landfill licence conditions / rural regulations. A summary of the current and proposed waste infrastructure and waste flows is outlined in **Table E2**.

Table E2: Summary of waste infrastructure within and outside the BROC utilising BROC waste infrastructure

Local Government Authority	Current Infrastructure	Proposed Infrastructure	Destination of Waste
City of Geraldton-Greenough	Meru Waste Disposal Facility	Strategic Landfill	Meru Waste Disposal Facility
Shire of Chapman Valley	• Nabawa Landfill • Yuna Landfill	• Transfer Station • Transfer Station	• Meru • Meru
Oakajee Port	None	Details unknown (however potential for landfill)	
Shire of Irwin	Dongara Transfer Station		Meru
Shire of Northampton	• Northampton Transfer Station (effective April 2008) • Kalbarri Landfill • Port Gregory Landfill • Binnu Landfill	• Strategic Landfill • Transfer Station • Transfer Station	• Meru • Kalbarri Landfill • Kalbarri Landfill • Kalbarri Landfill or Meru
Shire of Mullewa	*Mullewa Transfer Station*		*Meru*
Shire of Mingenew	*Mingenew Transfer Station*		*Meru*

Note: Shires of Mullewa and Mingenew are outside the BROC

DEC Licence and Landfill Regulation compliance audits were also conducted for each waste facility. Results, area of compliance / non-compliance, recommendations and areas for negotiation with the DEC are outlined in **Appendix D**.

Consultation with the BROC, DEC, Industry and the Community suggest key priorities for the region should be as follows (in no particular order).

- Kerbside Recycling Collections;
- Material Recovery Facility;
- Drop Off Recycling Facilities;
- Landfill Licence / Regulations Compliance;
- Greater engagement of the community through education;
- Greater regionalisation of Waste Services in the BROC; and
- Consolidation of landfills across the BROC;

This comprehensive SWMP has been developed to fulfil all requirements under Phase II of the ZWPDS. It is envisaged that this plan will further assist the BROC to align its activities 'Towards Zero Waste'.

Action Plan

Table E3: Action plan that LGA's should consider to improve waste services and reduce waste generation in the BROC.

Issue	Recommendation / Action (Some repeats as they resolve a number of issues)	Responsibility	Implementation	Timeline	Estimated Cost (further cost analysis required)	Potential Funding
Data Gaps	Conversion of small landfills in the region (Nabawa, Yuna, Port Gregory, Binnu) into transfer stations with Kalbarri landfill and Meru to be the strategic major waste depositories in the region (however Oakajee Port Project may require landfill)	Shire of Chapman Valley Shire of Northampton	A survey of each unmanned site to quantify waste tonnage received. 'Hook-lift' bins similar to those used at Dongara and Northampton Transfer Stations would be used.	2009 - 2013	$40,000 - $50,000	Shire of Northampton Shire of Chapman Valley (with potential in kind from DEC)
	Investigate management and destination of waste from Oakajee Project	Shire of Chapman Valley City Geraldton-Greenough	Talks commence between relevant LGA's with preferred contractor (Oakajee Port and Rail) and Landcorp	2009 -2010	Minimal (administrative)	N/A
	Investigate periodic bulk item drop-off days at transfer stations and landfills across region to minimise risk of high volume items being disposed in transfer station bulk bins	BROC Veolia Environmental	EHO's and Veolia to coordinate appropriate days and to man sites (if practicable)	2009 - 2013	$10,000+	LGA's / BROC
	Continue segregation and stockpiling of C&D waste at each transfer station / landfill to maximise landfill space therefore allowing for volume estimates / future recycling	All LGA's Construction Industry	Reserve space for inert waste and truck movement	Ongoing	Minimal	N/A
	Detailed survey of sites to be completed including past cells	All LGA's	Analysis of historical aerial photos through Landgate, historical records through library and site assessment	2009	$2,000 - $5,000	LGA's
	Detailed electronic register of incoming waste materials at proposed landfills (Meru and Kalbarri)	Shire of Northampton City of Geraldton-Greenough	Already achieved at Meru. Similar system should be investigated for Kalbarri (software / computer / training)	2009 - 2010	$2,000 - $3,000	Shire of Northampton
Direct and Indirect Environmental Impacts	Investigate the hire of a crusher to remove current C&D stockpile at Meru Waste Disposal Facility with potential for crushing region's stockpiled C&D material in the future with potential to also incorporate glass fines.	City of Geraldton-Greenough BROC	Contact providers of crushing equipment and determine market for material in each LGA. BROC commence talks prior to one LGA instigating crushing.	2010 - GGRC >2010 (Future crush)	Set asides funds depending on amount willing to be crushed. (~$22 / tonne)	2010 – City Geraldton-Greenough >2010 - BROC
	Continue the segregation and processing (where possible) of greenwaste with weed minimisation principles and increase monitoring of greenwaste disposal (where possible) to minimise contaminated loads. Where shredding not viable, controlled burning of greenwaste material.	All LGA's	Encouragement of greenwaste stockpile at transfer station and landfills with good signage	Ongoing	$10,000 / annum Small cost for signage	All LGA's
	Signage for scrap metal stockpiles at each transfer station (Binnu, Port Gregory, Nabawa, Yuna) with periodic (annual / bi-annual collection) depending on rate of metal disposal.	Shire of Chapman Valley Shire of Northampton	Signage on site. Coordinated drop-off days	Ongoing	Cost positive (metal commodity price)	N/A
	Discussions with DEC (Waste Management Branch) regarding inappropriate conditions and invitation of DEC officers to waste infrastructure across the region to work through current Licence requirements and negotiate new Licence conditions	All LGA's	Meetings and site visits to negotiate new licence / regulation conditions	2009 - 2010	Minimal (some administrative work)	N/A
	Meet practical DEC Licence conditions at Landfills and Transfer Stations (see **Appendix D** for detail)	All LGA's	EHO and site operator to familiarise and educate self with DEC Licence or Regulations for site, implement practical measures	2009	<$5,000 each LGA	All LGA's
	Investigate periodic household hazardous waste drop-off day (including fluorescent tubes / compact fluorescent lamps)	BROC Chemclear	Investigate program (when finalised by MWAC) and apply for funding.	2009 - 2010	$10,000	Funding available from MWAC Household Hazardous waste program
	Continue DrumMuster Program (Shire of Irwin to sign up)	All LGA's	Education of farm owners and sign up by Shire of Irwin	2010 - 2013	Minimal	N/A
	Investigate thermal treatment of mattresses with goal of extracting metals whilst minimising emissions	City of Geraldton-Greenough DEC Dept Health	Contact DEC and Dept Health. If permission granted trial the burning of mattresses with fire brigade present	2009	Minimal. Potentially cost positive with extraction of metals	N/A
	All LGA's to participate in MobileMuster	All LGA's	Investigate program and signup Council buildings to participate in program, inform community through media	2009	Minimal (some administrative work)	MobileMuster
	Investigate dry cell battery recycling	LGA's Veolia	Enter discussions with Veolia to supply pre-paid plastic containers to Council and encourage residents to drop off batteries.	2009 - 2010	Minimal	Veolia LGA's
	Investigate the viability of E-Waste Recycling in the region via backloading with scrap metal to Perth	BROC Sims E-waste Sims Metal	Trial E-waste collection depot at transfer station / resource recovery park to gage E-waste volumes. Begin talks with Sims metal to transport E-waste back to Perth for processing.	2010	$13 – computer monitor $6 – PC / printers Potential Transport Cost	All LGA's with potential assistance from DEC / MWAC or corporate (computer manufacturer) sponsorship

	Recommendation / Action **(Some repeats as they resolve a number of issues)**	**Responsibility**	**Implementation**	**Timeline**	**Estimated Cost** (further cost analysis required)	**Potential Funding**
	Investigate viability of plastics recycling at transfer stations and landfills in partnership with DrumMuster program plastics recycler	All LGA's CLAW Environmental	Begin talks with plastics DrumMuster recycling companies	2010	Minimal due to synergy with DrumMuster	LGA's
	Continue stockpiling of used tyres whilst remaining with DEC Licence and Rural Landfill regulations	All LGA's	Keep abreast with developments in used tyre recycling that may be economical in the region	2010-2013	Minimal	N/A
	Continue to work with WALGA and the DEC in regards to reducing costs for used oil collections	BROC	Continue talks	2010-2011	Minimal	N/A
	Continue segregation and stockpiling of C&D waste at each transfer station / landfill to maximise landfill space and allow for tonnage estimate for future recycling	All LGA's	Reserve space for inert waste and truck movement	Ongoing	Minimal	N/A
	Conversion of small landfills in the region to transfer stations	Shire of Chapman Valley Shire of Northampton	A survey of each unmanned site to quantify waste tonnage received. 'Hook-lift' bins similar to those used at Dongara and Northampton Transfer Stations would be used.	2009 - 2011	$40,000 - $50,000	Shire of Northampton Shire of Chapman Valley (with potential funding in kind from DEC)
Improving Existing Service Efficiencies	Investigate a Memorandum of Understanding (MoU) between LGA's with the aim of improved waste management efficiencies across the region	BROC	Commence talks on the MoU between LGA's	2010	Unknown	BROC
	Investigate regional contracts for the provision of waste services for the region - Waste collection - Greenwaste shredding / composting - Recycling	BROC Veolia Environmental Solutions	Commence talks on jointly tendering contracts with expiration of current contracts. LGA's to consider linking waste collection services with other LGA's at expiration of contracts with vision of regionalising contract across the BROC.	Waste Collection 2009-2016 Greenwaste late 2008	Potential cost savings with greater regionalisation Unknown Free → $550 / hour at present (depending on location)	BROC
	Investigate with relevant parties the possibility of a container berth within the Mid-West	BROC	Continue talks with relevant parties	2008 - 2013	Minimal	N/A
	Continue investigating the construction of a Material Recovery Facility (MRF) at the Meru Waste Disposal Facility	City of Geraldton-Greenough (in talks with surrounding LGA's)	Continue due-diligence	2008 - 2010	>$10,000	City of Geraldton-Greenough National Packaging Covenant
	Investigate public drop off centres once MRF is operational	City of Geraldton-Greenough	Locate strategic points in town centre for high co-mingled waste generation	2010	$5,000 - $10,000	City of Geraldton-Greenough
	Continue investigation of the viability of kerbside recyclable systems in the City of Geraldton-Greenough. Investigate viability of kerbside or drop-off co-mingled centres in surrounding LGA's and public recycling in key areas.	City of Geraldton-Greenough. Potentially other LGA's	Continue due-diligence	2008 - 2010	>$10,000	City of Geraldton-Greenough. Potentially other LGA's National Packaging Covenant
	Continue the acceptance of clean greenwaste, recyclable material (cardboard, aluminium cans) and some high value bulk items from the community for free	All LGA's	Continue current practices	Ongoing	Minimal (potential cost saving with maximising landfill / skip bins space)	LGA's
	Continue the operation of Resource Recovery Parks (RRP) at each major transfer station / landfill. Investigate the possibility of RRP at Northampton transfer station	All LGA's Shire of Northampton	Continue current practices	Ongoing. Northampton 2009	Minimal (potential cost saving with sale of product)	LGA's
	Investigate regionalisation of medical collection	BROC	Build on current partnership between Veolia and Stericorp to encompass all medical facilities in the region	2010	Unknown costs (additional transport costs to Perth)	BROC Department of Health
	Investigate installation of baler at landfills / transfer stations (where practical) to increase recycling efficiencies (Cogman Recyclers at Meru unable to recycle all incoming feedstocks)	LGA's Veolia Environmental Community	Collect cardboard through current bin systems, bale cardboard through council or community organisations	2010 -2011	Spare baler currently available from Meru. Additional balers ~$10,000 Some periodic operational costs	Funding from DEC AMCOR VISY
	Work with WALGA and DEC in regards to a reduced costs for used oil collections	All LGA's	Continue current practices	Ongoing	Minimal	LGA, DEC, WALGA
	Periodic regional meetings to discuss waste management in the BROC	BROC	Set meeting dates or align meeting with current interactions of EHO in the region	2009 - 2013	Minimal - Administration	N/A
Community / Commercial Awareness	Develop a regional waste education plan	BROC	Enter discussions with Forum of Regional Councils (FORC) and WMAA. Adopt regional coordination	Prior to kerbside recycling or construction of MRF (2009)	$10,000 - $30,000 (Consultant)	Joint funding BROC and DEC

	Recommendation / Action (Some repeats as they resolve a number of issues)	Responsibility	Implementation	Timeline	Estimated Cost (further cost analysis required)	Potential Funding
	Develop environmental / waste community group in each LGA	BROC and within each LGA	Develop framework to coordinate community group and its activities. Base on already established community groups such as Catchment Council's in region	2010 - 2011	Environmental coordinator (A) for City Geraldton-Greenough $60,000 annually Environmental Officer / Coordinator (A) for Region. - $60,000 annually	City Geraldton - Greenough LGA's BROC DEC
	Participate in Tidy Towns Sustainable Communities	All LGA's	Sign-up to program	2012	Environmental coordinator (A) for City Geraldton-Greenough $60,000 annually Environmental Officer / Coordinator (A) for Region. - $60,000 annually	City Geraldton - Greenough LGA's BROC DEC
	Participate in Waste Wise Schools Program	All LGA's	Sign-up to program	2012		
	Upgrade LGA websites in regards to waste management and education	All LGA's	Provide all necessary information in clear concise manner.	2009 (GGRC – Prior commissioning of MRF 2009)		
	Continue collaboration with the DEC and MWAC to promote and invigorate recycling	All LGA's DEC MWAC	Continue talks with MWAC and DEC	Ongoing		
	Educate the Commercial and Industrial (C&I) and Construction and Demolition (C&D) sector towards recycling	BROC Veolia Environmental Solutions	Continue talks with C&I and C&D sector	Ongoing	$10,000 - $20,000	BROC / Waste Collection Contractor
Local Government Waste Management Practices	Implement improved waste management practices	All LGA's	Educate staff on potential environmental initiatives in the workplace and draft policy guidelines for procurement policy in LGA operations.	2009 - Ongoing	Minimal – Administration	N/A
Monitoring and Reporting	Review strategic waste management plan every 2 years	BROC	Workshop to highlight achievements and/or difficulties and amend document as appropriate	2011 and 2013	Minimal – Administration	N/A
	Annual Environmental Achievement Reports to Community. Continue to promote success of recycling activities of communities and schools in their recycling efforts (e.g newspaper and aluminium cans)	All LGA's or BROC	Write report and distribute to community	2009 - Annually	Minimal – Administration Environmental Officer (B) City of Geraldton-Greenough - $60,000	LGA's BROC
	Develop monitoring and reporting regime (OSCAR + waste)	All LGA's	Annual report	2009 - Annually		BROC / DEC

Note: Costs are only estimates. A detailed cost analysis should be undertaken.

Summary Potential Funding Options from Table E3

- Local Government Authorities
- BROC
- Department of Environment and Conservation
- Department of Health
- Municipal Waste Advisory Council
- National Packaging Covenant
- MobileMuster
- Private sector

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APPENDICES

ACRONYMS

ABS – Australian Bureau of Statistics
AP – Alliance Partnership
BOO – Build Own Operate
BOOT – Build Own Operate Transfer
BROC – Batavia Regional Organisation of Councils
C&D – Construction and Demolition
C&I – Commercial and Industrial
CFL – Compact Fluorescent Lamp
D&C – Design and Construct
DEC – Department of Environment and Conservation
DEP – Department Environmental Protection
EHO – Environmental Health Officer
EMRC – Eastern Metropolitan Regional Council
EPR – Extended Producer Responsibility
FORC – Forum of Regional Councils
GGRC – Geraldton-Greenough Regional Council
HHW – Household Hazardous Waste
LGA – Local Government Authority
MGB – Mobile Garbage Bin
MRC – Mindarie Regional Council
MRF – Material Recovery Facility
MSW – Municipal Solid Waste
MWAC – Municipal Waste Advisory Council
MWDC – Mid-West Development Commission
NGERS – National Greenhouse Emission Reporting Scheme
OSCAR – Online System for Comprehensive Activity Reporting
RRP – Resource Recovery Park
SWMP – Strategic Waste Management Plan
WALGA – West Australian Local Government Authority
WAPC – West Australian Planning Commission
WMAA – Waste Management Association Australia
WMB – Waste Management Board
ZWPDS – Zero Waste Plan Development Scheme

1. INTRODUCTION

1.1 Purpose and Objectives

The Western Australian Waste Management Board (WMB) in its efforts to reduce the amount of waste being generated in Western Australian announced a Zero Waste Management Plan Development Scheme (ZWPDS) in 2006. The ZWPDS is intended to assist Local Government in Western Australia (WA) with the preparation of Strategic Waste Management Plans (SWMP) in order to facilitate enhanced planning for municipal waste management and recycling. It is intended that the plans will assist Local Governments in aligning their activities with the State's vision of 'Towards Zero Waste'.

The City of Geraldton-Greenough and Shires of Chapman Valley, Irwin and Northampton have collaborated together to form a regional group for the purpose of the ZWPDS. This group of Local Government Authorities (LGA's) is also known as the Batavia Regional Organisation of Councils (BROC). Whilst the BROC is not a formal regional body, for the purposes of this plan, when all LGA's are outlined as a grouping they will be referred to as the BROC. The Abrolhos Islands (60 kilometres off the coast of the BROC) has not been included as part of this plan as the operations are largely coordinated by the State Government Fisheries Department.

A key purpose of this waste management strategy is to develop co-operation and regionalise waste services between LGA's across the region for social, environmental and economic benefit.

Cardno WA Pty Ltd (Cardno) has been appointed by the BROC to complete this analysis of the region's current activities and develop a SWMP that encompass the goals and objectives set by the DEC and the BROC.

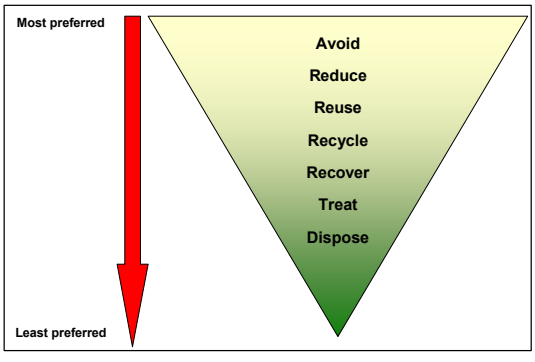
1.2 Goals

The vision and goals of the project (as defined in the Department of Environment and Conservation (DEC) Guidelines for the ZWPDS) are as follows:

- Development of a Strategic Waste Management Plan that outlines the steps to be taken to minimise the direct and indirect environmental impacts of waste and its management over the next five years;
- Management of waste in a sustainable manner; and
- Increased awareness of the impact of waste issues on the environment by the whole community.

The waste hierarchy adopted by the DEC (and which should be followed by the BROC) is outlined in **Figure 1.1**.

Figure 1.1: Waste Hierarchy

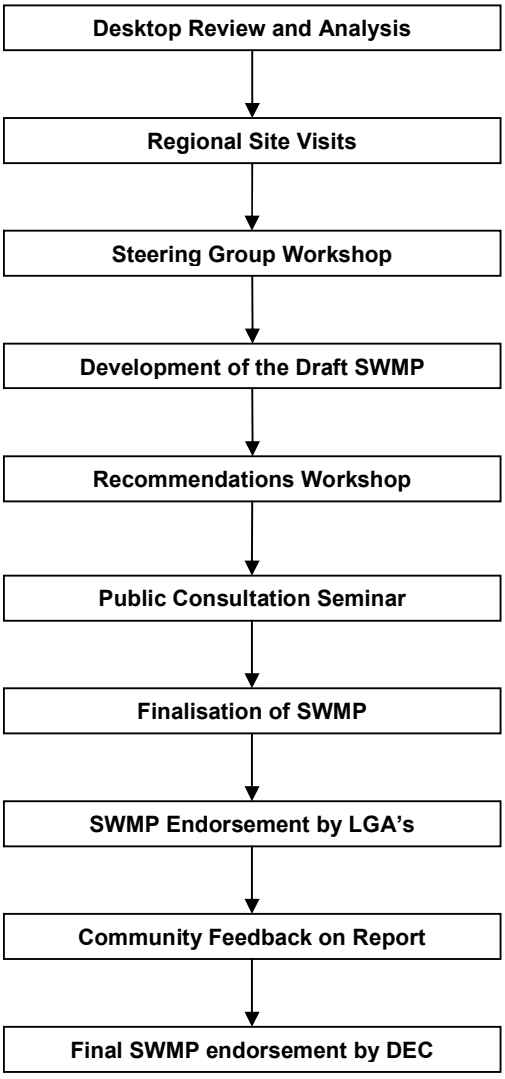


2. METHODOLOGY

The ZWPDS is designed in two phases. The initial data gathering phase (Phase I) was conducted via an online survey to establish baseline characteristics for Local Governments. The second phase (Phase II) involved the development of a SWMP incorporating and analysing Phase I data and providing recommendations (including DEC recommendations) for improved waste management in the BROC.

The methodology used for the development of the plan incorporates a number of steps that allow for a thorough analysis of current and proposed waste management practices in the region, in consultation with key stakeholders. Stakeholders contacted include LGA representatives, local and metropolitan-based waste contractors and the community. Previous waste strategies for the region and literature were also sought for the development of the plan. Specific methodology utilised to compile the information for the plan is outlined below in **Figure 2.1**.

Figure 2.1: Methodology utilised to compile the information required to develop the BROC strategic waste management plan



The desktop review and analysis involved analysis and interpretation of Phase I data provided by the DEC, waste projections for the region and a review of relevant literature provided by each LGA. Following a desktop review, Cardno conducted site visits of key waste infrastructure in the BROC with site operators and officers. This was completed in April 2008.

Whilst in the region, a workshop was conducted at the City of Geraldton-Greenough Council Chambers, that allowed for discussion of findings from the site visits, a presentation on DEC recommendations as well as providing all workshop members with the opportunity to voice their opinions about the issues faced by the region and priority waste streams that required attention. Attendees present at the workshop are outlined in **Table 2.1**.

Table 2.1: Steering Group Workshop attendees and contributors for the BROC SWMP

Attendee	Position	Organisation
Andrew Mack	Senior Environmental Consultant	Cardno (WA) Pty Ltd
Robert Sim	Environmental Consultant	Cardno (WA) Pty Ltd
Mark Wong	Manager Waste Management and Environment	City of Geraldton-Greenough
Lynley Rayner	Technical Officer	City of Geraldton-Greenough
Rod Bayliss	Environmental Health Officer (EHO)	Shire of Northampton
Felix Neuweller	Environmental Health Officer	Shire of Irwin
Kirrilee Warr	Planning Officer	Shire of Chapman Valley
Raymond Yorke	Project Coordinator	Department of Environment and Conservation
Maurice Battilana	Chief Executive Officer	Mid West Regional Council
Gordon Houston	Senior Environmental Consultant	Dallywater Consulting

Note: Whilst Veolia, the waste management contractors for the region, were invited to the workshop, unfortunately a representative was unable to attend.

A working draft SWMP was developed incorporating preliminary recommendations and strategies in line with the ZWPDS Guidelines. The working draft plan was then presented at a recommendations workshop held at Cardno offices in Subiaco. This workshop worked through the recommendations in addition to those provided by the DEC and also provided an opportunity to provide additional brainstorming before the community consultation phase. Attendees at the recommendations workshop are outlined in **Table 2.2**. The attendees were limited to Cardno personnel and project coordinator Mark Wong from the City of Geraldton-Greenough.

Table 2.2: Recommendations Workshop attendees

Attendee	Position	Organisation
Bill Marchbank	Waste Section Leader	Cardno (WA) Pty Ltd
Robert Sim	Environmental Consultant	Cardno (WA) Pty Ltd
Mark Wong	Manager Waste Management	City of Geraldton-Greenough

Community consultation seminars were conducted in July 2008. These seminars were held in major population centres in the BROC namely Dongara (Shire of Irwin), Geraldton (City of Geraldton-Greenough) and Kalbarri (Shire of Northampton). Residents of the Shire of Chapman Valley were invited to attend the Geraldton seminar. The purpose of the seminars was to give a short presentation of the purpose of the SWMP, a background on services currently available and waste quantities being produced. The seminars also allowed the community to present their thoughts on the current waste management practices in the region and how they could be improved. Attendees, besides general residents included a number of councillors, LGA officers, CEO's and industry

representatives. A number of comments from the seminars have been integrated into the SWMP. All comments received at the seminar are included in **Appendix F**.

A final report was then presented to each LGA for approval through Council.

*The final report was released to the community for comment for a 21 day period. Any comments received were incorporated into the document as an Appendix (**Appendix F**). Finally the report was forwarded to the DEC for approval. Note – to be undertaken in September 2008*

3. PHASE 1 ANALYSIS

3.1 Regional Profile

The BROC is located in the Mid West Region of Western Australia approximately 450 kilometres north of Perth. It consists of four LGA's, namely the City of Geraldton–Greenough (a recently merged LGA) and Shires of Northampton, Irwin and Chapman Valley. The area covers approximately 20,500 square kilometres (WALGA 2007) running along the coast from Kalbarri in the north to Dongara in the south. A map of the BROC and surrounding Shires utilising waste infrastructure in the BROC is outlined in **Appendix A**.

The BROC region is an important contributor to the Western Australian economy. Major industries in the region include mining, agriculture, tourism and aquaculture. The rock lobster catch alone was worth approximately $116 million in 2004/05 (Mid West Development Commission 2008). The majority of manufacturing businesses are based around servicing the needs of the regions agricultural, mining and fishing industry sectors.

The BROC region has well established transport infrastructure including a major network of sealed roads and rail that connect the region to the Perth Metropolitan Area. The City of Geraldton also has a large port to service industries in the area. More than half of the port's exports are generated from minerals and iron ore (Geraldton Port Authority 2008). Major arterial roads include the Brand Highway linking Perth to Geraldton via Dongara; the North West Coastal Highway linking Geraldton to Northampton and Chapman Valley Road linking Geraldton and Chapman Valley Shire. WestNet rail and the Australian Railroad Group operate the rail network and rolling stock in the Mid West and throughout the southern half of the State.

3.2 Population

Population in the region is concentrated around a number of urban nodes, namely Geraldton and Greenough in the City of Geraldton-Greenough, Northampton, Port Gregory, Horrocks Beach and Kalbarri in the Shire of Northampton, Dongara in the Shire of Irwin and Nabawa in the Shire of Chapman Valley. There are small population centres and isolated residents / farms throughout the rest of the region.

The distribution of population is related to the intensity of the landuse. Coastal areas with higher rainfall generally support industries such as horticulture and mixed crop/livestock agriculture. As the intensity of land use decreases inland into the pastoral and mining areas, local populations decline markedly. The aggregation of farming land has also decreased population in some areas (Mid West Development Commission 2008).

Tourism is also a major industry in the region, with large numbers of people from overseas, interstate and Perth visiting periodically. During peak period the population across the region can increase significantly. The Coral Coast Tourism Region stretching from Jurien Bay to Exmouth experienced approximately 650,000 visitors during 2006. In Kalbarri alone approximately 125,000 visitors were recorded. The number of tourists has remained largely

constant across the region due to limited accommodation. Local operators advise of 100% occupancy during peak periods and 70% occupancy in mid-season. Visitor numbers in the region peak during July to August and December to February each year (Koltaz Smith 2008).

Approximately 35,000 people or 83% of the total population in the BROC reside in the City of Geraldton-Greenough (ABS 2008). Both the Shires of Irwin and Northampton have a population of approximately 3,300 each and Chapman Valley a population of approximately 950 (**Table 3.1**). Population in each LGA has tended to fluctuate over calendar years however, overall growth in the region has been strong, especially recently. Between 2001 and 2006 there has been a 6.4% growth in population in the BROC. Between 2005 and 2006 there was a large population increase of 6.3%.

Table 3.1: Population growth in the BROC between 2001 and 2006

	Calender Year						Growth (%)	
Local Government	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**05-06**	**2001-2006**
Chapman Valley	876	884	892	957	984	957	-2.7%	9.2%
Geraldton-Greenough	32,764	32,654	32,452	32,156	32,604	35,022	7.4%	6.9%
Irwin	3,059	2,996	2,989	3,034	3,247	3,240	-0.3%	5.9%
Northampton	3,333	3,329	3,320	3,313	3,237	3,360	3.8%	0.8%
TOTAL	40,032	39,863	39,653	39,460	40,072	42,579	**6.3%**	**6.4%**

Source: Mid-West Development Commission / ABS Population data

The population of the BROC region has tended to fluctuate over time due to labour demands in major industries varying with economic activity especially in inland areas. The emergence of fly in - fly out to mining regions in the Pilbara and Mid-West from the Geraldton airport may also be contributing to population growth in the region. Overall, in the current economic climate, it can be expected that the region will continue to grow over the next five years.

The total number of households in the region is approximately 17,850 with the highest number in the City of Geraldton-Greenough (**Table 3.2**). Whilst the Shires of Irwin and Northampton have approximately the same population (3,300 persons) there is a large disparity in the total number of households and subsequent average number of persons that occupy each household. The additional households in the Shire of Northampton are holiday homes or holiday rentals that are used on a temporary basis (Koltaz Smith 2008).

Table 3.2: Total number of households in each LGA and average number of persons per household

Local Government	Total households	Persons per Household
Chapman Valley	416	2.3
Geraldton-Greenough	13,569	2.6
Irwin	1,614	2.0
Northampton	2,252	1.5
TOTAL	**17,851**	**2.4**

Source: ABS (2006 Census data)

3.2.1 Population Projections

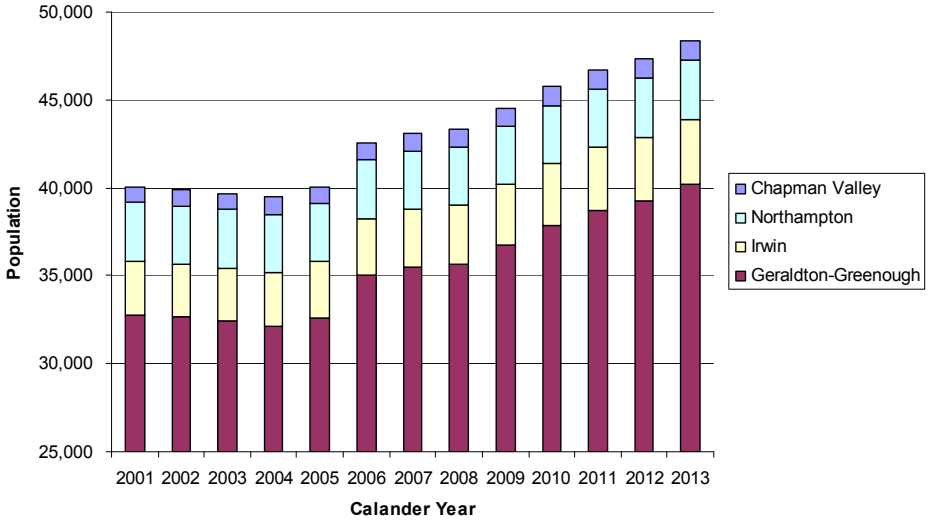
The Western Australian Planning Commission (WAPC) in 2000 released a report entitled "Western Australia Tomorrow". The purpose of the document was to predict population growth in all LGA's between 2004 and 2021. Comparisons between WAPC and ABS

census data conclude that the WAPC data is somewhat conservative in its estimates in regards to population growth in the region, therefore for the purposes of this report projections from actual ABS census data will be used.

As outlined previously the population in the region has tended to fluctuate depending on economic activity in the area, however overall there has been an increase in population over the past five years (6.4%). Accurate population projections for the region, due to the fluctuation, are therefore inherently difficult. An example of a high amount of fluctuation is the City of Geraldton-Greenough which has been experiencing a slow decline in population between 2001 and 2004, however experienced a population "boom" in 2005 and 2006.

Projections based on "trend" linear regression using Microsoft Excel suggest that approximately 46,000 people will be in the region by 2010 and 48,000 by 2013. The difficulty of accurately estimating population growth is clearly illustrated in **Figure 3.1** due to the population "boom" during 2006.

Figure 3.1: Population growth in the region over the next 10 years



Source: ABS Census data
Microsoft Excel – "Trend" linear projection

It must be noted that major economic developments such as the numerous resource projects proposed for the region, the region's lifestyle, proximity to the Metropolitan Area, strong supportive social infrastructure and relatively lower property prices have the capacity to boost these projections quite significantly (Mid West Development Commission (MWDC) 2008).

A proposed port in Oakajee (approximately 20 kilometres north of Geraldton (**Appendix A**)), within the Shire of Chapman Valley, also has the potential to significantly boost the population in the region further. On July 29th 2008 the State Government announced that Oakajee Port and Rail would be the States preferred developer for the deep water port at Oakajee. Landcorp will be the proponent for an industrial estate surrounding the port. It is envisaged the port could be in operation in 2012. It is estimated construction of the port and rail network will cost between $2.5 – 3.5 billion (MWDC 2008).

3.3 Waste Generation

LGA's were required under Phase I of the ZWPDS to submit data based on the total amount of waste being generated in their associated region during the 2006/07 financial year. Waste streams targeted included Municipal Solid Waste (MSW), Commercial and

Industrial (C&I) and Construction and Demolition (C&D) wastes, however the primary focus for the ZWPDS is on the generation of MSW.

3.3.1 Municipal Solid Waste

MSW waste is generally considered as rubbish, refuse, junk, garbage or scrap that originates from residential sources (DEC 2008a). Other types of waste that can be considered MSW include domestic cleanup wastes, furniture, residential garden waste and waste generated from Local Government activities.

The total amount of MSW generated in the region during 2006/07 financial year (as outlined in Phase I data supplied by the DEC (2008b)) was approximately 41,260 tonnes (**Table 3.3**). Of this total approximately 10,310 tonnes or 25% of waste generated was recycled or reused. It must be noted that data reliability could be in question in a number of LGA's due to the nature of the waste facilities in the region. The City of Geraldton-Greenough and Shire of Irwin have MSW tonnages quantitatively recorded at a weighbridge at the Meru Waste Disposal Facility in Geraldton and therefore can be considered accurate, whereas MSW estimates from the Shires of Northampton and Chapman Valley are only qualitative estimates due to weighbridges not being available and the Shires having a number of unmanned landfills during the 2006/07 time period (as of April 2008 waste from the Northampton Transfer Station is now disposed and recorded at the Meru).

MSW and C&I waste can also be collected together; further complicating the calculation of MSW waste tonnages. Income from recyclables / hardwaste (scrap metals) is normally paid on a volume / tonnage basis therefore these figures are likely to be accurate.

Table 3.3: Total amount of MSW generated in each region during 2006/07

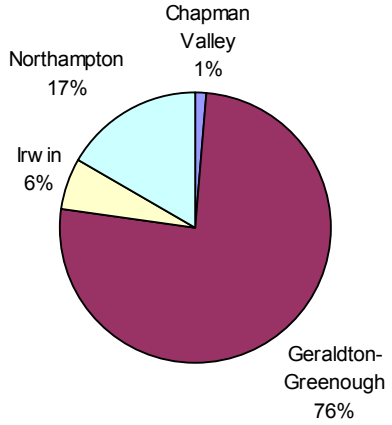
Municipal	Chapman Valley	Geraldton-Greenough	Irwin	Northampton	TOTAL
Municipal Waste Collected	*529*	*31,333*	*2,470*	*6,928*	***41,260***
Municipal Waste Recycled / Reused	*9*	*7,904*	*450*	*1,952*	***10,315***
Municipal Waste to Landfill	*520*	*23,429*	*2,020*	*4,976*	***30,945***
Kerbside					
Total Kerbside Waste Collected	170	13,857	1,300	4,826	***20,153***
Total Kerbside Waste to Landfill	170	13,857	1,300	4,826	***20,153***
Recyclables					
Aluminium Cans	1	1	2	3	***7***
Newspaper	0	320	22	3	***345***
Cardboard	0	462	14	8	***484***
Ferrous	4	1,746	164	350	***2,264***
Non-Ferrous	3	154	14	6	***177***
Greenwaste	N/A	1,175	59	1,500	***2,734***
Wood/Timber Offcuts	1	N/A	5	1	***7***
Total Recyclables	9	3,858	280	1,871	***6,018***
Drop Off					
Collected	250	9,195	720	150	***10,315***
Drop-Off Landfill	250	9,195	720	150	***10,315***
Vergside / Drop Off					
Total Greenwaste Individual Collected		1,229	100	15	***1,344***
Total Hardwaste Individual Collected		1,043	70	66	***1,179***
Total Green / Hard Combined Collected	100	2,151			***2,251***
Total Green / Hard Combined Recovered	0	1,774			***1,774***
Total Green / Hard Combined Landfilled	100	377			***477***

Note: A high amount of commercial waste would be hidden in the MSW tonnages due to both waste streams being collected by the same waste contractor
Note: Shires of Mingenew, Coorow and Mullewa also disposed of waste at Meru during 2006/07 (not included in any totals in Table 3.3).
Source: Submitted data under Phase I of the Zero Waste Plan Development Scheme (DEC 2008b)

The highest amount of MSW is generated in the City of Geraldton-Greenough (31,330 tonnes or 76%) followed by Shire of Northampton (6,930 tonnes), Shire of Irwin (2,470 tonnes) and Shire of Chapman Valley (530 tonnes). A highest amount of recyclables are

recovered in the City of Geraldton-Greenough (7,900 tonnes) and Shire of Northampton (1,950 tonnes). A summary of the share of waste generated in the BROC is outlined in **Figure 3.2**

Figure 3.2: Overall share of waste generated in the region by LGA (2006/07)



The generation of MSW by each LGA is largely dependant on its population size (and tourism). The recovery or reuse of material is more dependent on available collection / drop off infrastructure and the economics of transporting the recyclable material to an appropriate market.

The amount of MSW generated on a per capita basis is outlined below in **Table 3.4**.

Table 3.4: MSW generation in each LGA on a per household (tonnes) and waste per capita basis (kilograms)

Local Government	MSW per household	Per Capita (kg)
Shire Chapman Valley	1.3	550
City Geraldton-Greenough	2.3	890
Shire Irwin	1.5	760
Shire Northampton	3.1	2,060*
Average	**2.3**	**970**

Note: Average has been calculated by using total tonnages (2006/07) divided by total households / population during ABS census in 2006
*Tourism inflates average household / capita figures considerably (e.g. Shire of Northampton)

Approximately 2.3 tonnes of MSW was generated per household in the BROC in 2006/07. This is equivalent to 970 kilograms per person per year (based on 2006 ABS census data). The large discrepancy between LGA's can be attributed to inaccurate tonnage totals and tourism in the region. The Shire of Northampton in particular has high tourism activity that has resulted in inflated tonnages when compared to other LGA's.

Unlike the City of Geraldton-Greenough and Shire of Irwin that utilise the weighbridge at the Meru Waste Disposal Facility in Geraldton, the Shires of Northampton and Chapman Valley do not have weighbridges at their respective landfills. Instead tonnages were calculated using estimates (as of April 2008 waste from the Northampton Transfer Station is now recorded at the Meru weighbridge).

3.3.2 Commercial and Industrial Waste

C&I waste (e.g. supermarkets, office buildings, hotels and clubs) is a significant contributor to the generation of waste in the BROC. C&I waste can be collected either via kerbside Mobile Garbage Bins (MGB's) or by skip bins.

Data collected by LGA's in terms of C&I waste can be considered inconclusive due to limitations in available data. C&I and MSW waste can also be collected together; further complicating the calculation of C&I waste tonnages. The amount of C&I waste being recycled in the region can also be considered inconclusive due to commercial quantities likely to have been included in MSW totals.

3.3.3 Construction and Demolition Waste

C&D waste is defined as a material that arises from construction, refurbishment or demolition activities (Department of Environment 2004). The material is disposed at landfill by either public or private contractors.

Like C&I waste, LGA's found it difficult to accurately quantify the amount of C&D waste currently being generated. The City of Geraldton-Greenough has estimated that at least 10,000 tonnes of C&D waste was generated in the in 2006/07 (**Table 3.5**). Tonnages being generated in surrounding Shires is unknown due to tonnages not being recorded.

Table 3.5: Total amount of C&D waste generated in each region during 2006/07

Construction and Demolition	Chapman Valley	Geraldton-Greenough	Irwin	Northampton	TOTAL
Stockpiled at landfill	Uncertain	10,602	Uncertain	25	**10,627**

With the exception of the City of Geraldton-Greenough, a number of data gaps exist for the amount of C&D material being collected in each LGA, however observations from site visits indicate this material is being segregated from putrescible material and either stockpiled or landfilled in a separate cell on site. This segregation maximises landfill space and increases compaction within the putrescible cell.

3.3.4 Household Hazardous Waste

Household Hazardous Waste (HHW) refers to wastes which (a) contain components that have the potential to threaten human or environmental health; and (b) are reasonably likely to be used or stored on residential premises (DEC 2008a). Examples of HHW include cleaners, hydrocarbons, motor oil, paint, solvents, swimming pool chemicals, pesticides and their packaging (MWAC 2008). At present the Meru Waste Disposal Facility is the only facility in the BROC that accepts HHW. HHW is collected by Chemclear from the Meru Waste Disposal Facility on a periodic basis. Quantities of chemicals collected are unavailable.

3.4 Waste Composition

3.4.1 Household Domestic Waste

In 2000 the Geraldton-Greenough Regional Council (GGRC) commissioned Spartel Pty Ltd to conduct a waste audit in the region to provide data on the waste stream currently disposed of at the Meru Waste Disposal Facility. The study included analysis of 216 MGB's from residential properties within the GGRC.

Details of the composition of the waste for an average MGB in the City of Geraldton-Greenough region is illustrated in **Table 3.6**. Data has been extrapolated against the number of households in the City of Geraldton-Greenough and for the BROC so a total figure can be estimated (ABS 2006 census data).

Results from waste audits can vary considerably depending on the subject area chosen and the time of year. As the audit was undertaken in winter (May), weights (including recyclables) can be considered conservative.

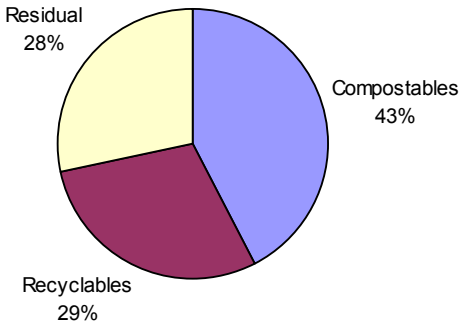
Table 3.6: Compositional analysis of kerbside MGB and extrapolated data for the whole region

Material	Total weight per household	Total weight per year GGRC (tonnes)	Total weight per year whole region (tonnes)
Newspaper	1.43	1,009	1,327
Cardboard	0.53	374	492
Other Recyclable Paper	0.22	155	204
Liquid Paper Containers	0.10	71	93
Recyclable Glass	1.40	988	1,300
PET	0.09	64	84
HDPE	0.15	106	139
Recyclable Ferrous	0.30	212	278
Recyclable Aluminium	0.13	92	121
TOTAL (Recyclables)	**4.35**	**3,069**	**4,038**
Food Waste	3.67	2,590	3,407
Garden Waste	2.25	1,588	2,089
Other Compostables	0.35	247	325
TOTAL (Compostables)	**6.27**	**4,424**	**5,820**
Non-recyclable Paper	1.01	713	938
Non-recyclable Glass	0.07	49	65
Non-recyclable Plastic	0.74	522	687
Contaminated Plastic	0.51	360	473
Other Metals	0.22	155	204
Ceramics, Dirt and Dust	1.09	769	1,012
Textiles, Wood and Rubber	0.49	346	455
Hazardous Waste	0.05	35	46
TOTAL (Other)	**4.18**	**2,949**	**3,880**
TOTAL Domestic Waste	**14.80**	**10,443**	**13,738**
Actual Waste (Phase 1)		**13,857**	**20,153**

Source: Spartel Pty Ltd (2000)
ABS 2006 Census - Households
Assumption: Surrounding LGA's have same MSW composition
Note: Waste audits results are highly dependant on season. As the audit was undertaken in winter (May) the recyclable estimates can be considered conservative.

The average amount of waste produced per week by the City of Geraldton-Greenough residents is approximately 14.8 kilograms. **Figure 3.3** illustrates the composition of a typical MGB in the City of Geraldton-Greenough. Compostables make up the greatest proportion (5,800 tonnes or 43%) of the MSW stream. This is followed by recyclables (4,000 tonnes or 29%) and residual material (3,900 tonnes or 28%). Residual material is unlikely to be able to be recovered and will require landfilling.

Figure 3.3: Estimated waste composition of a typical household MGB in the BROC (based on City of Geraldton-Greenough)



If this waste is extrapolated against the estimated number of households (ABS Census 2006) in the City, approximately 10,440 tonnes of waste is produced per year. However, when compared to actual kerbside Phase I data, there is a difference of approximately 3,400 tonnes. If the total is extrapolated for the BROC the difference is greater still (8,000 tonnes). Differences in totals can be attributed to:

- Commercial waste being incorporated into kerbside household kerbside totals,
- Public litter bin waste and waste generated by persons with temporary residence (e.g tourism);
- Inaccurate data provided by Shires without access to a weighbridge; and
- Waste audit being undertaken in winter.

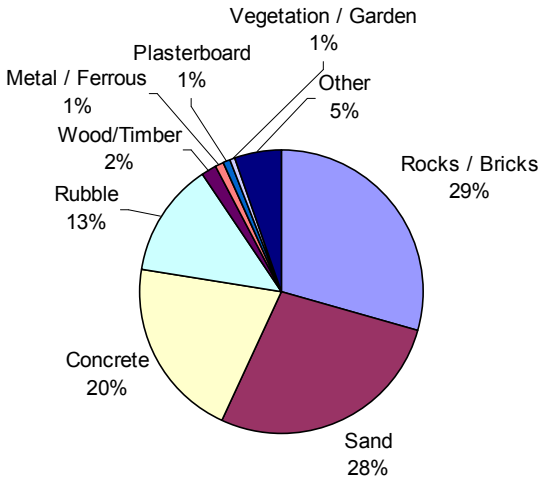
The extrapolated figures, especially in regards to recyclables, give a conservative estimate of the potential tonnages that could be recovered across the BROC.

3.4.2 C&I and C&D Waste

The composition of the commercial waste stream is largely unknown in the BROC, however an audit of C&I and C&D material sent to landfill in the Perth Metropolitan Area was undertaken by Golder Associates and Waste Audit & Consultancy Services in 2007. Detailed visual assessments of the materials disposed at each site provided a compositional analysis. A qualitative approximation of the percentage composition of C&I and C&D material being sent to landfill is outlined in **Figure 3.4** and **Figure 3.5**. The figures give a general indication of the percentage composition of C&D and C&I waste being sent to landfill in the BROC.

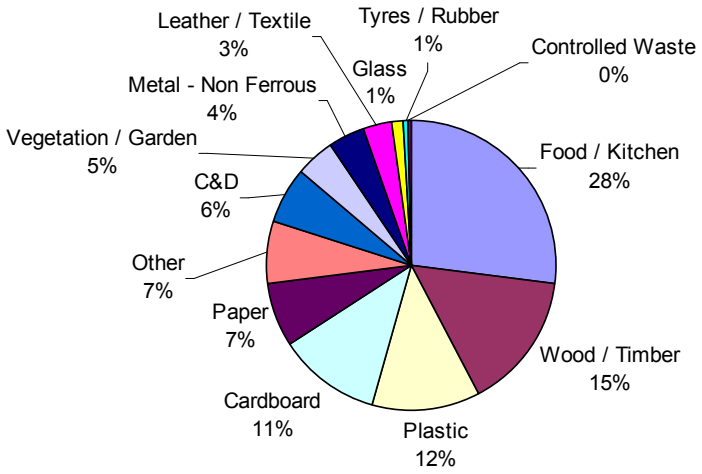
Whilst the figures above are not a quantitative assessment of C&D and C&I waste composition in the BROC, they do give an indication of waste streams that should be targeted by LGA's and the BROC in the C&I and C&D sector. It is likely that rocks / bricks, sand concrete and rubble are disposed in the greatest quantities from the C&D sector and food/kitchen, wood/timber, plastic and paper products are disposed by the C&I sector in the greatest quantities.

Figure 3.4: Percentage composition of C&D material being sent to landfill in the Perth Metropolitan Area



Source: Golder Associates and Waste Audit (2007)

Figure 3.5: Percentage composition of C&I material being sent to landfill in the Perth Metropolitan Area



Source: Golder Associates and Waste Audit (2007)

3.5 Waste Projections

Waste generation of a population, especially municipal waste, is related to population size. As outlined in **Section 3.2**, population in the region has fluctuated over the past five years, with strong growth between 2005 and 2006, especially in the City of Geraldton-Greenough. This population fluctuation therefore makes in difficult to project waste volumes into the future with any level of accuracy.

Projected waste volumes, based on Phase I data and ABS population data and calculated using a trend analysis through Microsoft Excel, suggest that waste in the BROC will vary depending on the LGA. The Shires of Irwin, Chapman Valley and Northampton will experience a static - slight increase in waste tonnages due to relatively low populations and population growth, whilst the City of Geraldton-Greenough will result in a significant increase in waste volumes due to rapid (+7%) population growth from an already significant population centre (**Table 3.1**). It is estimated the City of Geraldton-Greenough (31,300 tonnes) will generate an additional 3,000 - 5,000 tonnes of municipal waste from 2006/07 tonnages by 2013. The surrounding Shires are likely to generate an additional 500 – 1,000 tonnes of municipal waste between them by 2013 based on current population projection figures.

Significant infrastructure projects such as the Oakajee Port have the potential to generate significant amounts of waste especially C&D material during construction and C&I and MSW post construction depending on landuse planning. Construction could begin as early as 2009 with completion in 2012. Therefore, the BROC will need to accommodate a significant increase in waste volumes over the coming years. Infrastructure currently in place throughout the BROC is detailed in **Section 3.6**.

3.6 Waste Management Infrastructure

A total of six landfills and two transfer stations were visited during the waste management review tour. The location of each landfill / transfer station (and flow of waste municipal material) within the BROC waste infrastructure is outlined in **Appendix B**. During the review each facility was assessed against the DEC Licence conditions or where a facility was not Licensed the facility was assessed against the Environmental Protection (Rural Landfill) Regulations 2002. The results of each site review are in **Appendix D**.

The large size and isolation of some town centres has resulted in at least one putrescible landfill or transfer station being located in each LGA. The size, management and life expectancy of each of the waste infrastructure varies across the BROC, mainly as a result of population size.

An investigation into waste management in the Abrolhos Islands (off the coast of Geraldton) has not been undertaken for this plan, however anecdotal evidence suggests that incinerators are used on the islands to manage waste. Materials that are unable to be incinerated are transported back to the mainland where they are disposed into the Meru Waste Disposal Facility.

Whilst details regarding the disposal of waste from the construction of the Oakajee Port are unavailable a landfill may need to be constructed on site in Oakajee to accommodate the waste volumes, especially for inert material. This is further discussed in **Section 4**.

A summary of current waste infrastructure in the BROC is outlined in **Section 3.6.1**.

3.6.1 City of Geraldton-Greenough

Meru Waste Disposal Facility

Population Serviced:	~38,000
Tonnage per annum:	50,000 (approx)
Weighbridge	Yes
Compaction	Yes (30 tonne compactor)
Infrastructure:	1 x Loader, 1 x Site office, 1 x 30 tonne compactor, Water Truck, 1 x transfer station, 1 x truck wash, 1 x resource recovery park, storage sheds, hazardous waste storage shed, 2x large oil storage tanks, Cardboard conveyor / baler, 2x septage ponds

Comments:

- The site can be considered a tidy, well-run landfill;
- Operated by contractor;
- The most significant regional landfill in the BROC;
- Large volume of material enters the landfill from across the region;
- Greenwaste is chipped, mulched or composted by a private contractor on site;
- Construction and Demolition waste separated from waste stream and stockpiled;
- Small scale cardboard recycling facility (run by Cogman Recycling) with conveyor belt and baler is present on site supplied by AMCOR;
- Two large septage ponds;
- Very long life expectancy (100 years);
- High staff turnover;
- Large scrap metal stockpiles ;
- Clinical and asbestos cell;
- Some seasonal odour problems (crayfish offal); and
- Potentially non-compliant with some licence conditions (see **Appendix D** for details)

Photo 3.1 – C&D Waste Stockpile at Meru

Photo 3.2 – Compactor on tipping face at Meru

3.6.2 Shire of Irwin

Dongara Transfer Station

Population Serviced:	~3,000
Tonnage per annum:	1,500 tonnes (approx)
Weighbridge	No
Compaction	No
Infrastructure:	1 x excavator (property of Sims Metal) 1 x Site office, 1 x Used Oil facility, Transfer Station

Comments:

- Landfill ceased operations in 2001 and became transfer station;
- Segregation of some material types (scrap metals, cardboard, aluminium cans, inert material, greenwaste, batteries, hard waste / resource recovery park);
- Greenwaste beginning to be mulched instead of burnt;
- Separate asbestos cell with exposed crushed asbestos from traffic movements (needs attention);
- Large scrap metal stockpiles;
- Problems with used oil collections (currently at capacity);
- Wind shield at transfer station area to reduce wind blown waste;
- Resource Recovery Park facility;
- No historic site plan layout; and
- Potentially non-compliant with some licence conditions (see **Appendix D** for details)

Photo 3.3 – Transfer Station at Dongara

Photo 3.4 – Aluminium Cans ready for collection at Dongara Transfer Station

3.6.3 Shire of Northampton

Northampton Transfer Station

Population Serviced:	~1,000
Tonnage per annum:	2,000 tonnes (approx)
Weighbridge	No
Compaction	No
Infrastructure:	1 x Transfer Station, 1 x Used Oil Facility, DrumMuster Drop Off, lined septage pond

Comments:

- Landfill ceased operation in April 2008 and become a transfer station;
- Segregation of some material types (scrap metals, cardboard, aluminium cans, inert material, greenwaste);
- Greenwaste beginning to be mulched instead of burnt;
- Large scrap metal stockpiles, periodically collected by scrap metal contractor;
- Inert cell;
- Site currently being rehabilitated and capped;
- Restricted opening hours;
- Application for DEC licence to stockpile in excess of 100 tyres has been made;
- No historic site plan layout; and
- Potentially non-compliant with some licence conditions (see **Appendix D** for details)

Port Gregory Landfill

Population Serviced:	< 100 (+ tourism)
Tonnage per annum:	< 100 tonnes
Weighbridge	No
Compaction	No
Infrastructure:	1x Used Oils

Comments:

- Small unrestricted, unmanned drop off landfill that services Port Gregory and surrounding farms;
- No control over acceptance of waste, however signage on waste acceptance;
- Waste exposed for long periods;
- No separation of materials;
- Greenwaste stockpile burnt periodically;
- Whilst asbestos is not accepted on site, it cannot be policed due to facility being unmanned;
- No metal stockpiles;
- No historic site plan layout; and
- Potentially non-compliant with some rural landfill regulations (see **Appendix D** for details)

Photo 3.5 – Drop-off waste at Port Gregory Landfill ready for "push and cover"

Photo 3.6 – Signage at unmanned Port Gregory landfill

Binnu Transfer Landfill

Population Serviced:	< 100
Tonnage per annum:	< 100 tonnes
Weighbridge	No
Compaction	No
Infrastructure:	1 x Used Oil Facility

Comments:

- Small unrestricted, unmanned drop off landfill that services Binnu and surrounding farms;
- No control over receival of waste, however signage on waste acceptance;
- Waste exposed for long periods;
- Scavenger on site during site visit;
- Stockpiles of car bodies;
- Large amount of wind blown waste;
- Rehabilitation of old cells successful;
- Greenwaste stockpile burnt periodically;
- Located in high topographic area away from low lying wetland areas;
- No historic site layout; and
- Potentially non-compliant with some rural landfill regulations (see **Appendix D** for details)

Kalbarri Landfill

Population Serviced:	~1,600 (>100,000 visitors per year)
Tonnage per annum:	3,000 tonnes (approx)
Weighbridge	No
Compaction	Yes (excavator)
Infrastructure:	Transfer Station, 1x office

Comments:

- Large, manned landfill that services Kalbarri and surrounding farms;
- Located upon a Priority 3 groundwater area and surrounded by P1 groundwater area;
- Some waste exposed due to insufficient amount of cover material;

- Control over receival of waste with good signage;
- Segregation of some material types (scrap metals, cardboard, aluminium cans, inert material, greenwaste, hard waste / resource recovery park);
- Stockpiles of car bodies collected by scrap metal contractor;
- Greenwaste now being separated and mulched;
- Large amount of wind blown waste;
- Separate asbestos cell, with asbestos wrapped in plastic not covered;
- Rehabilitation of old cells successful;
- Lined septage pond;
- Separate inert cell;
- Stockpiling of quality inert material;
- Application for DEC licence to stockpile in excess of 100 tyres has been made;
- No historic site layout; and
- Potentially non-compliant with some licence conditions (see **Appendix D** for details)

3.6.4 Shire of Chapman Valley

Nabawa Landfill

Population Serviced:	~800
Tonnage per annum:	< 500
Weighbridge	No
Compaction	No
Infrastructure:	1x Used Oil Depot, 1x office, 1x Resource Recovery Centre (with roof), DrumMuster Depot

Comments:

- Small, manned landfill that services Nabawa and surrounding farms;
- Higher level of organisation than Yuna landfill;
- Used oil depot overflowing with used oil;
- High tipping face;
- Segregation of some material types (scrap metals, cardboard, aluminium cans, hard waste / resource recovery park);
- Large stockpile of cardboard bales and plastic film;
- Site layout map completed; and
- Potentially non-compliant with some rural landfill regulations (see **Appendix D** for details)

Yuna Landfill

Population Serviced:	< 100
Tonnage per annum:	< 100 tonnes
Weighbridge	No
Compaction	No
Infrastructure:	1x Used Oil Depot

Comments:

- Small, unmanned landfill that services Yuna and surrounding farms;
- No control over receival of waste. Poor signage;
- Waste exposed for long periods before cover;
- Some attempted separation of scrap metals / greenwaste;
- Abandoned car bodies scattered throughout site;
- Landfill well sheltered;
- No historic site layout;
- Unregistered site with the Department of Planning and Infrastructure;
- Leakage of oil barrels in oil depot, however well contained in concrete enclosure; and
- Potentially non-compliant with some rural landfill regulations (see **Appendix D** for details)

Photo 3.7 – Abandoned cars within Yuna Landfill site

Photo 3.8 – Waste disposal awaiting cover at Yuna Landfill

3.6.5 Waste Infrastructure Summary

As expected, the manned landfills (Dongara, Meru, Nabawa, Kalbarri) in the region exhibited a higher degree of organisation and separation of recyclable materials when compared to unmanned sites. These manned landfills can also regulate the type of material that can be received and disposed. Unmanned landfills (Binnu, Port Gregory and Yuna) generally exhibited little to no separation of recoverable materials, were unregulated in terms of material received, only had periodic covering of material and therefore were generally untidy in terms of wind blown waste, however the bulk of waste was disposed in designated areas.

An exception was the unmanned Northampton Transfer Station. The facility has limited attendance by LGA staff, yet has a high degree of organisation and material separation. This may be a result of good signage and a good layout with designated areas for certain material types (e.g scrap metal, greenwaste, inert material, general waste, household recyclables). The switch to a transfer station in April 2008 instead of a landfill has also helped to reduce windblown litter, however since the installation of the transfer station it has been noted that bulk materials (e.g couches) have been forced into the bins, restricting the disposal of other materials. The Shire of Northampton has since manned the facility on a periodic basis since June 2008.

There are signs of the recovery of waste at most waste facilities in the region with the exception of the unmanned and isolated Binnu, Port Gregory and Yuna landfills. The types of material recovered at each facility varies, however across the region materials that are generally recovered include aluminium cans, cardboard, scrap metal, greenwaste and in some cases inert (construction and demolition) material. Resource Recovery Parks have also been installed at the Meru, Kalbarri, and Nabawa landfills and the Dongara transfer station. These parks allow the general public to buy disused household “junk” including furniture, clothes, toys, plants, electronic equipment and mattresses, etc. Along with C&D waste, the parks also prevent bulky items being disposed in landfill which can be problematic in terms of compaction.

Due to the high commodity value of scrap metal at present, it is targeted by LGA’s and is therefore recovered in high quantities. Whilst commodity prices are high for scrap, the isolation of the LGA’s from Perth’s scrap reprocessors and associated high transport costs make regular collections problematic. Large stockpiles of scrap metal are normally required to meet the economies of scale required for Perth based scrap dealers to pick up the material. Sims Metal (the scrap metal contractor for the region) visits 2 - 3 times a year.

Despite waste infrastructure in the region having adequate signage indicating materials that are unacceptable for disposal (asbestos, chemical drums ect), the disposal of hazardous

materials including asbestos is still of a concern at some landfills / transfer stations, especially at unmanned facilities. The management practice of asbestos disposal at some manned and unmanned facilities is questionable with some asbestos not having an effective covering regime when the material is disposed. Illegal dumping of material is also a problem in the region

Used oil infrastructure has been installed at most landfills / transfer stations with the exception of Kalbarri Landfill (where the used oil facility is located at the works depot). The infrastructure provided free of charge by the federal government has been very successful in diverting used oil from landfill and preventing large stockpiles accumulating. Wren Oil and Nationwide Oil are the major oil collectors in the Western Australian marketplace at present and service the region in the collection of its oil. Whilst this service was provided for free in the past, recently due to a lack of local markets a fee (15 - 20c/L) is being charged to Local Government for pickup to subsidise the cost of stockpiling used oil in large tanks in Kwinana and exported internationally. Due to the high costs being imposed on LGA's for collection, some waste oil infrastructure has been temporarily closed. As of mid April 2008 used oil storage at Nabawa landfill and Dongara transfer station are currently at capacity. LGA's have outlined the disposal of used oil as a very high concern both financially and environmentally.

Life expectancies of waste infrastructure are based on the capacity of the current cells and the availability on site to create further landfill cells for waste disposal. The Meru Waste Disposal Facility (City of Geraldton-Greenough) and Kalbarri Landfill (Shire of Northampton) are the only landfills that have life expectancies in the medium to long term (+25 years), whereas the Nabawa and Yuna (Shire of Chapman Valley) landfills (<5 years) and Port Gregory and Binnu (Shire of Northampton) landfills (<15 years) can be considered to have short life expectancies. Strategies in regards to this issue are outlined in **Section 4**.

Historical site layouts for all facilities, with the exception of Meru and Nabawa landfills can be considered poor. The location of past landfill cells is not well understood by each LGA. This results in generalisations of where future landfill cells can be constructed and what the potential lifespan of the facilities' are. Knowledge of the waste facility is also lost when a landfill site manger or EHO is replaced. Due to staff shortages, environmental or planning officers are now required to fill multiple roles with the LGA or across a number of LGA's. A site investigation is planned for a decommissioned landfill at Flores Road in Geraldton. Any waste that needs to be removed from the site will be transported to the Meru Waste Disposal Facility for disposal.

All waste infrastructure in the region was non-compliant with at least one clause in its landfill Licence or Rural Landfill Regulation issued under the *Environmental Protection Act 1986*. Non-compliance is predominantly a result of onerous requirements in the landfill operators Licence or Regulation, especially in isolated areas where it is considered impracticable to meet some of the clauses.

Outlined in **Appendix D** are a number measures suggested by Cardno that could be implemented so landfill operators can meet compliance. Further information summarising waste infrastructure in the region is outlined in **Table 3.7** on the following page.

Table 3.7: Waste Management Facilities in the BROC (July 2008)

Owner / Operator	Name	Town / LGA Supported	Category	Landfilling Technique	Estimated Life	Staffed	Lined	Material Recovery
City Geraldton-Greenough	Meru Waste Disposal Facility	Shires of Geraldton-Greenough, Irwin, Mullewa, Mingenew and Northampton town site	Category 64 – Class III Putrescible	Excavation and Fill above ground in "lifts". Once "lift" have reached a specified height lifts commence in a newly constructed cell.	Current cells 30 years. Whole site 100 years	✓	✓	Construction and Demolition Greenwaste Aluminium Cans Cardboard Scrap Metal Resource Recovery Park Hazardous Car Batteries Used Oil
Shire of Irwin	Dongara Transfer Station	Shire of Irwin	Category 62 – Solid Waste Depot	• Transfer Station – Temporary storage / consolidation of waste prior to disposal at Meru. • Asbestos / Inert material landfilled on site.	No restriction	✓	✓ (Septage Lagoon only)	Greenwaste Aluminium Cans Cardboard and Newspaper Scrap Metal Resource Recovery Park Car Batteries Used Oil
Shire of Northampton	Northam - pton Transfer Station	Northampton town site and surrounds	Category 62 – Solid Waste Depot	• Transfer Station – Temporary storage / consolidation of waste prior to disposal at Meru. • Inert material landfilled on site.	No restriction	✓ (June 2008)	✓ (Septage Lagoon only)	Greenwaste Aluminium Cans Cardboard Scrap Metal Used Oil
	Port Gregory Landfill	Port Gregory and surrounds	Category 64 – Class II Putrescible	Excavated pit and fill	15 years	✗	✗	Used Oil
	Binnu Landfill	Binnu and surrounds	Category 64 – Class II Putrescible	Excavated pit and fill	15 years	✗	✗	Used Oil
	Kalbarri Landfill	Kalbarri and surrounds	Category 64 – Class II Putrescible	Excavated pit and fill	25 years	✓	✓ (Septage Lagoon only)	Construction and Demolition Greenwaste Aluminium Cans Cardboard Scrap Metal Resource Recovery Park Used Oil
Shire of Chapman Valley	Yuna Landfill	Yuna and surrounds	Not registered	Excavated pit and fill	5 years	✗	✗	Used Oil
	Nabawa Landfill	Nabawa and surrounds	Category 64 – Class II Putrescible	Excavated pit and fill	5 years	✓	✗	Cardboard Plastic Film Scrap Metal Used Oil Resource Recovery Park

3.6.6 Gate Fees

Gate fees charged throughout the BROC are outlined in **Table 3.8** below. Cost differentials between LGA's for waste disposal can be attributed to differing operational costs and circumstances in each LGA. In general costs to dispose of material are similar between LGA's, with the exception of the City of Geraldton-Greenough and Shire of Chapman Valley which offer free drop off disposal to residents. Greenwaste and recyclable drop off is free of charge in all LGA's. A fee is now being charged in the City Geraldton-Greenough and Shire Chapman Valley for used oil.

Table 3.8: Gate Fees charged to dispose of waste at manned landfills in the BROC (2006/07)

Waste Type		City Geraldton-Greenough	Shire Chapman Valley	Shire Irwin	Shire Northampton
Household Waste	Trailer	Free for residents	Free ($25 / m3 non residents)	$12 – 36 / trailer	$15 - $25 / trailer
Commercial Waste	Non-recyclable	$36 / tonne	$25 / m3	$42 / m3	$49.50 - $66 / trailer
	Clean Rubble	$24 / tonne	$25 / m3	$9.90 / m3	Free
	Mixed Rubble	$ 9 / tonne	$25 / m3	$38.50 / m3	N/A
	Clean Sand	$ 4 / tonne	Free - $25 / m3	Free	Free
Greenwaste	Sorted / Recyclable	Free	Free	Free	Free
	Other	$36 / tonne	$20 / m3	$5.50 – 38 / m3	$49.50 / trailer
Recyclables		Free	Free	Free	Free
Cardboard		$36 / tonne*	$5 / m3	$13.20 / m3	$25 / m3
Asbestos		$53.82 / tonne	Not accepted	$60 / trailer	$55 / trailer
Car Tyres		$3.00 (each)	$10 (each)	$3.30 (each)	$2.20 (each)
Used Oil		18c / L	$25 / 20L	Free	Free

Note: - Comparisons are difficult between City of Geraldton-Greenough and Shires due to costs being charged differently (i.e tonnes and m^3). Geraldton calculates cost by the tonne due to weighbridge.
- Gate fees are fixed at the Northampton Transfer Station and Kalbarri Landfill
- Gate fees are subject to change
- City Geraldton-Greenough cardboard rate is a result of limited capacity at Cogman Recycling. New baler will commence operation mid 2008.

LGA's should attempt to maintain consistency in regards to pricing regimes across the BROC to minimise risk of waste being transported to cheaper landfill / transfer stations. During the community seminar series there was a desire for the gate fee cost structure (cost incentives) at landfills / transfer stations to promote source separation for recycling.

3.7 Waste Collection Services in Region

A number of waste services are provided in the BROC. These services are outlined in the matrix compiled by the DEC from Phase I data (**Appendix E**). As a result of the site visits in the region, a number of modifications have been made to the matrix that more accurately represent waste services currently provided in the region (as of April 2008).

3.7.1 Kerbside Waste and Recycling Collections

All municipal waste collection services in the BROC are provided by Veolia Environmental on a weekly basis. Residents in urban areas or farms on the collection route to the Meru Waste Disposal Facility have been provided with a 240L mobile garbage bin (MGB). Isolated farms outside the collection route dispose of their waste at the closest landfill or transfer stations, however anecdotal evidence suggests some waste is disposed on site at some farms. The Shire of Northampton is currently planning an expansion of the kerbside service. Tip passes are issued in the Shire of Chapman Valley.

The cost of this service is covered under annual rates for each property.

At present there is no kerbside MGB recycling service provided in the BROC.

3.7.2 Vergeside Collections

Vergeside collections provided in the Shire of Northampton (bulkwaste only in Kalbarri and Northampton annually), City of Geraldton-Greenough (bulkwaste and greenwaste annually) and Chapman Valley (mixed bulkwaste / greenwaste biannually) in urban areas. These services are provided by a waste contractor from each LGA. The majority of bulk waste is landfilled; however some scrap metals / greenwaste and quality items are recovered. Quality items (e.g furniture, electronic equipment) are placed in Resource Recovery Parks located at the Meru and Nabawa landfills. Espinos Sand Supplies process the greenwaste at the Meru Waste Disposal Facility.

The cost of this service is covered via annual rates for each property.

3.7.3 Drop-off Collections

A number of drop off stations are available in each LGA to dispose of household waste and recyclables. Recyclable materials accepted include aluminium cans, cardboard, newspaper, scrap metals and greenwaste. Recyclable drop-off stations are provided at all landfills or transfer stations in the region with the exception of small unmanned landfills (Port Gregory, Binnu and Yuna). Aluminium cans and newspaper can also be dropped off by residents at selected schools, aquatic parks (Aqua Arena - Geraldton), newsagents and charity organisations.

Recyclable collections are provided by a number of organisations in the region depending on the material type. **Table 3.8** outlines the material type, its collector and market.

Table 3.8: Collection companies by material type and destination of recovered material

Material Type	Collection	Market
Aluminium Cans	Veolia Environmental	Sims Metal, Smorgon Steel
Cardboard / paper	Veolia Environmental	Cogman Recycling → AMCOR
Scrap Metals	Sims Metal	Sims Metal
Greenwaste	Espinos Sand Supplies, Braddon Mulching / Teraform Contracting	Local developers. Local Government
Used Oil	Wren Oil, Nationwide Oil	Wren Oil, Nationwide Oil

Used motor oil can be disposed at all waste infrastructure in the region (with the exception of the Kalbarri Landfill (drop off at works depot instead)). The sole facility the disposal of Household Hazardous Waste (HHW) is the Meru Waste Disposal Facility.

Markets for other potential recyclables are outlined further in **Section 4**.

3.7.4 C&I Waste Collections

As outlined in **Section 3.3** C&I operations are provided with waste collection services. For MSW waste this is either conducted in unison with municipal collections if the company utilises an MGB or separately if the commercial business utilises a large bulk bin. Large bulk bins require a different type of truck, usually a front loading operation instead of a side operated truck (used for domestic kerbside collections).

Other waste collection services such as septage waste is provided by a number of operators with specific licences to transport the material. This material is disposed at the Meru Waste Disposal Facility, Dongara transfer station, Northampton transfer station and Kalbarri landfill depending on the type of material.

C&I operations in each LGA can also be provided with a commercial recycling service. This service is usually provided by Veolia Environmental for the pick up of cardboard, however bags of plastic film may also be recovered. The cost of these services is negotiated between the waste collection contractor and the C&I operation.

3.7.5 C&D Waste Collections

C&D waste collections are provided by private logistics contractors in the region. All C&D waste is sent to major landfills in each LGA (Dongara and Northampton transfer stations and Meru, Kalbarri and Nabawa landfills). Clean C&D waste (sand, bricks, concrete) is stockpiled on site whilst mixed inert materials (plastics, rubber, cardboard, timber) are either disposed in the putrescible cell or in a separate cell (Kalbarri, Meru and Dongara Transfer Station). Source separated C&D material is accepted at a discounted rate (or free if can be utilised on site) at all waste infrastructure in the region (**Section 3.6.7**).

3.7.6 E-Waste Collections

At present the only E-waste collections currently being undertaken are by 'MobileMuster' at a number of locations throughout the BROC. MobileMuster is the official recycling program of the mobile phone industry. The Extended Producer Responsibility (EPR) program is supported by a number of leading manufacturers and network providers that aims to promote the recycling of disused mobile phones.

MobileMuster mobile phone collections points available in the region at present are outlined in **Table 3.9**. At present there is no drop off location in the Shire of Northampton.

Table 3.9: MobileMuster mobile phone drop off locations

Local Government Authority	Location
City of Geraldton Greenough	Department of Environment and Conservation Dick Smith Electronics ML Communications Telstra Shop Local Government Office (City Centre)
Shire of Irwin	Arrowsmith Midwest
Shire of Chapman Valley	Local Government Office
Shire of Northampton	No Service

The City of Geraldton-Greenough and Shire of Chapman Valley are the only LGA's that have signed up to 'MobileMuster' at present.

3.7.7 Plastics / DrumMuster

Other than DrumMuster (and some plastic film in the Shire of Chapman Valley) there is no plastics recycling currently taking place in within the region. DrumMuster is a national program that collects and recycles clean non-returnable crop production and on farm animal health chemical containers. It is a program similar to MobileMuster that acts as an industry run EPR scheme.

All LGA's in the BROC, besides the Shire of Irwin, currently participate in the DrumMuster program. Disused clean chemical drums are dropped off by farmers at landfills and transfer stations stored separately, prior to being and picked up on a periodic basis by CLAW Environmental (CLAW) (based in Welshpool in the Perth Metropolitan Area). CLAW transport a mobile shredding device into the region and shred the material into bags before

transporting back to the Welshpool operations where the material is then sent to markets for reprocessing.

The Shire of Geraldton-Greenough also participate in a similar program called Chemclear. The program aims to safely manage unwanted rural agricultural and veterinary chemicals.

3.7.8 Composting

The City of Geraldton-Greenough currently offers residents a compost bin or worm farm at a discounted rate. The purpose of the compost bin / worm farm is to reduce the amount of organics disposed into kerbside MGB's, retain the organics at source and reduce the need for residents to use artificial fertilisers.

4. ISSUES AND RECOMMENDATIONS

Phase I data was analysed by the DEC and recommendations provided for each and the BROC as a whole in regards to data gaps, minimising direct and indirect environmental impacts and monitoring and reporting. Additional recommendations, in consultation with LGA's, have also been included.

A number of recommendations are repeated in the following sections as they help resolve to multiple issues.

4.1 Data Gaps

A number of data gaps currently exist in the region in regards to waste type being generated by material category. This is a result of the current infrastructure in place and a lack of monitoring of waste. The Meru Waste Disposal Facility in the City of Geraldton-Greenough is the only landfill that accurately records both the tonnages and type of waste entering the facility. This is achieved by a weighbridge installed at the gate and a permanent attendant recording the types of waste entering the facility. Other manned facilities in the BROC can also record the type of waste being disposed, however the amount of material being disposed is uncertain.

As such, the City of Geraldton-Greenough and Shires of Irwin, Mullewa and Mingenew and the town site and surrounds of Northampton (as of April 2008) are the only LGA's that can have their kerbside waste and drop off tonnages accurately recorded. A data gap can also exist with some commercial tonnages being incorporated into the municipal tonnages.

Whilst the Meru Waste Disposal Facility has electronic software to record material and tonnages entering the facility, it is currently not landfill specific software.

4.1.1 Recommendations

- *Conversion of small landfills in the region to transfer stations*

The collection of data will continue to be problematic in the region without either manned or weighbridged facilities in place. Installing weighbridges and manning all facilities is obviously impracticable and uneconomic, however there are a number of measures that can be implemented to modify the flow and reduce the need to record and monitor waste at the eight waste facilities in the BROC. This involves modifying the current flow of waste in the region from localised landfill to the construction of transfer stations at smaller landfill sites and transport to major landfill waste nodes. The current flow of waste in the BROC is provided in **Section 3**. The proposed modified flow of waste developed in conjunction with the LGA's is provided in **Appendix C**.

Essentially, it is envisaged that all waste in the region will be landfilled in two locations rather than the five locations at present. It is recommended that the Meru Waste Disposal Facility in the City of Geraldton-Greenough and the Kalbarri landfill in the Shire of Northampton become the strategic putrescible landfills in the BROC[1]. All other facilities will continue to operate, however as transfer stations rather than landfills.

There was support during the community seminars that the Meru Waste Disposal Facility should be a hub for waste for throughout the BROC and wider Mid-West Region.

[1] *It is noted that the Oakajee Port Development will have a large impact on waste generation, especially in the short term during construction, and may impact on this recommendation. This point is discussed further on page 27.*

The justification for the selection of these landfills is the:

- long life expectancies / capacity;
- well developed infrastructure currently in place;
- close proximity to high waste generation sources (Kalbarri and Geraldton);
- central location in relation to the smaller landfills / transfer stations (reducing transport costs); and
- resource availability to maintain site in accordance with DEC Licence Conditions

Given that the Kalbarri landfill has been selected to be a strategic landfill in the region, it is important that DEC compliance issues currently present at the landfill be rectified in the short term.

The installation of a transfer station at the Yuna and Nabawa landfills in the Shire of Chapman Valley and transportation to the Meru Waste Disposal Facility and the installation of a transfer station at the Binnu and Port Gregory landfills in the Shire of Northampton and transportation to the Kalbarri landfill will allow greater control of waste disposal in the region. Modification of waste flows will allow for increased accuracy, reducing the amount of data inaccuracies / gaps currently present in the region. These transfer stations can also act as recycling hubs for the region including scrap metals, greenwaste, C&D waste, used oil and household recyclables.

Transfer stations would be based on established transfer stations in the BROC including the Northampton transfer station and the Dongara transfer station. Instead of the material being landfilled or temporarily disposed in stockpiles on site, elevated hardstands have been constructed where residents can dispose of their trailer material into large bulk bins. The hardstands have built in safety features including minimal elevation, timber, concrete or tyre stops and a chains running across the hardstand edge. (**Photo 4.1** and **4.2**). The bins can be lifted onto a single truck on a scheduled or a periodic basis and transported to a landfill facility.

Photo 4.1: Trailer drop off area at the Northampton Transfer Station

Photo 4.2: Public drop off area at the Kalbarri Landfill (within the Shire of Northampton)

Bulk bin pick up trucks may also be able to “replace and remove” at a number of transfer stations if they were on the same transport route (e.g Yuna and Nabawa in Chapman Valley). Bulk bins installed at each proposed transfer station may be able to be removed

and replaced in one run. As drop off tonnages are inconclusive, this would require further investigation.

Due to the small size of the Binnu, Port Gregory, Nabawa and Yuna landfills, a one or two bin transfer station should be sufficient. An audit of total volume of material should be undertaken over a number of weeks (or months if necessary) to determine the amount of waste being disposed prior to construction of the facilities. Subsequently the frequency of collection should be assessed also.

Costs for the installation of a transfer station will vary depending on traffic volumes and waste generation. The construction of the Northampton hardstand and bin disposal setup was approximately $40,000 (pers comm. Bayliss April 2008). Raw materials were sourced onsite and day labour and contractors (concrete only) utilised to construct the transfer station. Using contractors and virgin material from offsite may increase costs.

Transfer stations are recommended over shutting down of landfills as transport distances would become very high for some residents and will lead to uncontrolled illegal dumping of material.

- *Investigate management and destination of waste from the Oakajee Port Project.*

As outlined in **Section 3.5** the Oakajee Port has the potential to generate significant amount of waste, especially inert waste, during construction and potentially MSW and C&I post construction (depending on activities on site). As limited information is available in regards to construction schedule and the management and destination of waste (including recycling), investigations should commence in the short term between the BROC and the recently preferred contractor (Oakajee Port and Rail) and Landcorp.

Anecdotal evidence suggests that an additional landfill (inert or putrescible) may be required in proximity to the site. Therefore, this may have implications on the proposed strategic landfills in the BROC (outlined prior).

- *Investigate Bulk Material Drop-Off Days at Transfer Stations and Landfills*

Whilst the conversion of small landfills into transfer stations has a number of benefits (as outlined above), a downfall is the reliance on the public to “do the right thing” when disposing of material properly, especially if they are unfamiliar with the type of materials accepted. The Northampton transfer station has recently had problems with the public disposing of large bulky items into the bins, restricting the amount of space for other general wastes and increasing costs for disposal. The facility has subsequently now been manned.

To reduce the amount of large bulky waste entering drop off areas, it is recommended LGA’s continue to coordinate bulk verge collection days. In areas where bulk verge collections are uneconomical the BROC should coordinate a bulk-drop off day for residents at the local landfills and transfer stations. Each landfill / transfer station would be manned for the day (where practical) to enable management of waste material and allow for education of residents dropping off their material that disposing bulk items into the bins is not acceptable. The coordinated response will also allow for waste contractors to service the region over a number of days removing bulk items and transportation to either Kalbarri landfill or Meru Waste Disposal Facility for disposal (or for possible reuse in the Resource Recovery Parks). Bulk metal items may be able to be stockpiled at source for future pick up by a metal recycler.

- *Continue segregation and stockpiling of C&D waste at each waste facility*

C&D waste material should continue to be stockpiled at each transfer station or landfill as it can be considered an inert material that is unlikely to affect the surrounding environment.

An estimate of the size of the stockpile can easily be conducted periodically allowing for potential recycling in the future.

- *Detailed survey of sites to be completed identifying past land uses*

A detailed survey of past activity and land uses could only be provided by the Meru and Nabawa landfills. Historical records, site maps or surveys of Yuna, Dongara, Kalbarri, Binnu and Port Gregory have not been developed over time as new cells were created. The only indication of past cells is the vegetation structures present on site. An absence of records can cause problems when new cells are required or areas are desired to be reclaimed for future landuses. It is recommended historical aerial photographs from Landgate and records from local libraries are sought to construct a historical picture of activities of each site, thereby allowing for future site works to be planned.

As outlined in **Section 3.6.5** a site investigation is planned for a decommissioned landfill at Flores Road in Geraldton.

- *Detailed electronic register of incoming waste materials using landfill specific software*

A detailed electronic register using landfill specific software should be installed at the Kalbarri landfill and Meru Waste Disposal Facility. This will enable waste data to be easily accessed and assessed on an annual basis. High integrity data in the region will have a range of benefits for waste management. It will allow for proper future planning of waste infrastructure in the region and therefore will deliver less risk towards any major recycling efforts in the future.

4.2 Minimising Direct and Indirect Environmental Impacts

Waste generation can be considered to have a number of direct and indirect environmental impacts.

Direct environmental impacts include:

- Surface water contamination;
- Groundwater contamination;
- Odour;
- Dust;
- Noise;
- Litter;
- Impacts on Flora and Fauna;
- Net greenhouse gas emissions from the production of methane instead of CO_2; and
- The introduction of weed species

Indirect environmental impacts include:

- Resource depletion in the immediate area (basic raw materials and organics) and outside the BROC (iron ore (metals), petroleum (plastics), mineral sands (glass) ect);
- Associated environmental impacts from raw extraction industries (similar to landfill environmental impacts);
- Modification of fauna behaviour in the area towards feeding on rubbish or vermin;
- The generation of artificial fertilisers to substitute loss of organics / nutrients from land; and
- Net increase in greenhouse gas emissions via generation of additional resources and transportation to market.

4.2.1 Recommendations

- *Continue the separation and stockpiling of Construction and Demolition (C&D) wastes at each landfill and transfer station.*

Whilst not being reported by all LGA's in the Phase I data (due to data limitations) it can be assumed that a high proportion of waste being generated in the region is C&D waste, especially within the City of Geraldton-Greenough where there is strong residential growth. Waste audits of the total amount of waste material being generated usually result in a high proportion (30-50%) of the waste stream being C&D waste. Therefore, recycling C&D waste in the region would reduce waste to landfill significantly.

C&D material typically composes of sand, bricks, rubble, rock, concrete, metals and timber. These materials have the ability to be screened and crushed into aggregates as a raw material substitute. Potential markets for C&D waste are outlined in **Table 4.1**.

Table 4.1: Potential markets for C&D waste

Material	Markets
Concrete Aggregate (RCA)	Bulk Fill, Sub-base, Roadbase, Hardstands, Drainage Aggregate
Crushed Tiles	Bulk Fill, Landscaping, Remanufacturing
Sand	Bulk Fill, Landscaping, Cover in Landfills
Bricks (Whole)	Construction, Remanufacturing into new brick, Landscaping
Brick and Rubble	Bulk Fill, Cover in Landfills, Remanufacturing into new brick, Sub-base
Timber	Particle Board, Mulch, Animal Bedding, Firewood
Glass	Roadbase, Concrete Blocks

Processing costs to sort, screen and crush C&D material can be high depending on the contamination of the material being processed, the efficiency of the plant and the economies of scale of the recycling operation. The purchase of a crusher is currently uneconomic for the region due to the relatively low quantities being produced; however, there may be the possibility that a mobile crusher could be hired from Perth and service areas with large accumulated stockpiles of material. The crusher may also be able to service the Mid-West Regional Council to the east of the BROC (Shires of Carnamah, Coorow, Mingenew, Morawa, Mullewa, Perenjori and Three Springs).

The current practice of segregation and stockpiling of C&D waste at landfills and transfer stations in the BROC should continue with the expectation that there is the potential opportunity to recycle the material in the future.

The BROC should also enter talks with construction and demolition contractors in the region to minimise the amount of mixed C&D waste entering landfill facilities. For a quality recycled aggregate product to be created the incoming material has to be clean and absent from putrescibles (greenwaste), plastics, rubber ect. If contractors could source separate material at the source there would be benefits in terms of recycling, increasing landfill airspace and reducing waste contractor disposal costs.

The *State Gravel Supply Strategy (1998)* commissioned by Landvision identified the demand for basic raw materials in each LGA in Western Australia outside the Perth Metropolitan Area. Whilst the data from this report can be considered outdated it indicates that supply of good basic raw materials in each region in close proximity to markets is diminishing, with some reserves predicted to be depleted by 2013.

Commentary by Landvision on resources in each LGA is outlined below.

- **Shire Chapman Valley** – There are adequate resources of lateritic gravel throughout the Shire, though reserves from Geraldton to Nanson are depleted. Limestone is available along the coast. There are also scattered colluvial materials throughout. DEC reserves limit access to some resources.

- **Shire of Irwin** – The eastern portion of the Shire has adequate supplies of lateritic gravel. Limestone resources are not suitable for road construction although plentiful. Base coarse is usually hauled to the site over long distances. In the south-west, DEC reserves limit access to potential resources.

- **City Geraldton-Greenough** – There are adequate laterite resources in the eastern two-thirds beneath sandplain and on ridges. Much of the resources near Geraldton has been used. Haulage routes are now up to 20 kilometres in the western half. Limestone has been used, but its potential is controlled by nature of the terrain. DEC reserves limit access to potential supplies.

- **Shire of Northampton** – there are adequate supplies of lateritic gravel in the Shire, but they are poorly distributed in parts. Colluvial material supplies are adequate. Kalbarri National Park is a major restriction on potential resources.

It can be concluded that easy access to virgin resources for construction throughout the BROC is becoming scarcer with remaining virgin resources in the BROC being either managed by private extractive industries or the DEC. Therefore the recycling of C&D waste for construction (e.g subase / basecoarse) should be seen as a potential option in each LGA to reduce demand on virgin resources.

- *Investigate the hire of a crusher to share among LGA's in the region for C&D wastes*

At present, there is at least 100,000m^3 of material stockpiled at the Meru Waste Disposal Facility awaiting screening and crushing. A large amount of metal products are also interdispersed throughout the stockpile which will be able to be sold and recycled. Prior to recycling stockpiled C&D material, markets for recycled aggregates (**Table 4.1**) should also be sought to supplement the expense of crushing the material.

The City of Geraldton-Greenough is currently budgeting for the crushing of the stockpile in 2009. When the C&D stockpile has built up again, there may be an opportunity to crush stockpiled materials in the surrounding LGA's, e.g. Dongara and Northampton. As the quantity of C&D waste needs to be high to achieve the economies of scale it is likely material will only be able to be recycled periodically.

A quote was received by the City of Geraldton-Greenough for processing C&D material at the Meru Waste Disposal Facility for $22 / tonne.

- *Continue the segregation and processing of greenwaste with weed minimisation principles in the BROC*

Greenwaste material is produced in large quantities throughout the BROC. As outlined in **Section 4.1** the amount of greenwaste being produced is inconclusive, however it can be assumed approximately 4,000 tonnes of greenwaste material is currently being recycled per year. Segregating the greenwaste will continue to enable the private contractor to recycle the greenwaste, increase airspace of the landfill, reduce transport costs to landfill, reduces leachate generation and reduce the generation of greenhouse gas emissions.

With a high amount of development in the BROC, greenwaste mulch has been in high demand. Espinos Sand Supplies have been processing greenwaste at the Meru Waste

Disposal Facility for a number of years and providing the local market with mulch and compost material. Recently, mobile contractors have been shredding greenwaste material in the Shires of Northampton and Irwin.

- *Increase monitoring of greenwaste disposal, where possible, to minimise contaminated loads*

Whilst greenwaste processing (instead of landfilling) has many environmental benefits the BROC should be wary of the potential for weed or disease generation in application areas or at the landfill / transfer station. Whilst pasteurisation of greenwaste is a guaranteed method of killing weed seeds, the process is expensive. Espinos Sand Supplies at the Meru Waste Disposal Facility is the only facility that is currently undertaking the process (be it on a small scale). All landfills / transfer stations accepting greenwaste for stockpiling and processing should reject material high in weed content and instead dispose of the material in accordance with Licence conditions.

- *Conversion of small landfills in the region to transfer stations*

As outlined in **Section 4.1** converting a number of smaller landfills in the BROC into transfer stations will reduce the number of data gaps. In addition and perhaps more importantly, converting landfills into transfer stations will reduce direct environmental impacts in terms of potential groundwater and surface water contamination, impacts on flora and fauna, the introduction of weed species and indirect impacts in terms of a reduction in modified fauna behaviour in the region and vermin.

Many of the small landfills (Nabawa, Binnu, Yuna, Port Gregory) at present only have cover placed on the waste periodically due to their small size and high cost for weekly covering regimes. Whilst it is unlikely there would be a daily or weekly pickup of the bulk bins, the bins would be on a higher rotation than the current covering regime that attracts vermin to the area and creates litter and odour problems. Higher rotations would be possible as it is much more economical for a bulk bin pick up truck to “replace and remove” the bulk bins rather than an excavator needing to be transported over a long distance and utilised to cover waste material. The excavator often needs to create new cells on site once the current trench is exhausted.

The proposed waste flow and location of transfer stations is outlined in **Appendix C**.

- *Signage for Greenwaste and scrap metal stockpiles at each landfill / transfer station*

A large amount of material disposed into unmanned landfills in the BROC (Binnu, Port Gregory, Yuna) is bulky scrap metals (**Photo 4.3**). It is recommended signage for greenwaste and scrap metal stockpiles be introduced to each landfill in the area to reduce the amount being dumped into landfill. Once a sufficient stockpile of metal has been created, there is potential for the metal to be recycled. As it is unlikely that a sufficient greenwaste stockpile will be able to be established, periodic burning in the presence of fire authorities is recommended.

Segregation of greenwaste and scrap metal minimises a number of direct or indirect environmental impacts.

Photo 4.3: Scrap metal in small unmanned Binnu Landfill (Shire of Northampton)

- *Meet practical DEC Licence conditions at Landfills and Transfer Stations*
- *Commence talks with the DEC regarding impractical Licence conditions*

The proposed waste flow (**Appendix C**) will reduce the number of landfills in the BROC and therefore stringent DEC Licence or DEP Regulation requirements pertaining to these facilities. Transfer stations require much less regulation by the DEC as a result of the fewer environmental impacts transfer stations exhibit.

As outlined in **Section 3.5**, landfill audits were undertaken during site visits in April 2008. A number of Licence conditions / regulations were not being complied with. Landfill audit results and actions that should be taken are outlined in **Appendix D**. At present, whilst there is improvement to be made in a number of areas at each landfill, a number of DEC Licence / DEP Rural landfill regulations are too over prescriptive, impractical and serve little to provide added protection to the environment.

It is recommended each LGA familiarise themselves with their Landfill / Transfer Station DEC Licences / DEP Regulations and implement practical conditions. Any Licence / Regulation that are impractical (outlined in **Appendix D**) as they commit the landfill to an unacceptable cost burden should be negotiated with the DEC so compliance with appropriate conditions can be ensured. The DEC cannot impose impractical conditions that cannot be complied with.

Meeting all practical Licence conditions will reduce current direct and indirect environmental impacts and will reduce the potential for accidents that may cause direct environmental impacts.

- *Periodic household hazardous waste (HHW) drop-off day*

Hazardous drop off areas for household chemicals are currently only available at the Meru Waste Disposal Facility. Used Oil depots are provided at all waste infrastructure in the region. A periodic HHW drop-off day at designated landfills and transfer stations should be promoted in each LGA to remove unwanted chemicals or pesticides / fertilisers past their use by date. This encourages residents to not dispose of their HHW into their MGB or stockpile on their properties. Chemclear, the regions HHW contractor should also be present on the day to pick up wastes and provide any education if required.

LGA's are encouraged to participate in the joint DEC / Municipal Waste Advisory Council (MWAC) HHW collection program commencing in late 2008. The program, funded through

the metropolitan landfill levy, will provide Local Governments in Western Australia with funds to assist in the collection, storage and disposal of HHW. The aim of the program is to provide a safe option for the collection and disposal of HHW and will allow for the determination of the amounts of HHW being generated in Western Australia. The program envisages days where members of the community can drop off their HHW at designated drop off points. The program has funding for the next three years.

The City of Geraldton-Greenough has recently entered into an agreement with the Mid-West Regional Council to be the strategic drop off area for HHW. The Meru Waste Disposal Facility currently has a Licence and infrastructure in place to store HHW in large quantities. There is potential for Meru to be the Strategic HHW area for the Shires of Northampton, Irwin and Chapman Valley if requested.

- *Investigate Fluorescent Tubes / Compact Florescent Globe Drop Off day in conjunction with HHW drop off day*

The Federal Government has announced an importation ban on incandescent light globes in late 2008 and a ban on selling incandescent globes in 2009, forcing the introduction of more energy efficient compact fluorescent lamps (CFL). Whilst the globes have economic and environmental benefits in terms of greenhouse gas emmisions, the globes contain small concentrations of mercury. When the globes reach the end of their life, there is potential for contamination if globes are sent to landfill. Therefore it is recommended the region look to introduce fluorescent tube and CFL drop off days in conjunction with HHW drop off days.

Veolia Environmental has recently introduced the Recyclepak initiative in the Perth Metropolitan Area that allows commercial business to recycle fluorescent tubes via a box supplied by Veoila Environmental. It is recommended this initiative is investigated for the BROC to provide to commercial enterprises and also possibly to landfills / transfer stations on HHW drop off days to possibly include CFL's.

- *Continue DrumMuster program*

The DrumMuster program has proven successful throughout the region. LGA's currently participating in the program (City of Geraldton-Greenough and Shires of Northampton and Chapman Valley) should continue to participate and further promote the program to residents in their LGA to reduce the risk of chemicals being stored or dumped on properties or entering landfills.

The Shire of Irwin should consider signing up for the program to service their local farmers.

- *Investigate thermal treatment of mattresses to recover metals*

Large stockpiles of mattresses have accumulated at the Meru Waste Disposal Facility and have proved problematic. Whilst not the most ideal solution to the recovery of mattresses, burning may yield a significant amount of scrap metal that can be recycled and sold to scrap metal dealers. It is unknown whether mattresses are classified as putrescible waste or would be an emission hazard (due to plastics). Therefore, consultation with the DEC and Department of Health is recommended before commencing such a trial. If burning is approved, it should be undertaken in a well ventilated open area away from vegetation and residents.

- *All LGA's to participate in MobileMuster and Cartridge for Planet Ark*

MobileMuster is the official recycling program of the mobile phone industry. Other than recycling, MobileMuster can also provide the following benefits.

- Promote mobile phone recycling to residents, schools, businesses and employees, provides a free PR tool kit, exhibition materials and PR resources to support councils' promotional activities;
- Set up permanent public collection points in administration offices or libraries;
- Distribute or make available MobileMuster reply-paid satchels so that residents can send old mobiles to be recycled for free; and
- Negotiate with Material Recovery Facilities the possibility of mobile phones being accepted through kerbside recycling systems.

As the CDMA network has recently become obsolete it is likely a number of residents have a mobile phone that requires disposal. Without a recycling program in place in each LGA it is likely a number of mobiles will end up in landfill potentially leaching harmful chemicals. Therefore, it is recommended each LGA actively register to be a depot for disused mobile phones and educate the community towards the recycling of mobile phones at designated locations.

Cartridge for Planet Ark is another successful EPR scheme currently being funded by a number of printer manufacturing companies. Drop-off stations and pick-up is provided free of charge to any organisation that registers. It is recommended that all LGA offices continue to utilise cartridge bins and educate the C&I industry in the benefits of also registering with Planet Ark.

- *Investigate Dry-Cell Battery Recycling*

Dry-cell batteries also have the potential to leak harmful chemicals if they are not properly disposed. The Eastern Metropolitan Regional Council (EMRC) has recently launched a dry-cell battery recycling scheme in LGA offices and schools with pre-paid containers that can be sent to the Eastern States for reprocessing at minimal cost.

It is recommended dry-cell battery recycling is investigated by the BROC in consultation with Veolia Environmental for the region.

- *Investigate the viability of E-Waste Recycling in the region*

The speed at which technology is advancing is encouraging high volumes of electronic equipment to be upgraded regularly, generating significant amounts of electronic waste (E-waste). The generation of e-waste in the region is also a concern due to the toxic chemicals that can be leached from electronic components when E-waste is disposed.

It is recommended that an E-waste drop-off day trial be conducted at the Meru Waste Disposal Facility for residents (possibly in conjunction with the HHW drop-off day). E-waste currently has a market at Sims E-waste Recycling in Perth. There is the possibility of E-waste being backloaded with the periodic scrap metal collection conducted by Sims Metal in the region. Sims has indicated they are interested in investigating this option with the City of Geraldton-Greenough. If the trial proves successful and economically viable, then the scheme could be rolled out across the BROC.

- *Investigate recycling of C&I plastics in conjunction with DrumMuster plastic pickup*

There is potential for the DrumMuster contractor (currently CLAW Environmental) to also pick up other MSW and C&I plastics in the region at DrumMuster points (currently most landfill and transfer stations). CLAW Environmental currently service the area with a plastics shredder and truck to transport the recovered plastics on a periodic basis. CLAW

Environmental have indicated they are interested in providing an additional plastics recycling service in conjunction with the DrumMuster service on a periodic basis. It is recommended the region enter into discussions with CLAW Environmental to pick up MSW and C&I plastics across the region.

- *Continue stockpiling of used tyres whilst remaining within DEC Licence and Rural Landfill Regulations*

Unfortunately there is no immediate solution for appropriate and economic disposal of used tyres in the BROC. In the Perth Metropolitan Area tyre baling companies are now beginning to export waste rubber to Asia. If a container berth were to become available in the Mid-West, direct export is also a possibility (this is further discussed in **Section 4.3**).

An announcement has been made by the State Government on a total ban of landfilling of used tyres in the Perth metropolitan area and larger regional centres by 2011. As of January 2008 no used tyres can be dumped in putrescible landfills, rather all used tyres must be baled and placed into monofills. It is recommended that until such time tyres can properly recycled or exported from the region tyres are either monofilled or stockpiled in compliance with DEC Licence conditions and rural regulation to minimise fire risks.

LGA's should also keep themselves up to date with the latest developments in used tyre recycling technologies.

Some transfer stations and landfills in the region have found innovative ways of using the tyres for construction (**Photo 4.4**) which should be continued (where practical).

Photo 4.4: Tyre bunding wall at the Dongara Transfer Station (Shire of Irwin)

4.3 Improving Existing Service Efficiencies

Improving waste service efficiencies through regional collaboration has the potential to create significant cost savings to LGA's. Regionalisation also provides the opportunity to provide services to residents that may have not been possible thereby resulting in social and environmental benefits.

4.3.1 Recommendations

- *Investigate a Memorandum of Understanding (MoU) throughout the BROC in regards to waste management*

A key purpose of this waste management strategy is to develop co-operation and regionalise waste services between LGA's across the region for environmental, social and economic benefit. A MoU is a document the describes a multilateral agreement between

the LGA's and expresses a common line of action (in this case in regards to waste management). Therefore it is envisaged the MoU will promote co-operation, support schemes and share in development works to enhance service deliverability to residents throughout the BROC. Synergies may also be possible with the Mid-West Regional Council to the north-east to create even greater economic, social and environmental benefits in regards to waste management in the region.

- *Investigate jointly tendering contracts for the provision of waste services*

At present within the BROC, LGA's have individual contracts with waste collection contractors. Co-incidentally the waste collection contractor across the region is Veolia Environmental Services. Whilst this has a number of benefits in terms of serviceability, there may be an opportunity for greater economic benefits through increased economies of scale. It is recommended that when waste collection services (or any other services) are set to expire, LGA's investigate "teaming-up" to jointly tender contracts to increase the economies of scale. At present contract expiration dates for waste services are staggered across the BROC. Expiration dates are outlined in **Table 4.2**.

Table 4.2: Current waste collection contractor and contract expiration date for each LGA

Local Government Authority	Contractor	Expiration Date
Shire of Chapman Valley	Veolia Environmental	Unavailable
City of Geraldton-Greenough	Veolia Environmental	May 2013
Shire of Irwin	Veolia Environmental	June 2012
Shire of Northampton	Veolia Environmental	July 2011

Due to the staggered nature of the contract expiration dates short term extensions or contracts could be awarded to align timing of new waste contracts as existing contracts expire.

- *Investigate opportunities for a regional contract for greenwaste processing*

The BROC should also investigate a regional contract for greenwaste processing (mulch and/or composting) in the area when the Meru Waste Disposal Facility contract with Espinos Sand Supplies contract expires in late 2008. A joint contract will promote economies of scale and will lead to a greater economic efficiency across the BROC. A number of contractors have already shown interest in such a regional collaboration contract.

During the community seminar series there was a desire for partnerships between LGA's, contractors and end markets to reduce the amount of greenwaste being sent to landfill.

- *Continue investigation of kerbside recycling in the City of Geraldton-Greenough and processing through a Material Recovery Facility (MRF)*
- *Investigate the viability of a number of strategically located household recyclables drop-off centres within all LGA's*
- *Investigate public recycling in the City of Geraldton-Greenough when the MRF is constructed / operational*

There has been a strong desire from the community for kerbside recycling. Kerbside recycling would involve dry recyclables (aluminium cans, steel cans, plastics, newspaper, cardboard, liquid paperboard and glass) generated in the region being recovered and recycled. This has resulted in the City of Geraldton-Greenough announcing kerbside recycling through the utilisation of a MRF in its business plan.

As outlined in **Section 3.4** there is at least 4,000 tonnes of dry recyclables from household kerbside available in the BROC (actual recovery is likely to be less (50-75%) due to

contamination issues). Material is also potentially available from the commercial sector and LGA's surrounding the BROC. If local markets cannot be sought then material would require transportation 430 kilometres to Perth for reprocessing or export. Backloading with existing logistics companies should be investigated as an option to reduce costs. If a container berth were to become available in the Mid-West, direct export is also a possibility (this is further discussed below).

Due to the significant costs of a kerbside collection system and utilisation of a MRF for the region, it is recommended that a thorough due-diligence process be undertaken for the construction of the MRF. Certain aspects that may be investigated include.

- A needs analysis (household services, generation yield, frequency of collection);
- Viability of kerbside systems or drop-off centres in each major town centres;
- Whether a transfer station is more viable in the region;
- Site Selection;
- Technology;
- Collection contractor;
- Approvals Process; and
- Potential project delivery mechanisms

A number of project delivery mechanisms are available for the construction and operation of the MRF. Some of these mechanisms and a brief description of each are listed below.

- Build Own Operate (BOO) – Private contractor builds and operates the facility, charging a gate fee for processing the product
- Build Own Operate Transfer (BOOT) - Private contractor builds and operates the facility, charging a gate fee for processing the product. After a fixed period the facility is transferred back to the LGA
- Design and Construct (D&C) – Local Government owns and operates the facility
- Alliance Partnership (AP) – Local Government and private contractor share ownership and operations

A number of these mechanisms are proving successful across regional and metropolitan Western Australia. These include (but not limited to) BOO's in the City of Albany, City of Kalgoorlie-Boulder and Mindarie Regional Council, D&C's in the Shires of Esperance, Shire of Broome and City of Wanneroo and an AP between the City of Mandurah and Cleanaway.

During the community seminar series there was also strong desire for an increased number of recyclable drop off centres throughout the BROC. As it is likely that kerbside recycling systems in the Shires of Chapman Valley, Irwin and Northampton would have an unacceptable high cost for LGA's without an increase in refuse rates, an investigation should be conducted in each LGA for the installation of drop-off points for household recyclables. This would reduce transportation and collection costs significantly whilst allowing for the community to recycle their household recyclables at strategic drop off points. The material could then be transported periodically (similar to cardboard and aluminium cans at present) to a central location in Geraldton.

Public place recycling drop-off points should also be investigated for the City of Geraldton-Greenough (and potentially surrounding LGA's). It is envisaged recycling stations would be located in strategic areas that would generate significant volumes of recyclables.

- *Investigate with relevant parties the possibility of a container berth in the Mid-West*

Excluding recycled C&D and organics approximately 89% of recovered materials are sent internationally for export for reprocessing and remanufacture. A further 16% is sent to the Eastern States for reprocessing (Cardno BSD 2008). The majority of recyclable material recovered in Western Australia (paper, scrap metal and plastics) is sent overseas from the Fremantle container port. Therefore any recyclables recovered in the BROC will need to be transported to Perth for export.

If a container berth were to become available in the Mid-West, transportation costs for recyclables could be minimised greatly. A container berth would not only benefit the BROC in terms of the cost of recycling, it would have implications on recycling in the entire Gascoyne and Pilbara region.

Therefore investigations should commence between the BROC and relevant parties in regards to whether a container berth could potentially be constructed in the Mid-West.

- *Continue the acceptance of clean greenwaste and some high value bulk items at landfills / transfer stations from the community for free*

All LGA's with the exception of the Shire of Irwin have bulk verge collections that target bulk junk and greenwaste in built up areas. This material is then transported to the nearest landfill / transfer station for disposal or recycling. All LGA's also have a drop-off centre at their landfill or transfer station for bulk and greenwaste.

Whilst bulk verge collections are largely cost negative, there are a number of benefits including reduced illegal dumping, reduced contamination of bulk bins at transfer stations and less burden on residents to take bulk material over long distances for disposal.

Residents should continue to be encouraged to take their greenwaste to the local transfer station of landfill for stockpiling free of charge which can then either be mulched by a contractor or burnt (if mulching not viable). Valuable bulk material items such as scrap metal or source separated cost neutral material (e.g clean inert material) should also be encouraged to be sent to landfill free of charge.

- *Continue the promotion of Resource Recovery Parks (RRP) in the region*
- *Investigate an RRP at the Northampton Transfer Station*

Resource Recovery Parks (RRP's) are a successful way in reducing the amount of waste to landfill and also allow for the community to purchase items that would have otherwise gone to waste. The RRP's can also provide a revenue stream for the LGA's that can be reinvested into the community or to charities. RRP's are already in place at the manned Meru Waste Disposal Facility, Nabawa Landfill, Kalbarri Landfill and Dongara Transfer Station.

The Shire of Northampton should also investigate the potential for a RRP at the Northampton Transfer Station in light of a plan to man the facility. Bulky waste that is not desired in the bulk bins may be able to be placed in the RRP for sale to residents.

- *Investigate the regionalisation of medical waste collection and disposal*

Until recently all medical waste generated in the region was being disposed into the Meru Waste Disposal Facility in Geraldton. A partnership between Veolia Environmental and Stericorp (a Perth based medical waste company) is now servicing a limited number of local hospitals and transporting medical waste to Perth for more appropriate disposal including incineration, shredding, chemical disinfection or autoclaving. It is the preference of the City of Geraldton-Greenough that the Meru Waste Disposal Facility avoid the acceptance of medical waste (where possible) for occupational health and safety reasons.

Therefore it is recommended the BROC investigate further opportunities for regional collection efforts for medical wastes (where practical).

- *Educate the C&I waste sector towards recycling*

The C&I waste sector (pubs, bottle shops and manufacturing / distribution industry) produce significant quantities of waste material in the region especially low density materials such as cardboard. Low density materials decrease the amount of waste that can be disposed into a bin and increase the frequency of bin collections required. Prior to the installation of cardboard collection depots at a number of transfer stations and cardboard bins at commercial premises a large amount of cardboard was being sent to landfill or transfer stations in the region creating a cost burden to LGA's.

C&I waste education by the BROC and collection contractors (Veolia) to specific cardboard waste generators has proven successful in reducing cardboard waste and should be continued. Significant cardboard waste generators in the region were (and should continue to be) targeted and bins provided to high cardboard generators.

- *Investigate installation of manual cardboard balers at transfer stations and landfills*

Whilst cardboard recycling has proven successful at a number of transfer stations / landfills in the BROC, unfortunately due to throughput constraints at the Cogman Recycling baling plant at the Meru Waste Disposal Facility a proportion of cardboard collected is required to disposed into landfill. The installation of a new baler (from storage) and a 3-phase power upgrade will help throughput, however it is envisaged by the City of Geraldton-Greenough that the new system will still not be able to accept all cardboard currently being generated in the region. Therefore, it is recommended that manual balers be installed (where practicable) at transfer stations / current landfills to allow for direct transport from Cogman Recyclers to AMCOR and minimise double handling.

The disused AMCOR baler from Cogman Recycling has the potential to be utilised elsewhere in the BROC to reduce the throughput burden on the new baling system at Cogman Recycling.

- *BROC to work with WALGA and the DEC in regards to reducing costs for used oil collections*

The cost of collection of used oil in the region is a major issue in the BROC at present. This is predominantly due to the limited markets currently available in Western Australia, resulting in oil being stockpiled in expensive storage depots in Kwinana, the cost of transport to Perth and shipment costs internationally for market. This in turn is resulting in expensive pick ups by either Nationwide Oil or Wren Oil. The collection of oil in some areas is costing 15 – 20c/L, resulting in very large bills having to be absorbed by LGA's.

The Municipal Waste Advisory Council (MWAC) has recently secured $150,000 in funding from the DEC to subsidise waste oil collections. MWAC is also proposing to tender waste oil contracts to the market to further reduce the cost burden on LGA's. It is recommended the BROC keep in contact with MWAC on the progress of the initiative and when funding may be available to LGA's to subsidise waste oil pick ups. It is envisaged the grant and tendering waste contracts to the market will halve the cost of current pick ups across Western Australia, including the BROC.

Whilst waste oil is becoming a burden for LGA's economically, pick ups are still essential to protect the environment. At present there are a number of depots that are at capacity and/or overflowing which may have a detrimental impact on the environment if not monitored. Refusing waste oil from residents can result in large stockpiles accumulating on properties or worse, being illegally dumped.

- *Periodic regional meetings to discuss waste management in the BROC*

Periodic meetings should be established between the LGA's, with possible input from the Mid West Regional Council to discuss waste related issues.

4.4 Raising Community Awareness

A key objective of waste management plan, as outlined by the Department of Environment and Conservation (DEC) is to:

"increase awareness of the impact of waste issues on the environment by the whole community"

During the community seminar series there was a strong desire (and responsibility) for the BROC to reduce the amount of waste currently being generated. The community are looking for leadership by LGA's to tackle the waste problem and for the LGA's to empower the community (and commercial sector) with knowledge so actions can be made to reduce waste. It was noted that even the most educated and passionate community members in regards to waste reduction were unawares of the current services that each LGA provides. A classic example was the City of Geraldton-Greenough initiative to offer compost bins / worm farms at a discounted rate to residents to promote at home organics recycling.

Community drivers will be very important in the successful reduction of waste in the BROC. Increasing the awareness of the community towards waste will increase the likelihood that members of the community will participate and embrace any recycling strategies that are implemented in the region. This is especially the case in the establishment of a MRF and kerbside / drop off recyclable collection service. Low participation or high contamination rates will increase the cost of providing the service, subsequently decreasing the viability of the service.

As the following recommendations will require resources in addition to what is currently available in the BROC, additional staff will be needed in the region. It is envisaged a total of 3 more staff will be required in the following fields:

- 2x Environmental Officer / Coordinator's (City Geraldton-Greenough); and
- 1x Environmental Officer / Coordinator (Shared amongst Shires Chapman Valley, Irwin and Northampton).

4.4.1 Recommendations

- *The BROC develop a regional waste education strategy*

A waste education plan encompassing the BROC should be developed with the goal of increasing community awareness of sustainable waste management and increase community desire to reduce waste from landfill. For example the Mindarie Regional Council (MRC) has developed a regional waste education plan that encompasses a number of strategic key components that could be considered by the BROC region in developing their waste education plan.

The key strategic components that should be considered include:

- A regional strategy that creates a regional approach to waste education through strong leadership and co-ordinated activities across the region;
- Increasing knowledge and awareness of sustainable waste management and what is happening in the region in regards to sustainable waste management;
- Empowering the community with knowledge about sustainable waste management will create behavioural change and move people towards more sustainable waste practices; and

- Youth / school programs to boost awareness and involvement.

Education of the community is critical for the region to move forward in its aim of reducing waste. Communication could take many forms including letter drop offs, local newspaper articles, public forums, stickers on bins, fridge magnets, drop off location maps and websites. Any strategies should involve consultation with stakeholders, the DEC and MWAC. The education plan should also target C&D and C&I waste industries

- *Develop environmental / waste community group in each LGA*

Community groups can be a powerful tool in educating fellow community members amount waste reduction initiatives and ways to reduce waste.

One such group that is currently operating in the Western Metropolitan Regional Council (WMRC) and proposed for the Mindarie Regional Council (MRC) is the Earthcarer's program. Earthcarer's is a community voluntary program that operates in each of the LGA's that aims to educate and support schools, community organisations and commercial businesses in adopting more environmentally sustainable behaviours by reducing waste and conserving resources. Regular free workshops organised by Earthcarer's for the community are also held in regards to making environmentally friendly purchasing decisions, composting, worm farms, minimising household waste and how the council is currently handling waste and recycling effectively.

It is envisaged these community groups could also organise "trash and treasure markets" that get the community together to swap, buy and sell disused goods, further reducing material requiring landfill.

- *All LGA's to participate in Tidy Towns Sustainable Communities*

Tidy Towns Sustainable Communities is a Keep Australia Beautiful program that recognises community projects that enhance and look after the community's assets and surrounding environment. The program also recognises the importance of regional collaboration amongst LGA's.

Traditionally, the program focused on tidy streets, litter prevention and beautification; however the program has extended its scope to focus on community activities to conserve assets such as their cultural heritage, bushland and rivers and to increase recycling and resource recovery. The program can provide LGA's with much useful information on ways to reduce waste generation and provides tools whereby community members can collaborate to make a difference.

The program also has an awards program that recognises the best LGA in Western Australia and Australia in regards to being a sustainable tidy town. Achieving this recognition also has a number of tourism benefits. Walpole was awarded the Sustainable Tidy Towns Award for Western Australia in 2007.

At present the Shire of Irwin is the only BROC LGA that is currently participating in the program. It is recommended that the City of Geraldton-Greenough and Shires of Chapman Valley and Northampton sign up to the Tidy Towns Sustainable Communities program.

- *All LGA's to participate in Waste Wise Schools Program*

Research suggests that one of the greatest influences on a households waste management procedures is pressure from children on their parents to be more environmentally friendly. The DEC's WasteWise Schools program is a program that engages children from an early age into the idea of environmental issues and waste reduction. At present no schools in the BROC have signed up to the Waste Wise Schools

program. It is recommended that LGA's provide information to schools to sign up to the program.

The City of Geraldton-Greenough currently awards grants and provides financial rewards to schools and communities that can demonstrate waste reduction initiatives. These grants are available throughout the BROC. Any revenue generated by communities or schools can then be used locally for more waste reduction initiatives.

- *Upgrade LGA websites in regards to waste management services provided*

Information on LGA websites regarding waste management varies in its detail. The Shire of Irwin currently provides the most detail. The website details waste collection days, opening hours and other waste services provided in the Shire. A downloadable file detailing a price list and waste accepted / not accepted at the Dongara Transfer Station is also available. The remaining LGA's websites are limited in detail and do not provide the community with sufficient information regarding waste management in their respective regions. It is recommended all LGA's detail on their websites as much information as possible in regards to what is accepted at each landfill, where material should be disposed if it can't be accepted, opening hours, discounts / free disposal for source separated waste material, gate fee charges ect.

- *Work in collaboration with the MWAC and the DEC to promote and invigorate recycling*

The DEC regional coordinator can assist in the development and delivery of consistent waste education and promotion material for Western Australia. The Waste Management Branch of the DEC has developed standard waste management education material for the State, however if specific education material is required the Waste Management Branch can work in collaboration with the BROC or individual LGA's to develop education programs specific to each LGA.

The City of Geraldton-Greenough's SWMP project coordinator is currently the Mid-West coordinator for waste management. The attendance of regular meetings in Perth with the DEC and MWAC through the regional officer liaison scheme enables information to be relayed to Mid-West LGA's through this officer. The City of Geraldton-Greenough is also a member of the Forum of Regional Councils (FORC). This again allows for information to be relayed between current activities taking place between metropolitan and regional areas in the State.

It is recommended the Mid-West coordinator continue to effectively facilitate communication between external metropolitan or regional bodies and the BROC in regards to waste management. Ensuring fluid communication between parties will allow for the BROC to remain well informed whilst allowing the BROC to have adequate input into any discussions.

- *Educate the Commercial and Industrial (C&I) and Construction and Demolition (C&D) sector towards recycling*

As outlined in **Section 4.3** the BROC should target the C&I and C&D sector in addition to the municipal sector in terms of waste generation, source separation and potential recycling options to minimise landfilling. Cardboard is a particular waste stream that should be targeted to reduce waste volumes and cost to the LGA's in transportation and landfilling.

4.5 Monitoring and Reporting

Monitoring and Reporting is a vital tool to maintain accountability of operations in the BROC and will allow the determination of whether improvements are being made. Keeping records also allows knowledge to be stored for ready reference by any agency where the need arises to access data.

4.5.1 Recommendations

- *Review of strategic waste plan every two years*

It is recommended the BROC strategic waste plan be reviewed every two years to highlight achievements or difficulties in the implementation of recommendations / actions items and amend the document as appropriate.

- *Develop monitoring and reporting scheme*
- *Annual Environmental Achievement Report*

It is recommended a monitoring and reporting scheme be developed that is consistent and standardised across the region. This will allow for the BROC to keep records of performance and fulfil legal requirements. There are a number of monitoring schemes that should be investigated and implemented in the BROC. These include:

- Waste generation / recycling in each LGA and the BROC;
- DEC Landfill Licence conditions compliance report (where required);
- National Greenhouse Emission Reporting Scheme (NGERS) Act; and
- Environmental achievement report to the community

As recommended in **Section 4.1**, a detailed standardised electronic waste database should be developed for each LGA and the BROC. This will allow for easy access of records and allow for the region to track landfilling / recycling activity and potential improvements with new initiatives (e.g. kerbside recycling, education of community)

As a Condition of Licence of operating the Meru Waste Disposal Facility and Kalbarri Landfill an annual monitoring report is required from the LGA's operating these facilities. Data required to be reported includes:

- groundwater monitoring data;
- the number and severity of any fires on site;
- measures taken to suppress dust;
- measures taken to control windblown waste;
- measures taken to control pest and vermin;
- the number and type of complaints received including complainants name, address, nature of complaint (where appropriate cross referenced with prevailing wind directions) and action taken;
- any changes to site boundaries, internal buffer zones, and surface drainage channels; and
- issues raised by the DEC (e.g. arising from inspections) during the reporting and details on how these have been addressed/rectified or, if the required work has yet to be completed, how and when they will be rectified/completed.

A standardised report template would allow for easy documentation on the year's activities and minimise reporting time requirements.

The introduction of the NGERS **Act** as part of the leadup to an Emissions Trading Scheme (ETS), to help reduce Australia's carbon / global warming footprint, may also be a requirement of some LGA's (depending on emission output) during 2008/09. There is also some confusion on whether LGA's need to report at all due to LGA's classification under the scheme.

From 1 July 2008, "corporate" groups that emit 125 kilo-tonnes or more of greenhouse gases each year, or produce or consume 500 terajoules or more of energy, will be required to collect data to meet annual reporting requirements. Corporations controlling facilities that emit more than 25 kilo-tonnes of greenhouse gases, or use or produce 100 terajoules or more of energy, will also need to collect data. At present it is unknown whether LGA's are classified as a corporation. This is currently being investigated by WALGA. In respect of this information, WALGA assumes until otherwise informed that LGA's will be covered under the NGERS. Whether an LGA needs to report under NGERS can be determined through an online reporting scheme called the Online System for Comprehensive Activity Reporting (OSCAR). The OSCAR system allows companies / LGA's to calculate their current emissions and outlines whether the company / LGA has exceed the threshold and therefore is liable to report under the scheme.

While the Act governing the system comes into effect on 1 July 2008, relevant corporations will have until 31 August 2009 to apply to register under the scheme, and until 31 October 2009 to submit their first annual greenhouse and energy report.

Finally, an environmental achievement report (including recycling activities) should be issued to ratepayers annually to outline current environmental and waste management achievements in the LGA or across the BROC. Whilst giving guidance, the report will also identify areas that can be improved with the help to the community and show the communities' efforts in waste minimisation are making an impact on a reduction of waste to landfill.

4.6 Improved Local Government Waste Management Practices

There are a number of measures that can be undertaken in each LGA office to improve internal waste management practices. Measures can range from small local waste measures such as reusing cups to policy measures when procuring materials for LGA activities. Measures that could be implemented to improve existing efficiencies are outlined in **Table 4.3**

Table 4.3: Potential measures to be undertaken in LGA Offices and operations to reduce waste generation and increase recycling

Measure	Objective	Program of Achievement	Expected Result	Priority
Purchasing Policy	Materials purchased by LGA's are purchased with sustainability measures in mind	• Encourage the use of products produced from recycled materials (paper products) • Illustrate on final document recycled paper content	Promotes sustainability principles to stakeholders / contractors	Short term
Procurement Policy	Outsourcing contractors that have adopted waste management principles in their operations	• Develop a waste minimisation policy for the region that cover all construction activities • Requirement that any developments that are likely to generate significant quantities of waste to produce a waste management plan • Educate engineers on the potential use of recycled building products in construction operations in low specification applications • Increase demand for recycled building products by outlining the potential use of either virgin or recycled material in construction specifications • Make it a requirement that greenwaste mulch be used in landscaping activities for developments • Procure greenwaste mulch for all of LGA's landscaping activities	• Minimisation of waste being generated in the region. • Further price incentives to source separate • Further onsite mulching of greenwaste at subdivisions	Medium Term
Double Sided Printing	Avoidance in the use of singled sided printed paper	• Avoid printing where possible • Encourage employees to print double sided via printing settings on computer • Encourage employees to photocopy double sided • Consider replacing printers without a double sided function	• Will increase employee awareness of localised waste management issues in the office and operations • Large reduction in paper waste and associated purchasing costs • Prizes for staff for recognition of achievements	Short term

Measure	Objective	Program of Achievement	Expected Result	Priority
Waste minimisation	Reduce the amount of waste being generated within the office environment	• Identify waste streams by conducting a waste audit of premises • Develop procedures that will reduce waste stream (e.g glass cups instead of disposable plastic cups. Electric hand dryer instead of disposable hand towels) • Each LGA to sign up to mobile muster • Investigate whether a printer cartridge recycling service is available • Investigate whether a dry-cell battery service is available	• Will increase employee awareness of localised waste management issues in the office and in operations • Will allow residents to access the drop off infrastructure (i.e MobileMuster) • Prizes for staff recognition of achievements (e.g discounted compost bin)	Short Term
Composting	Reduction of organic wastes from own LGA operations	• Install a compost bin or begin a worm farm at each LGA office • Encourage staff members to take compost home for gardens	• Shows LGA's are leading by example • Can be used as a guide for members of the community to install their own compost bin or worm farm, further reducing waste to landfill	Short Term
Staff Education	Empowering staff with knowledge to reduce own waste generation and LGA's waste generation	• Induction manuals for new staff • Staff meeting • Presentations	• Will increase employee awareness of localised waste management issues in the office and in operations	Short Term
Retrofitting office building to environmental management principles (e.g Greenstamp)	Incorporates sustainable design into building construction and promotes the uptake of recycled materials into building operations	• Uptake recycled materials into building design	• Show LGA's are leading by example • Provides an example of building design practices that could be used in other developments, reducing waste to landfill.	Long Term

Other waste management practices will be able to be implemented when MRF is operational.

4.7 Action Plan

Table 4.4: Action plan that LGA's should consider to improve waste services and reduce waste generation in the BROC.

Issue	Recommendation / Action (Some repeats as they resolve a number of issues)	Responsibility	Implementation	Timeline	Estimated Cost (further cost analysis required)	Potential Funding
Data Gaps	Conversion of small landfills in the region (Nabawa, Yuna, Port Gregory, Binnu) into transfer stations with Kalbarri landfill and Meru to be the strategic major waste depositories in the region (however Oakajee Port Project may require landfill)	Shire of Chapman Valley Shire of Northampton	A survey of each unmanned site to quantify waste tonnage received. 'Hook-lift' bins similar to those used at Dongara and Northampton Transfer Stations would be used.	2009 - 2013	$40,000 - $50,000	Shire of Northampton Shire of Chapman Valley (with potential in kind from DEC)
	Investigate management and destination of waste from Oakajee Project	Shire of Chapman Valley City Geraldton-Greenough	Talks commence between relevant LGA's with preferred contractor (Oakajee Port and Rail) and Landcorp	2009 -2010	Minimal (administrative)	N/A
	Investigate periodic bulk item drop-off days at transfer stations and landfills across region to minimise risk of high volume items being disposed in transfer station bulk bins	BROC Veolia Environmental	EHO's and Veolia to coordinate appropriate days and to man sites (if practicable)	2009 - 2013	$10,000+	LGA's / BROC
	Continue segregation and stockpiling of C&D waste at each transfer station / landfill to maximise landfill space therefore allowing for volume estimates / future recycling	All LGA's Construction Industry	Reserve space for inert waste and truck movement	Ongoing	Minimal	N/A
	Detailed survey of sites to be completed including past cells	All LGA's	Analysis of historical aerial photos through Landgate, historical records through library and site assessment	2009	$2,000 - $5,000	LGA's
	Detailed electronic register of incoming waste materials at proposed landfills (Meru and Kalbarri)	Shire of Northampton City of Geraldton-Greenough	Already achieved at Meru. Similar system should be investigated for Kalbarri (software / computer / training)	2009 - 2010	$2,000 - $3,000	Shire of Northampton
Direct and Indirect Environmental Impacts	Investigate the hire of a crusher to remove current C&D stockpile at Meru Waste Disposal Facility with potential for crushing region's stockpiled C&D material in the future with potential to also incorporate glass fines.	City of Geraldton-Greenough BROC	Contact providers of crushing equipment and determine market for material in each LGA. BROC commence talks prior to one LGA instigating crushing.	2010 - GGRC >2010 (Future crush)	Set asides funds depending on amount willing to be crushed. (~$22 / tonne)	2010 – City Geraldton-Greenough >2010 - BROC
	Continue the segregation and processing (where possible) of greenwaste with weed minimisation principles and increase monitoring of greenwaste disposal (where possible) to minimise contaminated loads. Where shredding not viable, controlled burning of greenwaste material.	All LGA's	Encouragement of greenwaste stockpile at transfer station and landfills with good signage	Ongoing	$10,000 / annum Small cost for signage	All LGA's
	Signage for scrap metal stockpiles at each transfer station (Binnu, Port Gregory, Nabawa, Yuna) with periodic (annual / bi-annual collection) depending on rate of metal disposal.	Shire of Chapman Valley Shire of Northampton	Signage on site. Coordinated drop-off days	Ongoing	Cost positive (metal commodity price)	N/A
	Discussions with DEC (Waste Management Branch) regarding inappropriate conditions and invitation of DEC officers to waste infrastructure across the region to work through current Licence requirements and negotiate new Licence conditions	All LGA's	Meetings and site visits to negotiate new licence / regulation conditions	2009 - 2010	Minimal (some administrative work)	N/A
	Meet practical DEC Licence conditions at Landfills and Transfer Stations (see **Appendix D** for detail)	All LGA's	EHO and site operator to familiarise and educate self with DEC Licence or Regulations for site, implement practical measures	2009	<$5,000 each LGA	All LGA's
	Investigate periodic household hazardous waste drop-off day (including fluorescent tubes / compact fluorescent lamps)	BROC Chemclear	Investigate program (when finalised by MWAC) and apply for funding.	2009 - 2010	$10,000	Funding available from MWAC Household Hazardous waste program
	Continue DrumMuster Program (Shire of Irwin to sign up)	All LGA's	Education of farm owners and sign up by Shire of Irwin	2010 - 2013	Minimal	N/A
	Investigate thermal treatment of mattresses with goal of extracting metals whilst minimising emissions	City of Geraldton-Greenough DEC Dept Health	Contact DEC and Dept Health. If permission granted trial the burning of mattresses with fire brigade present	2009	Minimal. Potentially cost positive with extraction of metals	N/A
	All LGA's to participate in MobileMuster	All LGA's	Investigate program and signup Council buildings to participate in program, inform community through media	2009	Minimal (some administrative work)	MobileMuster
	Investigate dry cell battery recycling	LGA's Veolia	Enter discussions with Veolia to supply pre-paid plastic containers to Council and encourage residents to drop off batteries.	2009 - 2010	Minimal	Veolia LGA's
	Investigate the viability of E-Waste Recycling in the region via backloading with scrap metal to Perth	BROC Sims E-waste Sims Metal	Trial E-waste collection depot at transfer station / resource recovery park to gage E-waste volumes. Begin talks with Sims metal to transport E-waste back to Perth for processing.	2010	$13 – computer monitor $6 – PC / printers Potential Transport Cost	All LGA's with potential assistance from DEC / MWAC or corporate (computer manufacturer) sponsorship

	Recommendation / Action **(Some repeats as they resolve a number of issues)**	**Responsibility**	**Implementation**	**Timeline**	**Estimated Cost** (further cost analysis required)	**Potential Funding**
	Investigate viability of plastics recycling at transfer stations and landfills in partnership with DrumMuster program plastics recycler	All LGA's CLAW Environmental	Begin talks with plastics DrumMuster recycling companies	2010	Minimal due to synergy with DrumMuster	LGA's
	Continue stockpiling of used tyres whilst remaining with DEC Licence and Rural Landfill regulations	All LGA's	Keep abreast with developments in used tyre recycling that may be economical in the region	2010-2013	Minimal	N/A
	Continue to work with WALGA and the DEC in regards to reducing costs for used oil collections	BROC	Continue talks	2010-2011	Minimal	N/A
	Continue segregation and stockpiling of C&D waste at each transfer station / landfill to maximise landfill space and allow for tonnage estimate for future recycling	All LGA's	Reserve space for inert waste and truck movement	Ongoing	Minimal	N/A
	Conversion of small landfills in the region to transfer stations	Shire of Chapman Valley Shire of Northampton	A survey of each unmanned site to quantify waste tonnage received. 'Hook-lift' bins similar to those used at Dongara and Northampton Transfer Stations would be used.	2009 - 2011	$40,000 - $50,000	Shire of Northampton Shire of Chapman Valley (with potential funding in kind from DEC)
Improving Existing Service Efficiencies	Investigate a Memorandum of Understanding (MoU) between LGA's with the aim of improved waste management efficiencies across the region	BROC	Commence talks on the MoU between LGA's	2010	Unknown	BROC
	Investigate regional contracts for the provision of waste services for the region - Waste collection - Greenwaste shredding / composting - Recycling	BROC Veolia Environmental Solutions	Commence talks on jointly tendering contracts with expiration of current contracts. LGA's to consider linking waste collection services with other LGA's at expiration of contracts with vision of regionalising contract across the BROC.	Waste Collection 2009-2016 Greenwaste late 2008	Potential cost savings with greater regionalisation Unknown Free → $550 / hour at present (depending on location)	BROC
	Investigate with relevant parties the possibility of a container berth within the Mid-West	BROC	Continue talks with relevant parties	2008 - 2013	Minimal	N/A
	Continue investigating the construction of a Material Recovery Facility (MRF) at the Meru Waste Disposal Facility	City of Geraldton-Greenough (in talks with surrounding LGA's)	Continue due-diligence	2008 - 2010	>$10,000	City of Geraldton-Greenough National Packaging Covenant
	Investigate public drop off centres once MRF is operational	City of Geraldton-Greenough	Locate strategic points in town centre for high co-mingled waste generation	2010	$5,000 - $10,000	City of Geraldton-Greenough
	Continue investigation of the viability of kerbside recyclable systems in the City of Geraldton-Greenough. Investigate viability of kerbside or drop-off co-mingled centres in surrounding LGA's and public recycling in key areas.	City of Geraldton-Greenough. Potentially other LGA's	Continue due-diligence	2008 - 2010	>$10,000	City of Geraldton-Greenough. Potentially other LGA's National Packaging Covenant
	Continue the acceptance of clean greenwaste, recyclable material (cardboard, aluminium cans) and some high value bulk items from the community for free	All LGA's	Continue current practices	Ongoing	Minimal (potential cost saving with maximising landfill / skip bins space)	LGA's
	Continue the operation of Resource Recovery Parks (RRP) at each major transfer station / landfill. Investigate the possibility of RRP at Northampton transfer station	All LGA's Shire of Northampton	Continue current practices	Ongoing. Northampton 2009	Minimal (potential cost saving with sale of product)	LGA's
	Investigate regionalisation of medical collection	BROC	Build on current partnership between Veolia and Stericorp to encompass all medical facilities in the region	2010	Unknown costs (additional transport costs to Perth)	BROC Department of Health
	Investigate installation of baler at landfills / transfer stations (where practical) to increase recycling efficiencies (Cogman Recyclers at Meru unable to recycle all incoming feedstocks)	LGA's Veolia Environmental Community	Collect cardboard through current bin systems, bale cardboard through council or community organisations	2010 -2011	Spare baler currently available from Meru. Additional balers ~$10,000 Some periodic operational costs	Funding from DEC AMCOR VISY
	Work with WALGA and DEC in regards to a reduced costs for used oil collections	All LGA's	Continue current practices	Ongoing	Minimal	LGA, DEC, WALGA
	Periodic regional meetings to discuss waste management in the BROC	BROC	Set meeting dates or align meeting with current interactions of EHO in the region	2009 - 2013	Minimal - Administration	N/A
Community / Commercial Awareness	Develop a regional waste education plan	BROC	Enter discussions with Forum of Regional Councils (FORC) and WMAA. Adopt regional coordination	Prior to kerbside recycling or construction of MRF (2009)	$10,000 - $30,000 (Consultant)	Joint funding BROC and DEC

	Recommendation / Action **(Some repeats as they resolve a number of issues)**	**Responsibility**	**Implementation**	**Timeline**	**Estimated Cost** (further cost analysis required)	**Potential Funding**
	Develop environmental / waste community group in each LGA	BROC and within each LGA	Develop framework to coordinate community group and its activities. Base on already established community groups such as Catchment Council's in region	2010 - 2011	Environmental coordinator (A) for City Geraldton-Greenough $60,000 annually Environmental Officer / Coordinator (A) for Region. - $60,000 annually	City Geraldton - Greenough LGA's BROC DEC
	Participate in Tidy Towns Sustainable Communities	All LGA's	Sign-up to program	2012		
	Participate in Waste Wise Schools Program	All LGA's	Sign-up to program	2012		
	Upgrade LGA websites in regards to waste management and education	All LGA's	Provide all necessary information in clear concise manner.	2009 (GGRC – Prior commissioning of MRF 2009)	Environmental coordinator (A) for City Geraldton-Greenough $60,000 annually Environmental Officer / Coordinator (A) for Region. - $60,000 annually	City Geraldton - Greenough LGA's BROC DEC
	Continue collaboration with the DEC and MWAC to promote and invigorate recycling	All LGA's DEC MWAC	Continue talks with MWAC and DEC	Ongoing		
	Educate the Commercial and Industrial (C&I) and Construction and Demolition (C&D) sector towards recycling	BROC Veolia Environmental Solutions	Continue talks with C&I and C&D sector	Ongoing	$10,000 - $20,000	BROC / Waste Collection Contractor
Local Government Waste Management Practices	Implement improved waste management practices	All LGA's	Educate staff on potential environmental initiatives in the workplace and draft policy guidelines for procurement policy in LGA operations.	2009 - Ongoing	Minimal – Administration	N/A
Monitoring and Reporting	Review strategic waste management plan every 2 years	BROC	Workshop to highlight achievements and/or difficulties and amend document as appropriate	2011 and 2013	Minimal – Administration	N/A
	Annual Environmental Achievement Reports to Community. Continue to promote success of recycling activities of communities and schools in their recycling efforts (e.g newspaper and aluminium cans)	All LGA's or BROC	Write report and distribute to community	2009 - Annually	Minimal – Administration Environmental Officer (B) City of Geraldton-Greenough - $60,000	LGA's BROC
	Develop monitoring and reporting regime (OSCAR + waste)	All LGA's	Annual report	2009 - Annually		BROC / DEC

Note: Costs are only estimates. A detailed cost analysis should be undertaken.

Summary Potential Funding Options from Table E3

- Local Government Authorities
- BROC
- Department of Environment and Conservation
- Department of Health
- Municipal Waste Advisory Council
- National Packaging Covenant
- MobileMuster
- Private sector

4.8 Budget

Budgeting procedures for the 2009/10 financial year are expected to begin in early 2009, therefore it is unlikely any monies will be available to implement recommendations from the report until July 2009, however if monies can be secured internally or from the DEC prior to this date some recommendations may be able to be implemented. Budgets that are set for each financial year for implementation of recommendations are dependant on the BROC, however budget estimates and implementation years in **Table 4.4** should be used as a guide in this process.

During the budget process investigations should be conducted into potential funding options to assist in the implementation of the provided recommendations. Potential funding options are outlined in **Table 4.4**.

5. CONCLUSION

The Batavia Regional Organisation of Councils comprising of the City of Geraldton-Greenough and Shires of Chapman Valley, Irwin and Northampton have joined together to develop a Strategic Waste Management Plan (SWMP) for the region as part of the Zero Waste Plan Development Scheme (ZWPDS).

Consultation with the BROC, Department of Environment and Conservation, Industry and the Community suggest key priorities for the region should be as follows (in no particular order).

- Kerbside Recycling / Material Recovery Facility;
- Drop Off Recycling Facilities;
- Landfill Licence / Regulations Compliance;
- Greater engagement of the community through education;
- Greater regionalisation of Waste Services in the BROC; and
- Consolidation of landfills across the BROC;

This comprehensive SWMP has been developed to fulfil all requirements under Phase II of the ZWPDS. It is envisaged that this plan will further assist the BROC to align its activities 'Towards Zero Waste'.

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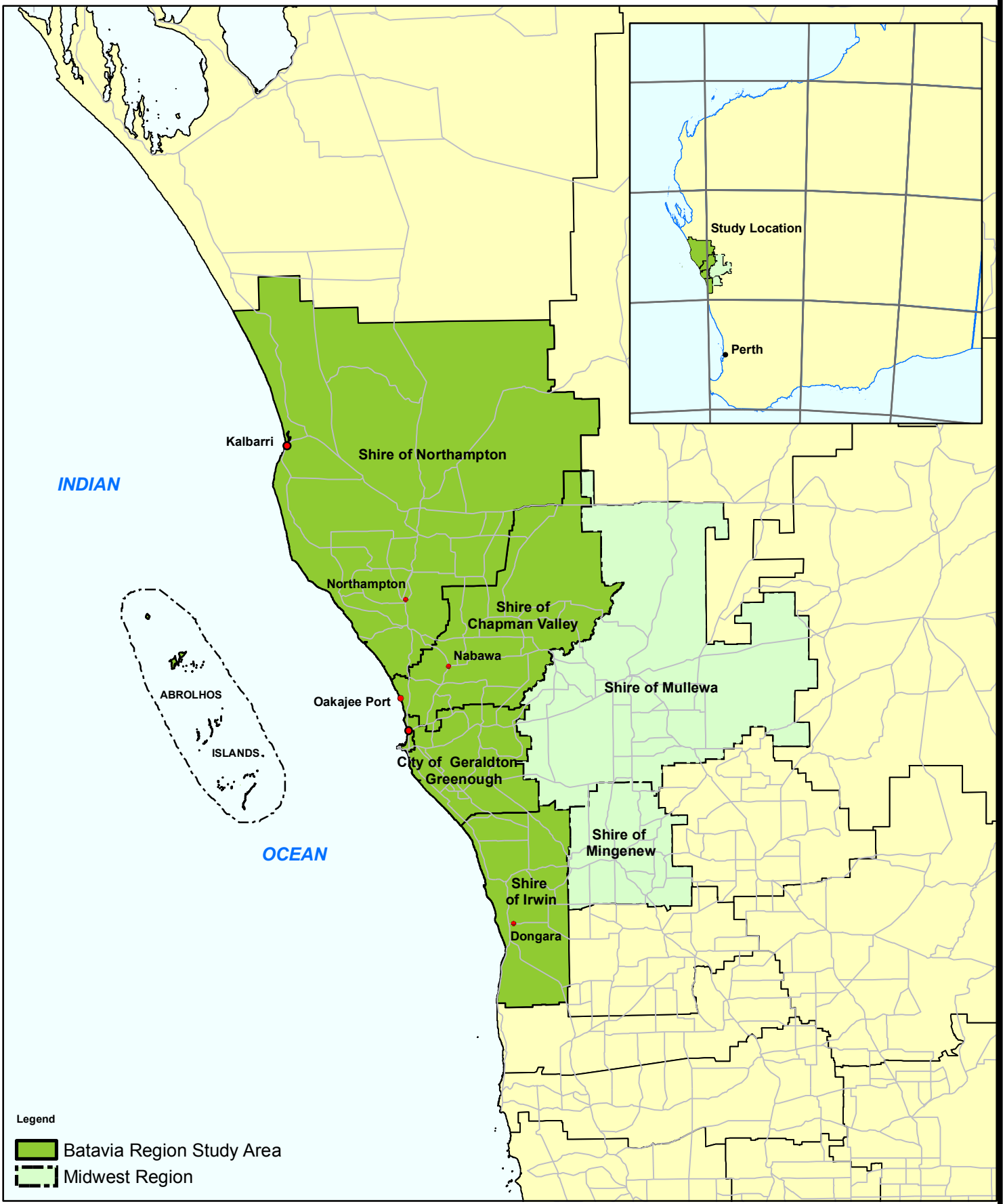
APPENDIX A

REGIONAL MAP



DATE	No.	ACTIVITY - REVISION DESCRIPTION	DES	DRN	CHK'D	APPD

DATE	No.	ACTIVITY - REVISION DESCRIPTION	DES	DRN	CHK'D	APPD

Cardno

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PROJECT **Strategic Waste Management Plan**

DRAWING TITLE **Regional Map**

PRINCIPAL **Batavia Regional Organisations of Councils**

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Project Number **V8011**

Original **A4**

Drawing Number **SK01**

Revision **00**

Designed RS

Checked

Drawn MGW

Approved

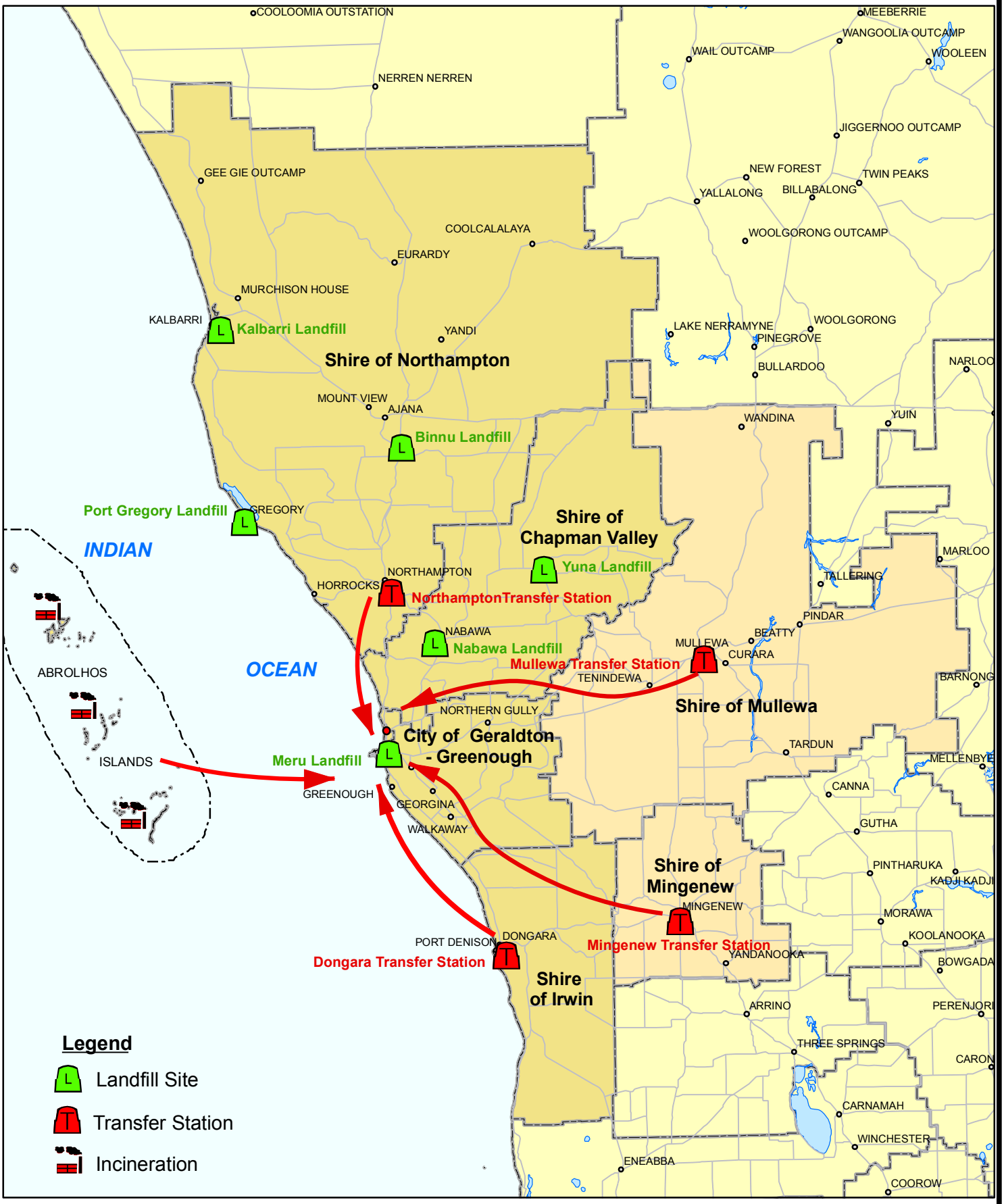
Local Authority Various

Sheet 1 of 1

Date 2/07/08

APPENDIX B

CURRENT WASTE FLOWS IN THE REGION



DATE	No.	ACTIVITY - REVISION DESCRIPTION	DES	DRN	CHK'D	APPD

DATE	No.	ACTIVITY - REVISION DESCRIPTION	DES	DRN	CHK'D	APPD

Cardno

CONSULTING ENGINEERS
TOWN PLANNERS
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Scale: 1:1,400,000

0 5 10 20 30 40 50 60 70 80 90 100 Kilometres

PROJECT **Strategic Waste Management Plan**

DRAWING TITLE **Current Waste Flows**

PRINCIPAL **Batavia Regional Organisation of Councils**

This drawing has been prepared in accordance to Cardno Quality Management System. It remains the property of Cardno WA Pty. Ltd. and shall not be used without permission. The drawing shall be preliminary only and/or not for construction until signed approved.

Project Number **V8011**

Original **A4**

Drawing Number **SK02**

Revision **00**

Designed RS

Checked

Drawn MGW

Approved

Local Authority Various

Sheet 1 of 1

Date 3/07/08

APPENDIX C

RECOMMENDED WASTE FLOWS IN THE REGION

DATE	No.	ACTIVITY - REVISION DESCRIPTION	DES	DRN	CHK'D	APPD

DATE	No.	ACTIVITY - REVISION DESCRIPTION	DES	DRN	CHK'D	APPD

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Scale: 1:1,400,000

0 5 10 20 30 40 50 60 70 80 90 100 Kilometres

PROJECT **Strategic Waste Management Plan**

DRAWING TITLE **Recommended Waste Flows**

PRINCIPAL **Batavia Regional Organisation of Councils**

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Project Number **V8011**

Original **A4**

Drawing Number **SK03**

Revision **00**

Designed RS

Checked

Drawn MGW

Approved

Local Authority Various

Sheet 1 of 1

Date 3/07/08

APPENDIX D

LANDFILL LICENCE AUDIT with RECOMMENDATIONS

Shire of Northampton

Kalbarri Landfill

General Conditions

		Compliance × / ✓	Comments	Recommendations / Actions	DEC Negotiation Required?
1	**Throughput**				
	Overall waste – 3,000 tonnes		Manned, Not open Tuesday		
2	**Waste Acceptance**				
	Waste accepted: Clean Fill Inert Waste Type 1 Inert Waste Type 2 Putrescible waste Type 1 special waste (asbestos) Type 2 special waste (biomedical)		Used oil disposed at Council depot.		
3	**Clinical Waste**				
	Cover asbestos / clinical waste ASAP with 1m of cover	×	Exposed wrapped asbestos in cell	All future asbestos to be covered when disposed	
	Disposed under supervision	✓			
	Register for clinical / asbestos waste	×		Register to be created	
	Plan showing the position of clinical waste / asbestos (grid references)	×	Current designated area. No plan	Historical record search. Detailed plan of past and future activities on site	
4	***Landfill Activities***				
	No waste within 35m of boundary	✓			
	Waste in trench enclosed by bunds	×	Unknown	Comply with DEC condition	
	Tipping area restricted to 30m	✓			
	Covered twice per week	✓	Monday and Friday		
	Sufficient cover material	✓			
	Waste is totally covered	×	Waste (plastics / paper) exposed through cover	More cover required to prevent vermin and wind blown litter	
	Tipping area no greater than 2m in height	✓			
5	**Used Tyres**				
	Where 100 used tyres are to be stored a licence is required	-	Less than 100 tyres. Buried	Commence monofilling of tyres or stockpiling of tyres	
6	**Fencing**				
	Maintain a wire stock fence around premises and locked after hours	✓			
	Weekly inspection of fence	✓	As required		Yes
7	**Washborne and Wind Blown Waste**				
	Within 50 metres of boundary of active landfill cell	×	Very high winds present on site. Chook wire fencing to be installed at tip face and	Minimise time lag as much as possible disposal of waste and cover regime	Yes. Wind conditions on site difficult to maintain condition Low resources
	Remove litter from fences and road on a monthly basis	×	Periodically. New fence to be installed on northern side of access road to contain litter		Yes. Resources unavailable on a monthly basis

		Compliance × / ✓	Comments	Recommendations / Actions	DEC Negotiation Required?
8	**Signage**				
	Signage at entrance	✓			
	Hours of operation	✓			
	Contact number	✓			
	List of materials	✓			
	Type of waste that must not be deposited and contact number	✓	No contact number	Installation of sign with contact number in proximity to "types of waste not accepted sign"	
	Warning and penalties of fires	✓			
9	**Monitoring and Reporting**				
	Annual monitoring report (incidences, monitoring bore results, fires, dust suppression, windblown waste, pests and vermin, complaints, updated site plan, issues during site inspections)	×	Incidences / Fire only at present	- Commence monitoring of bore on site or enter talks with Water Corporation - Create annual monitoring report template and submit report in December annually.	Yes. Commence talks with DEC regarding suitability of using Water Corp bore data

Air Pollution Control Conditions

1	**Dust**				
	Suppress dust from face or trench.	×	No dust reduction systems in place		Yes. Due to isolation of property, onerous condition
2	***Burning of Waste***				
	No burning of non-greenwaste	✓	Greenwaste now shredded		
	Fire procedures	✓			
	Report unauthorised fires	✓			
	Fire equipment on site	✓	Fire brigade present		
	Adequate water supply	✓	Fire brigade present		

Water Pollution Control Conditions

1	**Stormwater Management**				
	Direct stormwater away from tipping area	×	Little engineering done on site. Very little rainfall present in area.		Yes
	Stormwater that has come into contact with waste is retained on site	✓			
	Stormwater drains clear of waste	×	No drains present		
2	**Capping of Completed Trenches**				
	300mm clay cap over completed cells	✓	Site located on P3 groundwater area and surrounded by P1 groundwater area Capping undertaken on old cells. Capping of recent cell planned 08/09	Clay cap be installed in future cells	Yes. Negotiate with DEC whether aggregate cap is appropriate
	Stormwater flows away from capped cell to ground or sump free from waste	×			
	700mm of soil suitable for revegetation on clay cap	✓	Good revegetation present on site		
	Report cataloguing date of cap, coordinates of cap, depth of cap, contractor involved, name of person that supervised cap, source of clay, date of revegetation, map of landfill where cap took place	×	No capping undertaken	Submit report to DEC in regards to capping procedure undertaken in compliance with DEC requirements	

		Compliance × / ✓	Comments	Recommendations / Actions	DEC Negotiation Required?
3	**Protection of Ground and Surface Waters**				
	At least 3m between waste and groundwater level	✓			
	100m between filled areas and surface water	✓			
4	**Groundwater Monitoring**				
	Biannual sampling of groundwater bores	×	- Site located on P3 groundwater area and surrounded by P1 groundwater area. - No samples taken	- Commence monitoring of bore on site or enter talks with Water Corporation on use of their bore	Yes. Commence talks with DEC regarding suitability of using Water Corp bore data
5	**Water Quality Criteria**				
	Notify within 24 hours if sample has exceeded levels	-			
6	**Maintenance of Septage Lagoons**		Lined with clay. Evaporation of liquid		
	Stormwater diverted away from lagoons	✓			
	Uncontaminated stormwater shall not enter	✓			
	No overflow (except in extreme event)	✓			
	No vegetation in septage pond	✓			
	Locked 1.8m cyclone fence around perimeter	✓			
	No leakage	✓			

Solid Waste Control Conditions

1	**Disposal of Sludge Materials**				
	Inform prior to desludging	✓			

Northampton Transfer Station

Note: Category 64 - Licence used for assessment (now Category 62 Transfer Station – Application Lodged to DEC). Therefore a number of conditions would not apply.

General Conditions

		Compliance × / ✓	Comments	Recommendations / Actions	DEC Negotiation Required?
1	**Throughput**				
	Overall waste – less than 1,000 tonnes		Recently been turned into transfer station.	Seek Category 62 (Waste Depot) Licence + Category 63 (Inert) for Facility	
2	**Waste Acceptance**				
	Waste accepted: Clean Fill Inert Waste Type 1 Inert Waste Type 2 Putrescible waste				
3	**Clinical Waste**				
	Cover asbestos / clinical waste ASAP with 1m of cover	-	Signage for asbestos (not accepted). No evidence of asbestos disposal.		
	Disposed under supervision	-			
	Register for clinical / asbestos waste	-			
	Plan showing the position of clinical waste (grid references)	-			
4	**Landfill Activities**				
	No waste within 35m of boundary	✓			
	Waste in trench enclosed by bunds	-	Now transfer station		
	Tipping area restricted to 30m	✓			
	Covered fortnightly	-	Now transfer station		
	Sufficient cover material	✓			
	Waste is totally covered	-	Now transfer station		
	Tipping area no greater than 2m in height	✓			
5	**Used Tyres**				
	Where 100 used tyres are to be stored a licence is required	-	Less than 100 tyres. Buried	Commence monofilling of tyres or stockpiling	
6	**Fencing**				
	Maintain a wire stock fence around premises and locked after hours	✓			
	Weekly inspection of fence	×	Periodically		Yes. Onerous condition
7	**Washborne and Wind Blown Waste**				
	Within 50 metres of boundary of active landfill cell	✓			
	Remove litter from fences and road on a monthly basis	×	As required		Yes. Onerous condition. Resourcing issues
8	**Signage**				
	Signage at entrance	✓			
	Hours of operation	×	Days only	Installation of sign with new open days, hours and contact number.	
	Contact number	×			
	List of materials accepted	✓			
	Type of waste that must not be deposited and contact number	✓	No contact number	Installation of sign with directions for HHW and contact number	

		Compliance × / ✓	Comments	Recommendations / Actions	DEC Negotiation Required?
	Warning and penalties of fires	✓			
9	**Monitoring and Reporting**				
	Annual monitoring report (incidences, fires, dust suppression, windblown waste, pests and vermin, complaints, updated site plan, issues during site inspections)	×	Incidences / Fire only at present	Create annual monitoring report template and submit report in December annually.	

Air Pollution Control Conditions

1	**Dust**				
	Suppress dust from face or trench.	-	Now transfer station		
2	**Burning of Waste**				
	No burning of non-greenwaste	✓			
	50 metres from boundary, waste and trees	✓	Fire Brigade in attendance		
	Is at least 500 metres from residences	✓			
	Positioned in an area that has not been used for waste disposal	✓			
	Fire procedures	✓			
	Report unauthorised fires	✓			
	Fire equipment on site	✓			
	Adequate water supply	✓			

Water Pollution Control Conditions

1	**Stormwater Management**				
	Direct stormwater away from tipping area	✓			
	Stormwater that has come into contact with waste is retained on site	-	Now transfer station		
	Stormwater drains clear of waste	-			
2	**Capping of Completed Trenches**				
	300mm clay cap over completed cells	×	Aggregate capping undertaken		Yes. Commence talks with DEC regarding absence of clay cap and aggregate cap substitute
	Stormwater flows away from capped cell to ground or sump free from waste	×			
	700mm of soil suitable for revegetation on clay cap	✓	Good revegetation present on site		
	Report cataloguing date of cap, coordinates of cap, depth of cap, contractor involved, name of person that supervised cap, source of clay, date of revegetation, map of landfill where cap took place	×	Aggregate capping undertaken		
3	**Protection of Ground and Surface Waters**				
	At least 3m between waste and groundwater level	✓			
	100m between filled areas and surface water	✓			
4	**Maintenance of Septage Lagoons**				
	Uncontaminated stormwater shall not enter	-			
	300mm buffer to overflow (except in extreme event)	-			
	No waste other than septage in pond	-			
	No vegetation in septage pond	-			
	No leakage	-			

Solid Waste Control Conditions

1	**Disposal of Sludge Materials**				
	Inform prior to desludging	-			

Port Gregory Landfill

General Conditions

		Compliance × / ✓	Comments	Recommendations / Actions	DEC Negotiation Required?
1	**Throughput**				
	~ 2 tonne		Unmanned, Unrestricted Access	Conversion of Landfill into Transfer Station, Seek Category 62 (Waste Depot) Licence + Category 63 (Inert) for Facility	
2	**Waste Acceptance**				
	Waste accepted: Clean Fill Inert Waste Type 1 Inert Waste Type 2 Putrescible waste		Oil Depot		
3	**Clinical / Asbestos Waste**				
	Cover asbestos / clinical waste ASAP with 1m of cover	-	Signage for asbestos (not accepted). No evidence of asbestos disposal.		
	Disposed under supervision	-			
	Register for clinical / asbestos waste	-			
	Plan showing the position of clinical waste (grid references)	-			
4	**Landfill Activities**				
	No waste within 35m of boundary	✓			
	Waste in trench enclosed by bunds	✓			
	Tipping area restricted to 30m	✓			
	Covered fortnightly	×	Covered when required. Approx every 3-months	Transfer Station (see above)	Yes. Onerous condition with such low volumes of waste disposal
	Sufficient cover material	✓			
	Waste is totally covered	✓			
	Tipping area no greater than 2m in height	✓			
6	**Fencing**				
	Maintain a fence around premises that is an effective barrier to cattle, horses and other stock	✓			
7	**Washborne and Wind Blown Waste**				
	No waste to be washed or blown off site	✓			
	Remove litter on a monthly basis	×	Once a year by prisoners / community service		Yes. Onerous condition with isolated location and low resources

Air Pollution Control Conditions

		Compliance × / ✓	Comments	Recommendations / Actions	DEC Negotiation Required?
1	**Dust**				
	No visible dust escape from the landfill site	✓			
2	**Firebreak**				
	3 metre firebreak around premises	-	Unknown	Investigate	
3	**Burning of Greenwaste**				
	Dry and seasoned for 2 months	-	No stockpiles of greenwaste	- Create greenwaste stockpile to reduce volumes of greenwaste entering landfill. - Create scrap metal stockpile - Install signage	
	50 metres from boundary, waste and trees	-			
	Is at least 500 metres from residences	-			
	Positioned in an area that has not been used for waste disposal	-			
	Fire procedures	-			
	Report unauthorised fires	-			

Water Pollution Control Conditions

1	**Stormwater Management**				
	Direct stormwater away from tipping area	×	Little engineering done on site. Low waste volumes. Very low rainfall. Porous sand		Yes. Onerous condition for small low volume site
	Stormwater that has come into contact with waste is retained on site	✓			
2	**Protection of Ground and Surface Waters**				
	At least 3m between waste and groundwater level	✓			
	100m between filled areas and surface water	✓			

Binnu Landfill

General Conditions

		Compliance × / ✓	Comments	Recommendations / Actions	DEC Negotiation Required?
1	**Throughput**				
	Unknown		Unmanned, Unrestricted Access	Conversion of Landfill into Transfer Station, Seek Category 62 (Waste Depot) Licence + Category 63 (Inert) for Facility	
2	**Waste Acceptance**				
	Waste accepted: Clean Fill Inert Waste Type 1 Inert Waste Type 2 Putrescible waste		Unknown waste deposited. All farmer waste drop off		

		Compliance × / ✓	Comments	Recommendations / Actions	DEC Negotiation Required?
3	**Clinical / Asbestos Waste**				
	Cover asbestos / clinical waste ASAP with 1m of cover	-	Signage for asbestos (not accepted). Unlikely asbestos disposed. Few contractors in town that can remove asbestos		
	Disposed under supervision	-			
	Register for clinical / asbestos waste	-			
	Plan showing the position of clinical waste (grid references)	-			
4	**Landfill Activities**				
	No waste within 35m of boundary	✓			
	Waste in trench enclosed by bunds	✓			
	Tipping area restricted to 30m	✓			
	Covered fortnightly	×	Covered when required. Approx bi-monthly		Yes. Onerous condition with such low volumes of waste disposal
	Sufficient cover material	✓			
	Waste is totally covered	✓			
	Tipping area no greater than 2m in height	✓			
6	**Fencing**				
	Maintain a fence around premises that is effective barriers to cattle, horses and other stock	✓			
7	**Washborne and Wind Blown Waste**				
	No waste to be washed or blown off site	✓			
	Remove litter on a monthly basis	×	Occasionally by prisoners / community service		Yes. Onerous condition with isolated location and low resources

Air Pollution Control Conditions

1	**Dust**				
	No visible dust escape from the landfill site	✓			
2	**Firebreak**				
	3 metre firebreak around premises	?	Unknown	Investigate	
3	**Burning of Greenwaste**				
	Dry and seasoned for 2 months	✓	Every few years	- Create greenwaste stockpile to reduce volumes of greenwaste entering landfill. - Create scrap metal stockpile - Install signage	
	50 metres from boundary, waste and trees	✓			
	Is at least 500 metres from residences	✓			
	Positioned in an area that has not been used for waste disposal	✓			
	Fire procedures	✓	Fire Brigade Present		
	Report unauthorised fires	✓			

Water Pollution Control Conditions

		Compliance × / ✓	Comments	Recommendations / Actions	DEC Negotiation Required?
1	**Stormwater Management**				
	Direct stormwater away from tipping area	×	Little engineering done on site. Low waste volumes. Very low rainfall		Yes. Onerous condition for small low volume site
	Stormwater that has come into contact with waste is retained on site	✓	Very low rainfall		
2	**Protection of Ground and Surface Waters**				
	At least 3m between waste and groundwater level	✓	Located on high point of site		
	100m between filled areas and surface water	✓			

Shire of Geraldton-Greenough

Meru Waste Disposal Facility

General Conditions

		Compliance × / ✓	Comments	Recommendations / Actions	DEC Negotiation Required?
1	**Throughput**				
	Liquid Waste – approx. 5,000 tonnes per annum Compost – 900 tonnes Overall waste – 70,000 tonnes				
2	**Waste Acceptance**				
	Waste accepted: Clean Fill Liquid Waste (to septage ponds) Inert Waste Type 1 Inert Waste Type 2 Putrescible waste Type 1 special waste (asbestos) Type 2 special waste (biomedical) Other waste that comply with Class II criteria		Manned, Weighbridge		
3	**Clinical Waste**				
	Waste transport certificates for three years	×	Held by waste contractor	Obtain waste certificates from contractor	
	Cover clinical waste immediately with 1m of cover	✓			
	Clinical disposed under supervision	✓			
	Register for clinical waste	✓			
	Plan showing the position of clinical waste (grid references)	✓	One area	Develop historic / future plan for entire site	
	Restrict access to the landfill site	✓			
4	**Asbestos Waste**				
	Asbestos wrapped in plastic	✓			
	Plan showing the position of asbestos waste (grid references) greater 1 metre cubed	✓			
	Waste transport certificates for three years	×	Held by waste contractor (Veolia, Batavia Timber Salvage, Geraldton Handy Bins)	Obtain waste certificates	
	Asbestos waste disposed under supervision and covered with 1m of fill	✓			
	Register for asbestos waste	✓			
5	**Landfill Activities**				
	No waste within 35m of boundary	✓			
	Waste in trench enclosed by bunds	✓			
	Tipping area restricted to 30m	×			Yes. Negotiate reasonable tipping area as 30m hard to work with
	Daily 230mm of cover	✓			
	Covered within 24 hours of delivery	✓			

		Compliance × / ✓	Comments	Recommendations / Actions	DEC Negotiation Required?
	Sufficient cover material	✓			
	Spread waste in layers <500m prior compaction (minimum 5 passes with a machine)	✓	35 Tonne waste compactor		
	Exposed face <2m	✓			
	Final soil cover of 1m	✓			
6	**Used Tyres**				
	Shall not store more than 1,000 tyres on premises	✓	Licence to hold 1,000 tyres		
	Stored in windrows	×	Bundles 10		Yes. Negotiate current method of tyre storage
	Disposed in accordance with Regulations	✓			
7	**Fencing**				
	Mesh fence 1.8m high with entrance locked	✓			
	Weekly inspection of fence	✓	Daily		
8	**Washborne and Wind Blown Waste**				
	Within areas of active landfill cell	✓			
	Remove litter from fences and road on a weekly basis	✓	Regular inspections		
9	**Signage**				
	Signage at entrance	✓			
	Contact number	✓			
	List of materials	×		Install signage with material accepted / not accepted	
	Type of waste that must not be deposited and contact number	×	Accept most materials		
	Location of tyre stockpile area	-	Transfer station drop-off		
	Warning and penalties	×	No penalties	Installation of signage warning of penalties	
10	**Monitoring and Reporting**				
	Annual monitoring report (pest control measures, fires, dust suppression measures, litter measures, average compaction rates, records detailing tyres, complaints, updated site plan, issues during site inspections)	✓	Biannual		

Air Pollution Control Conditions

1	**Dust**				
	Suppress dust from face or trench.	✓	Water Truck on site. Large buffers to nearest landuse		
2	**Burning of Waste**				
	No burning of non-greenwaste	✓	Greenwaste mulched / composted		
	Fire procedures	✓			
	Report unauthorised fires	✓			
	Fire equipment on site	✓	Fire brigade present		
	Adequate water supply	✓	Fire brigade present. Planning to sink bore for fire brigade use. Currently tap water from septage ponds (insufficient)		

		Compliance × / ✓	Comments	Recommendations / Actions	DEC Negotiation Required?
3	**Fire Fighting**				
	Fire fighting equipment	✓	Looking to upgrade		
	Tyre fire management strategy	×	No formal report	Draft guidelines	

Water Pollution Control Conditions

1	**Stormwater Management**				
	Uncontaminated stormwater diverted into a sump	×	Likely to pool at bottom of cell. Pumps in place to draw into septage ponds		Yes
	Stormwater drains clear of waste	×	No drains present	Trenching to alleviate problem	
2	**Protection of Ground and Surface Waters**				
	At least 2m between waste and groundwater level	✓			
	100m between filled areas and surface water	✓			
3	**Groundwater Monitoring**				
	Annual sampling of groundwater bores	✓	Biannually		
4	**Maintenance of Septage Lagoons**		Lined with clay. Evaporation of liquid. 2x ponds.		
	Stormwater diverted away from lagoons	✓			
	No overflow (30 centimetre buffer)	✓	One pond reaching capacity		
	No leakage	✓	One pond may need remediation due to possible leakage	Perform investigation and remediation works if necessary	
5	**Liquid Chemical Storage**				
	Store in compound	✓	Removed periodically		
	Graded and sump installed	×	Unknown whether graded	Installation of sump to collect and HHW material	
	Adequately protected (e.g bollards)	×	No protection besides shed	Installation of bollards	
	Separation of reactive chemicals (e.g bund)	×	No separation of chemicals	Allocate areas in shed for HHW types	
	Record of incidences	✓			

Solid Waste Control Conditions

1	**Disposal of Sludge Materials**				
	Inform prior to desludging	✓	DEC already aware of need to desludge		
	Remove accumulated Biosolids from truck wash	✓	Residue landfilled and occasionally composted		

Shire of Irwin

Dongara Transfer Station

Note: Rural landfill Regulations used for assessment (now Category 62 Transfer Station + Inert / Asbestos landfilling). Current Licence unattainable.

General Conditions

		Compliance × / ✓	Comments	Recommendations / Actions	DEC Negotiation Required?
1	**Throughput**				
	Unknown				
2	**Waste Acceptance**				
	Waste accepted: Clean Fill Inert Waste Type 1 Inert Waste Type 2 Putrescible waste Asbestos / Clinical		Waste Oil depot currently closed due to waste oil collection costs	Seek Category 62 (Waste Depot) Licence + Category 63 (Inert) for Facility	
3	**Clinical / Asbestos Waste**				
	Cover asbestos / clinical waste ASAP with 1m of cover	×	Designated area for asbestos disposal. High amount of exposed broken asbestos observed. No clinical waste disposed on site. Sent to Meru	- Greater management required - Importation of fill to completely cover asbestos material and particles - All asbestos to be covered in plastic prior to disposal	
	Disposed under supervision	×		- Attendant always present when material disposed	
	Register for clinical / asbestos waste	×		- Implement register for asbestos waste	
	Plan showing the position of asbestos waste (grid references)	×	General location for disposal	- Develop historic / future plan for entire site	
4	**Landfill Activities**				
	No waste within 35m of boundary	✓			
	Waste in trench enclosed by bunds	-	Now transfer station		
	Tipping area restricted to 30m	-	Now transfer station		
	Covered fortnightly	-	Now transfer station		
	Sufficient cover material	✓			
	Waste is totally covered	×	Some asbestos exposed	- Importation of fill to completely cover asbestos material and particles	
	Tipping area no greater than 2m in height	✓			
5	**Fencing**				
	Maintain a fence around premises that is effective barriers to cattle, horses and other stock	✓			
6	**Washborne and Wind Blown Waste**				
	No waste to be washed or blown off site	✓			
	Remove litter on a monthly basis	✓			

Air Pollution Control Conditions

		Compliance × / ✓	Comments	Recommendations / Actions	DEC Negotiation Required?
1	**Dust**				
	No visible dust escape from the landfill site	✓			
2	**Firebreak**				
	3 metre firebreak around premises	✓			
3	**Burning of Greenwaste**				
	Dry and seasoned for 2 months	✓			
	50 metres from boundary, waste and trees	✓			
	Is at least 500 metres from residences	✓			
	Positioned in an area that has not been used for waste disposal	✓			
	Fire procedures	✓	Fire brigade in attendance		
	Report unauthorised fires	✓			

Water Pollution Control Conditions

1	**Stormwater Management**				
	Direct stormwater away from tipping area	-	Now transfer station		
	Stormwater that has come into contact with waste is retained on site	-	Now transfer station		
2	**Protection of Ground and Surface Waters**				
	At least 3m between waste and groundwater level	✓			
	100m between filled areas and surface water	✓			

Point to Note

1	**Maintenance of Septage Lagoons**		Lined with clay.		Lined with clay.
	Stormwater diverted away from lagoons	-	Unknown		Yes. Inform DEC of septage ponds and enquire of management procedures that should be undertaken
	Uncontaminated stormwater shall not enter	-	Unknown		
	No overflow (except in extreme event)	-	Could be likely. At capacity		
	No vegetation in septage pond	×	High amount of vegetation		
	Locked 1.8m cyclone fence around perimeter	✓			
	No leakage	-	Unknonwn. At capacity		

Shire of Chapman Valley

Nabawa Landfill

General Conditions

		Compliance × / ✓	Comments	Recommendations / Actions	DEC Negotiation Required?
1	**Throughput**				
	Unknown		Manned Sat, Sun, Wed. Closed other days.	Conversion of Landfill into Transfer Station, Seek Category 62 (Waste Depot) Licence + Category 63 (Inert) for Facility	
2	**Waste Acceptance**				
	Waste accepted: Clean Fill Inert Waste Type 1 Inert Waste Type 2 Putrescible waste		Oil Depot at capacity (overflowing)	Restrict access to oil depot until collection	
3	**Clinical / Asbestos Waste**				
	Cover asbestos / clinical waste ASAP with 1m of cover	-	Signage for asbestos (not accepted). No evidence of asbestos disposal.		
	Disposed under supervision	-			
	Register for clinical / asbestos waste	-			
	Plan showing the position of clinical waste (grid references)	-			
4	**Landfill Activities**				
	No waste within 35m of boundary	✓			
	Waste in trench enclosed by bunds	✓			
	Tipping area restricted to 30m	✓			
	Covered fortnightly	×	Covered when required. Approx every 3-months		Yes. Onerous condition with such low volumes of waste disposal
	Sufficient cover material	✓			
	Waste is totally covered	✓			
	Tipping area no greater than 2m in height	×	Height over 5 metres. Dangerous for residents	Construct chain link across tipping area to help prevent falls	
6	**Fencing**				
	Maintain a fence around premises that is effective barriers to cattle, horses and other stock	✓			
7	**Washborne and Wind Blown Waste**				
	No waste to be washed or blown off site	✓			
	Remove litter on a monthly basis	×	Once a year by prisoners / community service		Yes. Onerous condition with isolated location and low resources

Air Pollution Control Conditions

		Compliance × / ✓	Comments	Recommendations / Actions	DEC Negotiation Required?
1	**Dust**				
	No visible dust escape from the landfill site	✓			
2	**Firebreak**				
	3 metre firebreak around premises	✓			
3	**Burning of Greenwaste**				
	Dry and seasoned for 2 months	-	No stockpiles of greenwaste	- Create greenwaste stockpile to reduce volumes of greenwaste entering landfill. - Create scrap metal stockpile - Install signage	
	50 metres from boundary, waste and trees	-			
	Is at least 500 metres from residences	-			
	Positioned in an area that has not been used for waste disposal	-			
	Fire procedures	-			
	Report unauthorised fires	-			

Water Pollution Control Conditions

1	**Stormwater Management**				
	Direct stormwater away from tipping area	×	Little engineering done on site. Low waste volumes. Very low rainfall		Yes. Onerous condition for small low volume site
	Stormwater that has come into contact with waste is retained on site	✓	Very low rainfall		
2	**Protection of Ground and Surface Waters**				
	At least 3m between waste and groundwater level	✓			
	100m between filled areas and surface water	✓			

Yuna Landfill

General Conditions

1	**Throughput**				
	Unknown		Unmanned, unrestricted access, not registered with Dept Planning and Infrastructure (DPI)	Conversion of Landfill into Transfer Station, Conversion of Landfill into Transfer Station, Seek Category 62 (Waste Depot) Licence + Category 63 (Inert) for Facility, Register site with DPI	
2	**Waste Acceptance**				
	Waste accepted: Clean Fill Inert Waste Type 1 Inert Waste Type 2 Putrescible waste		Leakages from oil drums in concrete enclosure, scattered car bodies and bulk material around site	Monitor oil leakage. Cleanup car bodies on-site (if possible) and create scrap metal stockpile for recycling with signage	

		Compliance × / ✓	Comments	Recommendations / Actions	DEC Negotiation Required?
3	**Clinical / Asbestos Waste**				
	Cover asbestos / clinical waste ASAP with 1m of cover	-	Signage for asbestos (not accepted). No evidence of asbestos disposal.		
	Disposed under supervision	-			
	Register for clinical / asbestos waste	-			
	Plan showing the position of clinical waste (grid references)	-			
4	**Landfill Activities**				
	No waste within 35m of boundary	✓			
	Waste in trench enclosed by bunds	✓			
	Tipping area restricted to 30m	✓			
	Covered fortnightly	×	Covered when required. Approx every 4-months		Yes. Onerous condition with such low volumes of waste disposal
	Sufficient cover material	✓			
	Waste is totally covered	✓			
	Tipping area no greater than 2m in height	✓			
6	**Fencing**				
	Maintain a fence around premises that is effective barriers to cattle, horses and other stock	✓			
7	**Washborne and Wind Blown Waste**				
	No waste to be washed or blown off site	✓			
	Remove litter on a monthly basis	×	Once a year by prisoners / community service		Yes. Onerous condition with isolated location and low resources

Air Pollution Control Conditions

1	**Dust**				
	No visible dust escape from the landfill site	✓			
2	**Firebreak**				
	3 metre firebreak around premises	?	Unknown	Investigate	
3	**Burning of Greenwaste**				
	Dry and seasoned for 2 months	-	No coordinated stockpile of greenwaste	- Create greenwaste stockpile to reduce volumes of greenwaste entering landfill. - Create scrap metal stockpile - Install signage	
	50 metres from boundary, waste and trees	-			
	Is at least 500 metres from residences	-			
	Positioned in an area that has not been used for waste disposal	-			
	Fire procedures	-			
	Report unauthorised fires	-			

Water Pollution Control Conditions

		Compliance × / ✓	Comments	Recommendations / Actions	DEC Negotiation Required?
1	**Stormwater Management**				
	Direct stormwater away from tipping area	×	Some pooling in trench from recent rainfall. Low waste volumes.		Yes. Onerous condition for small low volume site
	Stormwater that has come into contact with waste is retained on site	✓	Very low rainfall		
2	**Protection of Ground and Surface Waters**				
	At least 3m between waste and groundwater level	✓			
	100m between filled areas and surface water	✓			

APPENDIX E

WASTE SERVICES DELIVERED IN THE BROC (APRIL 2008)

	Reference		Chapman Valley	Geraldton-Greenough	Irwin	Northampton
Collaboration	1	Are you a single Local Government or part of a Regional Council or a grouping of Local Governments	No	Fully collaborating with other councils in a formal or informal arrangement, including collection, processing, education, joint contracts etc.	Partial collaboration, e.g. taking some material from neighbouring areas, Exporting materials to another council area.	Partial collaboration, e.g. taking some material from neighbouring areas, Exporting materials to another council area.
Kerbside	2A	Container type and size (waste)	MGB	MGB	MGB	MGB
	2B	Container type and size (recycling)	No Service	No Service	No Service	No Service
	2C	Collection frequency (waste)	Weekly	Weekly	Weekly	Weekly
	2D	Collection frequency (recycling)	N/A	N/A	N/A	N/A
	2E	Participation rate (recycling)	N/A	N/A	N/A	N/A
	2F	C&I services	LG or Contractor	LG or Contractor	LG or Contractor	LG or Contractor
Vergeside Collections	3A	Green Waste (GW)	No Service	Yes	No Service	No Service
	3B	Bulk waste	No Service	Yes	No Service	Yes (Kalbarri / Northampton)
Public Place / Event Recycling	4A	Waste Collection	Yes	Yes	Yes	Yes
	4B	Public Place Recycling	No	No	No	No
Drop off centres	5A	Waste Transfer Station	No	Yes	Yes	Yes
	5B	Paper/cardboard	Yes (Nabawa)	Yes	Yes	No
	5C	Glass container	No	No	No	No
	5D	Plastics	Yes (Nabawa - Film)	No	No	No
	5E	Metal (ferrous)	Yes	Yes	Yes	Yes
	5F	Metal (non-ferrous)	Yes	Yes	Yes	Yes
	5G	Aluminium	Yes	Yes	Yes	Yes
	5H	E-waste	No	No	No	No
	5I	Greenwaste	Yes	Yes	Yes	Yes
	5J	Oil	Yes	Yes	Yes	Yes
	5K	Batteries	No	Yes	Yes	Yes
	5L	HHW facility	No	Yes	No	No
Landfill management	6A	Number/Status	More than one, Limited Management	Single well engineered either within area or located in another local government	Single well engineered either within area or located in another local government	More than one, Limited Management
	6B	Operational staff	Yes (Nabawa)	Yes	Yes	Yes (Kalbarri)
	6C	Fenced	Yes	Yes	Yes	Yes
	6D	Lined	No	Yes	No	No
	6E	Data collection	No	Yes	No	No
	6F	Gas recovery	No	No	No	No
Separation/treatment/disposal strategies	7A	Transfer Station(s)	No	Yes	Yes	Yes (Northampton)
	7B	Access to MRF	No	No	No	No
	7C	AWT facility for organics from MSW	No	No	No	No
	7D	Green Waste facility	No	Yes	No	No
Communications / Education	8A	Education centre (or have access to)	No	Yes	Yes	No
	8B	Publications/Flyers	Annual newsletter	Regular, targeted information	Ad-hoc publications	No
	8C	Waste Wise Schools	No	Yes	Yes	Yes
Local Government's own activities	9A	C&D Waste	No	No	No	No
	9B	Green Waste	Yes	Yes	Yes	Yes
	9C	Office Waste	Yes	Yes	No	No
	9D	Data Collection and Reporting	Level Unknown	Level Unknown	Level Unknown	Level Unknown
	9E	Sustainable procurement Policy	No	Yes	No	Yes
Participation in waste management related programmes	10A	DrumMUSTER	Yes	Yes	Yes	Yes
	10B	ChemClear	No	Yes	No	No
	10C	Mobile Muster	Yes	Yes	No	No
	10D	Tidy Towns-sustainable communities	No	No	Yes	No

APPENDIX F

COMMUNITY SEMINAR COMMENTS / IDEAS
COMMUNITY DOCUMENT FEEDBACK

Community Seminar Series

City Geraldton-Greenough / Shire Chapman Valley
17th July 2008 – 6-8pm Geraldton-Greenough Council Chambers

Attendance – Approximately 40-50 people

- Increased Drop-Off Facilities
- Used pays system
- More glass recovery
- More Used Tyres Recovery
- Container Deposit System
- Current Facilities Inadequate
- Not enough facilities (50 kilometres distance is too far)
- Dry cell battery collection
- Back loading of recyclables
- LGA's / community need to take responsibility
- Partner of soil blending company to reduce organics
- Green Globe 21 – BROC to sign up to UN initiative
- Tax Incentives
- Rate Incentives
- More education
- New Survey regarding community attitudes
- Lack of will politically
- Increase rates at landfills
- Non-User Pays System
- Need to look at long term benefits
- Long term problem needs long term effort
- Concerns with Nabawa Landfill
- More transfer stations
- Carbon emissions for transport increasing
- Investigate SW Perth for recycling (e.g Albany)
- Worm farms at shopping centres
- More Policing of household hazardous waste dumping
- Education from children highly beneficial
- Children biggest teachers of all
- Large cost burden and risks to community for recycling
- Feed more waste from small landfills back to Meru (regional centre)
- Increase education for consumer power
- No cost incentive to source separate
- Tip costs should reflect higher costs for mixed material
- Green Stamp – Commercial industries
- Fear of Illegal dumping
- Community event was not well promoted
- Drop Off recycling maps
- Regional LGA's instead of individual LGA's
- Sustainability maps
- Fridge magnets
- Promotion of buying in bulk
- Farmers market
- Support from Council
- Education onf community in composting
- Kerbside recycling trial
- Legislation to recycle

- Frustration in regards to recycling in region
- "Dob in a Dumper" more promoted
- This process is good start for change across region
- Extend recycling collection area to make recycling viable

Shire of Irwin
(18th July 2008 - 6:15pm-7:30pm Council Chambers)

Attendance – Approximately 10 people.

- More E-waste recycling
- More planting of vegetation around landfill
- Aesthetics are important especially encroaching development
- Cockburn Cement – Looking at Used Oil
- Ti-west in Muchea, successfully using used oil
- No burning of greenwaste policy. Creating dissatisfaction
- Limits of markets of compost due to glass
- Looking at compost instead of fertiliser due to fuel prices
- Rabbit netting for windblown waste
- Need approximately 5,000 m^3 to have mobile shredder. Need regional approach
- Kerbside recycling
- User pays system. Weighing system
- Sticker for non-compliance (waste and or recycling in)
- Require short distances for drop off centres to be effective
- Timeframe for recycling has been too slow
- Chipping on site for subdivisions
- Iluka starting to recycle cardboard
- Drop off facilities in the mid term before a MRF
- Past projects have been successful (glass. aluminium) why not now?
- Contractor will benefit with reduction in waste quantities

Shire of Northampton
(16th July 2008 – 5-6pm Sports Centre)

No attendance

Community Document Feedback Period

** To commence early September 2008