

ANNEXURE J.3



INTEGRATED WASTE MANAGEMENT PLAN

MERAUFONG CITY LOCAL MUNICIPALITY

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SECTION A - INTRODUCTION

This first generation Integrated Waste Management Plan (IWMP) to follow was based on the guidelines provided by Department Of Agriculture, Conservation, Environment And Land Affairs Of The Gauteng Provincial Government.

The "Guidelines for the Development of Integrated Waste Management Plans for Local Governments" was supplied in APRIL 2004 and developed by JARROD BALL & ASSOCIATES cc. The IWMP of March 2004 was subsequently changed according to this new guideline.

This first generation document serves as the basis for IWMPs to follow and due to the limited funding available consists of information that was available for the March 2004 IWMP starter document. Furthermore, no Interested and Affected Parties (IAPs) has been consulted during the process as the document serves as the basis for the future work to follow.

A 1 Objectives of IWMPs

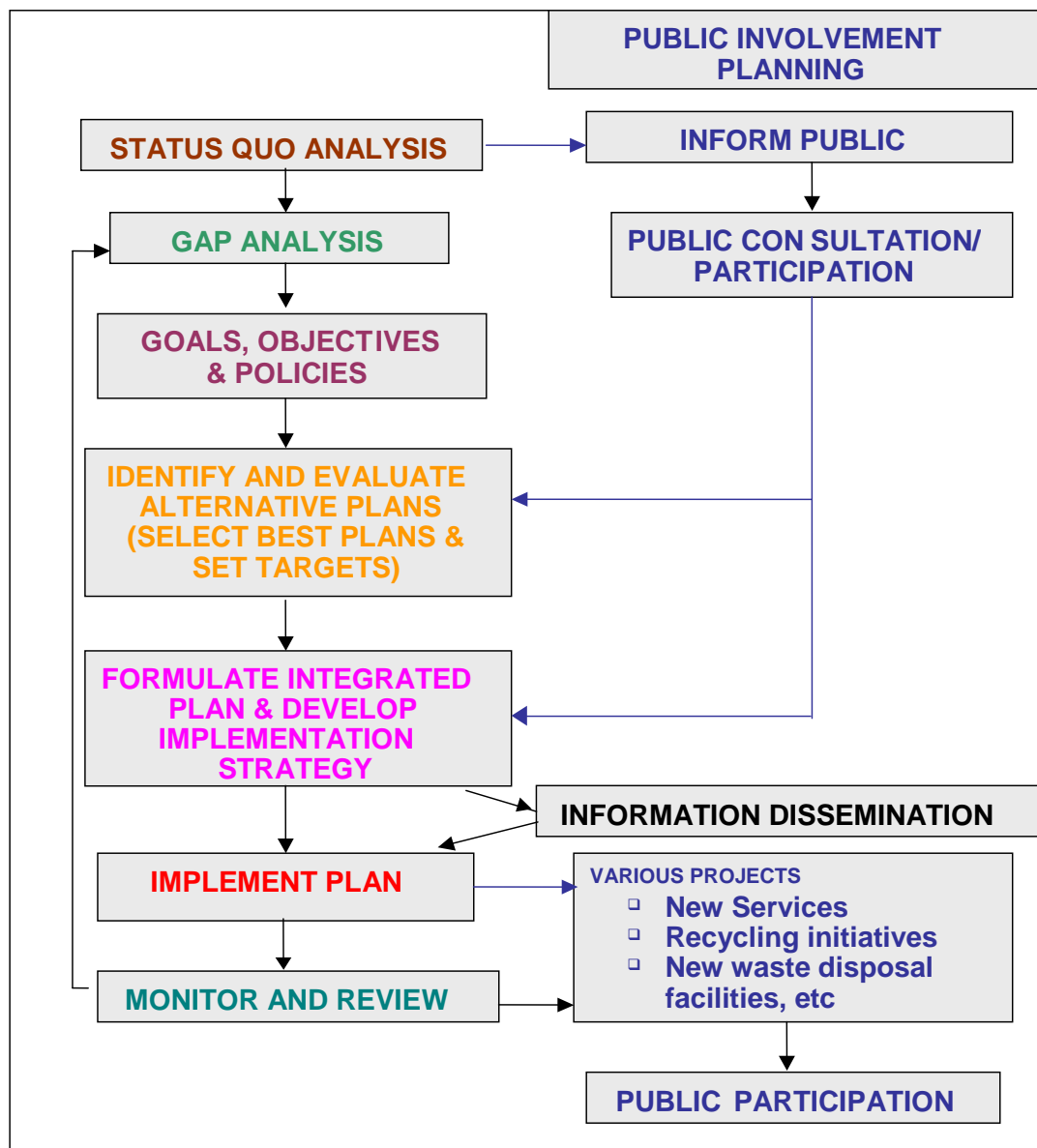
The following are some of the key objectives of IWMPs to integrate general waste management within, and where possible, with services in adjacent municipalities, in order to:

- Identify and plan for future waste management needs and requirements
- Minimise waste management costs by optimising the efficiency of the waste management system in terms of usage of infrastructure, labour and equipment.
- Minimise adverse social and environmental impact related to waste management and thereby improve the quality of life for all citizens.

These should be developed through a process of public participation and in consultation with primarily provincial government. Legal requirements of the IWMP

The development of an IWMP can be broken down into the following major elements:

- Status quo or situation analysis.
- Gap, needs analysis and the development of targets, objectives and policies.
- Development and evaluation of alternatives and scenarios.
- Development of an implementation strategy.
- Monitoring and review.
- Discussion.



Source: "Guidelines For The Development Of Integrated Waste Management Plans For Local Governments" of APRIL 2004

A1.1 Status Quo or Situation Analysis

The status Quo study was, to some degree, conducted by the municipality but does not conform 100% to guidelines. The objective of the *status quo* analysis is to qualify and quantify all aspects related to current waste management services and practices carried out by a municipality. Information collected during this stage will be used as the basis planning.

Information required for the *status quo* are as following:

- Current Legislation and By-laws.
- Geographical waste management area of the municipality.
- Population of the area, growth estimates, densities and the population's socio-economic categories and income levels.
- Development and infrastructure within the municipality.

- Defining waste management and generation areas.
- Types and amounts of general waste.
- Waste generated, collected, recycled, composted and disposed in the municipal area.
- Existing waste management systems and practices
- Organisational structures.
- Costs associated with providing the waste management services.

A1.2 Gap, Needs Analysis And The Development Of Targets, Objectives And Policies

The municipality indicated that a Gap and Needs analysis were conducted however the results were limited to the information provided in the sections to follow. The objective is to address issues, gaps and needs that arise from the status quo analysis in the IWMP. Following this step is the prioritisation of issues, gaps and needs, goals, objectives and finally development of an Integrated Waste Management policy.

When identifying issues, gaps and needs, the short, medium and long-term objectives of the NWMS and the principles of the National Environmental Management Act (NEMA), as well as other legislative requirements, such as the Municipal Systems Act, need to be considered. This guideline suggests a methodology for undertaking a gap and needs analysis.

Gaps and Need identified during the *status quo* analysis could bring forth issues such as:

- Institutional and Organisational.
- Regulatory.
- Social and Socio-economic.
- Technical and Operational.
- Waste Minimisation and Recycling.
- Financial and Economic.
- Information.

SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis could be conducted on issues pertinent to the efficiency and effectiveness on the service.

The gaps and needs identified and prioritised assist in the development of a waste management policy, goals, objectives and targets. The development of the policy framework should include the participation of IAPs to ensure the buy-in and feasibility from these IAPs.

A1.3 Development And Evaluation Of Alternatives And Scenarios

The municipality should expand on the alternatives developed in the sections to follow, as these alternatives were limited to the information available during March 2004. Alternative solutions are developed to assist in achieving the identified goals, objectives and policy statements of the IWMP. Feasible scenarios should be compiled and evaluated in terms of a number of criteria to ensure that the most suitable scenario(s) is selected for implementation for the developed alternatives.

Evaluating tools, as described in this guideline document, could be the:

- Waste flow path analysis.
- Financial analysis.
- Preliminary environmental and social impact assessment.
- Technical feasibility assessment.
- Integrating the evaluations.

Useful summary tables have been developed for the last 4 analyses/assessments indicated above to easily evaluate the various financial, social, environmental and technical criteria and thereby develop final scenarios/strategies.

A1.4 Development Of An Implementation Strategy

The preferred scenario has to be accepted on political level and a strategy should be developed to implement the scenario. This strategy will consist of a various projects, identified in the selected scenario, which will realise the identified objectives and targets.

The implementation strategy should cover the following:

- Person(s) responsible for the organisation, planning and implementation of the IWMP.
- Integration of the IWMP into the IDP.
- IWMP Project Implementation Programme and Public Participation Programme.
- Introduction of partnerships.
- Financing of the various projects within the IWMP.
- Legal aspects such as by-laws and tariff structures.
- Monitoring and Review Programme for the IWMP.

A1.5 Monitoring And Review

Monitoring systems must be put into place to monitor the implementation of the approved IWMP and the performance of the services rendered against agreed upon Key Performance Indicators and that DACEL is supplied with the required information for reporting purposes.

Reviewing and refining of the IWMP will be required as situations and issues change due to the impact of the IWMP.

Performance management is critical in ensuring that:

- Plans are implemented.
- Resources are used efficiently and effectively.
- Implementation is moving towards the desired outcomes.

A 2 Legal requirement of the IWMP

The National Waste Management Strategy (NWMS), which was developed by the National Departments of Environmental Affairs & Tourism (DEAT), and Water Affairs & Forestry (DWAF), requires local authorities to develop their own Integrated Waste Management Plans (IWMPs) for general waste in accordance with the national guidelines.

The NWMS requires the development of Intergrated Waste Management Plans in accordance with the National guideline. The development of such plan was meant to commence in 2001 for submission to provincial government in 2003 for approval. However, due to problems and institutional challenges within the local and national authorities, this was not possible.

A 3 About the professional compiler of the IWMP

The Department of Development Planning and Local Government has appointed PD Naidoo and Associates through the Municipal Institutional Support Centre (MISC) office as a Technical Support Services Provider in the West Rand District Municipality including the local municipalities to develop an Integrated Waste Management Plan.

PD Naidoo and Associates (Pty) Limited (PDNA) is a multidiscipline consulting engineering company with the head office in Johannesburg and twelve branch offices in South Africa and three international branch offices.

PDNA has been involved in numerous institutional development projects and engineering projects of which work in the field of solid waste covers a wide spectrum such as solid waste management system assessments and facility design.

SECTION B - STATUS QUO ANALYSIS

B 1 Legislation and By-laws

The By-law "SOLID WASTE BY-LAWS" compiled by Merafong Local Municipality cover the following main chapters:

- Introduction
- Definitions
- Solid Waste Generation And Storage
- Collection And Removal Of Business And Domestic Waste
- Industrial Waste
- Garden, Special Domestic And Bulky Waste
- Builders Waste
- Special Industrial, Hazardous Or Medical And Infectious Waste
- Mini Disposal Sites And Waste Transfer Stations
- Solid Waste Disposal
- Littering, Dumping And Abandoning Of Waste Material And Waste
- Ancillary Matters
- General Provisions
- Enforcement

- Tariffs And Penalties
- Revocation Of By-Laws
- Complaints

The district uniform By-law must be circulated and accepted by IAPs to ensure all inputs were receive, evaluated and incorporated before the By-law is passed.

B1.1 Current Implementation of the legal requirements

The above mentioned By-law is used to regulate the service.

B1.2 Legislative Requirements

B 1.2.1 Department of Environmental Affairs and Tourism

Environmental Conservation Act, 1989 (Act 73 of 1989)

Section 19 provides that no person may litter. The authority in control of or responsible for the maintenance of any place to which the public has access, must provide containers for litter. The local government must therefore provide containers that are adequate and suitable for discarding litter at places under its control or maintenance.

Section 19A provides for removal of litter. The authority in control or responsible for the maintenance of a place to which the public has access, to remove litter that has been discarded, dumped or left behind at that place. The Local Government will thus be responsible for removal of litter from a place under its control or maintenance, including pavement adjacent to that place or land situated between the place and the street, road or site used by the public to get access to such place.

Section 24A empowers a competent authority to make regulations regarding the control of the dumping of litter, including the removal of litter, placing of containers for the dumping of litter and any other matter necessary to control and prevent littering.

B 1.2.2 Department of Health

Health Act 1977 (Act 63 of 1977)

Section 20 of the Act places an obligation on the local authority to take lawful and responsible practicable measures to maintain its district in a hygienic and clean condition; and

(i) *to prevent occurrences within its district, if:*

- any nuisance*
- any unhygienic condition*
- any offensive condition*
- any other condition which will or could be harmful or dangerous to the health of any person within its district or the district of any other local authority or where nuisance or conditions referred to in sub-paragraph (a) – (d), inclusive has so occurred, to abate or cause to be abated, such nuisance or remedy, or cause to be abated, such nuisance or remedy or cause to be remedied, such condition as the case may be.*

B 1.2.3 Road and Ribbon Development Act, 1940 (Act 21 of 1940)

It regulates the depositing or leaving of disused machinery or refuse near certain public roads. Council may remove the objects, which have been left next to the road in contravention of the Act and recover the cost of the removal from the person who left it there.

B 1.2.4 Local Government Systems Act 2000 (Act 32 of 2000)

Describe how powers and functions allocated to local government must be managed. It does this by establishing principles, mechanism and processes for local government including the way in which power and functions should be exercised, public participation, planning, human resources, development and monitoring of standard setting.

B 1.2.5 Polokwane Declaration (September 2001)

Describes the need to reduce, re-use and recycle waste so as to protect the environment.

B1.3 Adequacy and effectiveness of legislation

Although the legislation exist it is not possible for the municipality to enforce the law until appointments for law enforcement personnel has been made.

B1.4 Policies

B 1.4.1 National policies

National waste management policies exist and should followed as soon as adequate capacity exist within the municipality.

B 1.4.2 West Rand District policies

No policy exist in the West Rand District area for waste management.

B1.5 By-Laws

Municipal By-laws are deemed to be effective, although the manpower is not available to follow it through on the ground. The By-laws has not been updated to cover all the areas under the municipal jurisdiction.

B 2 Demographics

The demographics for the population residing in the area of responsibility are set out in the tables below.

Table B-1: Age group distribution:

YEARS	TOTAL	%
0 – 4	15530	7
5 – 19	38123	19
20 – 29	45905	22
30 – 49	86871	41
50 – 64	16155	8
Overt 65	4345	2
Unknown	2847	1
TOTAL	209776	100

Source: Supplied by Merafong Municipality

The age group distribution indicated that the majority of the population fall within the economic active range.

Table B-2: Ethnic group distribution:

African	Coloured	Asian	White	Unspecified	Total
174005	1444	231	32669	1427	209776

Source: Supplied by Merafong Municipality

The ethnic distribution data was not available during the compilation of this report.

Table B-3: Population growth estimation:

Area	1995	2005	2015	2025
Fochville / Kokozi	24447	25243	23500	21517
Carletonville / Khutsong	175200	185481	178127	167692
Oberholzer	2800	2294	1669	1190
Total	202447	213018	203296	190399

*Source: The Distribution Of South Africa's Population, Economy And Water Usage Into The Long Term Future
Department Of Water Affairs and Forestry Directorate: Water Resources Planning*

The data provided by the municipality seems to be in conflict with the data from the Department Of Water Affairs and Forestry's Water Resources Planning Directorate. The conflicts should be investigated as the population totals and densities are vital for the planning of waste management services. The data obtained from Department Of Water Affairs and Forestry's Water Resources Planning Directorate indicates that Merafong experiences negative population growth and the magisterial area a positive population growth. Therefore services should be planned along the outer suburbs experiencing this incline population.

B2.1 Management area

The municipal jurisdictional area includes the following town areas:

- Carletonville
- Fochville
- Wedela

Merafong City Local Municipality includes the following farms namely:

Table B-4: Farm Names in the Jurisdictional Area:

Farm Areas
Doornfontein 118 IQ
Blyvooruitzicht 116 IQ
Driefontein (117 IQ, 355 IQ, 113 IQ, 117 IQ)
Driefontein 113 IQ
Smalbank 279 IQ
Uitspanning van Wonderfontein 104 IQ
Varkenslaagte 119 IQ and other smaller farms and smallholding areas
Wedela
Stompoorfontein 391 IQ
Boschhoek 393 A
Caribe 417 IQ
Klipdrift 395 IQ
Nooitgedacht 426 IQ and 404 IQ
Kaalplaats 394 IQ
Deelkraal 142 IQ
Buffelsdoorn 143 IQ
Taaiboschspruit 400 & 401 IQ
Rietfontein 398 IQ, 399 IQ, 520 IQ and 519 IQ
Droogheuvel 521 IQ
Wildebeestkuil 360 IQ
Springbokkraal 359 IQ
Weltevreden 356 IQ
Varkfontein 403 IQ
Driefontein 406 IQ
Goedgedacht 408 IQ
Slagterbosch 407 IQ
Rhenosterfontein (560 IQ, 561 IQ, 599 IQ, 563 IQ, 405 IQ)
Doornfontein 522 IQ
Fochville-Kokosi
Greenspark and its surrounding farmsGatsrant (western portion farms)

The municipal area is in the order of 1631,70 km² and renders a service to the following areas:

Table B-5: Service Areas:

AREA	TYPE OF WASTE GENERATED	QUANTITIES OF WASTE GENERATED	
Fochville	Domestic waste Business waste Light industrial waste Garden refuse	Total refuse (m ³)	1325
Kokosi	Domestic waste Ash Garden refuse	Building rubble (m ³)	120
		Garden waste (m ³)	137
Greenspark	Domestic waste Ash Garden refuse	Household waste (m ³)	1068
		Garden services (%)	14
Wedela	Domestic waste Ash Garden refuse	Private (%)	9
		Mass containers (%)	32
		REL (%)	45
		Total Council (%)	77
Carletonville	Domestic waste Business waste Light industrial waste Garden refuse		
Khutsong	Domestic waste Ash Garden refuse		
Blybank	Domestic waste Business waste Light industrial waste Garden refuse	Total refuse (m ³)	9650
Welverdiend	Domestic waste Business waste Light industrial waste Garden refuse	Building rubble (m ³)	350
		Garden waste (m ³)	2100
Elandsrand	Domestic waste Business waste Light industrial waste Garden refuse	Household waste (m ³)	7200
		Garden services (%)	22
Deelkraal	Domestic waste Business waste Light industrial waste Garden refuse	Private (%)	4
		Mass containers (%)	0
Western Deep Levels	Domestic waste Business waste Light industrial waste Garden refuse	REL (%)	74
		Total Council (%)	74

Table B-6: Population and number of household per area:

Area	Population	% of pop	No of Households
Fochville			
Kokosi			
Greenspark			
Wedela			
Carletonville			
Khutsong			
Blybank			
Wilverdiend			
Elandsrand			
Deelkraal			
Western Deep Levels			
Farm Areas			
Totals			100%

Source: Supplied by Merafong Municipality

No data regarding the population in the different suburbs were available during the study and should be collected for zone planning.

The socio-economic information provided by the municipality only assessed the status of 27450 of the 107761 and should be seen as not 100% accurate during the planning process of the IWMP.

Table B-7: Socio-economic income:

	Household Income	Individual Income	% Of Population
None	3 565	68 537	33%
R1 – R2 400	2 418	6 026	3%
R2 401 – R6 000	4 113	11 995	6%
R6 001 – R12 000	4 613	18 781	9%
R12 001 – R18 000	4 240	45 401	22%
R18 001 – R30 000	3 310	14 484	7%
R30 001 – R42 000	1 951	3 776	2%
R42 001 – R54 000	1 609	2 762	1%
R54 001 – R72 000	1 790	2 511	1%
R72 001 – R96 000	1 233	1 279	1%
R96 001 – R132 000	1 019	630	0%
R132 001 – R192 000	518	319	0%
R192 001 – R360 000	328	173	0%
R360 000 +	42	40	0%
Unspecified	8 881	30 425	15%
Not applicable	156	2 637	1%
TOTAL	89 822	209 776	100%

Source: Supplied by Merafong Municipality

The socio-economic standing indicate that 33% of the population currently does not have the financial capability to pay for services, accommodation and education. This is vital to the planning process as these areas will be services without any of the rates being paid. The financial stability of the service is required therefore a plan, programme and scenario may be developed to ensure that the risk is limited.

The following table indicates economical information with regard to employment per industry sector.

Table B-8: Employment per Sector:

Sector	Percentage of total employment
Mining	74%
Private households	5,5%
Trade	4,3%
Social Services	3,8%
NEC	3%
Farming	1,9%
Business Services	1,8%
Manufacturing	1,7%
Construction	1,6%
Transport	1,5%
Unspecified	0,5%
Utilities	0,4%
TOTAL	100%

Source: Supplied by Merafong Municipality

From the table it is clear that mining provides the largest percentage of employment for the area. It is unclear how this percentage will change due changes in the industry and the closing of depleted mines.

B 3 Development and infrastructure

No Spatial Development Strategy was available for Merafong jurisdictional area during the compiling of this report.

B 4 Waste management and generation areas

The Merafong area has a number of waste generation areas of different levels of income and density. The municipality in terms of collection, transportation and cleaning manages waste from these areas.

The number of households located in the municipal area is not know however the population is in the order of 210 000. Income of the residents varies from the zero income to high income as can be seen from the tables in the previous section.

B 5 Types and amounts of general waste

General waste types and quantities recorded and expressed in the table below are that of the waste collected from the entire municipal area. In general the waste types are that of domestic, business, industrial (non-hazardous), garden and building waste.

Records from the Weighbridge, which is in disrepair, were not available during the compilation of this IWMP starter report although some indication could be deducted from the information provided.

Table B-9: Quantity of waste collected by the Municipality:

Quantity of waste collected by the Municipality (tonnes/month)					
Area collected	Domestic	Industrial	Business	Illegal	TOTAL
Fochville					
Kokosi					
Greenspark					
Wedela					
Carletonville					
Khutsong					
Blybank					
Wolverdiend					
Elandsrand					
Deelkraal					
Western Deep Levels					
Farm Areas					

Source: Supplied by Merafong Municipality

The information received from the municipality indicated that a total of ????? t/year of waste were disposed of at the landfill site. This relates to an average generation of ??? t/capita/annum or ??? kg/capita/day.

Table B-10: Summary of general waste types:

Summary of general waste types disposed of at Fochville Landfill site	
Type of general waste	Tonnes/month
Domestic waste	
Clean garden waste	
Business waste	
Industrial waste	
Building waste	
Illegally dumped waste	
Street cleaning waste	
Problematic waste types	
Sub-Total	
Summary of general waste types disposed of at Carletonville Landfill site	
Type of general waste	Tonnes/month
Domestic waste	
Clean garden waste	
Business waste	
Industrial waste	
Building waste	
Illegally dumped waste	
Street cleaning waste	
Problematic waste types	
Sub-Total	
Total	

Source: Supplied by Merafong Municipality

No information was available during the compiling of the starter report.

B 6 Waste generated, collected, recycled, composted and disposed

Table B-11: Area of Service:

Area Serviced
Fochville
Kokosi
Greenspark
Wedela
Carletonville
Khutsong
Blybank
Wolverdiend
Elandsrand
Deelkraal
Western Deep Levels
Farm Areas

Source: Supplied by Municipality

The demarcated area is in the order of 1631,70 km² and the area serviced in the demarcated area is in the order of ??? km² or ??% of the area. It is expected that the majority of the population reside within this ??% of the demarcated area.

B6.1 Per Capita Waste Generation Figures

The low-income groups generally generate less waste per capita than in high-income groups and by using these specific waste profiles waste generation quantities, projections and generation areas can be defined accordingly. However, the lack of detailed information regarding the number of people in these different income areas does not make it possible for such an analysis.

Table B-12: Estimated waste generation for population:

Income level	Population	Waste generation rate	Waste Generation Quantity
Very low			
Low			
Middle			
High			
Very High			
TOTAL domestic waste generated			t/year
			Xxx t/day OR xxx t/month

B6.2 Current Waste Minimisation, Re-use and Recycling Initiatives

No waste minimisation, re-use and recycling activities are currently being pursued.

B6.3 Disposal

The current landfill sites of Fochville and Carletonville was started on the ??? and ??? consecutively. The sites are expected to reach maximum capacity and height in ??? and ???. It is not clear if alternative sites have been identified to succeed the existing two sites. The succeeding landfill sites will need to be investigated and permitted according to the minimum requirements of the Department of Water Affairs and Forestry. This process may take as long as two years to finalise depending on the availability of land and amendments to the minimum requirements and improvement of technology.

B6.4 Landfill site evaluations

GDACEL is required to conducting regular general waste landfill site evaluations, as stipulated in the Constitution, 1996 (Act 108 of 1996). Records of the evaluations and the finds must be kept with the responsible official for reference and measurement of the performance of the facilities. No evaluation information was available during the compiling of the report.

The site however needs to be evaluated according to:

- Environmental performance
- Access
- State of equipment and facilities
- Site management and administration
- Human and environmental health risk
- Compliance with the permit condition and relevant provisions of the Minimum Requirements.
- Reclaiming or salvaging
- Hazardous waste
- Waste loads and daily activities at the landfill site
- Operation Plan

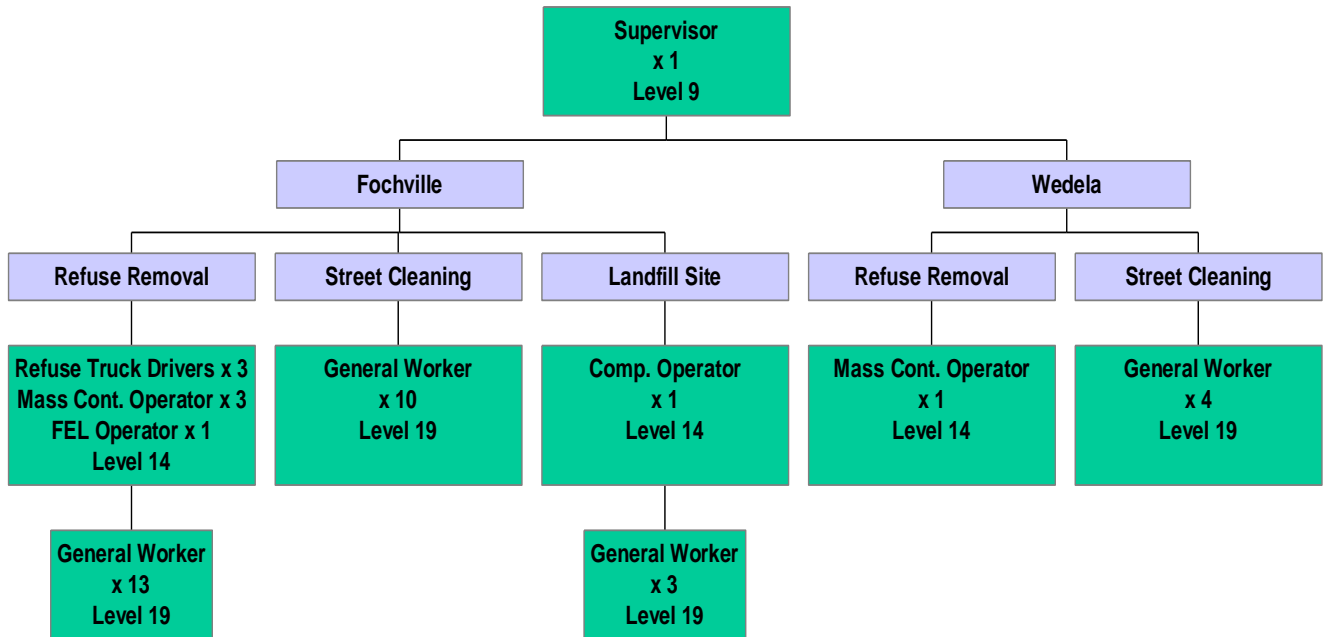
B 7 Existing waste management systems and practices

The Council is in the process of detailed unit design that is intended to be complete by the end of June 2004. Until then very little detail was available the intended management structure and administration.

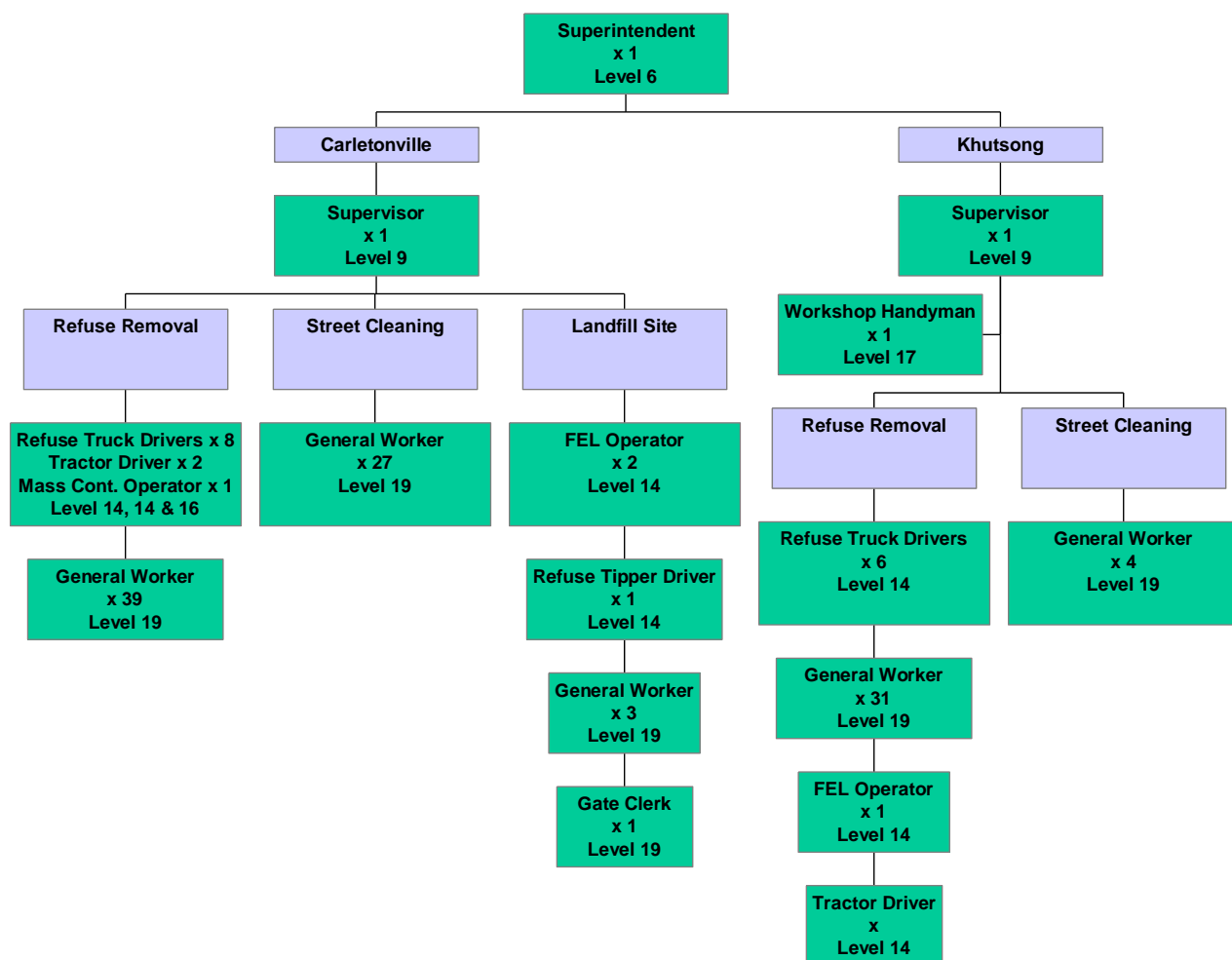
B7.1 Organisational Structure

Currently personnel from other functions are taking responsibility for the management of the service. The organigram should be completed as soon as the internal management arrangements and appointments have been concluded.

B 7.1.1 Fochville/Wedela



B 7.1.2 Carletonville/Khutsong



Source: Supplied by Merafong Municipality

B7.2 Collection and Cleansing Services

Litter picking is done on a day-to-day basis in the areas most prone to litter. Labourers with carts, brooms and spades render the service. The refuse trucks then collect the litter during overlapping or arraignment. Financial assistance is received from Gauteng Province to assist with the cost implications. The financial assistance only maintains the litter picking service costs associated with Town and Ward areas. Other areas do not receive the service on regular basis.

Street cleaning service is limited to the CBD area. A supplementary service is rendered by the provincially funded initiative (Zivuseni). Additional staff from this initiative renders a litter picking as well as general cleaning service outside the CBD areas where and when required.

During the time this report was compiled the staff of Merafong waste management consisted of the following:

Total approved posts	-	53
Total filled posts	-	37
Total vacant posts	-	16

Weekly collection programme and time spend per service round for areas of responsibility can be found in the table to follow:

Table B-13: Weekly collection programme:

Day	Area
Monday:	
Tuesday:	
Wednesday:	
Thursday:	
Friday:	
Saturdays & Sundays	

B7.3 Storage Containers

Types of containers used in the Merafong jurisdictional area consist of the following:

- Residential premises uses 85P PVC black refuse bags
- Business premises uses 85P PVC containers & 1,75m³ mini mass containers
- Containers for supplementary and special services:
 - 3m³ mass containers
 - 4m³ mass containers
 - 6m³ mass containers
 - 30m³ roll-on mass containers
 - street pole refuse bins – street cleansing
 - concrete litter bins – street cleansing

The type of containers used in the different collection areas can be found in the table below:

Table B-14: Types of Storage Containers:

Type of Storage Containers	
Collection Area	Type of containers
Fochville	85P PVC black refuse bags
Fochville Businesses	85P PVC black refuse bags and 1,75m ³ mini mass containers
Kokosi	85P PVC black refuse bags
Greenspark	85P PVC black refuse bags
Wedela	85P PVC black refuse bags
Carletonville	85P PVC black refuse bags
Khutsong	85P PVC black refuse bags
Blybank	85P PVC black refuse bags
Welverdiend	85P PVC black refuse bags
Elandsrand	85P PVC black refuse bags
Deelkraal	85P PVC black refuse bags
Western Deep Levels	85P PVC black refuse bags
Farm Areas	85P PVC black refuse bags

The above table needs to be updated to ensure that the latest situation is taken into consideration during the development of the scenarios.

B7.4 Transportation and Transfer

Information in this regard were limited although a report is being compiled by the municipality to buy or rent refuse trucks and other equipment required to render the service to an acceptable level.

It is unclear what the round trip distance is as this type of records was not kept or made available. However, the reporting team made the following general assessment:

Table B-15: Estimated round trip distances:

Estimated round trip distances (km)		
Collection Area	Fochville	Carletonville
Fochville	7.2	49
Fochville Businesses	8.9	51
Kokosi	5.8	55
Greenspark	12.1	53
Wedela	38.6	60
Carletonville	39	12
Khutsong	64	30
Blybank	54	13
Wolverdiend	66	32
Elandsrand	42	34
Deelkraal	42	56
Western Deep Levels	26	32
Farm Areas	??	??

Average distances travelled per round trip ranges from 66 kilometres (for Wolverdiend area) to 5.8 kilometres (for Kokosi area). The time to travel these round trip distances at an average speed of 26km/hr is in the order of 152 and 13 minutes respectively. Therefore it is estimated that the collection vehicles will be able to do 3 to 36 round trips per day. These are estimations and should be verified for proper collection route planning and workload distribution. It is clear that it will not be economical to travel the 66km round trip from Wolverdiend to the Fochville landfill site if the Carletonville landfill site is 32km per round trip. The collection and disposal of waste from different locations of the Western Deep Levels properties is location dependant. The above distance information will form the basis for the completion of Table B-17 below.

Table B-16: Equipment used for the service of waste management:

Collection Equipment				
Collection Vehicle Type	Number	Status	Age [years]	Comment
Refuse Tractors				
Light Delivery Vehicle				
Grabs				
Front End Loaders				
Rear End Loaders				
Tipper Trucks				
Refuse tipper				
Bulldozer				

No further information was available regarding the status or age of the equipment.

Table B-17: Summary of waste quantities, characteristics and practices:

No information was available regarding the current waste quantity distribution.

B7.5 Types of waste services

B 7.5.1 Domestic waste

Little detail information regarding the quantity and generation rated during the year was available or has been recorded by the municipality. The number of residential stands recorded by the municipality is 89 822 with the total number of service points unknown. It can be assumed that in the order of 28kg/point/week could be collected per week from these points. This indicated a total of 2515 tonnes/week for the 89 822 points or 10928 tonnes/month.

Records from the landfill sites indicate that 2894 tonnes/week or 12574 tonnes/month has been received on average for the domestic type. These figures correspond with the expected generation quantities.

Summary of waste quantities, characteristics and practices									
Waste generation Area	Service points	Waste type	Waste removed daily	Rounds/ Day/ Vehicle	Distance per round	Distance to disposal site	Approximate time per round (hours)	Number of crew/vehicle	Frequency of collection
Fochville									
Fochville Businesses									
Kokosi									
Greenspark									
Wedela									
Carletonville									
Khutsong									
Blybank									
Wolverdiend									
Elandsrand									
Deelkraal									
Western Deep Levels									
Farm Areas									
Totals									

B 7.5.2 Business waste

Detail records are not available thus it is not possible to assume a waste production rate and it is recommended that detail investigation be required to determine the type of waste generated and disposal of such waste.

B 7.5.3 Industrial waste

Detail records are not available thus it is not possible to assume a waste production rate and it is recommended that detail investigation be required to determine the type of waste generated and disposal of such waste.

The type of waste generated is extremely important, as the generation of hazardous waste is to be expected.

B 7.5.4 Garden waste

Garden waste was recorded at the sites as 137m³/month and 2100m³/month for the Fochville and Carletonville landfill sites respectively.

B 7.5.5 Building waste

Building rubble disposed of at the sites was recorded as 120m³/month and 350m³/month for the Fochville and Carletonville landfill sites respectively.

B 7.5.6 Illegal dumping

Refuse are dumped illegally, mainly on open and vacant stands within the CBD areas as well as in residential areas. Supplementary mass container service is rendered in an effort to minimize the illegal dumping of refuse. Approximately 32% of refuse disposed at the landfill sites can be allowed for as illegally dumped refuse and includes the mass container services.

The illegally dumped waste, which is not removed by means of a mass container service are removed by making use of tractor and trailer, the tippers and supported by the Front End Loader.

B 7.5.7 Street cleaning

The street cleaning service only extends to the CBD area with a supplementary service rendered by a provincially funded initiative (Zivuseni). This initiative includes litter picking and general cleaning outside of the CBD areas depending on the building up of litter.

Presently the staff complement for street cleansing (excluding Zivuseni) is as follows:

Total approved posts	-	53
Total filled posts	-	37
Total vacant posts	-	16

B7.6 Disposal System

All general waste collected by the collection vehicles and street cleaning are disposed of at the two waste disposal sites (Fochville and Carletonville). No other facilities exist within the area of Jurisdiction and it is unclear where any Hazardous or de-listed waste from the area will be dumped.

The two sites are located near Fochville and Carletonville and managed by personnel of the waste management services. Waste collection and private vehicles enter the site with a basic record kept by the gate operator. Other activities on the landfill sites were not evaluated, as part of the starter document however should be investigated as part of the scenario evaluation.

B 7.6.1 Availability of covers and closure material

It was indicated that cover material is in abundance for the life of the landfill sites.

B 7.6.2 Equipment needs for operations

The municipality indicated that the Fochville landfill requires a proper landfill compactor as the current bulldozer is constantly under maintenance. The equipment at the Carletonville landfill site is adequate and in good order. However, no maintenance and replacement programme was available during the compiling of this starter report.

B 7.6.3 Closure

Currently it is unclear what the closer requirements will be for the two sites and if the sites will have a secondary end-use. Closure plans are part of the permitting process and will be required to be developed as part of the landfill site management.

B7.7 Current waste minimisation

No current waste minimisation system or initiative was in place during the compiling and collection of information for this report. The municipality supports and encourages efforts of waste prevention and minimization at source

B7.8 Re-use

No current re-use system or initiative was in place during the compiling and collection of information for this report.

B7.9 Recycling Initiatives

The municipality encourages recycling, however no budget has been allocated to any recycling programmes. Presently recycling is carried out on both the landfill sites with the quantities and types of recycled material not clear. A handful of business together with private companies actively separate waste at the source with subsequent removal of the material. The quantities and type is not available, as the businesses and companies keep no record.

B 8 Costs of waste management services

The costs to render the service have salaries, contractors and transport as the largest expenses as can be seen from this section.

B8.1 Personnel Costs

Salaries make up for 32% of the personnel cost of which street cleaning form part of the expenses.

B8.2 Administration Costs

It is not clear from the information provided what portion of the total budget is directed to administration or if the administration costs is covered from another source.

B8.3 Rental Costs

Vehicles are leased at an annual cost of R850 000-00 being 9% of the total budget of R9, 074 313-00 per annum.

B8.4 Sundry Expenses

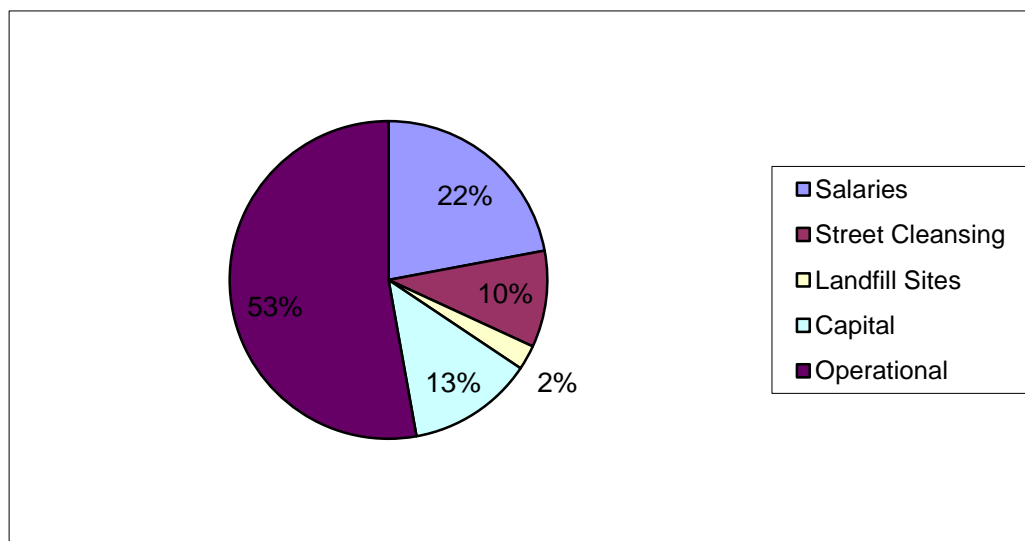
The various expenses consist of 65% towards paying of private contractors and 32% for vehicle charges.

B8.5 Overall Budget

The above highlighted expenses can be expressed in terms of a the chart below:

Table B-18: Expenses for Rendering the Service:

Expense	Annual cost	Percentage
Salaries		
Carletonville	R 3,146,357.00	10%
Khutsong	R 2,343,800.00	8%
Fochville/Kokosi/Wedela	R 1,289,598.00	4%
Street Cleansing		
Carletonville	R 1,543,235.00	5%
Khutsong	R 690,462.00	2%
Fochville/Kokosi/Wedela	R 790,803.00	3%
Landfill Sites		
Carletonville	R 451,630.00	1%
Fochville	R 321,929.00	1%
Capital		
Capital expenditure	R 659,900.00	2%
Capital items financed through leases	R 3,275,500.00	11%
Operational		
Refuse removal	R 12,243,618.00	40%
Street cleansing	R 2,344,294.00	8%
Landfill sites	R 1,659,749.00	5%
Total	R 30,760,875.00	100%



The number of possible service points in the area of responsibility is unknown however the municipality has indicated that the number of households is in the order of 89 822. The conclusion can be made that 4 people reside on average per service point. Furthermore that a tariff of R 342.46/service point is required per annum to breakeven. However the budget does not allow for the cost associated with replacement of equipment or expansion of the service to none paying areas. These issues and financial management of the service should be investigated in greater detail.

B8.6 Records required for detail Cost Breakdown

In order to perform the first generation IWMP a detail cost breakdown will be required. This involves the separation of costs relating to the different services provided in terms of the overhead costs and income per service area. The evaluation of the costs breakdown will highlight any discrepancies and cross subsidisation to be taken into account during the scenario development.

SECTION C - GAP AND NEEDS ASSESSMENT, SWOT, TARGETS, OBJECTIVES AND POLICIES

C 1 Gaps and needs from the Status Quo Analysis

During the *Status Quo* Analysis a number of gaps and needs were identified and covered in the sections to follow.

C1.1 Institutional and Organisational

The municipality seems to have adequate staff and resources to manage the waste services in the area of jurisdiction. The personnel require training in software and other aspects to further improve their skills.

Furthermore, there is a demand for decision-making information. This is mainly, due to the problems motioned, as well as the lack of information systems that allow for the quick and defined access of information.

C1.2 Regulatory

The regulations on National level are adequate and kept up to date with current waste management demands and challenges. On municipal level the current By-laws is in place but require enforcement to ensure that the regulations is used to protect the public health and the environment.

C1.3 Socio-economic

The data obtained from the IDP should be verified and supplemented for the above sections for which information is not available. A large majority of the residents is living in poverty and does not have the means to pay for services. Little information is available on the financial status of waste management and collection of rates. Detail regarding the socio-economic situation will be required during the evaluation of scenarios.

C1.4 Technical and Operational

No information was available on the current status of the equipment used for the service of waste collection and management. The information should be collected and compiled into a report by the municipality.

C1.5 Waste Minimisation and Recycling

Currently there is no capacity or expertise within the municipality to develop and drive waste minimisation and recycling initiatives. Very little activity in this regard has been recorded or reported for private initiatives. This is the aspect that will require the most attention as soon as waste management systems are in place to monitor the areas and types of waste generated within the area of jurisdiction.

C1.6 Financial and Economic

Detail information is not available for the financial status. Information systems are not geared to provide detail to the required extent. Therefore a clear need exists to improve on the systems and generate monthly reports on the cost and income of the service. Training in operating these systems forms part of the need and will improve decision making significantly.

C1.7 Social

Input from the communities and their representation regarding the development and improvement of the service has been invited and taken into consideration on several occasions. However, it is not clear if the community is educated in any of the on site waste management aspects or the importance of rate payment.

C 2 SWOT Analysis

In order to categorise the needs within the municipality a SWOT analysis was done the information provided by the municipality. The results of the analysis should be taken into consideration during the compiling of the IWMP and alternatives.

C2.1 Strength

The strong points are limited to the following:

- Existing functional collection service.
- Manpower & Equipment not suitable for work required.
- Municipal landfill site with adequate airspace for the next 10 years.
- Garden, Building Rubble and Septic tank Services are not rendered.
- Collection equipment in working order.
- Call centre for the logging of problems with the service.
- By-laws that address the current needs and provide a basis for waste management regulation.

C2.2 Weakness

Insufficient resources such as the following can be seen as weaknesses:

- Lack of a vehicle replacement Policy.
- Waste Management Services not rendered in the Agricultural Holdings and Newly Demarcated Areas.
- No Recycling Plan in place for the landfill sites or at source.
- No accurate measurement of the waste entering the landfill site.
- No scientific research programme is in place on Waste Management in the Merafong area.

C2.3 Opportunities

The opportunities within the area consist of:

- Improving the participation of the industrial and mining sector.
- Improving the awareness of the community and increase the involvement of the community through well structured and managed programmes.
- Funds available for maintenance of vehicles.
- Contracting out of the landfill site management.
- Development of a regional landfill site in the municipal jurisdictional area.
- Make use of a mobile scale to obtain more accurate tonnages.
- Integrated Waste Management to be coordinated by the District to enhance uniformity.

C2.4 Threats

Threats have been identified as being:

- Culture of non-payment of rates halts the financial viability of the service.
- Management of the waste site not according to legislation and guidelines.
- Hazardous waste entering the landfill site and polluting the groundwater.
- Waste minimisation program not implemented and national objectives not met.
- Total breakdown of service due to a lack of resources such as funds and manpower.
- Informal housing on landfill site.
- Scavengers on the landfill site creating a security problem and liability for the management of the site.

SECTION D - DEVELOPMENT AND EVALUATION OF ALTERNATIVES AND SCENARIOS

D 1 Development and Evaluation of Alternatives and Scenarios

The development and evaluation of alternatives and scenarios are the most critical step in the development of IWMP, as the municipality will focus on plans as part of the efficient and effective management of the service. The detail of the alternatives and scenarios will be developed during the first generation IWMP.

D1.1 Alternatives and scenarios

The following alternatives and scenarios may be investigated for the Merafong Municipality:

D 1.1.1 Maintain the Status Quo

The status quo situation could be maintained as a possible alternative, however a detail investigation as part of the first generation IWMP will highlight the reasons why this is feasible or not.

D 1.1.2 Development of a regional landfill site

The alternative has the objective to reduce the cost of developing a number of landfill sites, which is extremely expensive as all the investigations, specialist and construction costs has to be carried. The one regional site as opposed to a number of sites will carry the operational costs.

This alternative may have a number of scenarios of which the practical and financial considerations will eliminate most of the scenarios. The possible scenarios could be:

- Development of a general regional landfill site.
- Development of a co-disposal regional landfill site.
- Development of large provincial landfill site near major roads or railway lines.
- Include energy harvesting under the carbon credit system as funding for the development of the landfill site.

D 1.1.3 Minimise waste generation to extend the life of the landfill site

This alternative has the objective to reduce generation of waste in the area of jurisdiction to such an extent that the current landfill site will have a longer life. Waste recycling, re-use or recovery can achieve the reduction of waste generation goals and objectives.

This alternative may have a number of scenarios of which the practical and financial considerations will eliminate most of the scenarios. The possible scenarios could be:

- Massive drive to increase the awareness of waste minimisation.
- Employ a workforce to assist public and industry to minimize waste.
- Amend the By-law to enforce waste minimisation and therefore place the responsibility entirely on the waste generator.
- Investigate waste incineration and the relevant costs.
- Investigate the exporting of waste to regional landfill sites.

D 1.1.4 Partial to full involvement of contractors to render the service

The alternative will investigate the practical and financial considerations to eliminate the challenges associated with the service. The possible scenarios could be:

- Appoint a waste minimisation contractor.
- Appoint a waste collection contractor.
- Appoint a waste transfer contractor.
- Appoint a waste administration and logistics contractor.
- Appoint a waste landfill management contractor.
- Appoint a waste management contractor for all functions associated with the service.

D1.2 Ranking of Alternatives and Scenarios

The ranking process will be required to assist in the selection of the alternative and scenario that best serves the goals and objectives of waste management services. The ranking system must be uniform for the district to assist in the overall evaluation of a district approach. It is expected that the alternatives and scenarios will differ slightly in format for each of the municipalities in the district area. The ranking results will differ considerably as this is area dependent.

D1.3 Selection of best Alternatives and Scenarios

The alternative and scenario that best suites the municipality will be selected according to the ranking system. The selection will also be evaluated in terms of the other municipal areas within the district to ensure a focused and common drive by the district.

SECTION E - IMPLEMENTATION STRATEGY

E 1 Implementation Strategy

Once the preferred scenario has been accepted at political level, a strategy to develop and implement the IWMP should be drafted. The implementation strategy will have short, medium and long-term target dates that have to be met in line with the set targets.

The Implementation Strategy should describe

- Responsibility for the organisation, planning and implementation of the IWMP.
- How the IWMP will be integrated into IDP.
- The IWMP project implementation programme.
- The Public Participation programme.
- The financing of various projects within the IWMP (Financial Management).
- Legal aspects, such as the revision and development of new by-laws.
- Changes to the tariff structure.
- A monitoring and review programme for the IWMP.

E1.1 Responsibilities and Organisational structure

The responsibilities and milestones must be clear and the responsible persons must be totally informed of their role in the process.

E1.2 Integration into IDP

All aspects of the completed IWMP must be incorporated into the IDP development process to ensure transparency on all levels.

E1.3 IWMP project programme

In order to measure achievement and set milestones for activities a programme must be developed for the IWMP as a management tool and guidance to the implementation team.

E1.4 Public participation programme

This is one of the aspects that will require the team to dedicate considerable time and effort to ensuring the success of the IWMP. The interested and effected parties will provide support to the process if they were part of the development of the IWMP.

E1.5 Waste management By-laws

The By-laws will be changed to incorporate any regulatory changes as support to achieve the IWMP goals and objectives.

SECTION F - IMPLEMENTATION MONITORING

F 1 Monitoring System

F1.1 Monitoring

Municipal systems Act makes provision for provincial and national monitoring and standard setting. The objective of this is to ensure that non-performances and misadministration at local municipal level is identified and addressed. The management system of the municipality should therefore be performance outcome based. Key Performance Indicators (KPI's) will have to be developed and performance targets be set. This will enable municipality to do self-evaluation and continuous improvement.

Performance monitoring, measuring and review are inter-related activities which provides different levels of analysis. In terms of principles of Total Quality Management (TQM), an important aspect when implementing the IWMP should be to monitor and review various aspects of the plan so that adjustment can be made to the plan.

The objectives of monitoring is to:

- Ensure that implementation of the IWMP is on track, within the time period allocated, that objectives are being met and that adjustments and requirements can be made where required.
- Continuously improve the quality of services rendered.
- Identify needs and problems that needs to be addressed.
- Fulfil the monitoring requirements as may be improved in terms of provision of applicable legislation.
- Fulfil the information needs of the public.

Monitoring is essential for strategic planning, performance assessment, both technical and financial compliance monitoring and public accountability.

Monitoring activities will include:

- Volumes and rates of waste generated, recycled and disposed.
- Collection services.
- Recycling and composting initiatives.
- Illegal dumping and littering.
- Effectiveness of legislation, regulations, ordinances and/or by-laws.
- Complaints received regarding poor waste management.
- Communities' perceptions and opinions of level of service as well as waste management in general (number of recycling receptacles/garden sites, education, willingness to pay, etc.).
- Management and control of salvaging at landfill sites.
- Compliance of landfill sites to permit condition, RODs, etc.
- Finances, such as expenditure and income, payment for services, and recovery of costs, unit costs, etc.

KPI's will be developed for each program and for an overall performance of the plan.

An annual report should be compiled and sent to DACEL as part of information requirements on the level of execution and sustainability of the IWMP.

F1.2 Review

The objective of reviewing the IWMP and its implementation is to ensure its continuing sustainability, adequacy and effectiveness. The review will be submitted to Council and Dacel and should be made available to the public.

Because the implementation of IWMP will take a number of years to complete, partial reviewing and updating of certain areas will be adequate. The IWMP will be reviewed in full every 5 years in line with planning time period.

F1.3 Continuous improvement

Continuous improvement of the IWMP, goals and objectives will be ensure that the service keeps in line with norms and standards and the opportunities to render the service efficiently and effectively are not missed.

SECTION G - CONCLUSIONS AND RECOMMENDATIONS

G 1 Conclusions

From the report the following conclusion can be made:

- The municipality of Merafong has sufficient capacity to manage the service to an effective and efficient level.
- Additional capacity is required to implement future IWMP initiatives.
- The collection activities require a detail study to optimise the service.
- Detail records are not kept or are not easily accessible to decision makers.
- Electronic documentation and waste information databases lack in the Solid Waste Management services.

G 2 Recommendations

From the report the following recommendations can be made:

- All future IWMP initiatives should be developed and managed by waste management personnel and management.
- Investigate all waste generation and management activities.
- Assess and capture all information regarding the generation and handling of waste in the jurisdictional area.
- Develop and manage a database system that will provide critical decision-making information at any point in time.
- With all systems and personnel in place conduct the first generation IWMP investigation and develop plans to satisfy local, regional and national level requirements.

SECTION H - REFERENCES

- DACEL Guidelines For The Development Of Integrated Waste Management Plans For Local Governments, April 2004
- Department Water Affairs and Forestry, Minimum Requirements
- City of Tshwane Metropolitan Municipality, Solid Waste By-Laws