15th March 2011

MUNICIPAL WASTE MANAGEMENT FACILITY: UPPF PROJECT PREPARATION TOOLKIT

Notes and Disclaimer:

1) *Whilst these toolkits have been made available by UPPF for external consumption, including use in support of the CIDB's 'Gateway' process for preparing infrastructure projects, it is emphasized that these toolkits are a work-in-progress and should not be used in a prescriptive fashion. UPPF will update these toolkits from time to time based on experience gained in preparing specific projects. Any suggestions for improvements or refinements should be emailed to UPPF / PPT for the attention of the National Co-ordinator on pptrust@worldonline.co.za*
2) *With respect to cost norms and professional rates, it is recognized that these will vary depending on such factors as locality, project complexity, level of experience, and local skills scarcities. The rates and cost norms provided should therefore be regarded as an indicative guideline only.*
3) *Municipalities or Government Departments may find these toolkits useful in: a) determining the main risk factors associated with a particular project; b) benchmarking budgetary requirements for project preparation; c) issuing RFP's or tenders for project preparation; d) determining whether professional work rendered meets an appropriate specification.*
4) *UPPF preparation managers must refer to UPPF's internal UPPF Standard Operating Procedures including; Preparation Flow Chart; Detailed Project Preparation Methodology; specimen letters of appointment for professionals; specimen RFP's for procurement.*
5) *UPPF is a joint venture between Project Preparation Trust of KZN (PPT) and the Infrastructure Finance Company Ltd (INCA). It was established through the Support Programme for Accelerated Infrastructure Delivery (SPAID) with funding provided by the Business Trust. UPPF's core business is to assist Municipalities in preparing a range of infrastructure projects and to thereby assist in addressing service delivery backlogs.*

CONTENTS:

ANNEXURES:

SECTION A: GENERAL INFORMATION

A. Targeted Funder: Municipal funding for waste management infrastructure has traditionally trailed significantly behind funding for water and sanitation infrastructure. With the publication of the National Environmental Management: Waste Act, 2008, and the pending National Waste Management Strategy, more emphasis is to be placed on waste management in the context of service delivery. This is to take the form of waste avoidance, minimisation, recycling etc. to reduce waste firstly from being generated, and then lastly reducing the waste to landfill. This may result in additional waste management infrastructure requiring capital investment, for example waste transfer stations, materials recycling facilities, waste treatment facilities, and landfill sites.

The Act requires these waste management activities to be licensed, and must be designed and operated such that they do not adversely affect the environment (biophysical, economic, social and cultural).

Targeted funding may include Municipal Infrastructure Grant (MIG), provincial environmental department grant funding, loan funding, and Municipal funding. As such projects are rarely income generating, loan funding may be difficult to obtain. The most common form of targeted funding is likely to be MIG or provincial funding, with counter funding required by the Municipality through its own capital budget.

It must be noted that MIG funding is available only in proportion to the number of poor people being served by the facility, and should be within guideline service delivery levels and unit costs as presented by the Industry Guide: Infrastructure Service Delivery Levels and Unit Costs -2010 Version 6.0 (see http://www.thedplg.gov.za/subwebsites/mig/index.html)

B. Flow Chart: A detailed flow chart for the MIG process is presented on page 32 the attached MIG Booklet (**Annexure A**)

C. Funder Requirements:

i. Formats and Documentary Requirements:
MIG has detailed guidelines on processes, procedures (see MIG Booklet in **Annexure A**), levels of service and unit costs (e.g. Solid Waste Disposal Site refer to Table 86, page 137, the Industry Guide: Infrastructure Service Delivery Levels and Unit Costs)

MIG require a MIG 1 Project Registration Form to be completed and submitted via the internet based Management Information System (see http://www.mig.dplg.gov.za). This would normally be done by the Municipality, but if undertaken by the service provider the Municipality would need to authorise access by supplying their user name and password.

ii. *Requirements for Approval:*
The MIG 1 Project Registration Form must be approved by the municipal council and the municipal manager prior to submission to the Provincial MIG Management Unit (PMMU). Depending on the proposed project, the feasibility study is required to be approved by the relevant authorities (DEA and/or DWA) prior to PMMU approving the project registration.

iii. *Formats and Documentary Requirements for Funding Approval:*
The National MIG Management Unit (NMMU) considers and approves the project registration once it has been submitted and approved by the PMMU. Once approved by the NMMU, a Memorandum of Agreement (MoA) is drafted by the MIG office for signature between MIG and the Municipality. The signed MIG 1 Project Registration Form normally forms part of the MoA.

Note that technical and environmental feasibility must be demonstrated by complying with the procedures contained in the "Minimum Requirements for Waste Disposal by Landfill" (DRAFT 3rd Edition, September 2005) as produced by the Department of Water Affairs (DWA) (see Section C below), and the in accordance with the Environmental Impact Assessment Regulations: Government Notice No R 543 of 18 June 2010 –- published in terms of the National Environmental Management Act, 1998 (Act No 107 of 1998).

The funding is then made available by MIG for expenditure on the project by the Municipality.

For other forms of funding application it is envisioned that a Business Plan would be required to show economic, biophysical, social, cultural and technical feasibility would be required. The procedures as contained in the "Minimum Requirements" would be sufficient to demonstrate such feasibility, and would also enable Environmental and License approval.

D. Risk Profile:

The following risks may significantly affect the outcome of a waste management facility siting and licensing process, and due care must be exercised by the professional team to mitigate these risks through application of skill and experience.

i. *Information Issues*

Risks: -

- Reasonable existing waste generation quantities are very seldom available, and often unreliable when based on vehicle counts and volume estimations.
- Demographic data from different sources are often conflicting, including demographic data, expected growth rates etc.
- Detailed demographic data including numbers of residential units and socio-economic status is often not available or reliable.
- Unreliable demographic data and inappropriate waste generation rates may significantly impact on the required design capacity of a waste management facility.

Mitigation Measures:-

- Demographic data must be based on the most practical information available e.g. data used in water supply investigations, house/hut counts from aerial photography or even Google Earth, must also where possible be consistent with census figures and/or IDP.
- Waste generation rates available from other sources may be used along with demographic data to estimate the waste being generated. Care must be taken to apply socio-economic demographic data to the estimated waste generation rates based on visual assessment of the prevailing conditions and any cultural impacts that may affect waste generation rates.

ii. Environmental Issues

Risks: -

- Biophysical, economic, social and cultural issues may significantly affect the feasibility of a facility.

Mitigation Measures:-

- The professional team must rigorously assess potential "Fatal Flaws" in terms of the "Minimum Requirements", and their experience at an early stage. Particular significance must be given to potential social issues.
- The processes contained within the Environmental Regulations must be adhered to.

iii. Technical Issues

Risks:-

- Climatic data gathered from weather stations may not be representative for the actual location of the facility, and result in a conservative assessment that the facility may produce significant leachate, thus increasing infrastructure costs unnecessarily. Conversely, inaccurate data may indicate that no significant leachate may be produced which may increase the risk of impact of water resources through inadequate lining and infrastructure.
- Inadequate geohydrological investigation may not indicate significant features that may impact the facility.

Mitigation Measures:-

- Every effort must be made to obtain representative climatic data, and experience must be applied to the climatic water balance process.
- An appropriate budget must be made available for the geohydrological investigation, as this is a critical aspect of the feasibility and technical design. The investigation must be performed by a suitably qualified and experienced geohydrologist.

iv. Procedural Issues

Risks:-

- Inadequate public participation processes may result in significant opposition to a waste management facility, and result in extended delays in completing the environmental processes.
- On occasions, lack of institutional capacity results in lengthy delays in getting approvals and interactions with authorities.

Mitigation Measures:-

- Key I&AP's must be identified at the outset of the project and the appropriate detail of information must be openly made available such that effective public input is obtained. In certain instances a specialist in public participation processes may be required.
- The professional team must support the authorities where-ever possible to assist in decision making. Information must be clearly and unambiguously presented. Face to face meetings may be preferable when submitting reports, with short presentations to highlight key findings and aspects.

v. Funding Issues: -

Risks: -

- MIG funding is directly proportional to the number of poor that the facility serves. The availability of counter funding from municipal capital budgets and other loans may be limited, resulting in budget shortage stalling the project.
- MIG funding applications for waste management facilities are not common, hence there may be resistance and lack of understanding from the MIG system to process funding applications.
- Waste management facilities are rarely income generating, hence are not attractive to lenders.
- Municipalities often allocate insufficient operational budget to properly operate and maintain waste management facilities.

Mitigation Measures: -

- Preliminary estimated budgets should be prepared and presented to the municipality along with possible funding options should be highlighted at the Preliminary Assessment stage, so that necessary conservative budget provisions are made before proceeding with the feasibility.
- The professional team must engage with MIG officials during the feasibility process.
- Cost recovery measures must be assessed carefully to identify possible sources of revenue to cover loans, operation and maintenance.

E. Total Cost : Refer to Part B (Summary Scope of Work and Cost Norm). It is noted that, as at March 2011, the indicative preparation costs are estimated to range from between R 516,044 and R 1,741,823 for projects with capital values of between R 6million and R 12million respectively. These estimates include a provision for preparation management, travel disbursements and contingencies.

SECTION B: SUMMARY SCOPE OF WORK AND COST NORMS

Please refer to the separate excel spreadsheet provided which identifies the work packages for the various stages of project preparation, summary scope of work, and indicative professional time inputs and cost norms.

SECTION C: DETAILED SCOPE OF WORK

Background/Guidelines

A detailed Feasibility Study is required for a Waste Management facility. The feasibility study shall consist of a pre-feasibility assessment including a site selection process based on sound biophysical, economic, social and cultural aspects. A preferred site or sites will then be assessed in more detail to assess it's feasibility including a geohydrological investigation, the required level of environmental assessment, a preliminary design, a development and operating plan, a closure plan and a monitoring plan. Appropriate public participation is required throughout the process. The Feasibility Study will culminate in recommending a suitable location and type of waste management facility to suite the required purpose, and the associated preparation and submission of the Application for Authorisation and an Application for a Waste Management License.

This Scope of Work is based directly on the "Minimum Requirements for Waste Disposal by Landfill" (DRAFT 3rd Edition, September 2005) as produced by the Department of Water Affairs (DWA), referred to as the "Minimum Requirements" hereafter.

Although never officially released, the 3rd Edition of the "Minimum Requirements" is widely available, and is generally used by the Department of Environmental Affairs (DEA) as the definitive guideline for the licensing, design and implementation of waste management facilities. Although there are some differences between the 3rd Edition and the officially released 2nd Edition (1998), the overall procedures are similar. Where technical differences occur, the respective Departments normally apply the 3rd Edition Minimum Requirements as a precautionary principal.

Certain Waste Management Activities require a licence in terms of the National Environmental Management : Waste Act, 2008. These are listed in the Schedule to the Act (as updated from time to time – currently as published in Government Gazette Notice No 718 of 3 July 2009). In terms of Municipal Waste Management, these include facilities where waste is stored (even temporarily); reused, recycled and recovered; treated; or disposed of, all subject to minimum quantities.

In the absence of any other guidelines, the respective authorities appear to be applying the procedures as contained in the "Minimum Requirements for Waste Disposal by Landfill" to licence such facilities. **It is apparent, however, that new requirements/guidelines are currently being prepared for implementation during 2011.** Obviously these will apply once available, and it is incumbent on the consultant to clarify with DEA on the required procedures to be followed prior to commencement of the studies.

Stage 1: Preliminary Assessment

It is expected that the Preliminary Assessment would normally be undertaken by the PPT or a Project Preparation manager appointed by the PPT. The Preliminary Assessment should evaluate the three essential elements involved:

- The project
- The municipality
- The capital funder.

Input	Output	Professional Skills	Indicative Level of Effort	Duration / Timeframe

Input	Output	Professional Skills	Indicative Level of Effort	Duration / Timeframe
Evaluate the need for the project and the capacity of the Municipality: • Interviews/meeting with relevant Municipal personal Municipal Manager, Manager in charge of: Waste Management Services, PMU Manager etc., and with ward councillors, community leaders where possible. • Interview/meeting with any professionals already appointed by the municipality, and/or assessment of available project preparation professionals. • Obtain background to understand need for the project • Assess status of the project in relevant IDP's, IWMP's, Spatial Development Plans etc. • Assess any existing technical, environmental or social work already completed, or relevant from adjacent infrastructure development. • Interviews/meetings with any relevant regulatory authority, e.g. DEA, provincial environmental authority. • Site visit if necessary. • Provision of standard PPT Preparation Services Agreement to Municipality.	Preliminary Assessment Report including: • Confirmation of Municipal Prioritisation in terms of IDP, IWMP etc. • Confirmation of acceptability of terms of PPT Preparation Services Agreement by Municipality. • Appraisal of project based on Inputs including: - Municipal buy-in to project based on management commitment, - Prioritisation of project in terms of detail in IDP, IWMP etc. - Project need including reliability of demographic data, existing service level, required service level, legislative requirements, environmental impacts etc. - Environmental issues that may significantly affect the project – e.g. presence of conservation areas, wetlands etc. - Socio-political dynamics including current dynamics between residents, municipality, traditional authorities etc. - Land ownership issues e.g. is the potential area owned by Municipality or private? - Targeted capital funding, including targeted source of funding, availability of counter funding, budget allocation. - Availability of project professionals required to undertake the project feasibility studies, including any potential professional conflicts.	Knowledge and experience of waste management in South African Municipality context. Knowledge and experience in waste management activity licence application procedures, feasibility studies, and waste management facility design.	Approximately 2 to 18 days of professional time. (Refer also to Summary Scope and Cost Norm.)	1 to 4 weeks depending on size and extent of project, and on the capacity of the municipality.

Input	Output	Professional Skills	Indicative Level of Effort	Duration / Timeframe
	• Preliminary project risk profile in terms of Section a, Part 4 above • Recommendations including an assessment of Risk. • Detailed budget estimate for project preparation. • Project timetable.			

STAGE 2: Pre-feasibility (CIDB 'Assessment'): (Waste Management Facility Site Selection)

The Prefeasibility phase of the project preparation process, in terms of waste management facility projects, consists of determining the technical requirements of the proposed waste management facility. This coincides neatly with the Site Classification (Section 3) and Site Selection (Section 4) sections of the "Minimum Requirements".

Essentially the size of the waste stream that the facility needs to serve must be determined either from existing data, or from projections of population data and theoretical waste generation estimates. Climatic data is analysed to determine the waste facilities potential to produce leachate. This is then used to classify the proposed waste facility, which determines the detailed requirements for both the design requirements for the facility to mitigate potential environmental impacts, and the detailed procedure that is to be followed to obtain the necessary licenses and authorisations.

The region then has to be assessed in view of the requirements of the waste facility in terms of biophysical, economic, social and cultural impacts, and areas that appear suitable for the establishment of the facility are identified. Suitable sites are selected, and a ranking process determines the preliminary preferred site for the facility. The necessary Public Participation process must commence with the presentation of the site selection process, and input from I&AP's must be used to assist in the ranking process.

The outcome of this process is a Feasibility Report for the proposed facility, recommending the preferred site for the facility, and this information is used to complete the Waste Management License Application form, which is submitted to the licensing authority (the relevant Provincial Environmental Authorities). The process and work package requirements are presented in more detail below. The definitive reference for the required process and level of content is the "Minimum Requirements".

Input	Output	Professional Skills	Indicative Level of Effort	Duration/Timeframe
2.1 Waste Volume Assessment/Situational Analysis • Obtain all existing demographic data from Municipality, IDP, IWMP, Census data or from demographic studies for other infrastructure projects, including estimated population growth projections. Assess the number of residents who will practically be served by the facility. • Obtain any existing waste generation data (often not known). Research any applicable typical waste generation data based on income level for similar socio-economic conditions. • Include waste • characterisation if required using existing waste characterisation fractions if known, or use any applicable typical waste characterisation data. • Using above information formulate an objective waste generation model, including projections for the design life of the facility. • Adjust the model for waste minimisation initiatives (from IWMP). • Assess any existing facilities in terms of	• The size parameters for the required waste management facility. • The Maximum Rate of Deposition (in terms of the "Minimum Requirements") at the end of the design life of the facility for use in the Classification of the facility	Civil Engineer experienced in Waste Management	Approximately 2 to 8 days of professional time. (Refer also to Summary Scope and Cost Norm.)	CE : 1 to 2 weeks depending on the size of the municipality. Risks: Demographic data from different sources is often conflicting. Appropriate waste generation estimates must be made by an experienced waste manager as values can vary significantly depending on socio-economic profile and cultural issues. The combination of both these factors may significantly affect the estimated waste generated and projections into the future

legislative requirements, environmental impacts, current operational and maintenance issues, capacity of existing facility to fulfil future requirements etc.				
2.2 Preliminary Waste Management Facility Classification • Determine the preliminary Classification for the facility using:- - The waste classification – in the case of Municipal facilities these will inevitably be General waste - The waste volume to be handled at the facility based on the Maximum Rate of Deposition as defined in Section 3.3 of the "Minimum Requirements" i.e. Small, Medium or Large. • Obtain nearest suitable rainfall and evaporation data and determine climatic water balance in terms of methodology contained in the "Minimum Requirements" Section 3.4. i.e. B- or B+	• Present and discuss with the licensing authority to get their agreement. • The preliminary Site Classification • Agreement by the licensing authority	Civil Engineer experienced in Waste Management	Approximately 2 to 4 days of professional time. (Refer also to Summary Scope and Cost Norm.)	CE : 1 to 2 weeks depending on the size and complexity of the facility. Risk: (Landfill Sites) Appropriate climatic data must be selected for use in the climatic water balance, as there is a significant capital cost difference between B^+ and B^- infrastructure
2.3 Candidate Site Selection • Determine the space requirements for the waste management facility based on size of waste stream, ultimate capacity, transport requirements etc.	• Site Selection Report detailing processes followed. • Identified potential Candidate Sites	• Civil Engineer experienced in Waste Management	Approximately 5 to 10 days of professional time. (Refer also to Summary Scope and Cost Norm.)	CE: 4 to 8 weeks depending on environmental characteristics of the area. Risks:

• Determine areas with fatal flaws (i.e. areas that will not be acceptable for a licensed waste management facility) • Model area using "negative mapping" GIS techniques if possible, to determine areas that may be suitable for the establishment of the facility. • Inspect the suitable areas and determine possible actual locations for candidate sites for the facility. • Present sites to I&AP's and authorities, and obtain input.				Care must be taken to assess all potential "Fatal Flaws", as failure to identify at this stage will result in the site being rejected after considerable additional time and cost of further investigations. I&AP's – care must be taken in communicating with I&AP's – beware of NIMBY syndrome. Adverse public perception will delay process.
2.4 Preliminary Environmental Assessment • Investigate region to determine environmental characteristics using local knowledge, desktop studies and any other available relevant information. • Determine environmental parameters (biophysical, economic, social and cultural) in the region that may positively or negatively affect the location of the facility. • Assist Waste Management Specialist with locations for candidate sites. • Assist Waste Management Specialist with ranking exercise	• Preliminary Environmental Assessment for inclusion into the Site Selection Report	• Environmental Assessment Practitioner	Approximately 5 to 12 days of professional time. (Refer also to Summary Scope and Cost Norm.)	EAP: 1 to 2 weeks depending on the size of the facility.
2.5 Preliminary Geohydrological Assessment • Undertake a desktop	• Preliminary Geohydrological	• Geohydrologist with	Approximately 5 to 12 days of professional time. (Refer also to Summary	GH: 1 to 2 weeks

preliminary geohydrological assessment of the region. • Site visit to assess area • Assist Waste Management Specialist with locations for candidate sites. • Assist Waste Management Specialist with ranking exercise	Assessment for inclusion into the Site Selection Report	knowledge of waste management facilities	Scope and Cost Norm.)	depending on the size of the facility.
2.6 Preferred Site Selection • Perform a ranking exercise based on weighted scoring of environmental parameters to determine the most favourable potential site(s). • Present to I&AP"s and obtain their input. • Present to authorities and obtain acceptance.	• Recommendation for the preferred site(s) • Acceptance by the authorities of the preferred site.	• Civil Engineer experienced in Waste Management	Approximately 4 to 8 days of professional time. (Refer also to Summary Scope and Cost Norm.)	CE: 1 to 2 weeks depending on environmental characteristics of the area and the size of the facility.
2.7 Feasibility Report • Preliminary Geohydrological Investigation including:- - Description of geology - Description of soils - A borehole census or hydrocensus - Groundwater/aquifer details - An assessment of landfill gas • Preliminary Environmental Impact Assessment – re-address and confirm siting criteria, identify critical factors that and significant impacts that must be mitigated through design. • Conceptual design to address critical factors identified during the preliminary EIA and	• Feasibility Report • Authorities acceptance that the preferred site is suitable for the waste management facility.	• Civil Engineer experienced in Waste Management	Approximately 3 to 6 days of professional time. (Refer also to Summary Scope and Cost Norm.)	CE: 2 to 4 weeks Risks: Preliminary Geohydrological investigation may reveal complications or complexities that may require further investigation, or present a "Fatal Flaw" requiring moving to the next most favourable site. I&AP's – care must be taken in communicating with I&AP's – beware of NIMBY syndrome. Adverse public perception will delay process.

preliminary Geohydrological Investigation. Prepare maps and plans to present the locality, and it relation to the surrounding environment. • Prepare the Feasibilty Report including:- - Site description and zoning - Site Selection process followed - The preliminary EIA - The preliminary Geohdrological Investigation - The conceptual Design • Present to I&AP's • Present to licensing authorities and obtain acceptance				
2.8 Waste Management Licence • Complete and submit the License Application form to the authorities	• Acknowledgement of receipt of application by the authorities.	• Civil Engineer experienced in Waste Management	Approximately 1 to 2 days of professional time. (Refer also to Summary Scope and Cost Norm.)	CE: 1 week.
2.9 Application for Authorisation • Complete and submit the Application for Authorisation to the authorities. (note that in most instances the authority for both applications will be the relevant Provincial environmental authority)	• Acknowledgement of receipt of application by the authorities.	• Environmental Assessment Practitioner	Approximately 1 to 2 days of professional time. (Refer also to Summary Scope and Cost Norm.)	EAP: 1 week.
2.10 Social Facilitation: • Facilitate community liaison, particularly but not limited to, public meetings. • Maintain lines of communication between the community and the professional team	• Relay information from the professional team to the community. • Relay information from the community from the professional team.	• Social facilitator with excellent communication skills and having knowledge and experience of waste management projects and their delivery within the	Approximately 5 to 15 days of professional time over the course of the entire project. (Refer also to Summary Scope and Cost Norm.)	The extent of work involved is very project specific. The duration for this work package commences at the onset of the Pre-Feasibility stage and continues until the MIG application is submitted.

		South African municipal context.		

STAGE 3: FEASIBILITY (CIDB 'CONCEPT')

Once a preferred site has been selected and accepted by the authorities, a more detailed assessment of the site is required to confirm that the site is suitable for purpose. This includes a detailed geohydrological investigation, and the required environmental procedure as stipulated in the Schedule to the Waste Act (either a Basic Assessment for Category A activity, or an Environmental Impact Assessment for a Category B activity).

The following reports are also required to complete the Licence Application Report required to supplement the Licence Application Form submitted in the Prefeasibility Phase.

Input	Output	Professional Skills	Indicative Level of Effort	Duration/Timeframe
3.1 Detailed Environmental Site Investigation Background detailed information gathering and site visit by the to determine the following for the preferred site: • Infrastructure surrounding the site and manmade features • Climate – rainfall patterns, seasonal temperatures, wind patterns • Vegetation • Existing and future potential land-uses for the site and surrounds	This information is necessary to inform the detailed geohydro investigations, EIA and preliminary design.	• Environmental Assessment Practitioner	Approximately 1 to 4 days of professional time. (Refer also to Summary Scope and Cost Norm.)	EAP: 1 to 2 weeks
3.2 Geohydrological Investigation The extent of the detailed geohydrological investigation is determined by the Classification of the facility, and in conjunction with the authorities. This will include: • Topography and surface drainage features • Soil survey – trial pits to determine soils quality and quantity for use as liner (indicator tests,	A comprehensive **Geohydrological Report** detailing all the information obtained, demonstrating to the Authority that the geohydrology associated with the site is such that the site can safely be developed and operated in the environment under consideration. The report may also recommend mitigation measures that may need to be included in the design of the facility to minimise potential impacts.	• Geohydrologist	Approximately 3 to 25 days of professional time. (Refer also to Summary Scope and Cost Norm.)	GH: 4 to 12 weeks Detailed Geohydrological investigation may reveal complications or complexities that may require further investigation, or present a "Fatal Flaw" requiring moving to the next most favourable site.

Input	Output	Professional Skills	Indicative Level of Effort	Duration/Timeframe
compaction characteristics, permeability) and daily cover material • Geology – • Regional stratigraphy and lithology from published data, supplemented by • Field data obtained from borehole(s) drilled on site (positions determined by geophysical techniques). Note the number of boreholes required is determined by the site Classification and in conjunction with authorities. - Identification of tectonics, lineaments and structures that may impact the site • Geohydrology – - Groundwater morphology and flow to determine the presence of aquifers, phreatic surface or perched water surfaces, seasonal fluctuations, gradients and general flow directions - Determine if any aquifers present are strategic for water supply through borehole yield tests - Ground and surface water quality sampling to determine baseline				

Input	Output	Professional Skills	Indicative Level of Effort	Duration/Timeframe
conditions - Hydro-census to determine groundwater usage patterns • Risk assessment for potential for future groundwater pollution using all above data.				
3.3 Air Quality and Landfill Gas **If Required** – These issues are normally only considered for larger landfill sites and require specialist input depending on the climatic water balance, size and type of waste stream, topography, climatic conditions, geology etc.	**Specialist Air Quality / Landfill Gas Report** for input into the EIA and Preliminary Design.	• Air Quality Specialist	Approximately 5 to 15 days of professional time. (Refer also to Summary Scope and Cost Norm.)	AQS: 1 to 4 weeks
3.4 Site Preliminary Design A conceptual design must be prepared that adequately addresses identified potential impacts and incorporates all infrastructures required properly operating and maintaining the site. This will include • Confirmation of site Classification – quantities of waste, climatic water balance • Site layout to determine shape and extent of facility, e.g. for landfill – earthworks, availability of cover material, airspace, landfill height and stability,	A Conceptual or **Preliminary Facility Design Report** to a level of detail that will inform the EIA process, the client and the authorities sufficiently to determine fit for purpose, and that all potential impacts can be adequately mitigated such that feasibility of the facility is demonstrated for licensing purposes. A detailed cost estimate for development of the facility should also be included for client and funder budgetary purposes.	• Civil Engineer experienced in Waste Management	Approximately 4 to 10 days of professional time. (Refer also to Summary Scope and Cost Norm.)	CE: 1 to 3 weeks

Input	Output	Professional Skills	Indicative Level of Effort	Duration/Timeframe
life of facility etc., infrastructure requirements e.g. fencing, access gates, buildings. • Facility design for access, surfaced drainage, leachate management and liner, monitoring systems, phased development and remediation etc. • Cost estimate for development, including construction cost estimate and an estimate of all professional fees for detailed design, procurement and construction monitoring				
3.5 Basic Assessment/Scoping & Environmental Impact Assessment The required level of Environmental Impact Assessment must be undertaken in accordance with the Regulations Government Notice No R 543 of 18 June 2010 – Environmental Impact Assessment Regulations - published in terms of the National Environmental Management Act, 1998 (Act Non 107 of 1998): • Basic Assessment process if listed in Category A of the Schedule (Government Notice No 718 of 3 July 2009) • Scoping and Environmental Impact Assessment process if listed in Category B of the	The submission of the relevant **Basic Assessment Report**, or **Environmental Impact Assessment Report** to the Provincial Authorities for consideration as part of the Waste Management Licence Application.	• Environmental Assessment Practitioner	Approximately 15 to 365 days of professional time. (Refer also to Summary Scope and Cost Norm.)	EAP: 6 weeks to 12 months I&AP's – care must be taken in communicating with I&AP's – beware of NIMBY syndrome. Adverse public perception will significantly delay process. Inadequate Institutional Capacity may delay processing of Application. This work package embraces the Specialist Study work packages and thus inherits the time frames thereof.

Input	Output	Professional Skills	Indicative Level of Effort	Duration/Timeframe
Schedule (Government Notice • No 718 of 3 July 2009) • The Public Participation process that should commence at the Waste Management Facility Site Selection phase continues and is completed as part of this Environmental Impact Assessment. Note:- the Schedule forms part of the National Environmental Management Act: Waste Act, 2008 (Act No 59 of 2008)				
3.7 Specialist Study 1 Using the preliminary findings of earlier work packages and the public participation process, and the requirements of the relevant authorities calling for specialist input, compile a report for inclusion in the Basic Assessment/full Scoping & EIA report.	Specialist study and report for inclusion in the Basic Assessment/full Scoping & EIA report.	Specialist consultants must: • Be independent • Have recognized expertise in the specified field of study, including relevant knowledge of local, provincial and national legislation • Perform the study in an impartial manner even if findings are not in the interests of the applicant	Approximately 0 to 8 days of professional time. (Refer also to Summary Scope and Cost Norm.)	Two weeks to two months. NOTE: The extent of the work is very project specific. . If the specialist study is required to look at a full seasonal cycle of some aspect of the proposed site, for instance, fauna or flora, the 12 month time frame could apply. However, the possible subjects of specialist studies are extremely diverse, and could just as easily require a study lasting only a few days. Indicative cost ranges should be determined after the Preliminary Environmental Assessment work package. Actual time frames cannot be conclusively pre-

Input	Output	Professional Skills	Indicative Level of Effort	Duration/Timeframe
				determined before this step.
3.8 Specialist Study 2	Specialist study and report for inclusion in the Basic Assessment/full Scoping & EIA report.	Specialist consultants must: • Be independent • Have recognized expertise in the specified field of study, including relevant knowledge of local, provincial and national legislation Perform the study in an impartial manner even if findings are not in the interests of the applicant	Approximately 0 to 8 days of professional time. (Refer also to Summary Scope and Cost Norm.)	Two weeks to two months. NOTE: The extent of the work is very project specific. . If the specialist study is required to look at a full seasonal cycle of some aspect of the proposed site, for instance, fauna or flora, the 12 month time frame could apply. However, the possible subjects of specialist studies are extremely diverse, and could just as easily require a study lasting only a few days. Indicative cost ranges should be determined after the Preliminary Environmental Assessment work package. Actual time frames cannot be conclusively pre-determined before this step.
3.9 Development and Operating Plan The Development and Operating Plan essentially forms the Environmental Management Plan required by the EIA process above. It is a practical plan that details how the facility must be developed and operated such that it achieves it purpose efficiently and mitigates, minimises or eliminates potential impacts. As an example, a landfill	A **Development and Operating Plan** that details how the facility is to be operated such that it achieves all its design objectives. This Plan is submitted in support of the Waste Management Licence Application.	• Civil Engineer experienced in Waste Management	Approximately 2 to 5 days of professional time. (Refer also to Summary Scope and Cost Norm.)	CE: 1 to 2 weeks

Input	Output	Professional Skills	Indicative Level of Effort	Duration/Timeframe
Development and Operation Plan should include the operation and maintenance procedures for:- • Infrastructure – offices, service areas, ablutions and sanitation facilities, salvaging facilities fencing, access control etc. • Site drainage, separation of stormwater from the waste body, leachate control • Excavation and stockpiling of cover • Establishment and maintenance of buffer zones • Screening berms and vegetation management • Cell construction sequencing • Waste deposition methods, compaction • Machinery • Monitoring Plan An important part of such a plan is Health and Safety considerations. A relatively detailed Operation and Maintenance Budget should be prepared at this stage to inform the Municipality of on-going O&M budgetary requirements that must be allowed for to meet the requirements of operating the proposed facility in accordance with legislative and Licence requirements.				
3.10 End-Use Plan An End Use Plan includes			Approximately 1 to 3 days of professional time.	

Input	Output	Professional Skills	Indicative Level of Effort	Duration/Timeframe
• The use that the completed, closed landfill area will be utilised for. • The Closure Plan indicating the final levels and shape of the landfill upon completion, and the preliminary capping design, landscaping, vegetation etc.	The **End-Use Plan** The plan is also useful to the Environmental Assessment Practitioner to communicate with I&AP's	Civil Engineer experienced in Waste Management	(Refer also to Summary Scope and Cost Norm.)	CE:1 week
3.11 Licence Application Report The Licence Application Report is the combination of all the above reports that are required as part of the Waste Management Licence Application • Background and Site Description • Geohydrological Report • Environmental Assessment Report • Preliminary Design Report • Development and Operating Plan • End-Use Plan • Monitoring Plan	**Licence Application Report**, required to be submitted in support of the Waste Management Licence Application	• Civil Engineer experienced in Waste Management	Approximately 2 to 10 days of professional time. (Refer also to Summary Scope and Cost Norm.)	CE: 1 week for submission 2 to 6 months for issuing of Licence Risk: Inadequate Institutional capacity may delay processing of application.
3.12 Social Facilitation: • Facilitate community liaison, particularly but not limited to, public meetings. • Maintain lines of communication between the community and the professional team	• Relay information from the professional team to the community. • Relay information from the community from the professional team.	• Social facilitator with excellent communication skills and having knowledge and experience of waste management projects and their delivery within the South African municipal context.	Approximately 5 to 15 days of professional time over the course of the entire project. (Refer also to Summary Scope and Cost Norm.)	The extent of work involved is very project specific. The duration for this work package commences at the onset of the Pre-Feasibility stage and continues until the MIG application is submitted.

STAGE 4: FUNDING APPLICATION

Once the Licence Application Report required to supplement the Licence Application Form, and the Feasibility Report have been completed and the project approved by the relevant officials, MIG require a MIG 1 Project Registration Form to be completed and submitted via the internet based Management Information System (see http://www.mig.dplg.gov.za). This could be done by the Municipality, but if undertaken by the service provider the Municipality would need to authorise access by supplying their user name and password. For the sake of this toolkit, it has been assumed that the Civil Engineer would compile and submit the application.

4.1 Funding Application Complete relevant funding applications e.g. for MIG funding complete the MIG 1 Project Registration Form using the relevant guidelines/checklist. Note the application is carried out using the MIS (internet based MIG project management tool). Note that all sources of funding must be identified for the total cost of the project.	Completed and submitted forms, and registered project.	• Municipal official, or • Civil Engineer experienced in Waste Management	Approximately 1to 2 days of professional time. (Refer also to Summary Scope and Cost Norm.)	CE: 1 week. Risks: Waste Management funding applications are not common, and this may lead to delay in consideration and processing of the application.

SECTION D: SPECIMEN GANTT CHART

Please refer to the separate document provided for specimen Gantt charts for the preparation of this project type (timetables).