PAPER 8

REGIONALISATION OF WASTE DISPOSAL: THE WESKUS DISTRICT CASE STUDY

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ABSTRACT

The regionalisation of waste disposal is promoted by provincial and national government with the aim to close and rehabilitate all the small and often polluting local waste disposal sites in favour of larger properly designed waste disposal facilities in order to reduce potential pollution sources.

Article 84 of the Municipal Structures Act has given District Municipalities the function of establishing and operating waste disposal facilities for more than one local municipality in the district and to develop a waste disposal strategy for the district. The Weskus District Municipality commissioned an investigation into the status of waste disposal in the district in 1997 and after the amalgamation of the municipalities in 2000 developed a Waste Disposal Strategy for the five local municipalities within the district. Due to the fact that none of the existing 20 waste disposal sites within the Cederberg and Matzikama municipal areas had any long-term capacity and most were poorly located, not engineered to protect the environment and with limited operational control, the strategy recommended a new regional waste disposal facility to be established to serve these two northernmost municipalities in the district.

After a number of potentially suitable locations were identified, full Environmental Impact Assessment processes were conducted, including public participation, and the preferred location received Environmental Authorisation and a Waste Management Licence in 2014. The property was procured by the district and rezoned, again with the required public participation process. This was followed by the final design of the facility and eventually construction commenced in December 2023 and was completed in January 2025. The facility received its first waste in May 2025.

Regional waste disposal sites have on the one hand the economy of scale with regards to disposal costs resulting from an engineered basal lining system and proper operational resources, but on the other hand there is an increased cost of transporting waste to a remotely located waste site. Affordability is often questioned by the local municipalities, but when comparing apples with apples, regionalisation has proven to be more affordable than local, properly designed and operated waste disposal sites. Then there is also the additional benefit of reducing the risk to the environment that is often overlooked.

INTRODUCTION

None of the existing landfills within the municipalities of Cederberg and Matzikama have any long-term capacity to serve the waste disposal needs of the municipalities. When given the option by the Weskus District Municipality in 2001, these two municipalities opted for a new regional landfill to serve these two municipalities.

The Weskus District Municipality identified suitable locations for a future regional landfill, conducted a lengthy Environmental Impact Assessment process and obtained a waste management license for the preferred site in 2014. The final design of the facility commenced in 2021 and construction was completed in January 2025.

The first load of waste for disposal was received on 19 May 2025, more than twenty years after this project was commissioned. The paper will discuss the technical detail and the design changes as result of changing legislation, and also the unique complications when more than one municipality is involved.

The cost of regional landfills with its associated transport cost versus local landfills will also be discussed.

OVERVIEW OF WESKUS DISTRICT MUNICIPALITY

Vision: Weskus the caring centre for innovation & excellence.

Mission: Promote drivers of change, by leading well-co-ordinated and innovative initiatives to achieve sustainable and integrated development of West Coast.

The slogan *"Laat waai"*, popularised by our Executive Mayor, Boffie Strydom, has been a recurring theme for numerous presentations throughout the duration of this project. It captured the motivation that guided us through to the completion and operationalisation of the Weskus Regional Solid Waste Site and on all endeavours of the District Municipality. Translated as *"Don't waste time"*, it has come to symbolise the drive, urgency, and commitment that underpinned our efforts led by a dynamic and stable Council, backed by an enthusiastic competent, able and motivated workforce.

The Weskus Regional Solid Waste Site is now officially renamed the Weskus Regional Landfill to align with the entrance signage design developed by the Provincial Roads Department.

The office of the Auditor General of South Africa (AGSA) has published its annual review of local municipalities, covering audit results for the 2023/24 financial year, revealing the Weskus District Municipality as the best-run in the country after it has achieved a clean audit for 14 years in a row (the most in South Africa).

The development and successful commissioning of the Weskus Regional Landfill, a landmark infrastructure project led by the Weskus

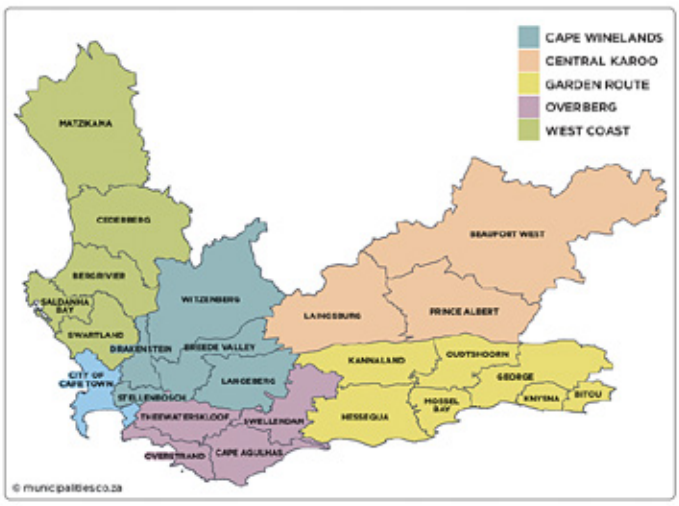

FIGURE 1: *Location of Weskus District Municipality*

District Municipality (WCDM), was guided by the principles of regulatory compliance, sustainable development, and inter-municipal cooperation. The project addresses the long-standing waste management challenges in the Cederberg and Matzikama municipalities. It further showcases best practices in stakeholder engagement, public-private collaboration, and local economic empowerment. The Weskus Regional Landfill stands as a replicable model for regional infrastructure execution and governance excellence.

PROJECT OVERVIEW

Background and Legislative Context

Pursuant to Section 84(e) of the Municipal Structures Act, the WCDM initiated a long-term regional waste management solution. A formal strategy was adopted following the West Coast District Waste Disposal Strategy (2001), which built on consultancy assessments dating back to 1997. The preferred strategic option was the construction of a single regional landfill to consolidate and replace aging, non-compliant local waste sites in Cederberg and Matzikama.

Site Selection and Licensing Compliance

The approved site, Farm Vaderlandsche Rietkuil No. 308, was a de-commissioned gypsum mine selected following a rigorous Environmental Impact Assessment (EIA) process. On 10 March 2014, the Department of Environmental Affairs issued a Class B Waste Management Licence stipulating that the activities of the Licence must commence by 10 March 2024 — a statutory deadline that defined the implementation trajectory.

Intergovernmental and Political Coordination

Initial efforts were hampered by inter-municipal complexities, including fragmented procurement responsibilities and political misalignment. The WCDM addressed this through persistent and structured consultations with the Cederberg and Matzikama Municipal Councils and eventually by August 2022, both municipalities passed enabling resolutions, followed by the final approval from Weskus District Municipality Council in January 2023 clearing the path for project implementation.

MUNICIPAL FUNCTIONS REGARDING WASTE MANAGEMENT

Schedule 5 of the South African Constitution gives local municipalities the function, amongst others, of refuse removal, refuse dumps and solid waste disposal.

Section 84 of the Municipal Structures Act (Act 117 of 1998) gives district municipalities the function, amongst others, of solid waste sites, in so far it relates to the determination of a waste disposal strategy, the regulation of waste disposal and the establishment, operation and control of waste disposal sites, bulk transfer facilities and waste disposal facilities for more than on local municipality in the district.

The above functions require that when a waste disposal site is served by only one municipality, the responsibility to establish, operate and control that facility resides with the local municipality, but when more than one municipality in a district disposes waste at a waste disposal facility, the responsibility to establish, operate and control that facility resides with the district municipality.

It also requires that when a municipality decides to dispose of its waste at an existing facility of a neighbouring municipality, the responsibility of that site remains with the local municipality since it is an existing site.

WASTE DISPOSAL STRATEGY

Having commissioned a study into the status of waste disposal within the district in 1997, the Weskus District Municipality extended the study, after the promulgation of the Municipal Structures Act, to develop a district waste disposal strategy and to investigate the establishment of four sub-regional waste disposal sites. However, after the 2000 amalgamation, the number of municipalities within the Weskus District Municipality was reduced to five, i.e. Swartland, Saldanha Bay, Bergrivier, Cederberg and Matzikama.

The waste disposal strategy had to allow for the option of municipalities opting to operate and maintain their own disposal sites, the option to transport and dispose its waste at a neighbouring municipality's disposal site or for the option to dispose at a new regional waste disposal site. Eight scenarios with cost analyses were therefore developed and presented to the municipalities to choose their preferred scenario.

Regional Costs vs Local Costs

The most-used arguments against regionalisation of waste disposal are the excessive transport costs because of vast distances and comparing the costs of refuse dumps with that of engineered landfills. The waste disposal strategy that was developed in 2001 compared the costs of regional waste disposal inclusive of the transport costs with the costs of developing and operating local landfills of the same standard and it was shown that the saving in the unit rate of disposal exceeded the additional transport cost, simply because the capital cost of the waste site and the fixed portion of the operational cost were divided by more tonnes of waste.

As example, in current values, the capital and operational transport cost for Cederberg Municipality to get their waste to the regional facility would cost an additional R1,219.41 per tonne, but their saving in disposal capital cost is R1,629.38 per tonne and their saving in disposal operational cost is R474.89 per tonne. Thus a total saving of R884.86 per tonne to transport and dispose their waste at the regional landfill rather than establishing their own local landfill. Matzikama Municipality does not have a transport cost component since the regional landfill is within their municipal boundaries.

Scenarios Selected

Swartland and Saldanha Bay Municipalities, the two southern-most municipalities with existing landfills, opted to continue with their own waste disposal sites. Bergrivier, with no future landfill capacity, opted to transport and dispose its waste at the Swartland and Saldanha Bay sites and Cederberg and Matzikama, the two northern-most municipalities, opted to have a new regional landfill established for their use. The Weskus District Municipality had, in terms of their function, to establish, operate and control such a facility.

The scenarios selected by the five local municipalities were incorporated into the Municipal Solid Waste Disposal Strategy of the WCDM in September 2001.

CANDIDATE SITES

The WCDM embarked on the identification of the suitable areas for the establishment of a regional waste disposal facility within the boundaries of the Cederberg and Matzikama municipal areas in 2008.

The identification of potentially suitable areas where a landfill can be established is done with a methodology referred to as negative mapping where all the areas that are unsuitable in terms of criteria published in the Minimum Requirements guideline (then Department of Water Affairs), are eliminated. The remaining areas are then investigated and evaluated according to environmental and technical grounds.

The criteria used to provisionally eliminate areas from further consideration were based on the identification of areas with inherent Fatal Flaws as defined in the Department of Water Affairs and Forestry's Minimum Requirements

document (DWAF, 2005). These include the following:

- Areas in proximity to significant surface water bodies,
- Sensitive ecological and/or historical areas,
- Catchment areas for important water resources such as dams,
- Area overlying or adjacent to important or potentially important aquifers,
- Areas overlying or adjacent to major fault zones,
- Areas with highly permeable soils,
- Areas associated with steep slopes, and
- Areas in close proximity to land uses which are incompatible with waste disposal.

All the overlays showing the above criteria are superimposed on each other to produce a composite map, areas where none of these criteria are present are indicated as "windows" of potentially suitable land for the establishment of a waste disposal site.

The study has shown that important and vulnerable aquifers under most of its municipal area make Cederberg an unsuitable location for waste sites. Since some of the map sets used are relatively old, site visits to these areas were undertaken to verify the information on the maps. Potential sites were identified within these windows and subjected to an Environmental Impact Assessment (EIA) process to determine the most suitable site.

Of the four candidates indicated in the above figure, the site near Klawer was rejected on grounds of visual impact and incompatible land use and the northern three were submitted to an EIA, inclusive of extensive public participation and specialist studies on geohydrology, geotechnics, visual impact, botany, agricultural impact, air quality impact and heritage.

After a lengthy EIA process, the site labelled as Site C was considered the most suitable site, and an Environmental Authorisation was issued to the

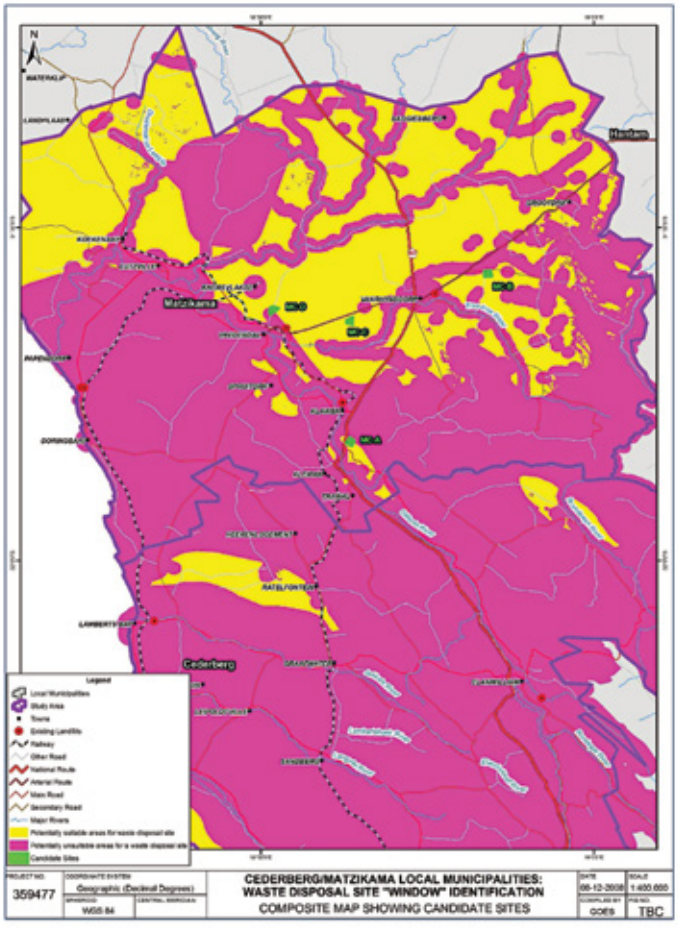

FIGURE 2: *Composite map indicating suitable areas*

WCDM on 24 February 2014 to establish a waste disposal site and associated infrastructure on this site. This site is located approximately 1km south of the R27 (Vredendal – Vanrhynsdorp road) and approximately 8.5km east of the R27 and R362 (Vredendal – Klawer road) intersection.

WASTE MANAGEMENT LICENCE

At the time that the EIA was conducted, waste licensing resided under the Environment Conservation Act (Act 73 of 1989) and the process consisted of obtaining Environmental Authority for the activities planned on a specific site, followed by a waste permit application to the Department of Environmental Affairs and Tourism. However, during the environmental impact assessment process, the National Environmental Management: Waste Act (Act 59 of 2008) was promulgated as the first comprehensive act to regulate waste management in a proactive way. This changed the waste management licence application process to a combined application that included both the environmental authorisation process and the licence application. Since the licensing process had already commenced with the promulgation of the Waste Act, this application was in the transitional period and the "old" licensing process was allowed to be finalised.

Also, since the design engineers were aware of planned amendments to the design requirements as reflected in Minimum Requirements, the licence application for Site C was accompanied by a design of the basal liner in accordance with the anticipated National Norms and Standards for disposal of waste by landfill for Class B sites. These Norms and Standards were published on 23 August 2013 in the Government Notice No R636 in Government Gazette No 36784 and the licence issued in 2014 stipulated a containment barrier for a Class B waste disposal facility. The design submitted with the licence application was approved and obtained a positive Technical Record of Decision from the then National Department of Water Affairs.

On 10 March 2014 a Waste Management Licence was issued by the provincial Department of Environmental Affairs and Development Planning for the establishment of a Class B waste management facility on Portion 2 (a portion of portion 1) of the farm Vaderlandsche Rietkuil No 308 Vanrhynsdorp. A period of five years was stipulated in the licence in which the activity, amongst others the construction of the facility, must commence.

No appeals were lodged against the issuing of the waste management licence.

LAND PROCUREMENT AND REZONING

Land Procurement

The property, 151.5 hectares in size, was previously used for mining activities and was procured in 2019 by the Weskus District Municipality after being appraised by an independent valuator.

Rezoning

The zoning of the property was Agricultural Zone 1 and an application was lodged at the Matzikama local municipality for the rezoning to Authority Zone in order to establish a regional waste management facility. After again following a public participation process the rezoning was approved in June 2020.

FINAL DESIGN

Since this project was the establishment of a new regional waste facility, the following infrastructure was required:

Roadworks

The licence conditions stipulated that a two-way access road be constructed with material that will create minimal dust, an asphalt surfaced access road of approximately 1.1km was designed between the R27 and the site entrance.

Segmented paving roadworks were designed at the site entrance and the weighbridge area as well as gravel surfaced site roads from the weighbridge to the base of the disposal cell.

Perimeter Fence

As per the licence conditions the whole of the site had to be fenced with security fencing.

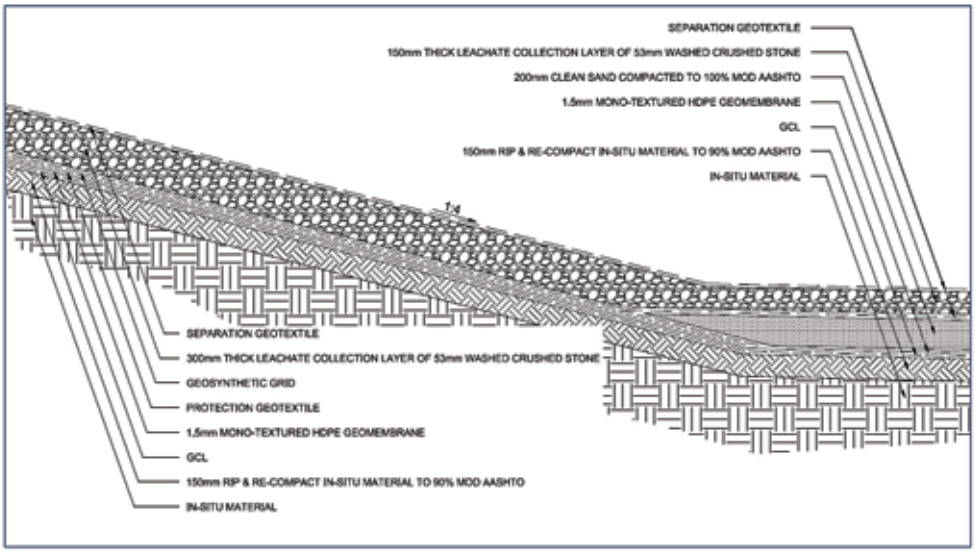

FIGURE 3: *Approved Class B liner*

Access Control Facilities

Access control facilities were designed as well as a weighbridge to accurately record incoming waste loads. Accurate waste recording and monthly reporting to the licensing authority is a statutory requirement. Offices, an ablution facility and a small workshop were added to cater for the day-to-day operations.

Waste Diversion Facilities

Waste diversion facilities such as a recycling facility, builder's rubble crushing area and garden waste chipping area have spatially been provided for, but will only be designed and constructed if required. The intention is that the two contributing municipalities will provide local diversion infrastructure to reduce transport costs and to create local work opportunities.

Storm Water Management Structures

It is a requirement that external and internal storm water be separated to minimise the risk of storm water contamination and as such a storm water drainage system must be provided to accommodate a 1 in 50-year storm of 24-hour duration.

The design and specified operation of the cells are such that all run-off water from the sides of the landfill will be uncontaminated and all contaminated or potentially contaminated water will remain on the waste area.

Leachate Management Structures

Leachate will drain from the disposal cell to a pump sump from where it will be pumped to a double-lined leachate evaporation pond.

Disposal Cell

In accordance with the Norms and Standards (2013) a class B containment liner is required for the disposal of general waste.

A typical class B liner consists of 600mm compacted clay overlain by a 1.5mm High Density Polyethylene (HDPE) overlain by a protection layer and finally overlain with a stone layer for the drainage of leachate.

The local soils were found to be of insufficient quality to be used as compacted clay layers in the basal liner and was replaced with a geosynthetic clay liner (GCL).

The basal liner that has been designed (and approved) for the Weskus Regional Landfill is indicated in the following figure.

The first cell has 271,000m^3 airspace and has been designed for a seven-year lifespan based on projected waste volumes from Matzikama and Cederberg calculated from population data since no weighbridges exist at current local facilities.

CONSTRUCTION

Tender Process

A public tender for the construction of the new landfill closed on 14 March 2023 with a pre-qualification of a specified minimum square meters of geocomposite landfill or mining liners on previous projects to ensure that an experienced contractor be appointment.

The construction contract was awarded with the commencement date of 8 December 2023 and a construction duration of 40 weeks.

Construction Quality Assurance

An important aspect with the construction of landfill liners is the construction quality assurance that must be conducted on the installation of various layers of the composite liner over and above normal construction monitoring. This includes amongst others quality assurance, with independent laboratory tests, of the compliance of the manufactured geosynthetic materials with the specifications, the quality of installation with regards to the integrity of the welding joints of the HDPE, thickness of layers and ensuring that all material used conforms to the specification both for supply and installation. Construction quality assurance requires full time personnel on site for the duration of the liner installation. All the construction quality assurance results must also be compiled in a summarized report, the Construction Completion Report, and submitted to the Department of Water and Sanitation before the construction of the cell is approved and disposal of waste may commence.

Construction Challenges

Initial indications were that construction would be fairly trouble free considering the remoteness of the site. However, it turned out to be one of the wettest seasons in over a decade and the clayey soils caused many delays, not only for the abnormal weather but also for consequential delays. Excessive wind speeds also made the installation of the geomembrane difficult as the sheets were simply blown away before it could be welded in place and covered with the sand protection layer. High wind speeds seemed to occur from midday to late afternoon, and the installation of the geomembrane was limited to morning and night shifts. This resulted in numerous claims for extension of time.

FIGURE 4: *Aerial view of completed Weskus Regional Landfill*

Practical Completion of the construction was issued on 31 January 2025. See below photograph for an aerial view of the waste site.

Economic Empowerment and Local Participation

A key component of the project was local economic development, specifically:

- Sourcing materials and fuel locally,
- Subcontracting local SMMEs
- Employing community labour
- Installation of a Weskus designed, prefabricated wastewater treatment plant enabling us to re-use the effluent for gardening purposes.

Impact Highlights

- 77 direct jobs created (including 4 women and 21 youth)
- R13.7 million (excl. VAT) in local procurement

Community cooperation was exemplary, with no reported project resistance or disruption.

Approval of Construction

Landfill construction must, in accordance with the Technical Record of Decision issued with the approval of the design by the Department of Water and Sanitation, be approved by the department after scrutinizing the Construction Completion Report and a site visit by departmental officials. Even though a Construction Completion Report was not requested in the Technical Record of Decision issued in 2014, the department still insisted on it being compiled and submitted. Fortunately, the departmental officials were visiting another landfill in the Western Cape and decided to, at the same time, conduct the site visit on 10 April 2025.

Since the amended National Norms and Standards of 7 November 2024 lists the placing of the pioneering layer of waste (first layer of waste on the liner) as soon as possible after completion of construction to protect the separation geotextile on top of the leachate drainage layer, as good engineering practise, correspondence was-sent to the licensing authority to immediately start with the placement of the pioneering layer of waste – to which there was no objection.

LANDFILL COMMISSIONING

Operation of the Weskus Regional Landfill

The operation and management of the landfill up to 30 June 2027 was put out on a public tender process. The tender had a minimum number of years of landfill operating experience as pre-qualification criteria, again to ensure that an experienced contractor be appointed.

The operating contractor was appointed, completed their establishment on site and received training from the weighbridge software provider.

The first loads of waste were received on 19 May 2025 from Matzikama Municipality using their collection vehicles, but waste from Cederberg Municipality cannot yet be transported economically to the new regional facility due to their transfer infrastructure not yet constructed.

Management of the Operational Contract

The operational contract is being managed by monthly contractual meetings and third-party certification of monthly payments due to the contractor.

COSTING

The costing of the regional facility was regularly updated during the years of planning by using a business case model to indicate the capital, operational and future rehabilitation costs associated with the regional landfill as well as the waste infrastructure required by the two local municipalities to get their waste to the regional landfill. All of the above costs were presented as a municipal household tariff per month to illustrate the affordability of the project. Although the projected household monthly tariffs for refuse removal of the two municipalities were to increase, it would still represent approximately the median of monthly tariffs charged by all municipalities in the Western Cape.

The cost of the completed landfill was R93,965,971 (incl VAT), R3.27 million under budget – a rare feat for infrastructure projects of this magnitude and also considering the inclement weather encountered.

FIGURE 5: *Road Map of Activities since Council Decision to proceed*

Financing Mechanism

- Funding secured via the Development Bank of South Africa (DBSA)
- Municipal loan structured over 20 years.
- Initial 2-year capital repayment holiday negotiated to stabilize cash flow and tariff structures.
- Tariff modelling agreed upon with Cederberg and Matzikama municipalities to ensure affordability and includes a pro rata availability amount plus an operational tariff and a rehabilitation tariff.

This structure reflected sound financial stewardship and sensitivity to the municipalities' participation in the Eskom Debt Relief Program.

OUTCOMES AND IMPACT

The Weskus Regional Landfill project represents:

- **Full compliance** with national and provincial environmental regulations
- **Sustainable, regionalized service delivery** in solid waste management
- Effective **intergovernmental collaboration**
- Significant **local socio-economic benefits**
- **Fiscal discipline** and **risk mitigation**

This project sets a high standard for integrated, sustainable, and people-centred infrastructure delivery in South Africa.

CONCLUSION

The Weskus Regional Landfill project has a long history of over twenty years from the moment the regional scenario was selected up to the point where Council may the decision to proceed.

Below is a timeline indicating the relative short time span of two years from when the decision to proceed was made until the landfill was constructed.

In terms of the waste hierarchy of preferred waste management options the generation of waste should be avoided, and the waste that was generated should be diverted from disposal. Only the waste that cannot be diverted should be disposed at properly designed and operated landfills.

The Weskus Regional Landfill is a properly designed and operated landfill and will serve as a safety net for all waste generation that cannot be avoided or diverted through other beneficial technologies or uses, even when such technologies are down for maintenance. It is the responsibility of the Weskus District Municipality to ensure that the operation, maintenance and further development of the Weskus Regional Landfill is in accordance with best environmental practise.

It is the responsibility of the local municipalities to divert as much of their generated waste from landfill through technologies such as recycling, composting, etc. not only to pay less disposal costs or transport costs, but to improve the environmental sustainability of waste management as a whole.

REFERENCES

Constitution of the Republic of South Africa, (Act 108 of 1996)

Department of Environmental Affairs, National Environmental Management: Waste Act, *National Norms and Standards for Disposal of Waste to Landfill*, Government Gazette, 23 August 2013.

Department of Water Affairs and Forestry, *Minimum Requirements for Waste Disposal by Landfill*, Second Edition. 1998

Environment Conservation Act (Act 73 of 1989)

Local Government: Municipal Structures Act (Act 117 of 1998)

Matzikama/Cederberg Local Municipalities: Waste Disposal Site "Window" Identification, SRK Consulting. October 2008

National Environmental Management: Waste Act (Act 59 of 2008)

West Coast District Municipality, *Municipal Solid Waste Disposal Strategy*, Entech Consultants (Pty) Ltd. September 2001