

DATE: 09 MAY 2022

REPORT TO: URBAN WASTE MANAGEMENT PORTFOLIO COMMITTEE

1. ITEM NUMBER N3296 UWM 13/05/22

2. SUBJECT

LANDFILL SITES & FUTURE DEVELOPMENTS

2. ONDERWERP

GRONDOPVULTERREINE EN TOEKOMSTIGE ONTWIKKELINGS

2. ISIHLOKO

IZIZA EZINGOKUFUNJWA KWENKUNKUMA NEZOPHULISO LWEXESHA

3. DELEGATED AUTHORITY

In terms of delegation

This report is for NOTING BY

- Committee name** : Urban Waste Management
- The Executive Mayor together with the Mayoral Committee (MAYCO)
- Council

4. DISCUSSION

The [Disposal Branch](#) provides 'end of pipe' waste management services and is responsible for the operations at two waste disposal facilities (WDF), four refuse transfer stations (RTS) and one compost plant.

The Disposal branch also has the following responsibilities:

- Specialist technical advisory, co-disposal assessments, slope stability analyses, landfill airspace modelling
- Landfill rehabilitation and post-closure monitoring
- Research and Development
- Rubble diversion and beneficiation projects
- Environmental compliance monitoring and auditing against respective authorizations of facilities
- Integrated waste management through materials recovery facilities and drop-offs

- Project and contract management of operational projects (previously carried out by Contract Management Services (now Capital Projects Branch)

There are currently two operational landfill sites owned and managed by the City

- Vissershok Landfill Site
- Coastal Park Landfill Site

There are currently four transfer stations and six drop-offs managed by the Disposal Branch:

- Athlone Refuse Transfer Station
- Bellville Waste Management Facility
- Kraaifontein Waste Management Facility
- Swartklip Refuse Transfer Station
- Faure Drop-off

1. Vissershok landfill site:

The Vissershok Landfill Site is located off the N7 and south of Frankdale road. The Site is divided into two portions – the current operational Vissershok South (the original site) and the as yet non-operational Vissershok North (newly licenced site). The two sites are separated by a road reserve (future Blouberg East-West Arterial freeway). The combined landfill area is about 117 hectares.

The Vissershok Landfill receives waste directly from the City's internal departments and private customers as well as general waste destined for landfill from the Kraaifontein Waste Management Facility (WMF), Bellville Refuse Transfer Station (RTS), Swartklip RTS and Athlone RTS (feeder sites).

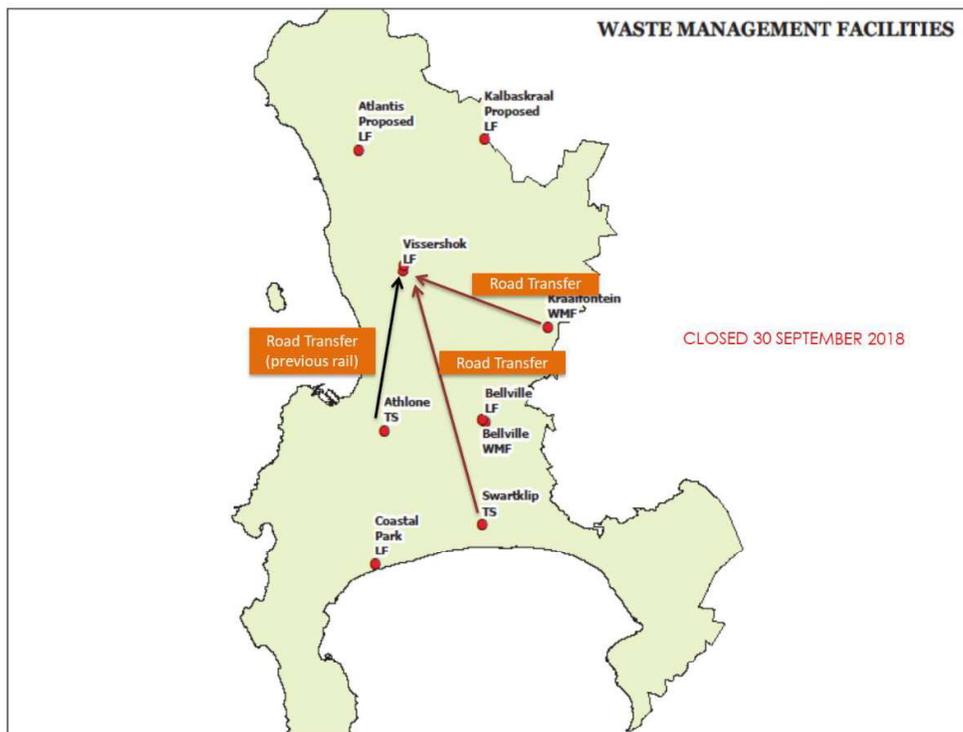


Figure 2: Disposal Facilities and waste movement

Current and planned projects will impact on landfill practices, operations, and resource flows in the future. Several infrastructure projects have been planned for the Vissershok Landfill site, some of which are already in progress:

- Gas monitoring wells
- Fuel Tanks installations
- Development, maintenance and **remediation of the Vissershok Landfill Site**, including:
 - The development of new cells (piggyback cells over Cells 0 and cell 7)
 - Construction of a new leachate collection pipeline from **Vissershok North**

- Progressive capping of the **Vissershok** waste pile
- Extension of the leachate pollution control pond, amongst assorted minor civil and associated works.
- Relocation of FFS refinery facilities, currently occupying space on the Vissershok South site that is earmarked for landfill. This is currently in the process of being decommissioned.
- **Development of the "Triangle facilities"** including:
 - New staff Administration facilities to replace existing facilities: Offices, ablutions and mess facilities
 - Weighbridge facilities to replace existing
 - Various ancillary facilities including equipment stores and a new container yard to replace existing
 - New waste drop-off facility
 - Space allowance is also made for the following:
 - Greens chipping facility
 - Waste to energy facility
 - Tyre storage and processing area
 - Future organics treatment plant
 - Workshop
- **Future cells development at Vissershok North**

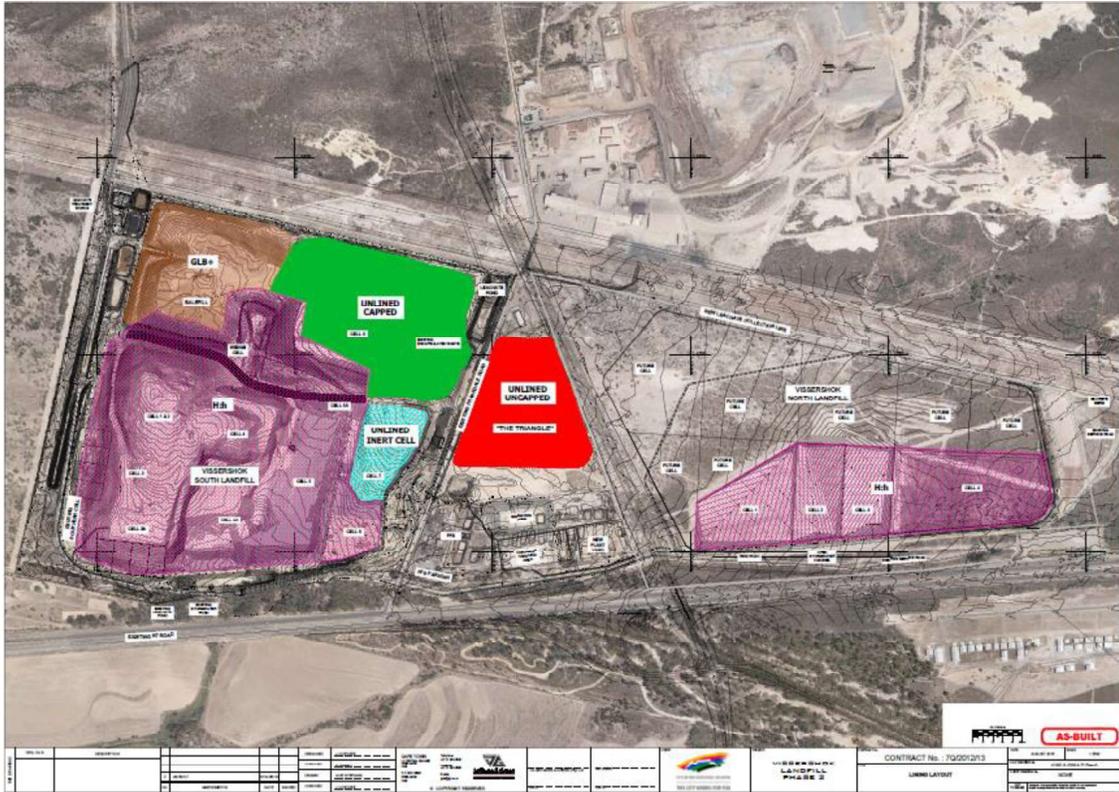


Figure 3: Visual of Vissershok landfill and various cells

2. Coastal Park Landfill Site

The Coastal Park Landfill Site is located off Baden Powell Drive in Muizenberg and serves the southern metropolitan areas as the primary municipal waste disposal facility. The site is licensed and is classified as a General, Large, Leachate producing site (formerly G: L: B+, now Class B).

The site is conceptually divided into two areas, namely "Phase 1" and "Phase 2". The "Phase 1" area is divided into a "Phase 1A" and a "Phase 1B" area. Phase 1B is the unlined, old waste fill site prior to the Site being permitted. The "Phase 1A" area has been developed and now receives waste, in conjunction to "Phase 2" area. In 2000/2001 the first engineered basal cell was developed to receive solid waste, known as "Phase 2A". The "Phase 2" area is lined and is currently being used for wastefill.



Figure -4: Coastal Park Landfill Site Overview

Current and future projects

For the Coastal Park Landfill site, a number of projects are underway or planned to show what may impact future landfill practices, operations, and future volumes.

- Development of an **Integrated Waste Management Facility (IWMF)** on the southern portion of the existing site:
 - The initial Construction Contract for the Bulk Earthworks of the IWMF commenced on 16 June 2019 .
 - The design for the IWMF Building and associated services has been completed in March 2019 and the Construction Contract is **due to commence shortly**.
 - The Mechanical IWMF Operation Design has been completed and the Construction **Contract is due to start**.
- **Development of the final piggy-back Cell (Phase 1B) and Progressive Capping** works. The detailed design was completed in January 2019 and Construction is expected to start mid-August 2020 and be complete by end of 2021.
 - The Coastal Park landfill site receives large quantities of builders' rubble. A contract was awarded to an independent contractor to crush and remove builders rubble on site, however the Contractor made limited progress in processing the rubble due to weak demand for the material. To make use of

the rubble remaining on site, the Phase 1B Cell and Progressive Capping works incorporates crushed builder's rubble from the building rubble stockpile on site for the layer works and landscaping. This innovative approach will utilise what is otherwise a waste material and liability to the CCT in a sustainable way while replacing expensive, imported materials

- There is currently an ongoing contract for the [operation and maintenance](#) of existing [landfill gas extraction infrastructure](#)
- There is planned construction of new [landfill gas to electricity generation infrastructure](#), including a new electrical sub-station. The aim is to generate electricity from the landfill gas and deliver it into the City of Cape Town electrical network with specific focus on power supply power to the proposed IWMF at Coastal Park.
- There is an existing contract for a service provider to [chip and process garden greens](#) delivered to the Coastal Park Landfill. All garden waste delivered to Coastal Park is diverted to the chipping area where the contractor chips, processes and removes for further beneficiation.

3, Kraaifontein Integrated Waste Management Facility (KWMF)

The KWMF is an integrated waste management facility consisting of the following:

- Refuse compaction hall – Capacity 960tons/day;
- Three (3) open top filled container loading bays,
- Compaction hall with 3 inclined conveyors and static compactors,
- Materials recovery facility (MRF) – capacity 100tons/day, Tipping hall flow, bag splitter, primary sorting station with automated bunkers and conveyors, magnetic separator; bottle piercer, baler ;
- Admin office,
- Public drop-off,
- Container washing facility;
- Workshop;
- Bunded diesel refueling
- Security offices,
- Four (4) weighbridges,
- Weighbridge control building ;
- Bioswale area,
- Greens chipping



Figure 5:
Kraaifontein
Integrated Waste
Management
Facility

4. Bellville Refuse Transfer Station

The Bellville Refuse Transfer station is an innovative solution to the complex social, environmental and financial issues of waste management in the City of Cape Town. It is the largest RTS in South Africa, and at its peak will receive up to 1 500 tonnes of domestic waste per day. This facility, boasts a number of key innovations for South African waste management technology, energy-efficient LED lighting, and longer-term solutions through the future inclusion of an MRF and a rail link on the site.

Efficient waste management

Husmann compactor technology from Germany was used for waste compaction.

This low-risk technology can handle a large variety of waste at lower capital and operating costs. The technology includes:

End-tipping technologies:

Rear-end loaders end-tip waste directly into the hopper of the compactor rather than tipping onto the hopper apron. The latter would require a front-end loader to pick up and transfer the waste into the hopper.

Containers:

The technology achieves higher compaction densities in the waste transfer containers, thereby pre-processing bulky waste for compaction.

Four lines of compactors:

At this stage the mechanical equipment for two lines only have been installed but the design allows for phased development of the site up to three operational lines plus ne standby line. The facility will be able to run off-grid in the event of an interruption to the power supply. Besides the backup power supply for operation of the control systems, a standby generator will supply power to the compactors to allow the facility to run continuously. Interruption to this service could have potentially negative health impacts.

The integrated information system design ensures full visual access and operations control of the plant from each of the control rooms and the administration building. There is also full control over the entry and exit of vehicles through one entrance.



Figure 6: Aerial view of Bellville Refuse Transfer Station

5. Athlone Refuse Transfer Station

Athlone RTS has a design capacity of 800tpd but in the past has frequently surpassed this by achieving between 900-1100 tpd on average when rail was in operation.

The various equipment interfaces, operational flow restrictions, container availability, double handling of waste and containers and space limitations, significantly stifle operations and an upgrade and improvement to modernize is in progress.

A thirty (30) ton crane is required to place and replace all containers at Compactors whilst travelling long distances to store or load full containers onto road haul vehicles. The crane removes the full container; loads it onto a vehicle (a slow process made even slower with windy conditions); then collect and empty container and replace it at the process line where the full container was removed, before the Process Line can recommence with processing waste.

Since February 2018 the waste by rail system has been non-operational) reducing the capacity of the facility. The intended facility was designed and built to cart waste to Vissershok LFS via rail and this has impacted the operations negatively. Road haul is now instead being used and since the spatial planning of the site was not designed to cater for road haul, the double handling of containers and slow loading operations result in an even further reduced capacity.



Figure 7: Athlone Refuse Transfer Station

6. Swartklip Refuse Transfer Station

The closure of Swartklip landfill, located in Swartklip Road, Mitchells Plain, during 2001 triggered investigation of resource recovery facility at Swartklip. Waste from ARTS and Klipfontein area were disposed at Swartklip landfill. Waste from Khayelitsha North was also directed to Swartklip. At this stage the total annual tonnage in the order of 200 000 tones or 770 tonnes a day. The site included a composting facility and landfill area and is approximately 104ha in size zoned municipal purposes.

A facility of approximately 660t/day transfer station, with an area of at least 5Ha was permitted. Although the sited is located close to rail (rail infrastructure comprising Mitchells Plain and Khayelitsha legs of the Cape Metrorail's Central line, with the practical link 3.5km north of the site at Nolungile Station). The apron (floor that waste is tipped onto) accepts municipal solid waste, with the loads then discharged into a conveyor hopper and then fed into the compactor. It is compacted into the containers, sealed and the portal crane moves these onto vehicles for transport by road to Visserhok landfill site.



Figure 8: Swartklip Refuse Transfer Station

7. Future developments - major disposal projects planned include:

Strategic Intent	Objectives	Capex Projects identified	
Extend the life of the existing landfill space to 2040 Develop a new regional landfill site	Increase existing landfill airspace	Coastal Park Airspace design and develop airspace	
	Invest in stimulating resource beneficiation	Coastal Park MRF	
	Accelerate waste avoidance	New RTS at Coastal Park	
	Invest in a new landfill site with a minimum of 35 years of airspace.	Athlone Refuse Transfer Station – MRF and Mechanical Biological Treatment (MBT) Facility	
			New Drop Off Helderberg
			New MRF Helderberg

		BRTS Materials Recovery Facility MBT
		Vissershok North Design and Development
		Helderberg RTS
		Land acquisition for Regional Landfill
		Construction of Regional Landfill (alternative technologies/best practice)

Strategic Intent	Objectives	Capex Projects identified
Invest in the city's efforts to mitigate climate change and minimise the health impacts of waste management	Maximise the opportunities to reduce GHG from waste streams and activities	Vissershok LFG Infrastructure to flaring including Beneficiation
		Bellville LFG to Flaring
		Coastal Park LFG Flaring Including Beneficiation

Financial Implications None Opex Capex
 Capex: New Projects
 Capex: Existing projects requiring additional funding
 Capex: Existing projects with no Additional funding requirement

Policy and Strategy Yes No

Legislative Vetting Yes No

Legal Implications Yes No

Staff Implications Yes No

Risk Implications Yes No

POPIA Compliance Yes It is confirmed that this report has been checked and considered for POPIA compliance.

5. RECOMMENDATIONS

Landfill and future developments aligned to sector plan and capital programme – for noting.

5. AANBEVELING

Grondopvulterreine en toekomstige ontwikkelings in pas met sektorplan en kapitaalprogram – ter kennisname.

5. ISINDULULO

Ukuba makuqwalaselwe ulungelelwaniso lokuNqunjwa kwenkunkuma nophuhliso lwexesha elizayo ukuba lijolise kwisicwangciso secandelo nenkqubo engezimali ezinkulu.

ANNEXURES

FOR FURTHER DETAILS CONTACT

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SIGNATURE : DIRECTOR	 <p>Digitally signed by Rustim Keraan Date: 2022.04.28 11:45:01 +02'00'</p>	 <p>Margot Ladouce</p>	<p>Digitally signed by Margot Ladouce Date: 2022.04.28 10:35:46 +02'00'</p>

EXECUTIVE DIRECTOR

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DATE			
SIGNATURE	 <p>Digitally signed by Rustim Keraan Date: 2022.04.28 11:28:40 +02'00'</p>		

The ED's signature represents support for report content and confirms POPIA compliance.

LEGAL COMPLIANCE

- REPORT COMPLIANT WITH THE PROVISIONS OF COUNCIL'S DELEGATIONS, POLICIES, BY-LAWS AND ALL LEGISLATION RELATING TO THE MATTER UNDER CONSIDERATION.
- NON-COMPLIANT

NAME _____

COMMENT: _____

DATE _____

SIGNATURE

Sarah Sanders Digitally signed by Sarah Sanders
Date: 2022.04.28 12:15:56 +02'00'

For information