

REFERENCE: 19/2/5/1/C3/12/WL0053/12

The Municipal Manager
Beaufort West Municipality
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Attention: Mr. Jackson Penxa

WASTE MANAGEMENT LICENCE GRANTED IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT: WASTE ACT 2008 (ACT NO. 59 OF 2008), AS AMENDED, FOR THE OPERATION OF THE CURRENT WASTE CELL AND THE FURTHER EXPANSION OF THE MERWEVILLE WASTE DISPOSAL FACILITY ON PORTION 6 OF FARM VAN DER BYLSKRAAL NO. 256, MERWEVILLE.

With reference to the application for the facility, find below the outcome with respect to this application.

WASTE MANAGEMENT LICENCE

A. DECISION

I, Eddie Hanekom, in my capacity as the Director: Waste Management of the Department of Environmental Affairs and Development Planning (hereinafter referred to as 'the Department'), in terms of the National Environmental Management: Waste Act (NEM:WA), 2008 (Act No. 59 of 2008), as amended, read with the Environmental Impact Assessment (EIA) Regulations promulgated in terms of Government Notice (GN) No. R. 982 of 4 December 2014, as amended, hereby grant this Waste Management Licence to the Beaufort West Municipality (hereinafter referred to as 'the Municipality') to operate the Merweville Waste Disposal Facility (WDF) (hereinafter referred to as 'the Facility') on Portion 6 of Farm Van der Bylskraal No. 256, Merweville.

B. DESCRIPTION OF THE ACTIVITY:

The construction and operational activities for this Class B Waste Disposal Facility must be in accordance with the *National Norms and Standard for the Disposal of Waste to Landfill, 2013*, as published in Government Notice No. R636 on 23 August 2013. The activity entails: -

- (a) The rehabilitation of the existing landfill (Cell 1), and the continued use of the rehabilitated Cell 1 for a limited time until Cell 2 has been commissioned (expected maximum of 2 years),
- (b) The planning, design, construction and commissioning of Cell 2,
- (c) The capping and closure of Cell 1, and
- (d) The future development of Cell 3.

As per the Minimum Requirements for Waste Disposal by Landfill of the Department of Water Affairs and Forestry Second Edition 1998 (DWAF, 1998) (referred to as "Minimum Requirements"), the Facility must implement, but not limited to, the following:-

- (a) Signposting and access control,
- (b) Waste acceptance criteria,
- (c) Adequate plant and equipment,
- (d) Responsible person and suitably qualified staff,
- (e) Compaction by any means and covering of waste,
- (f) Immediate covering of putrescible waste,
- (g) The prohibition of end-tipping,
- (h) Stockpiling of cover material,
- (i) Progressive shaping in accordance with the engineer's drawings,
- (j) Any reclamation operation formalised in the operating plan, with registration of reclaimers,
- (k) Personal protective equipment for staff,
- (l) Control of nuisances,
- (m) The prohibition of waste burning,
- (n) Diversion of clean stormwater and appropriate management of contaminated runoff,
- (o) Anti-erosion measures and graded slopes to avoid ponding,
- (p) General site maintenance, and
- (q) Sporadic leachate reporting.

The following activities listed of *The List of Waste Management Activities That Have, Or Are Likely to Have, A Detrimental Effect on The Environment, 2013*, as published in Government Notice No. 926 on 29 November 2013 (GN No. 921) are hereby authorised:-

Category B

- 4 (10) The construction of a facility for a waste management activity listed in Category B of this Schedule (not in isolation to associated waste management activity).
- 4 (8) The disposal of general waste to land covering an area in excess of 200m² and with a total capacity exceeding 25,000 tons.

The following listed activities may only require registration with the Licensing Authority if the respective thresholds are triggered or require adherence to conditions of the *National Norms and Standards for the Storage of Waste, 2013*, as published in Government Notice No. 926 on 29 November 2013 and/or the *National Norms and Standards for the Sorting, Shredding, Grinding, Crushing, Screening or Baling of General Waste, 2017*, as published in Government Notice No. 1093 on 11 October 2017, if the thresholds are triggered:-

Category C

- 5 (1) The storage of general waste at a facility that has the capacity to store in excess of 100m³ of general waste at any one time, excluding the storage of waste in lagoons or temporary storage of such waste.
- 5 (2) The storage of hazardous waste at a facility that has the capacity to store in excess of 80m³ of hazardous waste at any one time, excluding the storage of hazardous waste in lagoons or temporary storage of such waste.
- 5 (3) The storage of waste tyres in a storage area exceeding 500m².
- 5 (6) The sorting, shredding, grinding, crushing, screening or bailing of general waste at a Facility that has an operational area that is 1000m² or more.

As a waste management Licence Holder, you are also required to be familiar with the legislation, regulations and norms and standards about waste management in the Republic of South Africa and the Western Cape.

In this Licence, "Director" means the Director: Waste Management of the Western Cape Department of Environmental Affairs and Development Planning, who may be contacted at the address below:

Director: Waste Management
Department of Environmental Affairs and Development Planning
Private Bag X 9086
CAPE TOWN
8000

In this Licence, "Director: RPW" means the Director: Resource Protection and Waste of the Department of Water and Sanitation: Western Cape Provincial Operations who may be contacted at the address below:

Director: Resource Protection and Waste
Department of Water and Sanitation
Private Bag X16
SANLAMHOF
7532

The Licence Holder, the Beaufort West Municipality appointed the following independent Environmental Assessment Practitioner (EAP) to administer the application for a Waste Management Licence:

DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)

The Board of Directors
GIBB (Pty) Ltd
Postal address: P.O. Box 63703, Greenacres, 6057
Physical address: 1st Floor St. George's Corner, 116 Park Drive, Central, Gqeberha (Port Elizabeth), 6001
Contact person: Walter Fyvie
Tel.: (041) 509 9153
Fax: (041) 363 9300
E-mail: wfyvie@gibb.co.za

The granting of this Waste Management Licence is subject to compliance with the conditions set out in section C.

C. LICENCE CONDITIONS

LICENCE NUMBER: 19/2/5/1/C3/12/WL0053/12
WASTE APPLICATION: OPERATION OF THE MERWEVILLE WDF
LOCATION: PORTION 6 OF FARM VAN DER BYLSKRAAL NO. 256, MERWEVILLE
LICENCE HOLDER: BEAUFORT WEST MUNICIPALITY
CONTACT PERSON: THE MUNICIPAL MANAGER OR THE DESIGNATED WASTE MANAGER/
OFFICER
ADDRESS: PRIVATE BAG 582, BEAUFORT WEST, 6970

1. LOCATION

- 1.1 This Licence authorises the Beaufort West Municipality to operate and expand the existing waste cell of the Facility, on Portion 6 of the Farm Van der Bylskraal No. 256, Merweville.
- 1.2 The location of the Facility must be according to the co-ordinates indicated on the Waste Management Licence Application Form dated 24 May 2012 and Waste Management Licence Application Additional Information Annexure, dated 3 April 2017, submitted by the Licence Holder, which is defined as follows:

Table 1-1: Footprint of the Facility.

Corner Numbers	Latitude	Longitude
1	32°41'0.14"S	21°31'56.30"E
2	32°40'59.32"S	21°31'58.60"E
3	32°40'58.65"S	21°32'2.88"E
4	32°40'58.71"S	21°32'4.94"E
5	32°40'58.95"S	21°32'5.88"E
6	32°41'0.17"S	21°32'6.93"E
7	32°41'0.96"S	21°32'6.84"E
8	32°41'0.86"S	21°32'5.60"E
9	32°41'1.16"S	21°32'5.55"E
10	32°41'1.13"S	21°32'5.09"E
11	32°41'0.66"S	21°32'3.73"E
12	32°41'1.66"S	21°31'56.69"E

- 1.3 Location of property on which the Facility is situated:

Table 1-2: Location of the Facility

Latitude	Longitude
32°40'52"S	21°31'21"E

- 1.4 The footprint of the Facility and its associated infrastructure is approximately 17,550m².

1.5 The Surveyor General 21 Digit code of the Facility is: C00900000000026500006.

2. **PERMISSIBLE WASTE**

2.1 Any portion of the Facility which has been constructed or developed according to condition 4 of this Licence, may be used for the disposal of general waste. Only waste that is classified as general waste, according to the NEM:WA, or any current and future Norms and Standards developed by the Department, is authorised.

2.2 If more than 80m³ of hazardous waste is going to be stored at the Facility, registration in terms of the relevant *National Norms and Standards for the Storage of Waste, 2013*, as published in Government Notice No. 926 on 29 November 2013, must be done and the waste must be stored accordingly.

2.3 The Licence Holder must take all reasonable steps to ensure that:

2.3.1 no hazardous waste is disposed of at the Facility; and

2.3.2 no health care risk waste, including pharmaceutical waste, as defined by the Western Cape Health Care Waste Management Act, 2007, (Act No. 7 of 2007), is disposed of at the Facility.

2.4 The Licence Holder must prevent the acceptance of any waste not authorised at the Facility.

2.5 All waste loads must be checked at the gate to prevent the disposal of waste not authorised by this Licence.

2.6 Organic waste may be disposed of at the Facility, but in accordance with an Organic Waste Diversion Plan, which contain the targets and procedures referred to in conditions 18.8 and 18.9.

3. **APPOINTMENT OF WASTE MANAGEMENT CONTROL OFFICER/ENVIRONMENTAL CONTROL OFFICER**

3.1 A Waste Management Control Officer (WMCO)/Environmental Control Officer (ECO), who will monitor and ensure compliance and correct implementation of all mitigation measures and provisions as stipulated in the Licence and Environmental Management Programme (EMPr) dated 20 November 2017, must be appointed prior to any of the listed activities being undertaken on the Facility.

3.2 A waste management control officer must-

3.2.1 work towards the development and introduction of clean production technologies and practices to achieve waste minimisation;

3.2.2 identify and submit potential measures in respect of waste minimisation, including the reduction, recovery, re-use and recycling of waste to the waste management licence holder and the Licensing Authority;

3.2.3 take all reasonable steps to ensure compliance by the holder of the waste management licence with the licence conditions and requirements and the provisions of the NEM:WA; and

3.2.4 promptly report any non-compliance with any licence conditions or requirements or provisions of the NEM:WA to the Licensing Authority through the most effective means reasonably available.

3.3 Condition 3.2 does not affect the liability of the Licence Holder to comply with the conditions and requirements of this licence.

4. **CONSTRUCTION**

4.1 The construction of the Waste Disposal Facility should be in accordance with the Beaufort West Municipality Merweville Landfill Upgrade Design Report including drawings with reference J34213, Issue 2, compiled by GIBB Engineering, signed by MJ Saunders (Senior Technician) and P Grobbelaar Pr. Eng., dated August 2020, and the Beaufort West Municipality Merweville Landfill Upgrade Construction

Quality Assurance Plan with reference J34213, Issue 5, compiled by GIBB Engineering, signed by V de Wett and G Purnell Pr. Eng. 880638, dated August 2020 and shall adhere to a Class B containment barrier design as described in the *National Norms and Standards for Disposal of Waste to Landfill, 2013*, published in Government Notice No R. 636 on 23 August 2013.

- 4.2 Construction and further development within the Facility must be carried out under the supervision of a Professional Civil Engineer, registered under the Engineering Profession of South Africa Act, 2000 (Act No. 46 of 2000).
- 4.3 The Licence Holder must notify the Licensing Authority in writing within 24 hours if any of condition of the design acceptance cannot be or is not adhered to. The notification must be supplemented with reasons for non-compliance and proposed rectification measures.
- 4.4 Design and construction records including topographical surveys and methodical material tests results, on all materials used, shall be maintained and archived and accessible for the life of the Facility, including decommissioning.
- 4.5 The Licensing Authority shall not be held responsible for any damages or losses suffered by the Applicant or its successor in title in any instance where the construction or operation subsequent to construction is temporarily or permanently stopped for reasons of non-compliance by the Applicant with the condition of approval as set out in this Licence or any other subsequent document emanating from these conditions of acceptance.
- 4.6 The discharge of leachate or polluted water from the pollution control dam or process water dam is to be reported as an incident within 24 hours and treated as such with appropriate remediation.
- 4.7 All significant differences between predicted and actual performance of waste management facilities shall be reported to the Licensing Authority.
- 4.8 After construction of the Facility or further development within the Facility, the Licence Holder shall notify the Director thereof and the person referred to in condition 4.2 shall submit a certificate or alternatively a letter to the Director that the construction of the Facility or further development within the Facility, as proposed by the Licence Holder and approved by the Director, is in accordance with recognised civil engineering practice and the requirements in this Licence, before disposal may commence on the Facility. If the Director is satisfied with the construction of the Facility or any further development within the Facility and has given written permission, the Licence Holder may use the Facility or any further development within the Facility for the disposal of waste.
- 4.9 Works shall be constructed and maintained on a continuous basis by the Licence Holder to divert and drain from the Facility in a legal manner, all runoff water arising on land adjoining and adjacent to the Facility, which could be expected as a result of the estimated maximum precipitation during a period of 24 hours with an average frequency of once in fifty (50) years (hereinafter referred to as the "estimated maximum precipitation"). Such works shall, under the said rainfall event, reasonably prevent the stormwater from entering the working face of the Facility.
- 4.10 Works shall be constructed and maintained on a continuous basis by the Licence Holder to divert and drain from the working face of the Facility, all runoff water arising on the Facility, which could be expected as a result of the estimated maximum precipitation and to prevent such runoff water from coming into contact with leachate from the Facility. Such works shall, under the said rainfall event, maintain a freeboard of 0.8 metres and be lined to the satisfaction of the Responsible Authority, to prevent pollution to groundwater.
- 4.11 Runoff water referred to in condition 4.10 shall comply with the quality requirements as prescribed by the Director and the Director: RPW which may be determined from time to time and shall be drained from the Facility in a legal manner.

- 4.12 Runoff water referred to in condition 4.10 which does not comply with the quality requirements referred to in condition 4.11 and all leachate from the Facility shall, by means of works which shall be constructed and maintained on a continuous basis by the Licence Holder and be lined as approved by the Director and the Director: RPW, to prevent pollution to groundwater, be treated to comply with the quality requirements referred to in condition 4.11.
- 4.13 Any development which occurs within 1:100-year flood line and/or within 500m from the boundary of a wetland would require a water use licence in terms of section 40 of the National Water Act, 1998 (Act No. 36 of 1998).
- 4.14 One month's written notice must be given to the Licensing Authority before commencement of the construction and operational activities. Such notice shall make clear reference to the site location details and the reference number of the project as indicated above.
- 4.15 The Licence Holder must place cordons, barriers and warning systems around facilities to define the nature and extent of each disposal or waste management area, and avoid intersection of different waste types as per the *National Norms and Standards for Disposal of Waste to Landfill, 2013*, published in Government Notice No R. 636 on 23 August 2013.
- 4.16 The Licence Holder is to ensure that there is no alignment between engineer, contractor, subcontractors, material suppliers, and construction quality assurance (CQA) agent in the development, and implementation, of construction quality assurance, and is accountable therefore, as a public listed company.
- 4.17 No leachate recirculation may take place within the facility.
- 4.18 In the absence of a total load assessment of peak total tensile strain development within the geomembrane (GM), the Engineer shall confirm the maximum particle size within the above GM cushion layer and below GM Compacted Clay Liner (CCL), to confirm total tensile strain in the floor area of cell 2 is less than 3%.
- 4.19 The end of the construction engineer's certificate of completion of works in accordance with the accepted design and CQA with conditions of amendment shall be provided to the Licensing Authority with supporting evidence as required by CQA protocols for written acceptance prior to disposal of waste.
- 4.20 The draft CQA plan by GIBB Engineering in the design report shall be revised to incorporate the recommended lining contractors CQC and shall be augmented to reflect reporting as per the DWS technical advisory note on CQA of September 2020.
- 4.21 The SANS standard specifications and generally accepted engineering practices specified shall be the most recent amendment as at commencement of construction.
- 4.22 The recommendations within the design report form part of the specification for the works, unless agreed otherwise with the authorities in advance of deviation. Those design engineer's recommendations include the competence of the lining contractors and reservation of the right to undertake an electric leak location survey on cell 2 post placement of the protection layer.
- 4.23 The licence holder in conjunction with the design engineer is to be afforded the opportunity to make adjustments to the design for cost savings without compromising performance, provided such non-substantive amendments are agreed to in writing by the Licensing Authority prior to implementation. (For example, the potential reduction in cell 1 capping design materials such as lineaments, dykes, faults, shallow water table or on areas with potential for increased infiltration to groundwater).
- 4.24 The existing portion or waste cell must be reshaped according to the Engineer's Drawings included in the approved final BAR.
- 4.25 The maximum height of the Facility may not exceed 716.3m above mean sea level.

- 4.26 The slope of the waste body must be constructed and maintained in such a manner that the occurrence of erosion is prevented.
- 4.27 The Facility must be constructed in accordance with recognized civil engineering practice to ensure that it remains stable as well as to avoid and maintain erosion impact.
- 4.28 The Licence Holder must ensure that progressive capping of fully utilised waste cells is done, throughout the life of the Facility, until the Facility is ceased and capped upon reaching full capacity.
- 4.29 The Licence Holder must ensure that Construction Quality Assurance (CQA) takes place during construction, and that all construction material comply with relevant South African National specifications, or any prescribed management practice or standards which ensure equivalent performance. Details of quality assurance during construction must be provided to the Director and the Director: RPW. This must also include confirmation that construction will be supervised by a Registered Professional Engineer.
- 4.30 This Licence must be made binding to the main contractor as well as individual contractors and should be included in tender documentation for the construction contract.
- 4.31 Should any archaeological artefacts be exposed during excavation, the construction in the vicinity of the finding must be stopped. Under no circumstances shall any artefacts be destroyed. Such an archaeological Facility must be marked and fenced off, and the South African Heritage Resource Agency must be contacted within 48 hours.

5. **FACILITY MANAGEMENT**

- 5.1 The EMPr dated 20 November 2017, submitted as part of the final Basic Assessment Report (BAR), is hereby approved and must be implemented together with all the conditions of this Licence.
- 5.2 An application for the amendment to the EMPr could be submitted to the Director if any further amendments are to be made to the EMPr and such amendments may only be implemented if the amended EMPr has been authorised by the Director.
- 5.3 The EMPr must be included in all contract documentation for all phases of implementation.
- 5.4 The Licence Holder must notify the Director immediately of any events or incidents that may cause significant environmental damage or breach the requirements of the EMPr.
- 5.5 The activities authorised by this Licence must be managed by fit and proper persons who are competent in respect of the responsibilities to be undertaken by them.
- 5.6 Any persons having duties that are or may be affected by the matters set out in this Licence must have convenient access to a copy of it, kept at or near the place where those duties will be carried out.
- 5.7 A copy of this Licence and the EMPr must be kept at the Facility where the waste listed activities will be undertaken. The Licence and EMPr must be produced to any authorised official of the Department who requests to see it for the purposes of assessing and/or monitoring compliance with the conditions contained herein, and must be made available for inspection by any employee or agent of the Licence Holder who works or undertakes work at the Facility.
- 5.8 The Licence Holder shall remain responsible for the Facility, and/or any of the impacts arising from the operations on the environment.
- 5.9 The Licence Holder shall take all reasonable steps to ensure the Facility is operated in a manner which shall prevent the creation of nuisance conditions or health hazards, such as vectors (flies and vermin), exposed waste, dust, windblown litter, obnoxious odours and noise.

- 5.10 Reclamation of waste, below the legislated thresholds, may occur at the Facility at the discretion of the Licence Holder, but may not take place at the active working face.
- 5.11 All persons reclaiming waste must be wearing suitable personal protection equipment.
- 5.12 An Emergency Response Plan (ERP) must be developed, and all staff must be trained in the implementation thereof. The ERP should be regularly updated and must include fire evacuations, injury on duty, accidents, and procedures caused by unexpected hazardous waste ending up at the Facility.

6. **FACILITY SECURITY AND ACCESS CONTROL**

- 6.1 The Licence Holder must prevent unauthorised access to the Facility, by having the Facility enclosed within a fence and a gate, thereby providing adequate access control.
- 6.2 Weatherproof, durable and legible notices must be displayed at each entrance in at least 3 (three) official languages applicable to the area. These notices must prohibit unauthorised entry, state the hours of operation, include the types of waste permissible, the name, address and telephone number of the Licence Holder and the person responsible for the operation of the Facility.
- 6.3 The Licence Holder must prevent the acceptance of any waste not authorised at the Facility as per condition 2.
- 6.4 Waste must be screened at the entrance of the Facility to ensure compliance to condition 6.3.
- 6.5 All entrances to the Facility must be manned during operating hours and locked outside operating hours.
- 6.6 The Licence Holder must ensure that all roads at the Facility are maintained to allow access to all areas by vehicle.

7. **WATER QUALITY MANAGEMENT**

7.1 **Water Monitoring**

- 7.1.1 The Licence Holder must develop and implement a groundwater monitoring programme. The monitoring programme should include the monitoring boreholes (upstream and downstream), frequency of sampling, variables or parameters to be analysed as mentioned on page 8 of the Geohydrological Assessment of the Solid Waste Disposal Site, Merweville, Western Cape compiled by Geohydrological & Spatial Solutions International Consulting (GEOSS) (Pty) Ltd., dated 4 July 2011.
- 7.1.2 Groundwater monitoring should be conducted bi-annually in order to quantify impacts and note trends on the groundwater resources for both wet and dry season.
- 7.1.3 Two boreholes must be drilled (one upstream and one downstream) of the site to establish the current groundwater quality on the site as the water quality of the reservoir sample that was collected is not a true reflection of the quality as the distance/proximity of the neighbouring reservoir is not indicated. These boreholes will also be used for the water quality monitoring to quantify ongoing impacts on site.
- 7.1.4 Monitoring boreholes must be equipped with lockable caps. The Director and the Provincial Head reserves the right to take water samples at any time and to analyse these samples or have them analysed.
- 7.1.5 The proposed landfill must not be constructed on geological structures such as dykes. An acceptable barrier system must be implemented as per the recommendations by the engineering services section.

- 7.1.6 Clean runoff must be diverted away from dirty areas to maximise the separation of clean water from dirty water.
- 7.1.7 In the case of pollution at a latter stage, the cause of the pollution must be determined, and remediation measures should be implemented to reduce the potential migration of any contaminant from the site.
- 7.1.8 In the event that groundwater and downstream users are affected by unacceptable water quality as a result of contamination plume emanating from the landfill site, the licence holder must compensate the users with potable water.
- 7.1.9 Monitoring boreholes must be equipped with lockable caps. The responsible authority reserves the right to take water samples at any time and to analyse these samples or have them analysed.
- 7.1.10 A geophysical survey must be conducted to optimise the drilling targets for the monitoring boreholes/positions to maximise the likelihood of intercepting potential groundwater impacted by the landfill site.

7.2 **Liner Leak and Failure Detection Monitoring**

- 7.2.1 The leak detection system must be monitored daily for possible leakages in the Class B liner.
- 7.2.2 Should a leak or failure be suspected or detected during monitoring or at any time, it must be regarded as an incident and be reported to the Director and the Director: RPW accordingly.
- 7.2.3 Inspection of liners, where liners are accessible must be performed monthly. Liners must be repaired or replaced when inspection tests show deterioration or leakage and these corrective action(s) shall be performed to the satisfaction of the Director.

7.3 **Detection Monitoring**

- 7.3.1 Monitoring for groundwater quality must be conducted for variables listed in Annexure II – quarterly or such frequency as may be determined by the responsible authority.

7.4 **Investigative monitoring**

- 7.4.1 If, in the opinion of the Director, a water quality monitoring variable listed under the detection monitoring preprogramme, as referred to in condition 7.3.1, shows an increasing trend, the licence holder shall initiate a monthly monitoring programme until such time that the variable is within acceptable limits.

8. **METHODS OF ANALYSIS**

- 8.1 The Licence Holder shall carry out all tests in accordance with methods prescribed by and obtainable from the South African Bureau of Standards (SABS), referred to in the Standards Act, 2008 (Act No. 8 of 2008), to analyse the samples taken under the monitoring programmes specified in condition 7.1.1.
- 8.2 The Licence Holder shall only use another method of analysis if written proof that the method is at least equivalent to the SABS method, is submitted to the Responsible Authority.
- 8.3 The Licence Holder must put in place a monitoring and measurement plan that must inter alia include:-
 - (a) mass (in tonnes or kilograms) received, recycled, reclaimed, treated and transferred;
 - (b) waste types and sources;
 - (c) air quality monitoring; and
 - (d) an annual topographical survey submitted to the Director in the form of an Airspace Determination Report, which must estimate the remaining volume of airspace on the Facility and the remaining lifetime for the disposal of waste at the Facility.

9. **IMPACT MANAGEMENT**

- 9.1 All waste storage and sorting activities must be done on hardened surfaces with waterproof bases, drainage system with bund walls and must be roofed.
- 9.2 Windblown litter must be contained on Facility by any practical means. Any waste/windblown litter contained on any fences and outside the boundaries must be collected and disposed of.
- 9.3 Waste disposed of at the Facility must be compacted and covered frequently, with a layer of soil or other material such as builders' rubble, to prevent it from being blown away during windy conditions or being exposed such to scavenging animals and informal waste collectors.
- 9.4 Waste may not be burned at the Facility.
- 9.5 All staff and visitors' occupational health and safety risks must be identified and managed. Protective clothing must be worn on the Facility and the provisions of the Occupational Health and Safety Act, 1993 (Act No. 85 OF 1993) must be complied with.
- 9.6 A two-way access road must be constructed with material that creates minimal dust. This access road must also be maintained to allow easy access to Facility and the active cells.
- 9.7 The stockpiles of cover materials which can be a source of dust must be managed appropriately. The plan to minimise dust generation should be implemented as described in the EMPr.
- 9.8 Fugitive dust emission must be mitigated through wet suppression methods and earth moving operations should be restricted during windy conditions.
- 9.9 The presence of any nuisance such as vectors (flies and vermin), exposed waste, windblown litter, bad odours, etc. must be monitored and the monitoring results must be kept in terms of conditions 13 and 14.
- 9.10 The Licence Holder must determine the appropriate buffer zone for this Facility, within 6 (six) months of the date of this Licence. This buffer zone must restrict any residential and light industrial development within the buffer zone of the Facility. This buffer zone must then be established through written agreement between the Licence Holder and the adjacent property owners within the buffer zone.
- 9.11 Spill kits which include hydrocarbon absorbent material must be stored at the Facility and staff must be trained to use these spill kits.
- 9.12 Any complaint from the public must be attended to by the Licence Holder, who must take all reasonable and practical steps to alleviate the cause of the complaint within a reasonable timeframe to the satisfaction of the Director and record it in terms of conditions 13 and 14.
- 9.13 Skips must be provided for waste which is not allowed to be disposed of at this facility and must be removed regularly for disposal at a suitably licenced waste disposal facility.
- 9.14 An area must be demarcated for fuelling and workshop services. This area must be bund to contain any spillages with a 110% capacity to reduce the possibility of soil and water contamination.
- 9.15 The Director must be notified immediately of events or incidents that may cause significant environmental damage or breach the requirements of the EMPr.

10. **ENVIRONMENTAL POLLUTION INVESTIGATIONS**

- 10.1 If, in the opinion of the Director, any environmental pollution, nuisances or health risks may be or is occurring on the Facility, the Licence Holder must investigate the cause of the problem and take reasonable steps to alleviate the problem in consultation with the Director.

10.2 Should the investigation carried out as per condition 10.1 above reveal any unacceptable levels of pollution, the Licence Holder must submit a report with mitigation measures to the satisfaction of the Director.

11. **AUDITING**

11.1 **Internal Audits**

11.1.1 Internal audits must be conducted quarterly (four times per year) by the Licence Holder and on each audit occasion an official report must be compiled by the relevant auditor in the format specified by the Director as per condition 11.3 to report the findings of the audits, which must be made available to the external auditor specified in condition 11.2.1 and the Department (if requested), according to condition 11.4.2.

11.2 **External Audits**

11.2.1 The Licence Holder must appoint an independent external auditor to audit the Facility annually (once per year) and this auditor must compile an audit report in the format specified by the Director as per condition 11.3 documenting the findings of the audit, which must be submitted to the Department.

11.2.2 The audit report must specifically state whether conditions of this Licence are adhered to and must include an interpretation of all available data and test results regarding the operation of the Facility and all its impacts on the environment.

11.2.3 The audit report must contain recommendations regarding non-compliance or potential non-compliance with the Licence conditions and must specify target dates for the implementation of the recommendations by the Licence Holder.

11.2.4 The external audit report must be submitted to Environmental Monitoring Committee (hereinafter referred to as the 'Monitoring Committee'), provided in condition 12.1 below, within 3 (three) months, from the date on which the external auditor finalised the report.

11.2.5 Each external audit must be submitted to the Director within 30 (thirty) days, from the date on which the external auditor finalised the report.

11.3 Both the internal and external audit reports must be in accordance with the format as prescribed by the Department.

11.4 **Departmental Audits and Inspections**

11.4.1 The Department and the Director: RPW reserves the right to audit and/or inspect the Facility at any time and at such a frequency as the Director and the Director: RPW may decide, or to have the Facility audited or inspected.

11.4.2 The Licence Holder must make any records or documentation available to the Director and the Director: RPW upon request, as well as any other information the Director and the Director: RPW may require.

11.4.3 The findings of these audits or inspections shall be made available to the Licence Holder within 60 (sixty) days of the end of the audit or inspection and shall not be treated as confidential.

12. **MONITORING COMMITTEE**

12.1 The Licence Holder must establish a Monitoring Committee for the normal operative lifetime of the Facility.

- 12.2 The Licence Holder must take the necessary steps to establish, maintain and ensure the continued functioning of a Monitoring Committee for the normal operative lifetime of the Facility and for a period of at least two years after the closure of the Facility, or such longer period as may be determined by the Director.
- 12.3 The Monitoring Committee shall be representative of relevant interested and affected persons and may consist of at least 3 (three) of the following representatives:
 - 12.3.1 Licence Holder and/or his/her appointed consultant(s) or advisor(s);
 - 12.3.2 representative(s) of the Health, Environment and/or Waste Departments of the relevant local authority;
 - 12.3.3 representative(s) of this Department; and
- 12.4 at least 3 (three) persons/parties, their representatives elected by the local residents, or proof of notification of the Monitoring Committee to interested and affected parties of each meeting.
- 12.5 The Monitoring Committee must meet annually (once per year) and no later than 3 (three) months after the finalisation of the external audit report was conducted in terms of condition 11.2.1, and submitted in terms of condition 11.2.4.
- 12.6 The Licence Holder must keep minutes of all meetings of the Monitoring Committee and distribute these minutes to all members of the Monitoring Committee within 30 (thirty) days after the meeting.

13. **RECORD KEEPING**

- 13.1 The Licence Holder must keep records of all monitoring results, nuisances and complaints at the Facility.
- 13.2 Accurate records of waste volumes or masses received and recovered must be kept at the Facility and reported to the Department as per condition 14.7.
- 13.3 All records required or resulting from activities required by this Licence must:
 - 13.3.1 be legible;
 - 13.3.2 be made available and should form part of any audit report;
 - 13.3.3 if amended, be amended in such a way that the original and any subsequent amendments remain legible and are easily retrievable;
 - 13.3.4 be retained in accordance with documented procedures which are approved by the department; and
 - 13.3.5 be made available upon the request of the director.
- 13.4 The Licence Holder shall record all borehole data and chemical analysis as required in condition **7Error! Reference source not found..**

14. **REPORTING**

- 14.1 The Licence Holder must, within 24 (twenty four) hours, notify the Director of the occurrence or detection of any incident on the Facility which has the potential to cause, or has caused any pollution.
- 14.2 The Licence Holder must, within 14 (fourteen) days, or as specified by the Director from the occurrence or detection of any incident referred to in condition 10.1, submit an action plan, which must include a detailed time schedule, and resource allocation signed off by management, to the satisfaction of the Director, of measures taken to:-
 - 14.2.1 correct the impact resulting from the incident;
 - 14.2.2 prevent the incident from causing any further impact; and

- 14.2.3 prevent a recurrence of a similar incident.
- 14.3 In the event that measures have not been implemented within 21 (twenty one) days of the incident, to address impacts caused by the incident referred to in condition 14.1, or measures which have been implemented are inadequate, the Director may implement the necessary measures at the cost and risk of the Licence Holder.
- 14.4 The Licence Holder must keep and maintain an incident and complaints register, which must be kept at the Facility and be made available at the request of the Director.
- 14.5 The Department must be notified within 7 (seven) days of any changes to the management of the Facility including the name of the incoming person together with evidence that such person has the required technical competence.
- 14.6 The Department must be notified within 14 (fourteen) days of the following changes:
- 14.6.1 licence holder's trading name, registered name or registered office address;
 - 14.6.2 particulars of the licence holder's ultimate holding company (including details of an ultimate holding where a licence holder has become a subsidiary); and
 - 14.6.3 steps taken with a view to the licence holder going into bankruptcy, entering into composition or arrangement with creditors.
- 14.7 The Licence Holder must register and report all waste volumes or masses received, recovered, disposed of or stored to the Department's Integrated Pollutant and Waste Information System (IPWIS) which can be accessed on the URL: <http://ipwis.pgwc.gov.za/ipwis3/public>, as required by the Department.
- 14.8 The Department must be notified without delay in the case of the following:
- 14.8.1 any malfunction, breakdown of failure of equipment or techniques, accident or fugitive emission which has caused, is causing or may cause significant pollution;
 - 14.8.2 the breach of conditions of this licence; and
 - 14.8.3 any significant adverse environmental and health effects.
- 14.9 Prior written notification must be given to the Director of the following events and within the specified timeframes:
- 14.9.1 as soon as practicable prior to the permanent cessation of any operational activities;
 - 14.9.2 full or partial cessation of the operational activities for a period likely to exceed 3 (three) months; and
 - 14.9.3 full or partial resumption of the operation of all or part of the activities after a cessation notified under 14.9.2 above.
- 14.10 The information required in terms of conditions 7 must be reported to the Director and the Director: RPW in a yearly report. The information must also be included into a trend report, which must contain a graphical presentation of all results obtained previously at any specific point, as well as an interpretation and discussion of the results of each monitoring occasion.
- 14.11 The licence holder must submit a written report to the Licensing Authority regarding any deviations from the approved plans, which must then contain written permission from the Department of Water and Sanitation before such deviations may be implemented.

15. **LEASING AND ALIENATION OF THE FACILITY**

- 15.1 Should the Licence Holder want to alienate or lease the Facility, he/she must notify the Director in writing of such an intention at least 120 (one hundred and twenty) days prior to the said transaction. Should the approval be granted, the subsequent Licence Holder shall remain liable to compliance with all Licence conditions.

16. **TRANSFER OF LICENCE**

16.1 Should the Licence Holder want to transfer holder-ship of this Licence, he/she must apply in terms of section 52 of the NEM: WA. Should the transfer be approved, the subsequent Licence Holder shall remain liable to compliance with all Licence conditions.

17. **COMMENCEMENT**

17.1 The activities hereby Licenced may not commence within 20 (twenty) days of the date of signature of this Licence.

17.2 Should the Licence Holder be notified by the Director of a suspension of the Licence pending any appeals decision on the authorized activities, he/she may not commence with the activities until authorised by the Director in writing.

17.3 After the 20 (twenty) day appeal period has expired and no good cause to extend the appeal period has been submitted, a written notice must be given to the Department that the activity will commence.

17.4 This activity must commence within a period of 5 (five) years from the date of issue. If commencement of the activity does not occur within that period, the validity of this Licence lapses and a new application for waste management licence must be made, in order for the activity to be undertaken.

17.5 If the proponent anticipates that commencement of the activity would not occur within 5 (five) year period, he/she must apply and show good cause for an extension of the Licence 6 (six) months prior to its expiry date.

18. **GENERAL**

18.1 This Licence shall not be transferable unless such transfer is subject to condition 16 above.

18.2 This Licence shall not be construed as exempting the Licence Holder from compliance with the provisions of any National and Provincial Legislation and relevant Ordinance, Regulation, By-laws and relevant National Norms and Standards.

18.3 Transgression of any condition of this Licence could result in the suspension of the Licence by this Director.

18.4 This Licence is valid until the combined waste disposal airspace capacity of 38,603m³ has been reached for the waste cells authorised in this WML.

18.5 The Licence may be reviewed at any time before the waste disposal airspace capacity is reached. Based on the results of the review, especially compliance to Licence conditions or recommendations from the audit reports and/or changing legislation, the Licence can be amended or withdrawn, or the validity thereof be extended.

18.6 Non-compliance with a condition of this Licence may result in criminal prosecution or other actions provided for in section 67(1) of the NEM:WA.

18.7 In terms of sections 28 and 30 of the NEMA, and sections 19 and 20 of the National Water Act, 1998 (Act No. 36 of 1998), any costs incurred to remedy environmental damage must be borne by the person responsible for the damage. It is therefore imperative that the Licence Holder reads through and understand the legislative requirements pertaining to the project. It is the Licence Holder's responsibility to take reasonable measures which include informing and educating contractors and

employees about environmental risks of their work and training them to operate in an environmentally acceptable manner.

- 18.8 The Licence Holder must submit an Organic Waste Diversion Plan to the Director within 90 (ninety) days of the date of this Licence and annually thereafter.
- 18.9 The information within the Organic Waste Diversion Plan must:
 - 18.9.1 provide a status quo of current organic waste sources and volumes disposed at municipal WDFs, and current rates and procedures of organic waste diversion from WDFs; and
 - 18.9.2 set annual targets and identify procedures from the date of this Licence that will be implemented to meet these targets for the diversion of organic waste from municipal WDFs, in order to reach a 50% diversion by the year 2022 and 100% diversion by the year 2027.
- 18.10 The Licence Holder must ensure that the facility's topography is surveyed annually in order to track the rate of annual airspace utilisation of the Facility. The findings of topographical surveyed must be reported to the Director in the form of a Waste Disposal Facility Airspace Determination Report, on an annual basis, and which report must provide and estimates the remaining volume of airspace on the Facility and the estimated remaining lifespan for waste disposal operations at the Facility.

D. APPEAL OF LICENCE

1. Appeals must comply with the provisions contained in the National Environmental Management Act, 1998 (Act No. 107 of 1998) National Appeal Regulations, 2014, as published in Government Notice No. R. 993 on 8 December 2014, as amended.
2. An appellant (if the Licence Holder) must, within 20 (twenty) calendar days from the date that the notification of the decision was sent to the holder by the Competent Authority:
 - 2.1 submit an appeal in accordance with Regulation 4 of the National Appeal Regulations, 2014, as amended, to the Appeal Administrator; and
 - 2.2 submit a copy of the appeal to any registered I&APs, any Organ of State with interest in the matter and the decision-maker i.e. the Competent Authority that issued the decision.
3. An appellant (if NOT the Licence Holder) must, within 20 (twenty) calendar days from the date that the notification of the decision was sent to the registered I&APs by the holder:
 - 3.1 submit an appeal in accordance with Regulation 4 of the National Appeal Regulations, 2014, as amended to the Appeal Administrator; and
 - 3.2 submit a copy of the appeal to the holder of the decision, any registered I&AP, any Organ of State with interest in the matter and the decision-maker i.e. the Competent Authority that issued the decision.
4. The Licence Holder (if not the appellant), the decision-maker that issued the decision, the registered I&AP and the Organ of State must submit their responding statements, if any, to the appeal authority and the appellant within 20 (twenty) calendar days from the date of receipt of the appeal submission.
5. The appeal and the responding statement must be submitted to the address listed below:

By post: Western Cape Ministry of Local Government, Environmental Affairs and
Development Planning
Private Bag X9186
CAPE TOWN
8000

By facsimile: (021) 483 4174;

By hand: Attention: Mr Marius Venter (Tel.: 021 483 3721)
Room 809, 8th Floor Utilitas Building, 1 Dorp Street, Cape Town, 8001; or

By email: DEADP.Appeals@westerncape.gov.za

Note: A prescribed appeal form as well as assistance regarding the appeal processes is obtainable from the office of the Minister at: Tel. (021) 483 3721, E-mail Marius.Venter@westerncape.gov.za or URL <http://www.westerncape.gov.za/eadp>.

E. DISCLAIMER

The Western Cape Government, the Local Authority, committees or any other public authority or organisation appointed in terms of the conditions of the Licence shall not be responsible for any damages or losses suffered by the holder, developer or his/her successor in any instance where construction or operation subsequent to construction is temporarily or permanently stopped for reasons of non-compliance with the conditions as set out herein or any other subsequent document or legal action emanating from this decision.

Your interest in the future of our environment is greatly appreciated.

Yours faithfully,

DIRECTOR: WASTE MANAGEMENT

CC: (1) Walter Fyvie (GIBB Engineering (Pty) Ltd)
(2) Malise Noe: (DWS: Resource Protection and Waste)
(3) Christopher Wright: (Beaufort West Municipality)
(4) Vuyokazi Ruiters: (Beaufort West Municipality)

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ANNEXURE I
REASONS FOR THE DECISION

The reasons for the Licence decision and factors affecting the broader development that were considered to ensure the effective implementation of this Licence are explained below:

- (a) The information contained in the Application Form for a Waste Management Licence dated 24 May 2012;
- (b) The Basic Assessment Report (BAR) dated 20 November 2017, compiled by *Gibb Engineering (Pty) Ltd*, including the Waste Management Licence Application Additional Information Annexure dated 3 April 2017;
- (c) Comments raised by I&APs throughout the Public Participation Process (PPP), the Applicant and the Environmental Assessment Practitioner's responses thereto;
- (d) Inspections done by officials of this Department;
- (e) Relevant information contained in the Department's information base;
- (f) The objectives and requirements of relevant legislation, policies and guidelines, including section 2 of the National Environmental Management Act, 1998 (Act No. 107 of 1998); and
- (g) The Record of Decision (RoD) in support of granting a Waste Management Licence, by the Department of Water and Sanitation on 5 March 2021.

Please note this Waste Management Licence Application had various blockages, hurdles and temporary stoppages throughout the course of the application, due to legislative changes, financial shortfalls, the request for additional technical information required by the Department of Water and Sanitation, which required changes in the various documents, all of which led to the unforeseen and unprecedented time extensions and delays in issuing this Waste Management Licence.

A summary of the issues, which in the Department's view were of the most significance, are set out below.

Environment

The existing Merweville Waste Disposal Facility was established in 1967, prior to the Promulgation of the Environment Conservation Act, 1989 (Act No. 73 of 1989). The Facility is located on a flat terrain, with rocky slopes, within 100m of a source of surface water. The geological formation underlying the site is sandstone. The Facility is situated about 20m to 70m away from an episodic river named the Koedoeskloofspruit or nicknamed "Drooglopie", which rarely flows, but only after significant rainfall events and for a limited period of time. Based on the vegetation growing in and around the river, it is evident that the river does not flow frequently. The area receives about 168mm of rainfall per year and has a very hot and dry climate. The annual evaporation is 2,552mm per year. A small portion of the existing Facility falls within the 1:100 year flood line of the river, but as part of this authorisation, Facility be reshaped so that it does not fall within this 1:100 year flood line.

The Facility falls within an Ecological Support Area, due to its proximity to Critical Biodiversity Areas. However, CapeNature has confirmed that the Bioregional Plans for this region were not adopted. Furthermore, the site has already been disturbed by the waste disposal activities.

The site consist of 5% near natural habitat condition, with some acacia thorns sparsely distributed along the dry river bed, 15% degraded habitat condition with a few alien tree species in and around the dry river bed, and 80% transformed habitat condition due to the operation of the existing Merweville Waste Disposal Facility.

The site is in the Nam-Karoo biome. The land was previously covered with Gamka-Karoo vegetation, which is classified as least threatened. Thus, the terrestrial ecosystems can be described as least threatened. The vegetation around the site indigenous with some alien species, but extremely sparse. Mammals found in the area are usually small or highly mobile. This includes springboks, rabbits, hares rock hyrax. Insectivorous mammals including the aardwolf, aardvark, bat-eared fox, and long nosed elephant shrews also occur this biome. Near endemic species in this biome include Grant's rock mouse (*Aethomys granti*), Shortridge's rat (*Thallomys shortridgei*), the critically endangered riverine rabbit (*Bunolagus monticularis*).

The Waste Disposal Facility is located on mudstone and shale which is an impervious rock. The aquifers of the area are fractured rock aquifers and, although the geological map does not indicate any geological faulting, fracturing or lineaments in the vicinity of the waste disposal facility, groundwater is present. The groundwater table is located about 9.4m below ground level, at the wind pump, located 67m away from the waste disposal facility. Based on the favourable geological setting of the waste disposal facility, the depth to groundwater and the good quality of the groundwater with no indication of any contamination after many year of waste disposal operations, it is evident that the waste disposal facility has had no impact on the groundwater. Additionally, the production boreholes for Merweville are under no threat from the waste disposal facility.

Since the initial establishment of the Facility, the Municipality enclosed the waste cell within a fence, to formally upgrade the facility. Further upgrades such as, inter alia, the reshaping of the Facility, construction and installation of a Class B liner and construction of stormwater cut-off drains were authorised by this Licence.

According to the Census (2011), Merweville had a population of 1,592 people in 2011. There are high levels of poverty and unemployment. A Beaufort West Spatial Development Framework stated that the Merweville will be doomed to a future of dependence on social welfare funding and government grants, if no investment in strengthening the economic base of this settlement is made.

ALTERNATIVES

The following alternatives were considered: -

Activity and Facility Alternatives

The following waste management facilities were considered:

1. Rehabilitate the existing waste cell upon depletion of its remaining airspace.
2. Rehabilitate the existing waste cell upon depletion of its remaining airspace and construction of new adjoining and adjacent waste cells.
3. Close the Waste Disposal Facility and construct a new Waste Disposal Facility elsewhere.
4. Close the Waste Disposal Facility and construct a new Refuse Transfer Station.

As reported in the BAR, the second alternative was the most feasible for a medium to long term solution for the Licence Holder.

Layout and Design Alternatives

Two design or layout alternative were identified:

1. Use the existing waste cell.
2. Rehabilitate the existing waste cell upon depletion of its remaining airspace and construction of new adjoining and adjacent waste cells.

As reported in the BAR, the second alternative was the most feasible for a medium to long term solution for the Licence Holder.

The “no-go” option was also undesirable because it would mean that the Municipality would not have a solution for waste management in Merweville and the Municipality would be expected to spend more municipal funds to find a solution, or illegal dumping would likely occur as a result and thus degrade the environment even more. It was therefore important to mitigate the impacts of this Waste Disposal Facility by:

- (a) Reshaping the waste disposal facility so that no longer falls within the 1:100 year flood line,
- (b) Construction of the Class B containment barrier and stormwater diversion structures and leachate management structures.

PUBLIC PARTICIPATION PROCESS

The PPP comprised of the following:

DRAFT BAR

- (a) A notice placed at the Merweville Library from 27 May 2017 to 11 July 2017;
- (b) Site notice placed on the gates to the Merweville Waste Disposal Facility from 27 May 2017 to 11 July 2017 (40 days period);
- (c) Advertisement of the public participation process in “die Burger” on 23 May 2017 and “die Courier” on 26 May 2017;
- (d) Delivery of the draft BAR to:
 - Beaufort West Municipality on 22 May 2017,
 - CapeNature, George on 22 May 2017,
 - Heritage Western Cape, Cape Town on 22 May 2015,
 - Department of Water and Sanitation, Cape Town on 22 May 2017,
 - Breed-Gouritz Catchment Management Agency on 22 May 2017,
 - This Department's Directorate: Waste Management on 9 May 2017, and
 - This Department's Directorate: Environmental Impact Management Services on 25 October 2015.
- (e) Notification letters accompanied by the draft BAR, sent to authorities and Interested and Affected Parties including neighbouring landowners;
- (f) All comments on the draft Basic Assessment Report were collated into the second Comments and Response Report; and

FINAL BAR

- (g) The BAR was submitted to the Department of Environmental Affairs and Development Planning on 23 October 2017;
- (h) The BAR was placed at the Merweville Library from 25 October 2017 to 13 November 2017;
- (i) The BAR was also sent to the authorities including the Department of Water and Sanitation on 6 November 2017;
- (j) Following the conclusion of the final commenting period, the final BAR was submitted to the Department of Environmental Affairs and Development Planning and the Department of Water and Sanitation for

the decision-making regarding the application for the Waste Management Licence on 20 November 2017.

- (k) The DWS issued a RoD dated 19 June 2018 and specified that additional groundwater specialist studies needed to be done. After additional information and funds was to be procured to get the required information for DWS, the Republic of South Africa faced the and COVID-19 pandemic, but the additional information was submitted to DWS on 22 July 2020. On 5 March 2021 DWS issued a RoD in support of granting a Waste Management Licence for the Facility.

Authorities consulted:

- (a) Cape Nature;
- (b) Heritage Western Cape;
- (c) Department of Water and Sanitation (DWS); and
- (d) This Department's Directorate: Environmental Impact Management Services.

Comments and recommendations provided by the other relevant authorities have been considered in the evaluation of this application. No authorities objected to the commencement of the activity. However, some concerns about this Facility were raised. Where possible and relevant, the conditions imposed by Cape Nature, DWS and this Department's Directorate: Environmental Impact Management Services have been included in the Waste Management Licence.

_____END_____

ANNEXURE II

WATER QUALITY VARIABLES REQUIRED FOR DETECTION MONITORING:

Monitor at quarterly intervals for:

Alkalinity (P.Alk)
Ammonia (NH₃-N)
Chemical Oxygen Demand (COD)
Chloride (Cl)
Electrical Conductivity (EC)
Nitrate (NO₃-N)
pH
Potassium (K)
Total Dissolved Solids (TDS)
Calcium (Ca)
Fluoride (F)
Magnesium (Mg)
Sodium (Na)
Sulphate (SO₄)
Phosphate (PO₄)
Faecal coliforms
Escherichia coli (E.coli)
Total Coliforms

END