

## WATER USE AUTHORIZATION APPLICATION RISK MATRIX

### EXPANSION AND WASTE LICENSE APPLICATION FOR THE GROENFONTEIN KLAPMUTS COMPOST FACILITY ON REMAINDER FARMS GROENFONTEIN ANNEX 716 PORTION 54; PORTION 56 AND A PORTION OF PORTION 25, PAARL

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This Risk Matrix was requested by Department of Water and Sanitation (DWS) for the Water Use Authorization Application for the proposed expansion of the compost facility. This Risk Matrix assists DWS to determine where the proposed development triggers a Water Use License Authorization (WULA) or Water Use General Authorisation (WUGA). The risk assessment is based on the Department of Water and Sanitation 2015 publication: Section 21c and i water use Risk Assessment Protocol in Government Gazette no. 40229 dated 26 August 2016.

A non-perennial tributary of the Klapmuts River runs adjacent to the western and northern boundary of the site. The tributary originates south west of the town of Klapmuts and flows in a northern eastern direction past the west and northern boundary of the site to flow into the Klapmuts River to the east of the site. A rehabilitated landfill site on the western boundary of the site already diverted and impeded the flow of the river. The river on the northern boundary is totally transformed and a dam was constructed to further impede the flow of the river. A dam, which is the existing storm water collection dam to collect leachate off the exiting compost site, is constructed on the northern boundary. These dams are not wetlands and cannot be classified as wetlands. They are artificial manmade structures. All runoff from site will enter the two collection dams. A channel runs between the two dams with a sump and pump which pumps the collected runoff into the dams. It is proposed that the channel be closed and the two dams altered into one dam in order to avoid the risk of overflow at the sump and leachate from the compost site entering the non-perennial tributary of the Klapmuts river to the north.

**Habitat Assessment Of The Non-Perennial River adjacent to the compost facility**

**Instream Habitat Integrity**

Weights	14	13	13	13	14	10	9	8	6		
REACH	Water abstraction	Flow modification	Bed modification	Channel modification	Water quality	Inundation	Exotic macrophytes	Exotic fauna	Solid waste disposal	Total Score (%)	Classification

Impacted Site	25	25	25	25	25	2	25	25	25	9.2	E: Modifications have reached a critical level and the lotic system has been modified completely with an almost complete loss of natural habitat and biota. In the worst instances the basic ecosystem functions have been destroyed and the changes are irreversible.
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None	Small	Moderate	Large	Serious	Critical
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### Riparian Zone Habitat Integrity

Weights	13	12	14	12	13	11	12	13		
REACH	Vegetation removal	Alien encroachment	Bank erosion	Water abstraction	Flow modification	Channel modification	Water quality	Inundation	Total Score (%)	Classification
Impacted Site	25	25	25	25	25	25	25	2	11.96	E: Modifications have reached a critical level and the lotic system has been modified completely with an almost complete loss of natural habitat and biota. In the worst instances the basic ecosystem functions have been destroyed and the changes are irreversible.

None	Small	Moderate	Large	Serious	Critical
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From the results of the application of the IHIA to the impacted site, it is evident that the rivers

reach is modified and that the loss of natural habitat, biota and basic ecosystem functions is extensive. Instream impacts included a large impact from flow modifications, as well as bed and channel modifications. Overall, the site achieved a 9.2 % score for instream integrity.

Riparian impacts included a large impact from flow modifications, and bed and channel modifications. Overall, the site achieved a 11.96 % score for instream integrity.

The site obtained an overall IHIA rating of 10.48%, which indicates the loss of natural habitat, biota and basic ecosystem functions is moderate. (Class E conditions).

**Riparian Vegetation Response Assessment Index (VEGRAI)**

LEVEL 3 ASSESSMENT					
METRIC GROUP	CALCULATED RATING	WEIGTED RATING	CONFIDENCE	RANK	% WEIGHT
MARGINAL	20,0	7,5	2,7	2,0	60,0
NON MARGINAL	50,0	31,3	2,7	1,0	100,0
2.0					160,0
LEVEL 3 VEGRAI (%)				38,8	
VEGRAI EC				D/E	
AVERAGE CONFIDENCE				2,7	

The score attained for the VEGRAI indicated that the riparian system falls into the category D/E. This indicates that the loss of natural habitat, biota and basic ecosystem functions is largely modified. The loss of natural habitat, biota and basic ecosystem functions is extensive.

**Ecological Importance and Sensitivity (EIS)**

**Table 9:** Results of the EIS assessment for the affected watercourse

Component	Score	Confidence	Comments/description
Channel type	1	5	Impeded and diverted non-perennial river.
Conservation context	0	5	No Status
Vegetation and habitat Integrity	0	5	Largely modified
Connectivity	2	5	Connection to Klapmuts River.
Threat Status of Vegetation Type	5	5	Vegetation used to has critical endangered conservation status
<b>EIS Category</b>	<b>0.32</b>		<b>Low/marginal</b>

EIS considers a number of biotic and habitat determinants surmised to indicate either importance or sensitivity. The determinants are rated according to a four-point scale. The median of the resultant score is calculated to derive the EIS category.

The non-perennial river is considered to be of low ecological importance.

### Risk Assessment Matrix - Total Severity Score with Mitigation

No	Phases	Activity	Aspect	Impact	Severity				Total Severity Score
					Flow Regime	Physico & Chemical (Water Quality)	Habitat (Geomorph + Vegetation)	Biota	
1	Construction phase	Expansion of compost facility and upgrade of collection ponds	Compost facility is 90m from non-perennial river in north western corner.	Possible pollution of the water course.	<b>Score = 1</b> The Non-Perennial River that will be impacted by the proposed activity originate south west of the property and flow in a north eastern direction, only during heavy rains in a single channel.	<b>Score = 1</b> Water quality is poor as a result of the upstream rehabilitated landfill site and downstream agricultural activities and dam.	<b>Score = 1</b> No vegetation remaining as a result of the activities.	<b>Score = 1</b> No vegetation and biota remaining as a result of the activities.	1
2	Operational phase	Expansion of compost facility and upgrade of collection ponds	Compost facility is 90m from non-perennial river in north	Possible pollution of the water course.	<b>Score = 1</b> The Non-Perennial River that will be	<b>Score = 1</b> Water quality is poor as a result of the	<b>Score = 1</b> No vegetation remaining as a result of	<b>Score = 1</b> No vegetation and biota remaining as	1

		ponds	western corner.		impacted by the proposed activity originate south west of the property and flow in a north eastern direction, only during heavy rains in a single channel.	upstream rehabilitated landfill site and downstream agricultural activities and dam.		the activities.	a result of the activities.	
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**Risk Assessment Matrix – Final Risk Rating**

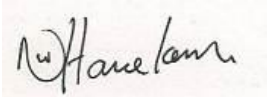
No.	Severity	Spatial scale	Duration	Consequence	Frequency of activity	Frequency of impact	Legal issues	Detection	Likelihood	Significance	Risk Rating
1	1	1	1	3	5	1	5	2	13	39	Low
2	1	1	1	3	5	1	5	2	13	39	Low

**Risk Assessment Matrix – Confidence Level and Proposed Post Control/Mitigation Measures**

No.	Risk Rating	Confidence level	Control measures	Borderline LOW – MODERATE Rating Classes	PES and EIS of Watercourses
1	21 Low	90%	Refer to the EMP included in the EIA process	Low and unchanged	Refer to above in report
2	21 Low	90%	Refer to the EMP included in the EIA process	Low and unchanged	Refer to above in report

**Recommendations in Terms of Water Use Application Requirements**

The overall risk rating of potential Impacts on the applicable river after mitigation is rated as low negative. It is recommended that a GA being issued for the proposed water use.



Nicolaas Hanekom Pri Sci Nat (Ecology)

400274/11

Director

01 November 2018



**APPENDIX A: ABBREVIATED CURRICULUM VITAE AND DECLARATION OF INDEPENDENCE OF FRESHWATER SPECIALIST**

<b>Name:</b>	Nicolaas Willem Hanekom (Pri.Sci.Nat)
<b>Profession:</b>	Ecological Scientist
<b>Nationality:</b>	South African
<b>Years experience</b>	26 Years
<b>Academic Qualifications</b>	<ul style="list-style-type: none"> <li>• National Diploma, Nature Conservation (Cape Technikon)</li> <li>• B. Tech Degree in Nature Conservation (Cape Technikon)</li> <li>• M.Tech in Nature Conservation (Cape Peninsula University of Technology)</li> <li>• Completed various Environmental Management Courses</li> <li>• Qualified Environmental Management System ISO 14001: 2004 Audit: Internal Auditor Course Based on ISO 19011:2002 (Centre for Environmental Management North West University)</li> </ul>
<b>Areas of specialisation:</b>	<ul style="list-style-type: none"> <li>• Ecosystem (terrestrial and aquatic) monitoring and assessments</li> <li>• Design of monitoring programmes for ecosystems (terrestrial and aquatic)</li> <li>• Environmental Impact Assessments</li> <li>• River classification and environmental water requirements</li> <li>• Wetlands Delineation</li> <li>• River and Wetlands management</li> <li>• Water Use Authorization Applications</li> <li>• Water quality management</li> <li>• River Health Assessments</li> </ul>
<b>Countries of Work Experience:</b>	South Africa (Northern Cape, Western Cape, Free State, Mpumalanga, Gauteng)
<b>Employment Record</b>	<ul style="list-style-type: none"> <li>• Student at Bontebok National Park (1992)</li> <li>• Assistant Reserve Manager at Gariiep Dam Nature Reserve, Free State 1993 - 1998)</li> <li>• Reserve Manager, Conservation Services Manager for Western Cape Nature Conservation Board (1998 - 2006)</li> <li>• External Lecturer at Cape Peninsula University of Technology (2003 - 2005)</li> <li>• Director: Environmental Management at Cape Lowlands Environmental Services (2006 – 2010)</li> <li>• Director, Environmental Management and lead Environmental Impact Assessment Practitioner at Eco Impact (Pty) Ltd (2010 – to date)</li> </ul>
<b>Professional membership, accreditations and courses</b>	<ul style="list-style-type: none"> <li>• South African Council for Natural Scientists Professions Pri.Sci.Nat (Ecological Science)</li> <li>• Riparian vegetation identification and health assessment. Internal Western Cape Nature Conservation short course presented by Dr C Boucher (Stellenbosch University) in 2000.</li> <li>• SASS5 Aquatic Biomonitoring Training Course. 2 to 5 September 2013. Ground Truth Water and Environmental Engineering consultancy in partnership with the Department of Water Affairs.</li> </ul>

	<ul style="list-style-type: none"> <li>• Workshop on “Section 21(c) and (i) Water Use Training: Understanding Watercourses and Managing Impacts to their Characteristics”. 10 May 2017. Presented by Dr Wietsche Roets of the Department of Water and Sanitation (Sub-Directorate: Instream Water Use).</li> </ul>
<b>Summary of experience</b>	<p>1992: South African National Parks. Student at Bontebok National Park with management and monitoring actions related to the Breede River.</p> <p>1993 -1998: Free State Nature Conservation. Ecological management and monitoring actions related to the Gariep Dam, Orange and Caledon Rivers.</p> <p>1998 -2006: CapeNature. Ecological management and monitoring actions related to the Berg River Estuary, Verlorenvlei, Lamberts bay's Jackalsvlei, Wadrift Soutpanne, Oliphant's River mouth, Rocherpan Nature Reserve, etc. Review and assessment of EIA applications, inclusive of Freshwater ecology. Did some site visits with Department of Water Affairs and Forestry (Hester Lyons) to confirm the presence of aquatic ecological features during EIA water use registration applications.</p> <p>2006 to date: Cape Lowland Environmental Services and Eco Impact Legal Consultant. Ecological (Freshwater and aquatic) Specialist input, assessment, monitoring and reports.</p>
<b>Publications and assessment reports</b>	<p>Just to name a few. Was involved in many Ecological Assessments, monitoring and inputs in EIA applications.</p> <ul style="list-style-type: none"> <li>• Elandskloof Farm 475 Citrusdal Biodiversity Baseline Survey. August 2010. This Biodiversity Assessment Covering Terrestrial and Aquatic Aspects to Inform Decisions Regarding The Proposed Elandskloof Weir Flood Damage Project On Farm 475, In The Citrusdal Area.</li> <li>• Cape Solar Energy Electricity Generation Facility. Farm 187/3 &amp; 187/13 Kenhardt. Biodiversity And Ecological Baseline Survey. January 2011. (Included Terrestrial and aquatic ecological assessments and water use authorization applications)</li> <li>• Prieska Photovoltaic Power Generation Project. Prieska Commonage Northern Cape. Biodiversity And Ecological Baseline Survey. July 2011. (Included Terrestrial and aquatic ecological assessments and water use authorization applications)</li> <li>• Witteklip Erf 123 Extension, Vredenburg. Biodiversity Baseline Survey. Updated - October 2012 (Included Terrestrial and aquatic ecological assessments and water use authorization applications)</li> <li>• Baseline Biodiversity Survey And Wetland Delineation for ECCA Holdings: Cape Bentonite Mine on Erf 1412 Near Heidelberg. Prepared for: Shangoni Management Services Pry (Ltd). October 2014.</li> <li>• Freshwater Impact Assessment Laingsburg Flood Damage Repairs &amp; Storm Water Infrastructure. 18 February 2016.</li> <li>• Ecological Assessment for Swartland Municipality - Upgrades To Voortrekker/Bokomo Road And Voortrekker/Rozenburg Road Intersections and Upgrade to the Diep River Bridge, Malmesbury on A Portion Of Erf 327, Malmesbury (Road) Erf 1530, Diep River Bridge</li> </ul>

	<p>Crossing, and Erf 1528, Property South of Diep River where Road Widening and Turning Circle Will Be Constructed. March 2016. (Freshwater Ecology Inputs and Water Use Registration)</p> <ul style="list-style-type: none"> <li>• Freshwater Impact Assessment. McGregor Bridge, Robertson Bridge and Willem Nels River Maintenance Management Plan. 24 June 2016. (Freshwater Ecology assessment and input as well as Water Use Registration)</li> <li>• Water Use Authorization Application Risk Matrix. Orange Grove Trust Vegetation Clearing and Agricultural Development on Portion 4 of Farm Glen Heatlie No 316, Worcester. 12 June 2017. (Freshwater ecological inputs in EIA process and Water Use Registration).</li> <li>• Water Use Authorization Application Risk Matrix Prepared For: Witzenberg Municipality Sand Mine Farm 1 Prince Alfred Hamlet. 28 March 2017. (Freshwater ecological inputs in EIA process and Water Use Registration).</li> <li>• Proposed Hartmanshoop Agri Vegetation Clearing Project and Irrigation on Erf 686, Laingsburg. 12 August 2017. (Freshwater ecological inputs in Water Use Registration).</li> <li>• County Fair: Hocraft Abattoir And Rendering Facility Waste Water Treatment Works “CF Hocraft WWTW” Mosselbank River Second Quarter 2018 Biomonitoring Report. June 2018. (Done quarterly biomonitoring for the last three years).</li> </ul>
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THE SOUTH AFRICAN COUNCIL  
FOR  
NATURAL SCIENTIFIC PROFESSIONS

herewith certifies that

**Nicolaas Williem Hanekom**

Registration number: 400274/11

is registered as a

**Professional Natural Scientist**

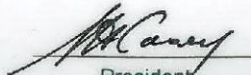
in terms of section 20(3) of the Natural Scientific Professions Act, 2003  
(Act 27 of 2003)  
in the following field(s) of practice  
(Schedule I of the Act)

**Ecological Science**

**27 July 2011**

27 July 2011

Pretoria

  
President

  
Chief Executive Officer

**RISK ASSESSMENT KEY** (Referenced from DWS 2015 publication: Section 21 c and i water use Risk Assessment Protocol)

**Negative Rating**

<b>TABLE 1- SEVERITY</b>	
How severe does the aspects impact on the environment and resource quality characteristics (flow regime, water quality, geomorphology, biota, habitat)?	
Insignificant / non-harmful	1
Small / potentially harmful	2
Significant / slightly harmful	3
Great / harmful	4
Disastrous / extremely harmful and/or wetland(s) involved	5
Total severity score calculation – (Flow Regime) + (Physico&Chemical) + (Habitat) + (Biota) = ? x 25 = ?/100 = Total Severity Score	
Where "or wetland(s) are involved" it means that the activity is located within the delineated boundary of any wetland. The score of 5 is only compulsory for the significant rating	

<b>TABLE 2 – SPATIAL SCALE</b>	
How big is the area that the aspect is impacting on?	
Area specific (at impact site)	1
Whole site (entire surface right)	2
Regional / neighbouring areas (downstream within quaternary catchment)	3
National (impacting beyond secondary catchment or provinces)	4
Global (impacting beyond SA boundary)	5

<b>TABLE 3 – DURATION</b>	
How long does the aspect impact on the environment and resource quality?	
One day to one month, PES, EIS and/or REC not impacted	1
One month to one year, PES, EIS and/or REC impacted but no change in status	2
One year to 10 years, PES, EIS and/or REC impacted to a lower status but can be improved over this period through mitigation	3
Life of the activity, PES, EIS and/or REC permanently lowered	4
More than life of the organisation/facility, PES and EIS scores, a E or F	5

<b>TABLE 4 – FREQUENCY OF THE ACTIVITY</b>	
How often do you do the specific activity?	
Annually or less	1
6 monthly	2
Monthly	3

Weekly	4
Daily	5

<b>TABLE 5 – FREQUENCY OF THE INCIDENT/IMPACT</b>	
How often does the activity impact on the environment?	
Almost never / almost impossible / >20%	1
Very seldom / highly unlikely / >40%	2
Infrequent / unlikely / seldom / >60%	3
Often / regularly / likely / possible / >80%	4
Daily / highly likely / definitely / >100%	5

<b>TABLE 6 – LEGAL ISSUES</b>	
How is the activity governed by legislation?	
No legislation	1
Fully covered by legislation (wetlands are legally governed)	5
Located within the regulated areas	

<b>TABLE 7 – DETECTION</b>	
How quickly can the impacts/risks of the activity be observed on the environment (water resource quality characteristics), people and property?	
Immediately	1
Without much effort	2
Need some effort	3
Remote and difficult to observe	4
Covered	5

<b>TABLE 8: RATING CLASSES</b>		
<b>RATING</b>	<b>CLASS</b>	<b>MANAGEMENT DESCRIPTION</b>
1 – 55	(L) Low Risk	Acceptable as is or consider requirement for mitigation. Impact to watercourses and resource quality small and easily mitigated. Wetlands may be excluded.
56 – 169	M) Moderate Risk	Risk and impact on watercourses are notably and require mitigation measures on a higher level, which costs more and require specialist input. Wetlands are excluded.

170 – 300	(H) High Risk	Always involves wetlands. Watercourse(s) impacts by the activity are such that they impose a long-term threat on a large scale and lowering of the Reserve.
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A low risk class must be obtained for all activities to be considered for a GA

<b>TABLE 9: CALCULATIONS</b>
Consequence = Severity + Spatial Scale + Duration
Likelihood=Frequency of Activity + Frequency of Incident +Legal Issues + Detection
Significance \Risk= Consequence X Likelihood