

WATER USE AUTHORIZATION APPLICATION RISK MATRIX

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This Risk Matrix was requested by Breede Gouritz Catchment Management Agency (BGCMA) for the Water Use Authorization Application. This Risk Matrix assists BGCMA 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. The site is located within the H40H quaternary catchment. The primary aquatic feature on the site is a non-perennial river located adjacent to the development site, on the northern boundary. The non-perennial river is a tributary of the Vink River and feeds into the Vink River located approximately 300m west of the proposed development. Both of which are classified as Critical Biodiversity Areas (CBA's). The study area falls into the Breede Gouritz Catchment Management Area (BGCMA), more specifically within the Upper Breede sub-Water Management Area (sub- WMA). The main river of the region is the Breede River, of which the Vink-Noree River system is a tributary. The study area falls within the Southern Folded Mountains¹, near the transition to the Western Folded Mountains Ecoregion (to west) and the Southern Coastal Belt Ecoregion (to south). More specifically, the study area forms part of the lowlands of the Langeberg Mountains, situated relatively close to the Langeberg-West Mountain Catchment conservation area. The physiographical characteristics of the Southern Folded Mountains Ecoregion, in terms of terrain morphology, are typically characterised by a diverse topography of closed hills and mountains with a moderate to high relief (slopes with a gradient of >3.69 - 5% are predominant within the Ecoregion). The study area for the proposed feedlot and compost area is thus somewhat atypical of the Ecoregion within which it falls, being located in a relatively non-mountainous part of the landscape. The rainfall seasonality and the vegetation types that occur within the Southern Folded Mountains Ecoregion are highly variable. The climate of the study area can be referred to as a local steppe climate and classified as "BSk" (cold semi-arid climate) with little rainfall throughout the year, according to Köppen- Geiger system². The subject property is located within Quaternary Catchment H40H, which is estimated to have a relatively low Mean Annual Precipitation (MAP) of 461 mm, a Mean Annual Evaporation (MAE) of 1605 mm and a Mean Annual Runoff (MAR) of 15.7 million m³.³

¹ Kleynhans CJ, Thirion C and Moolman J (2005). A Level I River Ecoregion classification System for South Africa, Lesotho and Swaziland. *Report No. N/0000/00/REQ0104*. Resource Quality Services, Department of Water Affairs and Forestry, Pretoria.

² Schulze RE (ed) (2006). South African Atlas of Climatology and Agrohydrology. *WRC Report No. 1489/1/06*. Water Research Commission, Pretoria.

³ Water Research Commission [WRC] (2008). Water Resources of South Africa, 2005 (WR2005). WRC Project No. K5/1491. Water Research Commission, Pretoria.



Risk Matrix without mitigation

No	Phases	Activity	Aspect	Impact	Severity				Severity
					Flow Regime	Physico & Chemical (Water Quality)	Habitat (Geomorph + Vegetation)	Biota	
1	Construction of feedlot and compost facility with associated stormwater management infrastructure.	Feedlot and compost facility within 100m from a watercourse	Sediment and contaminated stormwater entering the non-perennial river.	Polluted water entering the non-perennial water course with impacts to the river quality and ecological functioning.	A non-perennial river which is a tributary of the Vink River was identified in the impacted area. This non-perennial river originates in the Langeberg Mountains at an elevation of approximately 700m above mean sea level east of the	Pollution of the river system due to the possible risk of contaminated storm water from the feedlot and compost facilities entering the river systems generally result in significant impacts and degradation of the freshwater ecological system and functioning. The potentially affected river reach is characterised by a fairly incised single channel, approximately 10	<i>Vachellia karoo</i> is common and the dominant species in the river channel and valleys followed by <i>Searsia longispina</i> .	In terms of its EIS, the potentially affected reach of the river was rated to be of low/marginal EIS for biotic criteria, but with a low level of confidence due to the absence of biotic data, and of moderate EIS for habitat criteria. The overall EIS rating for the potentially affected reach of the river was that this system is of low-to-moderate ecological importance and sensitivity. Despite the low-to-moderate EIS of the river, it is important to bear in mind that this river	1



				<p>site and flows in a westerly direction for approximately 5.5km before it reaches the site and meets up with the Vink River approximately 300m west of the site. Two earthen instream storage dams were constructed in the river and 7 roads cross the river before it meets the impacted area.</p>	<p>to 20m wide, which has a bed comprising mostly cobbles and sand.</p>		<p>forms an important ecological corridor and is a major tributary of the Vink River, which is ecologically important to the Breede River. In addition, the floodplain along the river has been recognised as an Aquatic CBA in the WCBPF and the C.A.P.E. Fine Scale Planning initiative for the Upper Breede Valley. This elevates the conservation importance of the river corridor and implies that it should be protected from any further degradation.</p>	
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No	Phases	Activity	Aspect	Impact	Severity				Severity
					Flow Regime	Physico & Chemical (Water Quality)	Habitat (Geomorph + Vegetation)	Biota	
2	Operation Phase	Feedlot and compost facility within 100m from a watercourse	Sediment and contaminated stormwater entering the non-perennial river.	Polluted water entering the non-perennial water course with impacts to the river quality and ecological functioning.	A non-perennial river which is a tributary of the Vink River was identified in the impacted area. This non-perennial river originates in the Langeberg Mountains at an elevation of approximately 700m above mean sea level east of the site and flows in a	Pollution of the river system due to the possible risk of contaminated storm water from the feedlot and compost facilities entering the river systems generally result in significant impacts and degradation of the freshwater ecological system and functioning. The potentially affected river reach is characterised by a fairly incised single channel, approximately 10 to 20m wide, which has a bed	<i>Vachellia karoo</i> is common and the dominant species in the river channel and valleys followed by <i>Searsia longispina</i> .	In terms of its EIS, the potentially affected reach of the river was rated to be of low/marginal EIS for biotic criteria, but with a low level of confidence due to the absence of biotic data, and of moderate EIS for habitat criteria. The overall EIS rating for the potentially affected reach of the river was that this system is of low-to-moderate ecological importance and sensitivity. Despite the low-to-moderate EIS of the river, it is important to bear in mind that this river forms an important ecological corridor	1



					<p>westerly direction for approximately 5.5km before it reaches the site and meets up with the Vink River approximately 300m west of the site. Two earthen instream storage dams were constructed in the river and 7 roads cross the river before it meets the impacted area.</p>		<p>comprising mostly cobbles and sand.</p>			<p>and is a major tributary of the Vink River, which is ecologically important to the Breede River. In addition, the floodplain along the river has been recognised as an Aquatic CBA in the WCBPF and the C.A.P.E. Fine Scale Planning initiative for the Upper Breede Valley. This elevates the conservation importance of the river corridor and implies that it should be protected from any further degradation.</p>	
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No.	Severity	Spatial scale	Duration	Consequence	Frequency of activity	Frequency of impact	Legal issues	Detection	Likelihood	Significance	Risk Rating
1	1	1	1	3	1	1	5	1	8	24	Low
2	1	3	4	8	5	1	5	1	12	96	Moderate



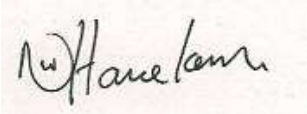
Risk Matrix with mitigation

No.	Risk Rating	Confidence level	Control measures	Borderline LDW Moderate Rating Classes	PES and EIS of Watercourses
1	Low	90%	Independent monitoring will be conducted via a competent specialist. The specialist will be responsible for monitoring, reviewing, reporting and verifying compliance with the Water Use Authorization, EMP, Environmental Authorisation (EA), Water Use Authorisation/license and all other specialist recommendations by all contractors and site management.	NA	The desktop buffer that was generated by the WRC Buffer Tool for the protection of drainage lines within the proposed impacted area itself was a modelled buffer width of 55m for the construction phase. This buffer width was then refined by applying the site based components of the WRC Buffer Tool, through which a site-specific recommended buffer width of 26m for the construction phase. Construction activities will have a buffer area of 43m which is significantly more than the 26m buffer assessed.

No.	Risk Rating	Confidence level	Control measures	Borderline LDW Moderate Rating Classes	PES and EIS of Watercourses
2	Moderate but with mitigation in can be lowered to low	90%	Independent monitoring will be conducted via a competent specialist. The specialist will be responsible for monitoring, reviewing, reporting and verifying compliance with the Water Use Authorization, EMP, Environmental Authorisation (EA), Water Use Authorisation/license and all other specialist recommendations by all contractors and site management. Storm water infrastructure was designed	After considering both the construction and operational phases of the activity, the risk of the activity to the resource quality post mitigation measures and the sensitivity (EIS) an and status (PES) of the watercourses receptor of risks posed and after considering the positive impacts/Risks reduction measures, we recommend that the risk rating be reduced to a low risk rating for this	The desktop buffer that was generated by the WRC Buffer Tool for the protection of drainage lines within the proposed impacted area itself was a modelled buffer width of 55m for the construction phase and 205m for the operational phase. This buffer width was then refined by applying the site based components of the WRC Buffer Tool, through which a site-specific recommended buffer width of 26m for the construction phase and 100m for the operational phase. The 100m buffer area is to manage the risk of nutrient inputs as a result of the bordering feedlot into the freshwater ecosystem.



		<p>outside the 1: 100 year flood line area to capture all contaminated storm water. The soil quality is classified as impermeable and therefore sufficient to be used to line the compost area, feedlot and related services and areas in order to prevent ground water pollution. A borehole down stream of the collection ponds is proposed to collect possible ground water for monitoring purposes.</p>	<p>activity.</p>	<p>However, there is an elevated area between the feedlot infrastructure and the non-perennial river and the topography and slope of storm water flow is away from the non-perennial river towards the compost facility.</p>
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