

## RISK ASSESSMENT MATRIX for Section 21 (c) and (i) Water Use activities (Version 2.1.1)

| POTENTIALLY AFFECTED WATERCOURSE/S |                                                                                                                      |                         | FIELD-VERIFIED ASSESSMENT RESULTS |          |          |          |                    |
|------------------------------------|----------------------------------------------------------------------------------------------------------------------|-------------------------|-----------------------------------|----------|----------|----------|--------------------|
| Watercourse number                 | Watercourse name                                                                                                     | Watercourse type        | PES                               | EI       | ES       | EIS      | Wetland Importance |
| (1)                                | Second-order non-perennial watercourse (significant ephemeral stream)                                                | River / Natural channel | C/D                               | Low      | Low      | Low      | Not assessed       |
| (2)                                | First-order non-perennial watercourses (small and very small ephemeral preferential water flow paths/drainage lines) | River / Natural channel | B/C                               | Very low | Very low | Very low | Not assessed       |

## DETAILED PROJECT SPECIFICATIONS:

Include detailed project description, including all proposed control measures to prevent/minimise impacts on watercourses

The project applicant, Dawid Kruiper Local Municipality, proposes to formally expand the existing cemetery outside the township of Louisvale into a vacant portion of land directly adjacent south-east. The proposed development footprint is located approximately 400 m east of the township which in turn, is situated approximately 3 km south-east of the town Upington, Northern Cape Province.

'Ground truthing' conducted during the site assessment, determined that two directly adjacent first-order non-perennial watercourses (very small ephemeral preferential water flow paths/drainage lines) rather commence within- and traverse the most southerly corner of the proposed development footprint. Two more first-order non-perennial watercourses (small and very small ephemeral preferential water flow paths/drainage lines) also flow past the proposed development footprint directly adjacent north and west. A single second-order non-perennial watercourse (significant ephemeral stream) furthermore also flows past the proposed development footprint within 100 m to the east.

## Recommended Mitigation Measures

- It is recommended that a sufficient grazing management plan and practices must be implemented for livestock of the local community. This must be done in order to prevent any significant overgrazing of the surrounding landscape and to attempt to improve/restore the ecological condition, over time
- Implement adequate alien invasive species management and prevention measures during the construction- and subsequent operational phases of the proposed development. An Alien Invasive Species Management Plan must be compiled by a suitably qualified and experienced SACNASP registered ecologist, if deemed necessary by the competent authority
- It is recommended that all individuals of any identified legally declared alien invasive species must be actively eradicated from the study area and specifically surrounding the artificial flow channel, in accordance with the requirements of the National Environmental Management: Biodiversity Act (Act 10 of 2004); Alien and Invasive Species Regulations, 2014. Removed materials must also be adequately and lawfully disposed of, in order to prevent potential further spreading/dispersal
- Implement adequate stormwater and erosion management measures during the construction- and subsequent operational phases of the proposed development. This must be done to sufficiently manage stormwater runoff and clean/dirty water separation, in order to prevent any significant surface water contamination of the local and broader surrounding landscape as well as prevent any significant soil erosion from occurring within and around the proposed development footprint and to attempt to maintain the ecological connectivity, -functionality and -integrity of the local watershed and broader sub-quaternary surface water catchment and drainage area
- It is recommended that the development design layouts for the proposed infrastructure must include adequate stormwater management measures to ensure that sufficient volumes and quality of surface water runoff from the study area during seasonal rainfall events, continue to be channelled through the local catchment
- It is further recommended that sufficient stormwater cut-off berms/trenches be constructed around the upslope boundaries of the proposed cemetery footprint. These cut-off berms/trenches must assist with- and manage clean/dirty water separation by diverting and channelling clean surface water runoff from the surrounding natural landscape around the proposed cemetery footprint during seasonal rainfall events, for continued flow. The cut-off berms/trenches are to be adequately lined internally, if deemed necessary by the engineer to prevent channel erosion. The cut-off berms/trenches are to be adequately maintained and regularly cleaned out, as and when necessary
- Water flow-breaks and dispersal infrastructure should be installed at the water release-points of the design layouts. This infrastructure must be able to adequately reduce the water flow velocity and disperse the water over a larger surface area, prior to entering into the surrounding landscape. This is necessary to prevent any potential localised erosion, which could occur at the water release-points due to high water volume concentration and flow velocity build-up. The water flow-breaks and dispersal infrastructure are to be adequately maintained and regularly cleaned out, as and when necessary
- The detailed design layouts including the slope- and measurement/capacity parameters of the stormwater cut-off berms/trenches, water flow-breaks and dispersal infrastructure must be calculated and determined by a suitably qualified and experienced engineer, in order to achieve this objective
- A Geo-hydrological assessment must be conducted of the study area, in order to determine the direct impacts of the proposed development on groundwater resources/aquifers, if deemed necessary by the competent authority.
- A Water Use License Application (WULA)/General Authorisation (GA) must be submitted to the Department of Water and Sanitation for the proposed development within 100 m of the significant ephemeral stream as well as through the small and very small ephemeral preferential water flow paths/drainage lines associated with the study area, as required in accordance with the National Water Act (Act 36 of 1998)
- All the applicable requirements in terms of Sections 9 and 10 of GNR 40229: General Authorisation in terms of Section 39 of the National Water Act, 1998 (Act No. 36 of 1998) for Water Uses as Defined in Section 21(c) or Section 21(i), must be adequately implemented for both the construction- and subsequent operational phases of the proposed development
- By implementing the relevant Department of Water and Sanitation (DWS) Wetland/Watercourse buffer calculation tools, a minimum Water Quality- and Biodiversity Buffer distance of approximately 22 m from the significant ephemeral stream, was determined. In accordance with the precautionary principle of the National Environmental Management Act (Act 107 of 1998), it is however highly recommended that the buffer zone be increased by a further 13 m due to the potentially significant additional continual anthropogenic activities associated with the subsequent operational phase of the established development. It is therefore recommended that a minimum Water Quality- and Biodiversity Buffer distance of approximately 35 m be implemented around the significant ephemeral stream. No current or future development or transformation or any movement/operations of machinery/equipment may take place within the buffered zone
  - o The original proposed development footprint was therefore proactively revised after the initial site sensitivity verification, based on the recommended buffer zone associated with the stream (see section 7.1)
- If building materials, hydrocarbons or other chemicals are to be stored on site during the construction- or subsequent operational phases, the storage areas must be situated as far away as practically possible/feasible from the significant ephemeral stream and minimum outside the buffer zone
- Building material, hydrocarbon and other chemical storage areas must be adequately bunded in order to be able to contain a minimum of 150 % of the capacity of storage tanks/units
- Adequate hydrocarbon and other chemical storage, handling, usage and spillage clean-up procedures must be developed, and all relevant employees must be sufficiently trained on- and apply these procedures during the construction- or subsequent operational phases
- Spill kits must be readily available at the construction- and subsequent operational site. All relevant employees must be adequately trained on the correct procedure and use of the spill kits
- Suitable and lawful management and disposal of hydrocarbons other chemicals and all waste products generated by the proposed cemetery must be ensured by the applicant
- Implement suitable dust suppression and management measures during the construction- and subsequent operational phases of the proposed development
- Construction areas and -roads to be sufficiently wetted down during the construction phase of the proposed development, if/when necessary, in order to suppress/prevent significant fugitive dust generation, emissions and fallout
- Adequate operational procedures for machinery and equipment must be developed to strictly govern and restrict movement of machinery, in order to avoid unnecessary fugitive dust generation, emissions and fallout and ensure environmentally responsible operational practices and activities
- It is recommended that environmentally friendly/biodegradable embalming chemical products, caskets and other options be utilised as far as practically possible/feasible in all the corpse preparation and burial processes associated with the operational phase of the proposed cemetery

- It is recommended that no bright light from any spotlights or perimeter lights or loud/excessive noise should be emitted into the surrounding landscape, during the nighttime. As little light emissions as practicably/reasonably possible from the established development, should occur during nighttime as this could lure aquatic bird- and other nocturnal avifaunal species individuals towards the perimeter fences and potentially result in collisions and mortality
- Lighting and illumination infrastructure technology and layout designs must be done in an environmentally friendly and responsible manner
- The minimum amount of lighting and illumination infrastructure which is practicably/feasibly possible for the established development to function at, must be utilised during nighttime
- Lighting and illumination infrastructure must as far as practicably possible be directed at low shining angles towards the ground and towards the inner portions of the established development, in order to reduce the amount of bright light being emitted into the surrounding natural landscape
- Lower shining intensity environmentally friendly lighting products must be utilised in order to reduce the brightness of light being emitted into the surrounding natural landscape
- An adequate sewage management system must be installed for the proposed development
- Adequate leakage detection and prevention systems/measures must be installed into the sewage management system in order to detect any potential leakages and subsequent contamination of soil and groundwater resources
- If any leakages or overflows of the sewage management system occur, the competent authority must immediately be notified and the necessary steps must be followed by the applicant to locate and remediate the source of contamination, as soon as practicably possible/feasible
- The integrity of the sewage management system must be inspected on a regular basis and adequately maintained over time, in order to ensure its continued functionality and prevent any leakages or failures