

EMPr – APPENDIX D

SOUTH AFRICAN NATIONAL ROADS AGENCY SOC LIMITED (SANRAL)

# STORMWATER MANAGEMENT PLAN

FOR THE

STRATEGIC INFRASTRUCTURE PROJECT (SIP2)

PROPOSED CAPACITY UPGRADES TO THE N2 AND N3 FROM DURBAN TO  
PIETERMARITZBURG, KWAZULU-NATAL

DEA REF NO: *TO BE ASSIGNED*

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## 1. SCOPE, PURPOSE, AIMS AND OBJECTIVES

The purpose of the Stormwater Management Plan (SMP) is to provide measures to manage storm water flow that will minimise impacts on both the road infrastructure and the environment, at the site and surrounds of the N2 and N3 upgrades within the eThekweni Metropolitan Municipality, KwaZulu-Natal.

During construction, measures are to be put in place that control the volume, velocity and quality of water that flows into natural drainage lines, rivers and wetlands within and adjacent to the works.

For the operation phase, storm water management measures are built into the engineering design, with the primary aim being to maintain the status quo of flow of the existing water courses and minimise alteration to flows. This is achieved by ensuring that the post development runoff does not exceed the pre-development runoff. In the case of these upgrades, this is achievable as the footprint of the upgrade does not influence the regional runoffs to any measurable extent. Also, by maintaining the existing culvert sectional areas, where they require replacement, and where necessary extending these structures, the status quo is maintained.

The SMP has the following objectives:

- Allow for natural surface and sub-surface flows.
- Avoid impeding the movement of water along drainage lines.
- Promote the dissipation of storm water run-off.
- Minimise soil erosion.
- Minimise sedimentation and pollution of water courses.
- Minimise impacts on existing natural habitats on site.
- Preserve or recreate the structural integrity of natural plant communities in adjacent riparian/wetland habitats.

This SMP must be read in conjunction with the following rehabilitation plans and procedures as identified by the appointed specialists:

- EMPr Appendix A1: N2/N3 Sensitive Areas Rehabilitation Plan (with plant rescue, plant translocation, alien invasive plant control, erosion control and soil management guidelines).
- EMPr Appendix A2: Paradise Valley Viaduct Rehabilitation Plan (with plant rescue, plant translocation, alien invasive plant control, erosion control and soil management guidelines).
- EMPr Appendix A3: Westville Viaduct Rehabilitation Plan (with plant rescue, plant translocation, alien invasive plant control, erosion control and soil management guidelines).
- EMPr Appendix A4: Umhlatuzana Viaduct Rehabilitation Plan (with plant rescue, plant translocation, alien invasive plant control, erosion control and soil management guidelines).
- EMPr Appendix B: Wetland and Riparian Areas Rehabilitation Plan.
- EMPr Appendix C: Erosion and Soil Management Plan

## **2. LEGISLATION AND STANDARDS**

Legislation relevant to the control of stormwater on site is described hereunder.

### **3.1 National Environmental Management Act, 1998 (Act 107 of 1998)**

The National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA) provides for the right to an environment that is not harmful to the health and well being of South African citizens. In addition, there is recognition that development must be socially, environmentally and economically sustainable, and that the disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimised and remedied (Government Gazette, 1998).

### **3.2 Conservation of Agricultural Resources Act 43 of 1983**

The aim of the Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983) (CARA) is to provide for control over the utilisation of the natural agricultural resources within South Africa and to promote the conservation of soil and water resources, indigenous vegetation and the control of invasive plants.

Thus, in terms of CARA, the landowner or land user is responsible for the maintenance of all soil conservation works located on his/her property. Added to this, the maintenance and improvement of the structure and function of wetlands furthers the aims of CARA.

### **3.3 Natal Nature Conservation Ordinance (Ordinance 15 of 1974)**

The main aim of the Natal Nature Conservation Ordinance (Ordinance 15 of 1974) is the protection of the natural resources of the province of KwaZulu-Natal. In particular, the Ordinance provides local conservation authorities with the power to enforce the protection of the province's resources through a permitting system, which is legally binding. Of particular relevance to the proposed construction of the Marula Pack House are the requirements for permits for the removal or destruction of protected indigenous amphibians, invertebrates or reptiles (Section 106 and Schedule 7 and 12a of the Ordinance), the removal or destruction of wild birds (Section 117 and Schedule 9 and 12a of the Ordinance) and the removal or destruction of protected plant species (Section 190 – 211 and Schedule 11, 12 and 12a of the Ordinance).

### **3.4 National Water Act, 1998 (Act 36 of 1998)**

The National Water Act, 1998 (Act 36 of 1998) (NWA) has various sections of relevance to the Upgrade of the Hammarsdale Interchange. The Department of Water and Sanitation (DWS) is the responsible authority with regard to matters affecting water resource management, including water quality. Added to this, certain provincial and local authority powers also influence the regulation of water resources, including agriculture, the environment, health services, nature conservation, pollution control, regional planning and development, soil conservation and water and sanitation services.

The development or modification of wetlands in any form are governed by conditions provided in Chapter 4, Part 1 of the Act which sets out general principles for regulating water use.

In general, water use must be licensed unless:

- It is listed in Schedule 1 of the Act.
- Is an existing lawful water use.
- It is permissible under a general authorisation.
- A responsible authority waives the need for a license.

As development or modifications of watercourses or wetlands are not included in Schedule 1, a license is required to carry out any activity involving a wetland. It is recognised that wetlands are beneficial in terms of stream flow regulation, flood attenuation and water purification. Any construction activity that takes place within a wetland may be considered to be an activity that is potentially harmful to both aquatic and non-aquatic organisms, and, generally, reduces local water quality.

Part 4 of the NWA deals with pollution prevention, and, in particular, the situation where pollution of a water resource occurs or might occur as a result of activities on land. The person who owns, controls, occupies or uses the land in question is responsible for taking appropriate measures to prevent the pollution of water resources. If these measures are not taken, the catchment management agency concerned may, itself, do whatever is necessary to prevent the pollution or to remedy its effects, and to recover all reasonable costs from the persons responsible for the pollution.

### **3. STORMWATER MANAGEMENT (CONSTRUCTION)**

The Contractor shall submit to the Engineer for approval, proposals to control stormwater drainage and prevent negative impacts on the environment and infrastructure during construction and rehabilitation. This shall be implemented and maintained throughout the construction and rehabilitation period.

The following general guidelines are to be adhered to:

- Remove only vegetation essential for construction and do not allow any disturbance to the adjoining natural vegetation cover.
- Ensure that measures are in place to control the flow of excess water so that it does not impact on surrounding vegetation.
- The stormwater drainage network system must be kept separate from the waste water (water containing waste) system.
- The accumulation of water on the surface must be prevented. The drainage of the surface must be done in such a way that stormwater will be led away quickly and efficiently from site without any erosion taking place.
- Runoff from roads must be managed to avoid erosion and pollution problems both on and off site.
- Prevent stormwater or contaminated water directly entering any watercourse.
- Install waste traps if necessary, to catch litter conveyed by surface runoff.

The following specific recommendations arising from the specialist studies and Basic Assessment Report must be included in the Contractor's Stormwater Management Plan:

- Storm water control measures must be implemented with all storm water generated within disturbed earthwork areas channelled to temporary, constructed settling ponds which allow the water to naturally filter back to the watercourse after settling.
- Storm water retention and other constructed settling ponds must be suitably sited or protected so that river channel high flows will not cause flooding of the ponds. Siting of

such ponds must be undertaken by a suitably qualified specialist who must also provide advice as to size and maintenance of the ponds.

- ❑ On steep slopes draining towards freshwater ecosystems, small-scale diversion berms should be constructed, to reduce the risk of the earthworks becoming a preferred surface flow path leading to erosion. Where space is insufficient, suitable road fill embankment protection will be designed).
- ❑ “Trench-breakers”, which are in-trench barriers, should be installed within any trench excavations to minimise the interception and accumulation of surface runoff water from upslope areas.
- ❑ Where construction activities take place within floodlines of watercourses, temporary berms must to be formed to ensure the construction site and disturbed soils are protected from flooding, stormflows and erosion.

#### **4. STORMWATER MANAGEMENT (OPERATION)**

The SMP for operation is built into the design of the infrastructure. The total catchment areas feeding all the cross drainage structures will not increase due to the road upgrades. The runoff however increases by a very small margin due to the relatively high runoff on the additional road surface width. In comparison to the total stormwater runoff, this is minimal and the culverts crossing the road are operating at very similar runoffs as in the past. All the stormwater which runs off the road surface is accommodated in lined storm water channels adjacent to the road surface. The concentration of stormwater from the concrete side drains is mitigated by the construction of energy dissipaters which ease the flow of water into the natural streams. Existing inlet and outlet structures are reviewed as part of design and provision made, as necessary, for additional erosion protection measures where the outlets are located.

Once the stormwater facilities along the N3 have been completed, the maintenance and monitoring thereof will remain the sole responsibility of SANRAL (or their appointed agent) who will take financial responsibility for the operation and maintenance of the stormwater infrastructure along the N3 during the operational life of the road. Management of the storm water infrastructure will include the following activities:

- ❑ Routine surveys of the road infrastructure by qualified Engineers to ensure the structural integrity of road infrastructure.
- ❑ Routine maintenance to road infrastructure.
- ❑ Routine cleaning of the road reserve and control of the vegetation on site. All stormwater infrastructure and drains will be kept clear of blockages.