



THE PROPOSED REPAIRS TO THE BANKS OF THE LOURENS RIVER  
AND OTHER REPAIRS DUE TO EXCESSIVE FLOODING OF THE  
WATERCOURSE ON FARM NO. 744, SOMERSET WEST IN THE  
WESTERN CAPE PROVINCE

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## Rehabilitation Plan

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| <b>Project Title</b> | The proposed repairs to the banks of the Lourens River and other repairs due to excessive flooding of the watercourse on Farm No. 744, Somerset West in the Western Cape Province. |
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## ABBREVIATIONS

|       |  |
|-------|--|
| AIP   | Alien and Invasive Plants                              |
| CESA  | Critical Ecological Support Area                       |
| DWAF  | Department of Water and Forestry                       |
| DWS   | Department of Water and Sanitation                     |
| ECO   | Environmental Control Officer                          |
| EIS   | Ecological Importance and Sensitivity                  |
| EMPr  | Environmental Management Programme                     |
| EN    | Endangered   |
| ERP   | Emergency Response Plan                                |
| FRRMP | Freshwater Resource Rehabilitation and Management Plan |
| GA    | General Authorisation                                  |
| GPS   | Global Positioning System                              |
| HGM   | Hydrogeomorphic  |
| NEMA  | National Environmental Management Act                  |
| NEMBA | National Environmental Management Biodiversity Act     |
| NFEPA | National Freshwater Ecosystem Priority Area            |
| NWA   | National Water Act                                     |
| PES   | Present Ecological State                               |
| SCC   | Species of Conservation Concern                        |

## 1 INTRODUCTION

NCC Environmental Services (Pty) (Ltd) (“**NCC**”) was appointed by Vergelegen Wines (Pty) Ltd (“**the applicant**”) to undertake an Environmental Impact Assessment (“**EIA**”) for the proposed repairs to the banks of the Lourens River and other repairs due to excessive flooding of the watercourse on Farm No. 744, Somerset West in the Western Cape Province. The Farm Vergelegen is situated just outside Somerset West and is surrounded by the Hottentots Holland Mountains. These mountains form most the catchment area of the Lourens River.

For many years the environment of this area has been disturbed by the infestation of alien woody vegetation. Although this has been cleared in many parts, the impact of this vegetation has been that river channels have become incised and flow with un-naturally high flow velocities. This increase in flow velocity river has resulted in the river transporting more and larger rock than what was believed to have occurred naturally. This causes sediment to be deposited at river bends or randomly at the end of flood pulses and forms blockages deflecting the flow of future floods into the riverbank causing them to erode. To have a long-term solution to the sedimentation and flooding of the Lourens River. the applicant intends to eradicate alien vegetation and rehabilitate the site with indegenious vegetation.

The current vegetation condition of the site is fair and while there are some areas that have clearly suffered some degradation in the past, the vegetation cover and composition can be considered typical for the area. There are some areas of alien invasion at the project site as such the applicant intends to eradicate the alien vegetation and rehabilitate the site with indegenious and wetland vegetation.

## 2 LEGAL FRAMEWORK

There exists various legislation that relates to the environmental industry in South Africa. The environmental legislation continues to evolve, resulting in both legislative and regulatory changes that have a material impact on any company and its operations. Environmental legislation in South Africa was promulgated because environmental degradation must at the very least be minimised and at the most prevented.

The South African Constitution gives the people of South Africa the right 'to an environment that is not harmful to their health or well-being' (Bill of Rights, Chapter 24). The various environmental legislation is detailed out below.

| Legislation   | Relevancy to the rehabilitation of the site  |
|---|--|
| The Constitution of the Republic of South Africa, Section 24                | The Constitution stipulates that everyone has the right to an environment that is not harmful to their health or well-being; and the right to have the environment protected, for the benefit of the present and future generations, through reasonable legislative and other measures. The Constitution has thus paved the way for environmental legislation and NEMA in South Africa post-1994.  |
| National Environmental Management: Biodiversity Act (No. 10 of 2004)        | To provide for the management and conservation of South Africa's biodiversity and the protection of species and ecosystems. Due to the site being situated in a critical biodiversity area, there is a possibility that protected flora and fauna found on site may be impacted upon during the clearance of vegetation. Furthermore, the Act deals with invasive alien species. Alien plant species will be required to be removed from the site and indigenous plant species planted.                                  |
| National Environmental Management: Protected Areas Act (Act No. 57 of 2003) | The Act provides for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes, for the establishment of a national register of all national, provincial and local protected areas. The proposed site falls with a protected area as identified on the South African Protected Areas Database and will therefore be subject to the provisions of this Act.   |
| Environment Conservation Act (Act 73 of 1989)                               | The main purpose of this Act is to provide for the protection of the natural environment (Section 16) to control environmental pollution by prohibiting littering and controlling the removal of littering and controlling waste management (Section 20) where the owner of a disposal site is required to apply for a permit from the minister of Water Affairs to operate such a facility. The Act further provides for the control of activities which may have a detrimental effect on the environment (Section 21). |

| Legislation   | Relevancy to the rehabilitation of the site  |
|---|--|
| Conservation of Agricultural Resources Act, 1983 (CARA, Act 43 of 1983) | Amendments to regulations under the Conservation of Agricultural Resources Act (CARA), 1983 (Act No. 43 of 1983) ensures that landowners are legally responsible for the control of invasive alien plants on their properties. The CARA legislation divides alien plants into weeds and invader plants, with weeds regarded as alien plants with no known useful economic purpose, while invader plants may serve useful purposes as ornamentals, as sources of timber and may provide many other benefits, despite their aggressive nature. |
| National Forests Act (Act No. 84 of 1998)                               | This Act provides for the management, utilisation and protection of forests through the enforcement of permitting requirements associated with the removal of protected tree species, as indicated in a list of protected trees. No protected trees were found on site during the site inspection of the removed trees. If a protected tree species is found on site and is required to be removed, a permit must be applied from the CapeNature.  |
| National Environmental Management Biodiversity Act 10 2004              | An Act to provide for the management and conservation of South Africa's biodiversity within the framework of the National Environmental Management Act, 1998; the protection of species and ecosystems that warrant national protection; the sustainable use of indigenous biological resources; the fair and equitable sharing of resources. All the species of biodiversity importance must be conserved to curb their extinction.   |
| Occupational Health and Safety Act (No. 85 of 1993)                     | To provide for the health and safety of persons at work and for the health and safety of persons in connection with the use of plant and machinery; the protection of persons other than persons at work against hazards to health and safety arising out of or in connection with the activities of persons at work.  |
| National Water Act (Act No 36 of 1998)                                  | Regulates the allocation of water and protection of water resources. The NWA regulates activities which may have a detrimental impact upon water resources.  |

### 3 PURPOSE/OBJECTIVES OF THE REHABILITATION PLAN

The rehabilitation plan aims to ensure compliance to the legislative requirements applicable to the site. Compliance thereof shall result with subsequent prevention of pollution and environmental degradation during and after site rehabilitation. Rehabilitation includes the re-vegetation of the sites cleared of alien vegetation and disturbed during construction and the creation of a stable land surface that is not subject to erosion or inundation of water. Re-vegetation should aim to accelerate the natural succession processes so that a healthy plant community develops. This Rehabilitation Plan has the following objectives:

- Ensure all areas are stable, and there is no risk of erosion.
- Prevent alien plant invasion on the site and allow for the establishment of indigenous plant communities.
- Ensure that all areas are free-draining and non-polluting.
- To outline functions and responsibilities of the responsible persons involved in the rehabilitation of the site.
- To state standards and guidelines which are required to be achieved in terms of environmental legislation.
- Minimise the visual impact of the site and rehabilitated areas by carefully shaping the site to blend with the surrounding landscape and by using indigenous vegetation from the area for rehabilitation.
- Ensure that the plant communities which establish within the rehabilitated areas comprise of indigenous vegetation only.
- Prevent erosion or dust creation by ensuring that all bare areas are efficiently rehabilitated,



## **4 . REHABILITATION PLAN ORGANIZATIONS, RESPONSIBILITY AND AUTHORITY**

This section describes the key functionaries in the implementation and monitoring of the Rehabilitation Plan (RP). All communication between the various organizations must be in writing and must include the landowner, where appropriate and necessary.

### **4.1 Duties and powers of the proponent/client**

- The Proponent is responsible for the appointment of a suitably qualified environmental Practitioner as an independent Environmental Control Officer (ECO) for the rehabilitation of the site.
- Commissioning the preparation, implementation and monitoring of the rehabilitation plan and implementing and enforcing the rehabilitation Plan
- The proponent is responsible for ensuring that sufficient funds are available to ensure that the development of the structure takes place in such a way as to ensure that the impact on the receiving environment is minimised and that all measures contained in the plan can be implemented and that the recommendations made by the ECO are implemented.
- The Proponent will be responsible for ensuring all relevant contractors receive a copy of the rehabilitation plan and understand its contents.

### **4.2 Duties of the Contractor**

All Contractors (including casual labour, subcontractors and staff) are ultimately responsible for:

- Incorporating the rehabilitation Plan into their contracts and signing agreements to comply with its conditions.
- Adhering to any instructions issued by the client and ECO.
- Submitting incident reports to the ECO.
- Documenting the details of any communication between the Contractor and the public.

- Any incident of un-authorized removal of plant material must be documented by the Contractor.
- Providing the site foreman with at least one hour of environmental training (to be provided by the ECO) and ensuring that he/she will be capable of sufficiently passing on the information to rehabilitation investigation staff.
- Any complaints from interest groups (e.g. residents) regarding the appearance of the construction site must be promptly recorded and addressed by the Contractor.
- All complaints and/or problems related to impacts on man-made facilities and activities must be promptly addressed and documented by the Contractor; and
- Maintaining a public complaint register.
- The Contractor(s) must arrange for all his/her employees and those of his/her sub-contractors to be informed of rehabilitation plan before the commencement of the rehabilitation investigation, construction or operation to ensure:
  - ❖ a basic understanding of the key environmental features of the work site and environments, and
  - ❖ Familiarity with the requirements of this rehabilitation Plan.

Casual labour, sub-contractors and their employees must comply with all the requirements of this rehabilitation plan and supporting documents (for example, the contract document that applies to the Contractor).. The Contractor will include the rehabilitation Plan's site-specific issues into its health, safety and environmental induction training programme for all staff that enter the site (including casual labour, sub-contractors and service providers).

The Contractor shall clearly describe the overall methodology proposed for the works and shall include method statements for preliminary and general works, site camp establishment (including work sequence and lay down areas), rehabilitation investigation, for instrumentation and control, for traffic management, for testing and proving of the works and for technical training. All method statements must take environmental requirements into account.

### **4.3 Duties and powers Environmental Control Officer (ECO)**

- The Environmental Consultant (NCC Environmental Services) is responsible for preparing and monitoring the implementation of the Rehabilitation Plan.
- The ECO is mandated to ensure that all contractors/ subcontractors/ employees are fully aware of their environmental responsibilities. This should take the form of an initial environmental awareness-training program in which requirements of the rehabilitation plan will be explained,
- Monitor site activities on a regular basis to ensure that there is minimal environmental impact due to rehabilitation activities.
- The ECO has the authority to stop works if in his/her opinion there is/may be a serious threat to or impact on the environment caused directly by the construction operations.
- Conduct a final environmental audit and a review of management and rehabilitation measures.

### **4.4 Environmental Awareness of the contractor**

Environmental awareness training must take place before rehabilitation can commence. The ECO shall conduct initial induction training with the Applicant, and Contractor/s before construction commencement. After such the client is to conduct environmental awareness briefings, in consultation with the ECO. It is of importance that workers are informed of no-go areas and strictly abide by the rehabilitation plan and Health and Safety Regulations. An environmental awareness plan must be implemented for both the construction and rehabilitation phases.

#### **4.5 Verification and Monitoring**

The objective of monitoring during the rehabilitation is to ensure that the agreed rehabilitation processes are successful and that the rehabilitation objectives prescribed are met. There is thus a need to carefully monitor the progress of the physical aspects of rehabilitation during the closure phase, and the progress of re-establishment of the desired final land use. Maintenance of rehabilitated sites is often the difference between the ultimate successes or failure of rehabilitation and monitoring of rehabilitation will determine whether rehabilitation objectives and requirements are being achieved. Post closure monitoring will be required to ensure rehabilitation has been successfully achieved and there are no residual impacts. Monitoring post rehabilitation will assess and ensure the following:

- Compliance with rehabilitation obligations.
- Physical stability of rehabilitated areas.
- Ecological function of rehabilitated areas.
- Impacts on final land use objectives.
- The requirement for maintenance or remedial work.

An independent Environmental Control Officer shall visit the site quarterly during the closure and rehabilitation process to ensure that the provision of closure and rehabilitations are being met. A report on non-conformances observed will be made and submitted.

#### **4.6 General site inspection**

Wide inspections will be undertaken regularly during and following closure of the site. The site inspections will be undertaken for a period post closure at an appropriate frequency. The objectives of these inspections are to:

- Identify any maintenance requirements such as remedial earthworks.
- assess the presence of weeds or pest species and determine if control measures are required.
- Undertake general observations (including photo point monitoring) of the success of vegetation reestablishment.
- Undertake general observations (including photo point monitoring) of the presence of erosion and landform stability issues.

- Identify safety issues and ensure all warning signs and safety barriers are intact.
- Additional inspections may also be undertaken following significant events such as substantial rainfall.

## 5 REGULATORY REQUIREMENTS FOR REHABILITATION PLAN

The site must be rehabilitated to ensure there are no adverse effects on the surrounding environment.

The rehabilitation will involve the following activities:

- Final contouring/shaping.
- Capping.
- Removal of any contaminated material and liner from the site.
- Removal of contaminated material. Level, tip, apply topsoil and vegetate the area
- Rip, topsoil and vegetate all compacted areas around.
- Rehabilitation of access/haul road.
- Apply topsoil and vegetate levelled areas.

### 5.1 Site Establishment

Due to the nature of the work/clearance that has been done onsite very limited earthworks, localized levelling is envisaged. However, should any earthworks need to be done the following site establishment aspects are applicable.

Required measures:

Before rehabilitation can commence several activities must occur. This includes, but not limited to:

- Environmental Training of workers and subcontractors.
- The demarcation of the construction site.
- Demarcating strict no-go areas around sensitive environments including, watercourses and trees.

- A buffer must be implemented between construction related activities and these sensitive environments.
- Determining the location of the construction offices/camp, screening and other structures.
- Determining and preparing site access (including entry and exit points) and access to different areas of the project area, taking into consideration the sensitive areas and existing roads.
- Solid waste collection facilities for litter, kitchen refuse, and for all nonhazardous solid waste including office and workshop waste.
- Implementing of security and safety measures (including temporary and permanent fencing, signage, lighting and the location of first aid kits, spill kits etc).

## 5.2 Health and Safety

Required measures:

The applicant must further adhere to the Occupational Health and Safety Act 85 of 1993. This includes, but is not limited to the following:

- Workers must be provided with dust masks when working in conditions that require protective measures.
- All workers on site must be medically tested annually to ensure fitness to work onsite.
- Operators of equipment and vehicles must be licenced and trained.
- Vehicles must be properly maintained. Hooters and lights must be in working order.
- Clean water must be provided to workers in a suitable container.
- There must be a registered first aider and medical equipment, should the need arise.
- The site area must be restricted to the public and signs clearly visible.
- The site must be clearly demarcated, with no-go areas identified and avoided.
- Accidents on site must be immediately reported and suitable action taken.
- Spill kits must be available if the need arises.
- Acceptable sanitation must be provided to workers.
- Rehabilitation must ensure the site is left in safe condition.

### 5.3 General site clean-up and removal of foreign material

Required measures:

- No Infrastructure was erected at the site.
- All logs from the cut trees must be given to the communities to use as firewood or be disposed at a landfill site.
- All foreign materials should be removed from site.
- Domestic or other waste should be removed from site and disposed off an approved landfill, and
- Soil contaminated with oil, grease, fuel or other hydrocarbon should not be disposed of in the excavation.

### 5.4 Alien Vegetation Control

Required measures:

The rehabilitated areas shall be maintained weed and invader plant free. An active programme must be implemented to ensure no further spread of these plants in adjacent areas occurs. Control of weeds and invader plants must be done in accordance with accepted control measures implementable for each species. The applicant shall identify and manage invasive and other noxious plants as per the requirements of the Conservation of Agricultural Resources Act's (Act 43 of 1983) Regulations (Notice No. R. 1048 of 25 May 1984, as amended by Government Notice No. R. 2687 of 6 December 1985) pertaining to weeds and invader plants control. As such, the following measures shall apply:

- Category 1 weeds and invader plants: the applicant shall actively remove all growth forms of Category 1 weeds from all works areas, at all times; and
- Category 2 and 3 weeds and invader plants: the applicant shall actively remove all Category 2 and 3 plants prior to flowering.

All weeds and invader plants shall be controlled before the setting of seeds. All such material must be removed to a registered landfill site. The transportation of such material must not result in the spread of weeds and invader plant species along public or private roads.

## 5.5 Trimming and Shaping

Required measures.

The site should be finished off in such a way that:

- It blends in with the surrounding area and appears as a natural extension to adjacent, undisturbed ground profiles;
- Sharp angles/corners are avoided;
- Smooth/flowing curves are created that lend with the surrounding landscape;
- All material whether spoil, excess stockpiled material, resulting from clearing and grubbing operations or excess overburden should be used for shaping or appropriate disposed of.

## 5.6 Compaction of disturbed areas

Required measures:

- The level of compaction of area disturbed by heavy-duty machinery should be addressed, preferably prior to the spreading of topsoil, by scarified the ground surface by hand, plough or a mechanical ripper to a depth of approximately 150 mm (and a maximum spacing of 1000 mm), to break down soil clogs.
- Compacted soil that has become too hard to scarify, should be ripped with a mechanical ripper to a depth of 250mm. No section of ground should remain undisturbed after ripping.

## 5.7 Topsoiling

Requirements measures:

- Approximately 50 to 100 mm of previously stripped and stockpiled overburden materials should be applied to the newly shaped and scarified/ripped area.
- Before placing topsoil, all visible weeds should be removed from the placement area and from the topsoil. The previously stripped and stockpiled topsoil should generally be spread evenly over the prepared surface to a depth of 75 to 150mm on flat ground or to a minimum of 75mm on slopes of 1:3 or steeper.



- Where amounts are inadequate to cover the entire area, slopes should receive priority treatment.

## 5.8 Stormwater management and erosion:

With the onset of the rain season signs of erosion have been observed onsite. Measures to prevent erosion must be implemented.

Required measures:

- The area must be finished in such a manner that, on completion of the rehabilitation process, the area drains properly, and run-off water does not cause erosion.
- High runoff and erosion rates and a poorly developed surface cover can jeopardise the success of the rehabilitation/re-vegetation programme since topsoil and seeds are washed away. Measures to prevent soil erosion should be established in all rehabilitated areas, including access roads.
- Such measures should include:
  - ❖ Appropriate shaping of the site
  - ❖ Stabilisation by re-vegetation.
  - ❖ Logging.
  - ❖ live staking.
  - ❖ The application of chemical stabilizers.
  - ❖ Straw stabilisation; and
  - ❖ Mulching; In terms of quantifying the adequacy of drainage measures; at least 80% of the surface area should be free of surface run-off water in a year of normal precipitation.
- Drainage should be designed in such a manner that it will minimize ponding.
- Drainage systems should be designed to minimize erosion caused by runoff and major rainfall events.

## 5.9 Revegetation

Re-vegetation must be done with trees species already found onsite.

Required measures:

- As a minimum, the site must be finished in such a manner that is suitable for the natural re-establishment of vegetation.
- The mix of vegetation types (indigenous, naturalised) and approach to re-vegetation (i.e. Seeds versus cultivated plants versus search and rescue from adjacent area) should be tailored to response to the receiving and environment and meet the specific rehabilitation Objectives. It should be noted that where quick cover is required, reliance on natural regeneration would be inappropriate, and re-vegetation programme would need to be implemented.
- Unless an elaborate and extensive approach to the rehabilitation is envisaged, in general the re-vegetation programme should focus on using species which:
  - ❖ Can establish rapidly on disturbed land.
  - ❖ Rapidly bind and cover soil, thereby affording effective protection against erosion.
  - ❖ Are resilient to the prevailing environmental conditions.
  - ❖ Will not invade the surrounding habitat; and
  - ❖ Will not prevent indigenous species colonising the rehabilitated areas from the surrounding veld.
- The specified re-vegetation measures should be applied to the entire site including all areas disturbed in the preparation of the site and all access roads.
- Re-vegetation measures should be phased and should ideally be implemented immediately following the shaping.
- The use of mulches, soil stabilizers, and fertilizers to establish plant growth and reduce erosion is desirable, although the cost implication of this should be borne in mind.
- All seed mixtures or plant materials to be used in the rehabilitation should be approved.
- For best results, re-vegetation should be programmed to occur during the period most likely to produce beneficial results in terms of vegetation establishment and growth, specifically in terms of the adequacy of rainfall (optimal period likely to be between September and April,

- It should be ensured that any plant material used for rehabilitation is free of noxious weeds as specified under the Conservation of Agricultural Resources Act.
- Within all re-vegetated areas, fertilizer should be added to the topsoil to encourage growth. Although the fertilizer application should be tailored to the specific rehabilitation programme, a generally recommended fertilizer mixture is as follows:
  - ❖ 2:3:2(20) 150kg/ha
  - ❖ Super phosphate 200kg/ha
- Whilst the super phosphate should be mixed in with the soil during scarification, 2:3:2 should be applied together with the seed.
- Water used for the irrigation of vegetated areas should be free of pollutants that will have a detrimental effect on the plants. The vegetated area should only be watered once, immediately following seeding. Watering should be carried out from a tanker, using a fine nozzle spray to avoid erosion and disturbance of the vegetation.
- Spreading of cleared and mulched vegetation on reshaped slopes will assist in reducing erosion and provide a seed bank (where the cleared vegetation is indigenous) and will thus aid in the speed and success of re-vegetation. The use of cut alien/invasive vegetation as brush packing for slope stabilisation may also be considered where alternative materials are lacking, and the cut vegetation is not seed bearing.

## 5.10 Protection of Rehabilitated Areas

Required measures:

- Re-vegetation should not occur in any areas until all operations within those areas that have been completed.
- Once re-vegetated, area should be protected to prevent trampling and erosion.
- No construction equipment, vehicles or unauthorized personnel should be allowed onto areas that have been vegetated.
- Only persons or equipment required for the preparation of areas, application of fertilizer and spreading of topsoil should be allowed to operate on these areas.
- Where rehabilitation sites are located within actively grazed areas, they should be fenced.

- Fencing should be removed once a sound vegetative cover has been achieved.
- Any runnels erosion channels or wash always developing after re-vegetation should be backfilled and consolidated and area restored to a proper stable condition. The erosion should not be allowed to develop on a large scale before effecting repairs and all erosion damage should be repaired as soon as possible.

### **5.11 Maintenance of the rehabilitated area.**

The following maintenance will be undertaken:

- All grazing animals will be kept off the area until the vegetation is self-sustaining.
- Newly seeded areas will be protected against compaction and erosion.
- Plants will be watered and weeded when necessary.
- Plants will be checked for pests and diseases at least once every two weeks during establishment and treated if necessary.
- Unhealthy or dead plant material will be replaced.
- Grassed areas will be fertilised for the first year after rehabilitation and thereafter self-sustainability will be monitored.
- The soil will be analysed to determine if the addition of lime and manure is required for vegetation establishment; and
- Any erosion damage will be repaired and reseeded.

## **6 TIMING OF REHABILITATION**

The timing of rehabilitation is critical to ensure sustainable development and optimize capability. The timing of rehabilitation is important, and rehabilitation of disturbed area should ideally be programmed to occur as soon as practically possible following the cessation of the work in a specific area.

## **7 CONCLUSION**



The site disturbed area and cleared of alien vegetation need to be rehabilitated to ensure ecological integrity of the Lourens River. All compacted and disturbed areas within the footprint of the site will be ripped, top soiled and vegetated. Disturbed areas will be sloped to enhance natural run-off patterns. Grassing of slopes, berms and areas outside of the footprints will be undertaken. All waste must be removed and disposed of at a suitably licensed facility. This Rehabilitation Plan has been designed as a flexible document that will be reviewed on a periodic basis and amended where and when necessary, changes are identified.