An MMP for the residential development on ERF 11330 Idas Valley was approved by DEADP on the 22 of March 2018. REFERENCE: 16/3/3/5/B4/45/1006/18.

This MMP covers the same maintenance activities that will be applicable to the OLD HELSHOOGTE ROAD UPGRADE.

It would be counter intuitive to have two MMPs for maintenance in the river on erf 11330.

The same maintenance activities apply.

As such is argued that the OLD HELSHOOGTE ROAD UPGRADE falls within the ambit of the approved MMP for the residential development on ERF 11330 Idas Valley.

Attached is the APPROVED MMP for the residential development on ERF 11330 Idas Valley.

MAINTENANCE MANAGEMENT PLAN
(OPERATIONAL PHASE)

FOR THE PROPOSED RESIDENTIAL DEVELOPMENT ON ERF 11330 STELLENBOSCH

January 2018

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DEA&DP Ref No: 16/3/1/1/B4/45/1114/14

	Title: **MAINTENANCE MANAGEMENT PLAN - ERF 11330 STELLENBOSCH**	
Eco Impact No: 2018/111-01	**Date:** 5 January 2018	**Report Status:** 2nd draft
Carried Out By: Eco Impact Legal Consulting (Pty) Ltd P.O. Box 45070 Claremont 7735 Tel: 021 671 1660 E-mail: admin@ecoimpact.co.za	**Commissioned By:** Stellenbosch Municipality PO Box 17 Stellenbosch 7600 Tel: 021 808 8111 Fax: NA E-mail: stellenbosch@stellenbosch.gov.za	**Client:** Stellenbosch Municipality PO Box 17 Stellenbosch 7600 Tel: 021 808 8111 Fax: NA E-mail: stellenbosch@stellenbosch.gov.za
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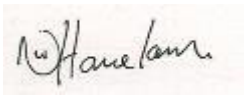
Verification	Capacity	Name	Signature	Date
By Author	Senior EAP	Jessica Le Roux		5 January 2018
Reviewed	Director: Environmental Management; Principle EAP & Biodiversity Specialist	Nicolaas Hanekom		5 January 2018

1. INTRODUCTION

This MMP is for the proposed construction of 203 single residential units (GAP and affordable housing) on 2.77ha, general residential (60 flats) on 0.56 ha and roads and services. The site is located in the eastern portion of Idas Valley, Stellenbosch and west of the old Helshoogte road on vacant undeveloped municipal land. A non-perennial river runs from east to west through the middle of the site.

This MMP has been prepared principally in compliance with the requirements of "Annexure A – Guideline for Compiling a Maintenance Management Plan".

This document, together with the conditions in the EMP and Environmental Authorisation, must be adhered to.

1.1. RESPONSIBLE PARTY

The responsible party that will be implementing the MMP is the Stellenbosch Municipality.

The Stellenbosch Municipality ("SM") has committed itself to a set of values that include the maintenance of good relations and transparent communications with all stakeholders, and the dynamic engagement of the larger community.

SM undertakes to implement suitable management systems for all the areas and aspects of this operation. This will ensure that development itself and management of the project will comply with legal, technical, environmental and transformation policies and standards.

SM intends to enable continuous improvement in legal compliance and the sustainable operation of the site. This MMP intends to further guide the achievement of the strategic objectives of the organization at the project site.

The satisfactory implementation of the MMP on site will require both the full support and commitment of all personnel.

1.2. AUTHOR

Eco Impact is an independent consulting company and has no interest in any business related to the development site, nor will it receive any payment or benefit other than fair remuneration for the task undertaken, as required in terms of the NEMA Regulations.

This report has been prepared by Jessica Le Roux, of Eco Impact, an environmental consultancy, engaged in providing professional services in the field of environmental planning, -systems, -auditing and -biodiversity assessment and -management.

Jessica Le Roux has completed her professional registration in terms of section 20(3) (b) of the Natural Scientific Professions Act, 2003 (Act 27 of 2003) as a Professional Natural Scientist in the field of practice Environmental Science (Registration number 400192/16). She obtained her BSc (Honours) in Environmental and Geographical Science in 2011 from the University of Cape Town and subsequently obtained her MSc in Zoology in 2013 from the same institution.

Jessica has practiced as an Environmental Assessment Practitioner since August 2013 and has been involved in the compilation, coordination and management of Basic Assessment Reports, Environmental Impact Assessments, Environmental Management Programmes, Waste Licence Applications, Water Use Licence Applications and Baseline Biodiversity Surveys for numerous clients.

1.3. DEFINITIONS

Auditing:	A systematic and objective assessment of an organization's activities and services conducted and documented on a periodic basis based to a (e.g. ISO 19011:2003) standard.
Biodiversity:	The variety of life in an area, including the number of different species, the genetic wealth within each species, and the natural areas where they are found.
Contractor:	An employer, as defined in section 1 of the Occupational Health and Safety Act 85 of 1993, who performs construction work and includes principal contractors
Developer:	One who builds on land or alters the use of an existing building for some new purpose.
Environment:	A place where living, non-living and man-made features interact, and where life and diversity is sustained over time.
Evaporation:	The change by which any substance (e.g. water) is converted from a liquid state into and carried off as vapour.
Groundwater:	Subsurface water in the zone in which permeable rocks, and often the overlaying soil, are saturated under pressure equal to or greater than atmospheric.
Independent:	Is independent and has no interest in any business related to the development site, nor will receive any payment or benefit other than fair remuneration for the task undertaken.
Landowner:	Holder of the estate in land with considerable rights of ownership or, simply put, an owner of land.
Monitoring:	A systematic and objective observation of an organisation's activities and services conducted and reported on regularly.
Natural vegetation:	All existing vegetation species, indigenous or otherwise, of trees, shrubs, groundcover, grasses and all other plants found growing on a site.
Pollution:	The result of the release into air, water or soil from any process or of any substance, which is capable of causing harm to man or other living organisms supported by the environment.
Protected Plants:	Plant species officially listed under the Threatened or Protected Species regulations as well as on the Protected Plants List (each province has such a list), and which may not be removed or transported without a permit to do so from the relevant provincial authority.

Red Data Species:	Plant and animal species officially listed in the Red Data Lists as being rare, endangered or threatened.
Rehabilitation:	Making the land useful again after a disturbance. It involves the recovery of ecosystem functions and processes in a degraded habitat. Rehabilitation does not necessarily re-establish the pre-disturbance condition, but does involve establishing geological and hydro logically stable landscapes that support the natural ecosystem mosaic.
Site:	Property or area where the proposed development will take place

1.3.1. ACRONYMS

DEA&DP:	Department of Environmental Affairs and Development Planning
DWS:	Department of Water and Sanitation
ECO:	Environmental Control Officer
EA:	Environmental Authorisation
EIA:	Environmental Impact Assessment
EM:	Environmental Manager
EMP:	Environmental Management Programme
EO:	Environmental Officer
ER:	Engineer's Representative
I&AP:	Interested and Affected Party
IEM:	Integrated Environmental Management
MS:	Method Statement
PM:	Project Manager
SANS:	South African National Standards

1.4. BACKGROUND

Environmental Authorisation and Water Use Licence have been applied for and if granted must be complied with.

The layout (dated 15 June 2017) – preferred alternative option consists of:

- 203 units of GAP and affordable housing (on 2.77ha)
- 60 flat units on one erven (on 0.56ha)
- 4 erven of public open space (on 0.95ha)

- The non-perennial river and its flood plain and buffer area will be zoned to Public Open Space. No construction will take place within the floodlines other than two vehicle

bridges. The vehicle bridges will be made with box culverts. The box culverts will be 1.2m x 0.9m.

- A retaining wall will be constructed on the edge of the parking area (outside the floodlines) and at 4 locations on the northern side of the river (outside the floodlines). Construction of the retaining walls will be outside the floodline and river buffer areas. A cross section of the retaining walls can be found in appendix G in the "Stormwater Management Plan annexure E2".

- The storm water currently runs from Old Helshoogte Road through an excavated channel and joins the stream. The proposed internal water reticulation system will consist of a 750mm diameter pipe and be connected to the existing water reticulation system. There will also be a box culvert of 1.2m x 0.9m adjacent to the flats.

- A detention pond is proposed to manage storm water discharge on the site. This detention pond is not within the floodline and is centrally located on the site. The pond area will be 500meter squared.

Pond Area	500m^2
1:50 Inflow	2.602m^3/s
1:100 Inflow	3.325m^3/s
Max. depth (1:50)	1.240m
Max. depth (1:100)	1.500m
Pond storage volume (1:50)	386m^3
Pond storage volume (1:100)	563^3
1:50 Outflow	2.179m^3/s
1:100 Outflow	2.459m^3
Orifice (Pipe dia.)	1 x 675mm
1:50 Freeboard	0.360m
1:100 Freeboard	0.100m

TABLE 1: PROPOSED DETENTION POND

2. RELEVANT LEGISLATION AND POLICIES

Applicable Legislation Identified

1. ADVERTISING ON ROADS AND RIBBON DEVELOPMENT ACT, 21 OF 1940
2. BASIC CONDITIONS OF EMPLOYMENT ACT 75 OF 1997
3. COMPENSATION FOR OCCUPATIONAL INJURIES AND DISEASES ACT 130 OF 1993
4. CONSERVATION OF AGRICULTURAL RESOURCES ACT, 43 OF 1983
5. CONSTITUTION OF THE REPUBLIC OF SOUTH AFRICA, 1996
6. ENVIRONMENT CONSERVATION ACT, 73 OF 1989, WESTERN CAPE NOISE CONTROL REGULATIONS
7. EMPLOYMENT EQUITY ACT, 55 OF 1998
8. ENVIRONMENT CONSERVATION ACT, 73 OF 1989
9. FENCING ACT, 31 OF 1963
10. HAZARDOUS SUBSTANCES ACT, 15 OF 1973
11. LABOUR RELATIONS ACT 66 OF 1995
12. NATIONAL BUILDING REGULATIONS AND BUILDING STANDARDS ACT, 103 OF 1977
13. NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 107 OF 1998
14. NATIONAL ENVIRONMENTAL MANAGEMENT: AIR QUALITY ACT 39 OF 2004

15. NATIONAL ENVIRONMENTAL MANAGEMENT: BIODIVERSITY ACT, 10 OF 2004
16. NATIONAL ENVIRONMENTAL MANAGEMENT: WASTE ACT, 59 OF 2008
17. NATIONAL FORESTS ACT, 84 OF 1998
18. NATIONAL HERITAGE RESOURCES ACT, 25 OF 1999
19. NATIONAL VELD AND FOREST FIRE ACT, 101 OF 1998
20. NATIONAL WATER ACT 36 OF 1998
21. OCCUPATIONAL HEALTH AND SAFETY ACT 85 OF 1993
22. TOBACCO PRODUCTS CONTROL ACT 83 OF 1993
23. WATER SERVICES ACT 108 OF 1997
24. STELLENBOSCH LOCAL MUNICIPALITY: BY-LAW RELATING TO THE CONTROL OF BOUNDARY WALLS AND FENCES
25. STELLENBOSCH LOCAL MUNICIPALITY: BY-LAW ON STREETS
26. STELLENBOSCH LOCAL MUNICIPALITY: COMMUNITY FIRE SERVICES BY-LAW
27. CAPE WINELANDS DISTRICT MUNICIPALITY: MUNICIPAL HEALTH BY-LAW
28. CAPE WINELANDS DISTRICT MUNICIPALITY: FIRE SAFETY BY-LAW

3. SITE LOCATION AND DESCRIPTION/PROJECT LOCATION & LAYOUT PLANS

3.1. LOCALITY MAP

See Annexure 1.2.

3.2. LAYOUT PLAN

See Annexure 1.3.

3.3. AERIAL PHOTOGRAPHS

See Annexure 1.1.

3.4. DESCRIBE THE SITE

The site is located in the eastern portion of Idas Valley, Stellenbosch and west of the old Helshoogte road on vacant undeveloped municipal land. A non-perennial river runs from east to west through the middle of the site.

3.4.1 THE TYPE OF ECOSYSTEM

The site is situated in a valley with a moderate to low slope from north and south towards the centre non-perennial river. The property is open municipal land that has no natural vegetation left on site other than some wetland vegetation in the river.

3.4.2 BIODIVERSITY FEATURES

The river channel is an Ecological Support Area.

The property lies in the general area that used to support Boland Granite Renosterveld and Cape Winelands Shale Fynbos, according to the new vegetation map of South Africa (Mucina & Rutherford 2006). Both these vegetation types are listed as endangered in the South African National Spatial Biodiversity Assessment (Rouget et al 2004). The site is totally disturbed with no natural vegetation left on site other than some wetland vegetation in the river.

3.4.3 CONDITION OF THE RIVER CHANNEL

This non-perennial river rises in the foothills of the Hottentots Holland Mountains and flows from east to west through the Idas Valley area of Stellenbosch. The non-perennial river rises at 359m above mean sea level and runs for 1.4km before it reaches the property at 211m above mean sea level.

The non-perennial river is defined by a deep narrow channel which is blocked at the Helshoogte and Old Helshoogte Roads before it meets up with a tributary of the Kromme River on the north of the property.

In general, the non-perennial river is impacted upon and in a poor ecological state. The flow regime of the non-perennial river is heavily affected at two places where the Helshoogte and Old Helshoogte Roads cross the river. The localised impacts where the river runs through the town have reduced the ecological integrity of the river. These include construction of roads and infrastructure crossings that cause sedimentation and reduced water flow.

The banks of the watercourse are mostly covered by indigenous vegetation but do also contain a number of alien species. The upper section of the river is invaded by alien trees while the lower section has some wetland vegetation present.

PHOTO 1: VEGETATION ON THE BANKS OF THE RIVER.

3.4.4 DESCRIBE THE RIPARIAN BUFFER ZONES

The non-perennial river and its flood plain and buffer area will be zoned to Public Open Space. No construction will take place within the floodlines other than two vehicle bridges. The vehicle bridges will be made with box culverts. The box culverts will be 1.2m x 0.9m.

A retaining wall will be constructed on the edge of the parking area (outside the floodlines) and at 4 locations on the northern side of the river (outside the floodlines). Construction of the retaining walls will be outside the floodline and river buffer areas.

3.4.5 FLOODING

See the “External Stormwater Management Plan” for further details.
The peak flow runoff expected during pre- and post-development conditions during the 1:50 year and 1:100 year recurrence interval storm events can be summarized as follows:

TABLE 2: PEAK FLOW RUNOFF

NODE	LINK	Pre- Development Runoff (m^3/s)		Post-Development Runoff (m^3/s)	
		1:50	1:100	1:50	1:100
10	10 – 20	2.718	3.271	2.718	3.271
10A	10A – 20	0.479	0.565	0.479	0.565
20	20 – 30	4.080	4.886	4.080	4.886
30	30 - 60	4.942	5.906	4.942	5.906
40	40 – 60	2.299	2.690	2.299	2.688
50	50 – 60	2.449	2.868	2.433	2.806
60	60 – 70	7.462	8.878	7.609	9.065
70	70 - OF	**7.613**	**9.057**	**7.782**	**9.267**

As such, to prevent flooding, an attenuation facility is proposed as part of the development in order to maintain pre-development runoff.

4. OBJECTIVE OF MAINETENENCE ACTIVITRIES/TERMS OF REFERNCE

4.1 OBJECTIVES

The non-perennial river is a designated sensitive area, namely an Ecological Support Area (ESA). The conservation objective for this MMP is to maintain the ecological processes and functioning of the river.

To set guidelines in a management plan for correct management procedures and methods, in such a manner that they may be flexible in as much as situations change.

This MMP will facilitate the manager’s annual planning in terms of allocating staff, time and financial resources towards management goals and responsibilities.

4.2 TERMS OF REFERENCE

- Review previous work done in the area and describe baseline conditions that exist in the study area.
- Provide a full report in accordance with the “Annexure A – Guideline for Compiling a Maintenance Management Plan”.
- Identify and assess any cumulative impacts arising from the proposed project.
- Identify and list all legislation that is relevant to the development proposal.
- Recommend appropriate, practicable mitigation measures that will reduce all major (significant) impacts or enhance potential benefits, if any.
- Indicate limitations and assumptions.
- This report should clearly indicate any constraints that would need to be taken into account.
- The objectivity of the EAP performing work under this appointment must not be compromised under any circumstances.

5. DESCRIPTION OF MAINTENANCE ACTIVITIES/BRIEF SUMMARY OF THE PROJECT

5.1. DESCRIPTION OF THE PROPOSED TASKS

Once construction is complete, the following tasks are proposed during the operational phase:

A. <u>Clearing of Alien species</u>

Throughout the operational phase the indigenous vegetation currently on the banks of the river in the buffer areas is to remain untouched.

The developer must implement alien clearing management programmes in the buffer areas. Clearing of alien invasive species must take place, in particular gum trees (Eucalyptus sp.) which are prevalent upstream and can have a significant negative impact on riparian areas through inhibiting undergrowth and thereby enhancing erosion impacts. All alien invasive trees, i.e. the large stance of cotton wood (Populus sp.), the large blue gum trees (Eucalyptus), black wattle and port jackson willow (Acacia spp.) must be eradicated from the stream and green buffer area and followed up yearly to prevent re growth.

See method statement for Activity A in Annexure 2.

B. <u>On-going Management and Litter Clearing</u>

- Site Inspections of the river corridor; at river crossings and the stormwater ponds.
- All waste within the drainage channels must be removed on a weekly basis.
- Sandy areas and riffles must be maintained for frog habitat. Where possible, habitat variability should be maintained and environmentally acceptable materials utilised.
- Buffer zones should be maintained on either side of the stream as described in the previous section.
- Inspect and maintain storm water systems in accordance with the method statement for Activity B in Annexure 2.

C. <u>Erosion Control</u>

If any erosion and/or degradation of the channels are noticed immediate action must be taken by the municipality to rectify the situation. Corrective and preventative measures are listed in the method statement for Activity C in Annexure 2.

Management and control of erosion will be an ongoing process and must be closely monitored and immediately rectified by the municipality.

The commitment remains to keep to the existing standards as evident. The municipality must implement erosion control measures to ensure that no erosion occur on site. The area must also be regularly monitored and erosion maintenance measures implemented to prevent erosion. Depending on type and extent of erosion occurred specialists may be contacted to provide specific recommendations.

D. Clearing of silt

The applicable river sections and associated infrastructure must be monitored and kept free of silt/sediment, waste or debris built-up and intrusive growth of invasive alien plants at least annually before the main rainfall season and all excess silt built-up, waste or debris must be removed immediately.

Built-up silt/sand must not be removed along riverbanks which receives direct storm water run-off/river water flow as this will expose the riverbank to potential erosion. Clearing of silt after any flood events as well as clearing of silt in box culverts under the two vehicle bridges may be required during the operational phase.

In these cases, such removal must be done in accordance with the method statement for Activity D in Annexure 2.

The following are also key guiding general principles of environmentally-sound river maintenance:

(some points were adapted from a report by Ninham Shand, 1999 and Western Cape Nature Conservation river maintenance guidelines)

a) Minimise the spatial extent of disturbance

Refugia (hiding places for aquatic organisms) are a critical component of natural river ecosystems and play an important role in maintaining biodiversity. Recovery of aquatic biota on a large scale is dependent on the presence of un-impacted reaches of rivers with refugia, thus modifying long stretches of river channel is not desirable due to the impaired re-colonisation and recruitment by the aquatic organisms. Long stretches of the river must therefore not be modified.

b) Maximise physical diversity

Environmentally sound river maintenance is to maintain physical/habitat diversity where it exists, or to create it where it no longer exists or where it has been removed by previous actions. This physical diversity will ensure diversity in the plant and animal components and thereby promote the development of biologically intact, healthy, and stable aquatic communities. Although restoration to pre-disturbance condition often may not be possible, the safe-guarding or increasing of the range of habitats along a section of the river would maintain the richness of vertebrates and invertebrates. Long stretches of the river must therefore not be modified.

c) Minimise the frequency of maintenance activities (temporally)

Biological recovery of rivers is dependent on their physical recovery and therefore river features such as pools and riffles (habitat diversity) must become established before complete recovery of aquatic communities can occur. These features are normally flow dependant, that is, work with nature, if they are to be self-maintaining. The planning and design of river maintenance activities should therefore be done in such a manner as to prevent the necessity to repeat the operation each year. Annual habitat destruction and subsequent aquatic biota depletion will decrease the system's resilience to cope with recovery.

5.1.1. THE AMOUNT OF MATERIAL THAT WILL BE DEPOSITED, REMOVED OR MOVED

Unknown.

5.1.2. LOCATION OF THE STORAGE/DISPOSAL OF THE MATERIAL AND HOW IT WILL BE TRANSPORTED

Unknown.

Alien species to be store and transported in accordance with municipal alien clearing programme procedures. No on-site burying, dumping or stockpiling of any weeds and aliens or invasive species must occur. They should be removed from the site and dumped at a suitable dumping site from which seed cannot escape.

5.1.3. COMMENCEMENT DATE AND DURATION IN DAYS FOR EACH TASK

Commencement dates are not clear at this point as this will be dependent on the granting of licences and authorisations.

Maintenance activities in rivers could lead to significant damage if interrupted by high flows or floods. Rather undertake activities during the dry season. Consult specialists with regard to the most appropriate times for disturbance to riparian vegetation and aquatic organisms.

5.2. IMPACTS ON THE ENVIRONMENT

5.2.1. DESCRIPTION OF THE IMPACTS

Assessments undertaken used to inform the MMP:

- "DWS (DW781) Freshwater Ecological Information-Proposed housing project on Erf 11330, Idas Valley, Stellenbosch"
- "Biodiversity Ecosystem Baseline Survey, Idas Valley erf 11330, Stellenbosch Residential Development"
- "Frogs of erf 11330 – Independent Assessment of the Eco Impact Freshwater Report"
- "Phase 1 Geotechnical site investigation for erf 11330, Idas Valley, Stellenbosch"
- "External Stormwater Management Plan and Floodline Study for erf 11330, Idas Valley, Stellenbosch"
- "Engineering Services Report for erf 11330, Idas Valley, Stellenbosch"
- Water Use Application
- "Birds of Idas Valley Erf 11330"

Impacts that may result from the operational phase and activities described in this MMP (briefly describe and compare the potential impacts (as appropriate), significance rating of impacts, proposed mitigation and significance rating of impacts after mitigation that are likely to occur as a result of the operational phase.

Nature of impact: Impact on sensitive environments (indigenous terrestrial and riparian vegetation, wetlands, water courses and steep slopes).						
Discussion: Sensitive environments: riparian habitat impacted on by activities such as silt removal, alien clearing and waste removal.						
Cumulative impacts: • Potential for erosion of granular surface soils due to steep slope conditions. Due to gradients across the site, variation of soils and proximity to the stream, the soils across the site will be susceptible to erosion by water.						
Mitigation: • Appropriate precautions will be necessary. • Ongoing alien clearing, litter clearing, erosion monitoring and maintenance are recommended to ensure possible impacts on biological aspects on site are avoided.						
Criteria	**Housing development LA 2– PREFERRED**		**Housing development LA 3**		**No-Go Alternative**	
	Without Mitigation	**With Mitigation**	**Without Mitigation**	**With Mitigation**	**Without Mitigation**	**With Mitigation**
Extent	3	2	3	2	3	2
Duration	5	1	5	1	5	1
Magnitude	6	2	6	2	6	2
Probability	4	2	4	2	4	2
Significance	56- Medium	10 - Low	56- Medium	10 - Low	56- Medium	10 - Low
Status	Medium significance if not mitigated	Low significance if mitigated	Medium significance if not mitigated	Low significance if mitigated	Medium significance if not mitigated	Low significance if mitigated
Reversibility	100%				100%	
Irreplaceable loss of resources	1-Will not be lost if mitigation measures are implemented				1-Will not be lost if mitigation measures are implemented	
Can impacts be mitigated?	1- Yes, can be completely mitigated				1- Yes, can be completely mitigated	

See "BASIC ASSESSMENT REPORT" for further details.

5.2.2. ANY MITIGATION OR MANAGEMENT MEASURES

See section 5.2.1 above, the Basic Assessment Report and EMP for further mitigation measures recommended.

5.3. SPECIALIST INPUTS

5.3.1. A DESCRIPTION OF NAY ACTIVITIES THAT HAVE COMMENCED ON SITE

No activities have commenced on site.

6. RESPONSIBLE PARTIES/ROLES AND RESPONSIBILITIES

6.1.1. DETAILS OF PERSON TO UNDERTAKE ACTIVITIES

Stellenbosch Municipality
PO Box 17
Stellenbosch
7600
Tel: 021 808 8111
E-mail: stellenbosch@stellenbosch.gov.za

6.1.2. LANDOWNER DETAILS

Stellenbosch Municipality
PO Box 17
Stellenbosch
7600
Tel: 021 808 8111
E-mail: stellenbosch@stellenbosch.gov.za

6.2. RESPONSIBILITIES AND FUNCTIONS

The Stellenbosch Municipality is responsible for all maintenance and planned activities during the operational phase of the development.

7. ENVIRONMENTAL EDUCATION/ENVIRONMENTAL AWRENESS PLAN

Before work is done in accordance with this MMP, persons who will be conducting the work must undergo environmental awareness training as outlined in the EMP.

8. IMPLEMENTATION MANGEMENT

No camp site or access route will be required. Alien eradication dealt with under “description of maintenance activities”.

9. GERNERAL CONTROL

The OEMP as included in the EMP must be approved by the deciding authority and subsequently complied with by the Stellenbosch Municipality during the operational phase of the development.

Detention pond must be maintained, if signs of leakage or infrastructure failure are detected it must be repaired immediately and preventative measures must be put in place to prevent re-occurrence. All storm water infrastructure must also be maintained.

It is the mandate of the municipality of to maintain a finite standard and quality finishing and of service delivery on the property to prevent degradation. This requires on-going maintenance of municipal buildings, gardens and infrastructure and the repair of environmental damage caused by users e.g. erosion or trampling of vegetation. The South African Constitution states that municipalities have the responsibility to make sure that all citizens are provided with services to satisfy their basic needs. The Municipality has a legal mandate to ensure that infrastructure development and maintenance of such infrastructure takes place to ensure the wellbeing of people within its jurisdiction.

10. RESTORATION/REHABILITATION SPECIFICATIONS & SITE CLEAN UP

The maintenance activities should not require rehabilitation measures. The maintenance activities should ensure that the environment in maintained in a suitable manner. The only rehabilitation that may be required is the planting of vegetation is cases where erosion is severe. No litter may be left behind my any persons conducting maintenance work.

11. ENVIRONMENTAL MONITORING AND REPORTING/AUDFITING

A monitoring programme must be implemented that detects changes that will inform intervention or remedial measures for good environmental performance. The data collection, management and reporting must be documented and be made available for inspection.

TABLE 3: TABLE FOR MONITORING OF ACTIONS

Part of the water course that is monitored	Frequency of monitoring	Monitoring procedure	How results are analysed and presented	Comments

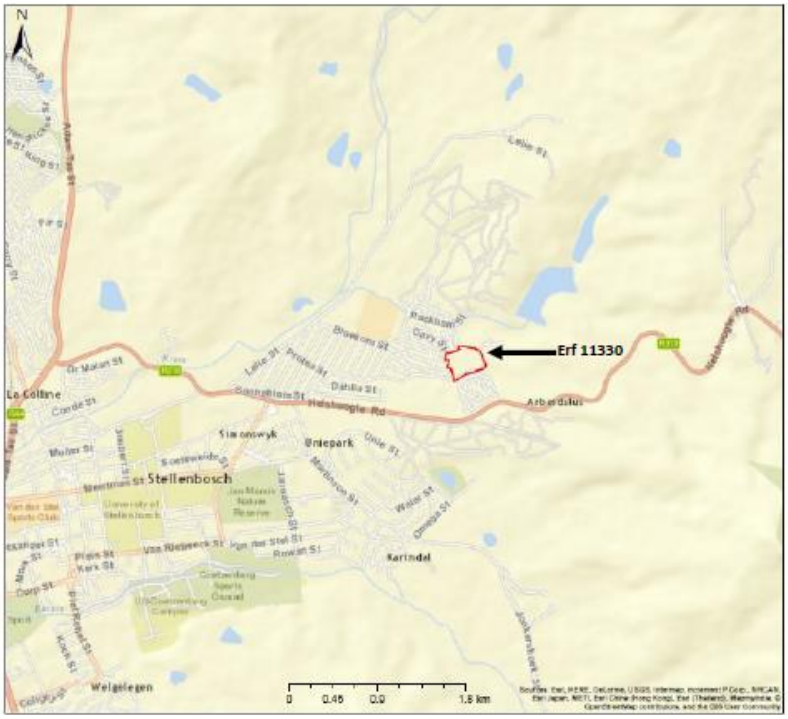
Yearly audits must take place. These audits will assess operations against the requirements of the EA, EMP and this MMP. The purpose of these audits will be to identify those requirements that are not being met. If environmental pollution has occurred the Department of Water and Sanitation and/or DEADP must be informed and a suitably qualified environmental specialist must be contacted to provide recommendations on how the affected site must be rehabilitated.

12. ANNEXURES

ANNEXURE 1.1 AERIAL PHOTOGRAPH

Latitude (S):			Longitude (E):		
33^0	55‘	17“	18^0	53‘	44“

ANNEXURE 1.2 LOCALITY MAP



ANNEXURE 1.3 SITE MAP

ANNEURE 1.4 ASSESSMENT CRITERIA

Criteria	Description		
Nature	a description of what causes the effect, what will be affected, and how it will be affected.		
	Type	**Score**	**Description**
Extent (E)	None (No)	1	Footprint
	Site (S)	2	On site or within 100 m of the site
	Local (L)	3	Within a 20 km radius of the centre of the site
	Regional (R)	4	Beyond a 20 km radius of the site
	National (Na)	5	Crossing provincial boundaries or on a national / land wide scale
Duration (D)	Short term (S)	1	0 – 1 years
	Short to medium (S-M)	2	2 – 5 years
	Medium term (M)	3	5 – 15 years
	Long term (L)	4	> 15 years
	Permanent(P)	5	Will not cease
Magnitude (M)	Small (S)	0	will have no effect on the environment
	Minor (Mi)	2	will not result in an impact on processes
	Low (L)	4	will cause a slight impact on processes
	Moderate (Mo)	6	processes continuing but in a modified way
	High (H)	8	processes are altered to the extent that they temporarily cease
	Very high (VH)	10	results in complete destruction of patterns and permanent cessation of processes.
Probability (P) the likelihood of the impact actually occurring. Probability is estimated on a scale, and a score assigned	Very improbable (VP)	1	probably will not happen
	Improbable (I)	2	some possibility, but low likelihood
	Probable (P)	3	distinct possibility
	Highly probable (HP)	4	most likely
	Definite (D)	5	impact will occur regardless of any prevention measures
Significance (S)	Determined through a synthesis of the characteristics described above: **S = (E+D+M) x P** Significance can be assessed as low, medium or high		
Low: < 30 points:	The impact would not have a direct influence on the decision to develop in the area		
Medium: 30 – 60 points:	The impact could influence the decision to develop in the area unless it is effectively mitigated		
High: < 60 points:	The impact must have an influence on the decision process to develop in the area		
No significance	When no impact will occur or the impact will not affect the environment		
Status	Positive (+)		Negative (-)
The degree to which the impact can be reversed	Completely reversible (R)	90-100%	The impact can be mostly to completely reversed with the implementation of the correct mitigation and rehabilitation measures.
	Partly reversible (PR)	6-89%	The impact can be partly reversed providing that mitigation measures as stipulated in the EMP are implemented and rehabilitation measures are undertaken
	Irreversible (IR)	0-5%	The impact cannot be reversed, regardless of the mitigation or rehabilitation measures taking place
The degree to which the impact may cause irreplaceable loss of resources	Resource will not be lost (R)	1	The resource will not be lost or destroyed provided that mitigation and rehabilitation measures as stipulated in the EMP are implemented
	Resource may be partly destroyed (PR)	2	Partial loss or destruction of the resources will occur even though all management and mitigation measures as stipulated in the EMP are implemented
	Resource cannot be replaced (IR)	3	The resource cannot be replaced no matter which management or mitigation measures are implemented.
The degree to which the impact can be mitigated	Completely mitigatible (CM)	1	The impact can be completely mitigated providing that all management and mitigation measures as stipulated in the EMP are implemented
	Partly mitigatible (PM)	2	The impact cannot be completely mitigated even though all management and mitigation measures as stipulated in the EMP are implemented. Implementation of these measures will provide a measure of mitigatibility
	Un-mitigatible (UM)	3	The impact cannot be mitigated no matter which management or mitigation measures are implemented.

ANNEXURE 2: METHOD STATEMENTS

Activity A		
Description of maintenance activity	**Alien vegetation removal along the river corridor; at river crossings and the stormwater ponds. Removal of all alien vegetation from the river channel and associated areas that were constructed and rehabilitated**	
Actions	The following actions are anticipated to be undertaken in order to carry out alien vegetation removal: • Removal of the invasive and alien plants should be according to the appropriate invasive alien plant clearing guidelines/methods provided by the Working for Water Programme.	
Impacts of actions	The following impacts are anticipated as a result of undertaking the maintenance activity: • Minor disturbance to the local indigenous vegetation within the aquatic habitats as a result of removal of alien and invasive plants. • Clearance of alien and invasive vegetation from the area and subsequent improvement in the ecological health where construction and rehabilitation has taken place within aquatic habitats	
Severity of impacts	Minor disturbance to the local vegetation	If all mitigation measures are implemented, the severity of the impact will be Negligible.
	Alien vegetation clearance	• N/A this impact is a POSITIVE
Measures to mitigate the severity of the impact	Minor disturbance to the local vegetation	Mitigation measures listed as follows: • Removal of the invasive and alien plants should be according to the guidelines provided by the Working for Water Programme.
	Alien vegetation clearance	• N/A this impact is a POSITIVE
Remedial measures if mitigation measures are not implemented adequately on site.	There are no additional remedial mitigation measures other than those listed above. As such, all mitigation measures as outlined above should be implemented in full.	
Method of Access to the site	Access to the site could be gained using the access roads and selected demarcated areas.	
Time period of maintenance management activity	The maintenance management activity should be undertaken on a regular basis (at least 12 monthly) after the work is completed. The maintenance management activity will last for approximately 1-2 days.	

Activity B		
Description of maintenance activity	**Site Inspections of the river corridor; at river crossings and the stormwater ponds. Inspection of the section of constructed and rehabilitated areas.**	
Actions	Undertake regular inspections to ensure that: • The river channel, road crossing and associated areas do not become blocked with sediment, debris or nuisance vegetation growth; • No erosion of the upgraded river channel and associated areas occurs; and • The areas remain clear of invasive alien plants and nuisance plant growth should it serve to block the channel or associated areas. These inspections can be undertaken from the banks where there is access and disturbance of any aquatic habitat is minimal. • All waste within the drainage channels must be removed on a weekly basis. • Sandy areas and riffles must be maintained for frog habitat.	
Impacts of actions	The following impacts are anticipated as a result of undertaking the maintenance activity: • A negligible disturbance to the local vegetation as a result of the inspection process.	
Severity of impacts	Minor disturbance to the local vegetation	If all mitigation measures are implemented, the severity of the impact will be Negligible.
Measures to mitigate the severity of the impact	Minor disturbance to the local vegetation	Mitigation measures are listed as follows: • The minimum area for the maintenance activity to be adequately undertaken should be properly demarcated. Outside of the maintenance activity area should be treated as a no-go area.
Remedial measures if mitigation measures are not implemented adequately on site.	There are no additional remedial mitigation measures other than those listed above. As such, all mitigation measures as outlined above should be implemented in full.	
Method of Access to the site	Access to the site could be gained using the access roads and selected demarcated areas.	
Time period of maintenance management activity	The maintenance management activity should be undertaken on a regular basis after the river works are completed and in particular following significant rainfall events as well as prior to the onset of the winter rainfall period. This maintenance management activity will last for not more than 2 hours.	

Activity C		
Description of maintenance activity	**Erosion Protection along the river corridor and buffer areas; at river crossings and the stormwater ponds.**	
Actions	The following actions are anticipated to be undertaken in order to remove blockages from the river channel and associated areas: • All rubble and waste debris in the river channel should be removed out of the river channel and banks by hand. Particular attention should be given to upstream of the structures in the river channel. • Clearing of nuisance growth of plants within the channel if necessary should also be undertaken by hand during the low/no flow period.	
Impacts of actions	The following impacts are anticipated as a result of undertaking the maintenance activity: • Minor disturbance to the local indigenous vegetation as a result of accessing the site • Disturbance to the river banks due to removal of sediment, debris and nuisance plant growth	
Severity of impacts	Disturbance to the river bed and banks due to removal of sediment, debris or nuisance plant growth	If all mitigation measures are implemented, the severity of the impact will be Negligible.
Measures to mitigate the severity of the impact	Disturbance to the river bed and banks due to removal of sediment, debris or nuisance plant growth Alien vegetation clearance	Mitigation measures listed as follows: • The disturbance of aquatic habitats associated with the maintenance works should be limited (both temporal and spatial extents) as far as possible. • Care should be taken to minimize the sedimentation that would be caused downstream of the works. • Work should preferably be undertaken by hand with no machinery driven into aquatic habitats. • Activities associated with the maintenance work should be undertaken during the low flow period before the onset of the high flows. • Soil, debris and nuisance plant growth removed from the river channel and associated areas should not be dumped within the immediate areas surrounding the aquatic habitats or any indigenous vegetation removed from the site. Removed soil could be used to fill eroded areas.
Remedial measures if mitigation measures are not implemented	There are no additional remedial mitigation measures other than those listed above. As such, all mitigation measures as outlined above should be implemented in full.	

adequately on site.	
Method of Access to the site	Access to the site could be gained using the access roads and selected demarcated areas.
Time period of maintenance management activity	The maintenance management activity should be undertaken on a regular basis (at least 6 monthly) after the work is completed. The maintenance management activity will last for approximately 1-2 days.

Activity D		
Description of maintenance activity	**Removal of Sediment, Debris or Nuisance vegetation growth within the river corridor and buffer areas; at river crossings and the stormwater ponds.**	
Actions	The following actions are anticipated to be undertaken in order to remove blockages from the river channel and associated areas: • All rubble and waste debris in the river channel should be removed out of the river channel and banks by hand. Particular attention should be given to upstream of the structures in the river channel. • Clearing of nuisance growth of plants within the channel if necessary should also be undertaken by hand during the low/no flow period.	
Impacts of actions	The following impacts are anticipated as a result of undertaking the maintenance activity: • Minor disturbance to the local indigenous vegetation as a result of accessing the site • Disturbance to the river banks due to removal of sediment, debris and nuisance plant growth	
Severity of impacts	Disturbance to the river bed and banks due to removal of sediment, debris or nuisance plant growth	If all mitigation measures are implemented, the severity of the impact will be Negligible.
Measures to mitigate the severity of the impact	Disturbance to the river bed and banks due to removal of sediment, debris or nuisance plant growth Alien vegetation clearance	Mitigation measures listed as follows: • The disturbance of aquatic habitats associated with the maintenance works should be limited (both temporal and spatial extents) as far as possible. • Care should be taken to minimize the sedimentation that would be caused downstream of the works. • Work should preferably be undertaken by hand with no machinery driven into aquatic habitats. • Activities associated with the maintenance work should be undertaken during the low flow period before the onset of the high flows.

		• Soil, debris and nuisance plant growth removed from the river channel and associated areas should not be dumped within the immediate areas surrounding the aquatic habitats or any indigenous vegetation removed from the site. Removed soil could be used to fill eroded areas.
Remedial measures if mitigation measures are not implemented adequately on site.	There are no additional remedial mitigation measures other than those listed above. As such, all mitigation measures as outlined above should be implemented in full.	
Method of Access to the site	Access to the site could be gained using the access roads and selected demarcated areas.	
Time period of maintenance management activity	The maintenance management activity should be undertaken on a regular basis (at least 6 monthly) after the work is completed. The maintenance management activity will last for approximately 1-2 days.	