



**DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED
KYALAMI, BRAAMFONTEINSPRUIT, AND NATALSPRUIT WATER
MANAGEMENT UNITS RIVERINE AND ECO-PARKS
REHABILITATION, CITY OF JOHANNESBURG METROPOLITAN
MUNICIPALITY, GAUTENG PROVINCE**

August 2016

GDARD Reference Number: 002/16-17/E0104



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PURPOSE OF THE DOCUMENT

The City of Johannesburg (COJ) Metropolitan Municipality is proposing to rehabilitate certain degraded watercourses and eco-parks within the Braamfonteinspruit, Kyalami and Natalspruit Water Management Units. The aim of the project is to improve the ecological status and habitat integrity of the earmarked river reaches and wetlands by implementing stabilization and remedial works within the watercourses. The project is being implemented by the COJ's Environmental Management Department through Johannesburg City Parks and Zoo (JCPZ). The latter is responsible for the management of the City's parks, cemeteries, nature conservation, education, research, and recreation functions to the citizens of the municipality.

Maragela Consulting Engineers was appointed by JCPZ as the project environmental and engineering consultant for the proposed project. The scope of the project includes engineering, landscape architectural, and environmental aspect. Project engineering activities will involve erosion control measures, river flow control, creation of attenuation ponds where necessary, and energy dissipaters (weirs), whilst landscaping entails clean-up and rehabilitation of severely polluted and degraded riverine sections and development of pedestrian bridges over the rivers. Environmental aspect of the proposed project entails obtaining applicable environmental authorisations which will include Water Use Licence and environmental authorisations from the Department of Water and Sanitation and the Gauteng Department of Agriculture and Rural Development.

A total of six (6) sites were selected for assessment and implementation of remedial works within the tributaries of the Jukskei River, Klein-Jukskei River and Natalspruit. The selected sites include Vorna Valley wetland area, Cottessmore Park, Bryanston Drive, Craighall Park, Carel Venter Park (Greymont), and Roseacre.

A wetland assessment was undertaken to identify hydro-geomorphic units (HGM) in order to establish the Present Ecological Status (PES) or health of the wetland and the Ecological Importance and Sensitivity of the sites.

The main concerns identified at the sites include, among others:

- Water pollution attributable to discharge from sewage networks
- During high rainfall periods some storm water is likely to overshoot the banks and might cause flooding in low-lying areas
- General site conditions include the following- rubble, illegal dumping and general litter in most of the existing parks and open space areas are prevalent
- Collapsed bridges, weirs, and gabions in some reaches
- Infestation of alien invasive plant species

- Erosion and incision of instream and riparian areas
- Collapsed existing sewage outfall within the watercourse
- Illegal river crossings
- Most minor tributaries in these WMUs are canalised and function as stormwater channel
- Modification of natural valley bottom wetlands to streams due to runoff changes from urbanisation.

To mitigate these negative impacts within the riverine systems, both engineering and landscape remedial works must be implemented in order to prevent pollution, protect the sensitive landscapes (wetlands and rivers), and to promote sustainable development within the City of Johannesburg Metropolitan Municipal Area. The engineering activities involve erosion control measures, river flow control, creation of attenuation ponds where necessary, and energy dissipaters (weirs), whilst landscaping entails clean-up and rehabilitation of severely polluted and degraded riverine sections and development of pedestrian bridges over the rivers.

The proposed project will trigger activities listed in Government Notice (GN) R983 and R985 which are under the National Environmental Management Act, 1998 (Act No. 107 of 1998): Environmental Impact Assessment Regulations (2014). The latter will be authorised through compilation of an Environmental Basic Assessment Process, which will also involve consultation with interested and affected parties. According to the EIR (2014), interested and affected parties must be provided with opportunity to comment on the proposed project and the Draft BAR before submission to Gauteng Department of Agriculture and Rural Development. The Draft BAR will be available for public review and comment from the 26th of August 2016 to the 26th of September 2016. A public meeting with all interested and affected parties will be held as follows:

Venue: Marks Park, Bowls Club House, Judith Road, Emmarentia

Date: 22nd of September 2016 (Thursday)

Time: 10H00-13H00

The decision-making authority for this BA is the Gauteng Department of Agriculture and Rural Development (GDARD). This Draft Basic Assessment Report (BAR) outlines the project, proposed alternatives considered, how interested and affected parties will be consulted and the impact assessment for the project. It is compiled in the standard format provided by the GDARD for BA's. The report will be available at www.ntcenvironmental.co.za and at the public places listed below:

- Johannesburg Zoo Jan Smuts Avenue, Parkview, corner Peter Road and Hole in One Street (Main Entrance Security Office);

- Randburg Public Library, Hill Street, Randburg, 2194; and
- Sandton Library, Nelson Mandela Square, West St & Rivonia Street, Sandton, Johannesburg, 2146,
- Headwaters Head Office, Birchwood Court, East Wing, 43 Montrose Street, Vorna Valley, Midrand
- On request from NTC Environmental Services.

Interested and affected parties (I & APs) may comment on the Draft Basic Assessment Report in any of the following ways:

- By completing the Registration and Comment sheets enclosed with this letter;
- By writing a letter or providing written submissions; and
- By email, fax or telephone to the Public Participation Office.

All comments on this report will be forwarded to the GDARD for consideration in their decision about the project.

PUBLIC PARTICIPATION OFFICE

Raisibe Mabiza/ Janna Bedford-Owen
NTC Environmental Services
Block 4E, Fancourt Office Park,
Felstead Avenue, Northriding, 2162
Tel: (+27) 11 462 2022
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E-mail: janna@ntcgroup.co.za

ENVIRONMENTAL ASSESSMENT PRACTITIONER

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GAUTENG PROVINCE
AGRICULTURE AND RURAL DEVELOPMENT
REPUBLIC OF SOUTH AFRICA

Basic Assessment Report in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended, and the Environmental Impact Assessment Regulations, 2014 (Version 1)

Kindly note that:

1. This **Basic Assessment Report** is the standard report required by GDARD in terms of the EIA Regulations, 2014.
2. This application form is current as of 8 December 2014. It is the responsibility of the EAP to ascertain whether subsequent versions of the form have been published or produced by the competent authority.
3. **A draft Basic Assessment Report must be submitted, for purposes of comments within a period of thirty (30) days, to all State Departments administering a law relating to a matter likely to be affected by the activity to be undertaken.**
4. **A draft Basic Assessment Report (1 hard copy and two CD's) must be submitted, for purposes of comments within a period of thirty (30) days, to a Competent Authority empowered in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended to consider and decide on the application.**
5. Five (5) copies (3 hard copies and 2 CDs-PDF) of the final report and attachments must be handed in at offices of the relevant competent authority, as detailed below.
6. The report must be typed within the spaces provided in the form. The size of the spaces provided is not necessarily indicative of the amount of information to be provided. The report is in the form of a table that can extend itself as each space is filled with typing.
7. Selected boxes must be indicated by a cross and, when the form is completed electronically, must also be highlighted.
8. An incomplete report may lead to an application for environmental authorisation being refused.
9. **Any report that does not contain a titled and dated full colour large scale layout plan of the proposed activities including a coherent legend, overlain with the sensitivities found on site may lead to an application for environmental authorisation being refused.**
10. The use of "not applicable" in the report must be done with circumspection because if it is used in respect of material information that is required by the competent authority for assessing the application, it may result in the application for environmental authorisation being refused.
11. No faxed or e-mailed reports will be accepted. Only hand delivered or posted applications will be accepted.
12. Unless protected by law, and clearly indicated as such, all information filled in on this application will become public information on receipt by the competent authority. The applicant/EAP must provide any interested and affected party with the information contained in this application on request, during any stage of the application process.
13. Although pre-application meeting with the Competent Authority is optional, applicants are advised to have these meetings prior to submission of application to seek guidance from the Competent Authority.

DEPARTMENTAL DETAILS

Gauteng Department of Agriculture and Rural Development
Attention: Administrative Unit of the of the Environmental Affairs Branch
P.O. Box 8769
Johannesburg
2000

Administrative Unit of the of the Environmental Affairs Branch
Ground floor Diamond Building
11 Diagonal Street, Johannesburg

Administrative Unit telephone number: (011) 240 3377
Department central telephone number: (011) 240 2500

(For official use only)

NEAS Reference Number:						
File Reference Number:						
Application Number:						
Date Received:						

If this BAR has not been submitted within 90 days of receipt of the application by the competent authority and permission was not requested to submit within 140 days, please indicate the reasons for not submitting within time frame.

The Basic Assessment Report will be submitted within 90 days from the date of application. The application for environmental authorisation was submitted on the 18th of July 2016, while the draft Environmental Basic Assessment Report will be available for public review and comment from the 8th of August 2016 (Monday) to the 7th of September 2016 (Wednesday). The final Environmental Basic Assessment Report will be submitted to the Gauteng Department of Agriculture and Rural Development on the 12th of September 2016.

Is a closure plan applicable for this application and has it been included in this report?

No.

if not, state reasons for not including the closure plan.

The proposed project involves rehabilitation of watercourses and eco-parks within the Kyalami, Braamfonteinspruit, and Natalspruit Water Management Units (WMUs) in the jurisdiction of the City of Johannesburg Metropolitan Municipality. Engineering drawing has been designed and incorporated in the draft Master Plans which shows the layout of the proposed rehabilitation options. No closure plan is required due to the rehabilitation nature of the project.

Has a draft report for this application been submitted to a competent authority and all State Departments administering a law relating to a matter likely to be affected as a result of this activity?

Yes.

Is a list of the State Departments referred to above attached to this report including their full contact details and contact person?

Yes.

If no, state reasons for not attaching the list.

All State Departments administering legal requirements associated with the proposed development have been consulted and included in the interested and affected parties database registration attached as **Appendix E**.

Have State Departments including the competent authority commented?

No.

If no, why?

Registered consultation letters will be sent to all State Departments registered in the interested and affected parties database. Furthermore, Draft Basic Assessment Report will be submitted to all identified state departments and they will be provided with a maximum of 30 days to review and comment on the report. No comments have been received as this is a Draft Basic Assessment Report. However, comments will be incorporated in the Final Basic Assessment Report.

SECTION A: ACTIVITY INFORMATION

1. PROPOSAL OR DEVELOPMENT DESCRIPTION

Project title (must be the same name as per application form):

1.1 Project Title

Kyalami, Braamfonteinspruit and Natalspruit Water Management Units Riverine Rehabilitation and Master Plan Development, City of Johannesburg Metropolitan Municipality, Gauteng Province.

1.2 Project Description

The City of Johannesburg (COJ) Metropolitan Municipality is proposing to rehabilitate certain degraded watercourses and eco-parks within the Braamfonteinspruit, Kyalami and Natalspruit Water Management Units. The aim of the project is to improve the ecological status and habitat integrity of the earmarked river reaches and wetlands by implementing stabilization and remedial works within the watercourses. The project is being implemented by the COJ's Environmental Management Department through Johannesburg City Parks and Zoo (JCPZ). The latter is responsible for the management of the City's parks, cemeteries, nature conservation, education, research, and recreation functions to the citizens of the municipality.

The three Water Management Units fall within the area of jurisdiction of the COJ and are located north and south of the COJ central business district (CBD) and are currently delineated with physical infrastructure, and not hydrological catchment boundaries. The Natalspruit lies south of the Johannesburg Central Business District (CBD), and is bordered to north by the M2 highway and to the east by the N3 highway. The N12 and M1 highways define the southern and western borders of the Natalspruit WMU, respectively. In terms of catchments, the Natalspruit WMU falls within the Klip River (Gauteng) Catchment in the Upper Vaal Water Management Area (WMA), whilst the Braamfonteinspruit and Kyalami WMUs for part of the Jukskei Catchment in the Crocodile (West) and Marico WMA.

Given the enormity of the project area, specific areas were identified for rehabilitation, based on assessments of the Present Ecological State (PES) and Ecological Importance and Sensitivity (EIS) of the riverine systems within the three WMUs. Consequently, 6 sites within the WMUs were selected and earmarked for rehabilitation, as shown in the tabulation below:

Table 1—1: Selected sites within the WMUs

Water Management Units	Selected Sites
Kyalami	<ul style="list-style-type: none"> • Vorna Valley wetland area
Braamfonteinspruit	<ul style="list-style-type: none"> • Cottesmore Park • Bryanston (Bryanston Drive) • Craighall Park • Carel Venter Park (Greymont)
Nataalspruit	<ul style="list-style-type: none"> • Roseacre

The main challenges identified concerning the selected sites can be summarised below. The scope of the project is to devise the most optimal remedial and stabilization measures to necessary to improve the current status and minimize the probability of further degradation:

- Increased runoff and change in watercourse hydrological regimes including higher velocity short-duration discharges
- Erosion and incision of instream and riparian areas leading to collapsed banks and sediment transport
- Sedimentation and alteration of instream and riparian habitat
- Establishment and infestation by Alien Invasive Plant (AIPs)
- Water pollution attributable to discharge from sewerage networks
- Pollution due illegal dumping of rubble and general litter in most of the existing parks and open space areas are prevalent
- Illegal river crossings
- Modification of natural valley bottom wetlands to streams due to runoff changes from urbanization
- Collapse of hydraulic infrastructure including bridges over watercourses, instream weirs, cascades and gabions (in some reaches)
- Exposed and collapsed decommissioned sewer outfalls along watercourse embankments

JCPZ appointed Maragela Consulting Engineers as the project environmental and engineering consultant for the proposed project. The scope of the project includes engineering, landscape architectural, and environmental aspect. Project engineering activities will involve erosion control measures, river flow control, creation of attenuation ponds where necessary, and energy dissipaters (weirs), whilst landscaping entails clean-up and rehabilitation of severely polluted and degraded riverine sections and development of pedestrian bridges over the rivers. Environmental aspect of the proposed project entails obtaining applicable environmental authorisations which will include Water Use Licence and environmental authorisations from the Department of Water and Sanitation and the Gauteng Department of Agriculture and Rural Development. GDARD environmental

authorisation will involve compilation of Basic Assessment Report and coordinates Master Plans which will be used as guiding tools for the remedial works at the selected sites. A Basic Assessment Report (BAR) is an effective planning and decision-making tool, which allows for the identification of potential environmental consequences of the proposed developments at an early stage, and recommends ways to enhance positive impacts and to avoid, reduce or mitigate negative impacts. The BAR will be undertaken in terms of section 19 of the Environmental Impact Regulation (2014) enacted in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998).

Select the appropriate box

The application is for an upgrade of an existing development

The application is for a new development

Other, specify

Riverine rehabilitation, eco-parks development and maintenance, slope stabilisation, maintenance of weirs.

Does the activity also require any authorisation other than NEMA EIA authorisation?

YES	NO
X	

If yes, describe the legislation and the Competent Authority administering such legislation

The proposed developments or remedial works entails working within the floodline or watercourse and as such requires authorisation from the Department of Agriculture and Rural Development and the Department of Water and Sanitation (DWS) in terms of the Environmental Impact Regulation (EIR) 2014 and the National Water Act, 1998 (Act No. 36 of 1998) (NWA), respectively. Listed activities triggered in terms of the EIR (2014) have been discussed in section 2 below, while identified section 21 water uses in terms of the NWA (1998) include:

Section 21 of NWA, 1998 (Act No. 36 of 1998)

Section 21 (c)- Impeding or diverting the flow of water in a watercourse

Section 21 (i)- Altering the bed, banks, course or characteristics of a watercourse

Water use technical forms DW763 and DW768 for section 21 (c) and (i) water use

activities have been included in the application for a water use licence.

If yes, have you applied for the authorisation(s)?

YES X	NO
YES	NO X

If yes, have you received approval(s)? (attach in appropriate appendix)

2. APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

List all legislation, policies and/or guidelines of any sphere of government that are applicable to the application as contemplated in the EIA regulations:

Title of legislation, policy or guideline:	Administering authority:	Promulgation Date:
National Environmental Management Act, 1998 (Act No. 107 of 1998 as amended).	National and Provincial Authorities	27 November 1998
Environmental Impact Regulation (2014)	National and Provincial Authorities	04 December 2014
National Water Act, 1998 (Act No. 36 of 1998)	Department of Water and Sanitation (DWS)	20 August 1998
National Heritage Resources Act, 1999 (Act No. 25 of 1999)	South Africa Heritage Resources Agency	14 April 1999
National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)	National and Provincial Authorities	7 June 2004
Municipal Systems Act, 2000 (Act No. 32 of 2000) (City of Johannesburg Municipal By-laws)	Provincial and Local Municipalities	20 November 2000
Occupational Health and Safety Act, 1993 (Act No. 85 of 1993)	Department of Labour	23 June 1993
Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996): Chapter 2 Section 24	National, Provincial, and Local Authorities	8 May 1996
Gauteng Planning and Development Act, 2003 (Act No. 3 of 2003)	Provincial Authorities	14 October 2003

Description of compliance with the relevant legislation, policy or guideline:

Legislation, policy of guideline	Description of compliance
National Environmental	An application for environmental authorisation

Management Act, 1998 (Act No. 107 of 1998): Environmental Impact Regulation (2014) (NEMA:EIR)	for the identified Listed Activities in terms of the Environmental Impact Regulation (2014) has been lodged with the Gauteng Department of Agriculture and Rural Development (GDARD). The application will follow a Basic Assessment approach in terms of section 19 of Government Notice R.982 of NEMA: EIR.
National Water Act, 1996 (Act No. 36 of 1998)	Water Use Licence Application for section 21 (c) and (i) water use activities will be lodged with both the Department of Water and Sanitation (DWS) Head Office (Gauteng) and North West Regional Office
National Heritage Resources Act, 1999 (Act No. 25 of 1999)	The South Africa Heritage Resources Agency will be consulted and a heritage case will be created in the SAHRIS program for statutory comment in terms of section 38(8) of the NHRA (1999).
Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) (OHSA)	The proposed rehabilitation activities will be subject to OHSA during construction/operational phase of the project
National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA)	Although it is not anticipated, rare or protected species may be affected during construction works. The NEMBA lists flora and fauna species that are threatened and requiring protection to ensure their survival in the wild, while regulating activities which may have a potential negative impact on their long-term survival.

Indicate the number of the relevant Government Notice	Activity Number	Describe each Listed Activity as per the working in the Listing Notices
GNR 983, December 2014	12	The development of (xii) infrastructure or structures with a physical footprint of 100

		square metres or more, where such development occurs (a) within a watercourse
GNR 983, December 2014	19	The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5 cubic metres from a watercourse
GNR 983, December 2014	27	The clearance of an area of 1 Ha or more, but less than 20 Ha of indigenous vegetation
GNR 985, December 2014	14	The development of (iv) dams, (v)weirs, (xii) infrastructure or structures, all exceeding 10 square metres or more in size (a) within a watercourse or (c) within 32 metres of a watercourse measured from the edge of a watercourse (b) in Gauteng Province
GNR 985, December 2014	14	The development of (iv) dams, (v)weirs, (xii) infrastructure or structures, all exceeding 10 square metres or more in size (a) within a watercourse or (c) within 32 metres of a watercourse measured from the edge of a watercourse (b) in Gauteng Province(x) sites zoned for conservation or public open spaces or equivalent zoning.

3. ALTERNATIVES

Describe the proposal and alternatives that are considered in this application. Alternatives should include a consideration of all possible means by which the purpose and need of the proposed activity could be accomplished. The determination of whether the site or activity (including different processes etc.) or both is appropriate needs to be informed by the specific circumstances of the activity and its environment.

The no-go option must in all cases be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed. **Do not** include the no go option into the alternative table below.

Note: After receipt of this report the competent authority may also request the applicant to assess additional alternatives that could possibly accomplish the purpose and need of the proposed activity if it is clear that realistic alternatives have not been considered to a reasonable extent.

Please describe the process followed to reach (decide on) the list of alternatives below

The process undertaken to determine the list of alternatives described below included the

development of feasible project variations by the project master planner, which could fulfill the basic project requirements.

Due to the highly degraded state of the rivers or open spaces it was decided that the alternative types would be determined by the minimum and maximum levels of environmental remedial works or intervention required to integrated the site to a state that best responds to the ecology and social needs of the communities within the City of Johannesburg Metropolitan Municipality.

Provide a description of the alternatives considered

No.	Alternative type, either alternative: site on property, properties, activity, design, technology, energy, operational or other(provide details of "other")	Description
1	Proposal	<p>Refer to Appendix B for the Master Layout of the selected sites.</p> <p>The preferred alternative entails the rehabilitation and slope stabilisation of the rivers within the selected sites as well as, the overall rehabilitation of the greater open spaces alongside the rivers. The rehabilitation of the open space areas will be aimed at restoration of the natural vegetation, introduction of pedestrian pathways and upgrading or maintenance of the bridges within the riverine zone. Rehabilitation and proposed Master layout Plans should also aim at promoting social activities such as play areas, sports fields, and picnic areas.</p> <p>The intent of this preferred alternative is to rehabilitate the riverine and open spaces that are safe, accessible, and well managed. This will include both engineering aspect and the landscape architectural aspect of the riverine rehabilitation. The engineering remedial works will involve:</p> <ul style="list-style-type: none"> • Erosion control measures through development of gabions • River flow control and energy dissipation through establishment of weirs and cascades within the rivers

		<ul style="list-style-type: none"> • Development of attenuation ponds where necessary • Stabilisation of the river banks • Upgrading or maintenance of bridges • Rehabilitation or remedial works along the river reaches must consider recurrence flood intervals from 1:50 to 1:10 years.. <p>Whilst landscaping will involve:</p> <ul style="list-style-type: none"> • Clean-up and rehabilitation of severely polluted and degraded sections of the rivers • Development of pedestrian pathway along the open spaces • Development of pedestrian bridges over the rivers where evident tracks crossing over the rivers can be seen. • Development of strategic waste collection points • Planting of trees throughout the open spaces • Removal of alien invasive plant species <p>Advantages of the proposed alternative include the following:</p> <ul style="list-style-type: none"> • Removal of existing waste dumped on site • Rehabilitation of extensively modified wetlands • Reconstruction of severely disturbed river channels • Improved hydrological and ecological systems through the development of attenuation areas (ponds) and flow dissipation areas (weirs) • Flash floods management through river channels rehabilitation, flow dissipation and attenuation • Ensure public safety through
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		development of river crossings and creation of safe children`s play areas away from the rivers and wetlands <ul style="list-style-type: none"> • Ensure good water quality within the riverine • Removal of alien invasive plant species
2	Alternative 2	
3	Alternative 3	
	Etc.	

In the event that no alternative(s) has/have been provided, a motivation must be included in the table below.



4. PHYSICAL SIZE OF THE ACTIVITY

Indicate the total physical size (footprint) of the proposal as well as alternatives. Footprints are to include all new infrastructure (roads, services etc), impermeable surfaces and landscaped areas:

Proposed activity

Vorna Valley Wetland Area

Carel Venter Park (Greymont)

Cottesmore Park

Bryanston (Bryanston Drive)

Craighall Park

Roseacre

Size of the activity:

20.738039 Ha

7.875 Ha

8.1144706 Ha

16.405511 Ha

0.9702044 Ha

2.5639015Ha

Total Aerial Extent:

56.6671265 Ha

(566671.3 m²)

Alternatives:

Alternative 1 (if any)

Alternative 2 (if any)



Ha/ m²

or, for linear activities:

Proposed activity

Vorna Valley Wetland Area

Carel Venter Park

Cottesmore Park

Bryanston Drive

Craighall Park

Roseacre

Length of the activity:

1581.11 m

401.88 m

1012.22 m

1366.28 m

397.05 m

701.80

Alternatives:

Alternative 1 (if any)

Alternative 2 (if any)



m/km

Indicate the size of the site(s) or servitudes (within which the above footprints will occur):

Proposed activity

Size of the site/servitude:

56.6671265 Ha

(566671.3 m²)

Alternatives:

Alternative 1 (if any)
Alternative 2 (if any)

Ha/m²

5. SITE ACCESS

Proposal

Does ready access to the site exist, or is access directly from an existing road?

YES	NO
X	

If NO, what is the distance over which a new access road will be built

Describe the type of access road planned:

Not applicable

Include the position of the access road on the site plan (if the access road is to traverse a sensitive feature the impact thereof must be included in the assessment).

Alternative 1

Does ready access to the site exist, or is access directly from an existing road?

If NO, what is the distance over which a new access road will be built

Describe the type of access road planned:

Not applicable

Include the position of the access road on the site plan. (if the access road is to traverse a sensitive feature the impact thereof must be included in the assessment).

Alternative 2

Does ready access to the site exist, or is access directly from an existing road?

If NO, what is the distance over which a new access road will be built

Describe the type of access road planned:

Not applicable

Include the position of the access road on the site plan. (if the access road is to traverse a sensitive feature the impact thereof must be included in the assessment).

PLEASE NOTE: Points 6 to 8 of Section A must be duplicated where relevant for alternatives

Section A 6-8 has been duplicated

Number of times

(only complete when applicable)

6. LAYOUT OR ROUTE PLAN

A detailed site or route (for linear activities) plan(s) must be prepared for each alternative site or alternative activity. It must be attached to this document. The site or route plans must indicate the following:

- the layout plan is printed in colour and is overlaid with a sensitivity map (if applicable);
- layout plan is of acceptable paper size and scale, e.g.
 - A4 size for activities with development footprint of 10sqm to 5 hectares;
 - A3 size for activities with development footprint of > 5 hectares to 20 hectares;
 - A2 size for activities with development footprint of >20 hectares to 50 hectares);
 - A1 size for activities with development footprint of >50 hectares);
- The following should serve as a guide for scale issues on the layout plan:
 - A0 = 1: 500
 - A1 = 1: 1000
 - A2 = 1: 2000
 - A3 = 1: 4000
 - A4 = 1: 8000 (±10 000)
- shapefiles of the activity must be included in the electronic submission on the CD's;
- the property boundaries and Surveyor General numbers of all the properties within 50m of the site;
- the exact position of each element of the activity as well as any other structures on the site;
- the position of services, including electricity supply cables (indicate above or underground), water supply pipelines, boreholes, sewage pipelines, septic tanks, storm water infrastructure;
- servitudes indicating the purpose of the servitude;
- sensitive environmental elements on and within 100m of the site or sites (including the relevant buffers as prescribed by the competent authority) including (but not limited thereto):
 - Rivers and wetlands;
 - the 1:100 and 1:50 year flood line;
 - ridges;
 - cultural and historical features;
 - areas with indigenous vegetation (even if it is degraded or infested with alien species);
- Where a watercourse is located on the site at least one cross section of the water course must be included (to allow the position of the relevant buffer from the bank to be clearly indicated)

FOR LOCALITY MAP (NOTE THIS IS ALSO INCLUDED IN THE APPLICATION FORM REQUIREMENTS)

- the scale of locality map must be at least 1:50 000. For linear activities of more than 25 kilometres, a smaller scale e.g. 1:250 000 can be used. The scale must be indicated on the map;
- the locality map and all other maps must be in colour;
- locality map must show property boundaries and numbers within 100m of the site, and for poultry and/or piggery, locality map must show properties within 500m and prevailing or predominant wind direction;
- for gentle slopes the 1m contour intervals must be indicated on the map and whenever the slope of the site exceeds 1:10, the 500mm contours must be indicated on the map;
- areas with indigenous vegetation (even if it is degraded or infested with alien species);
- locality map must show exact position of development site or sites;
- locality map showing and identifying (if possible) public and access roads; and
- the current land use as well as the land use zoning of each of the properties adjoining the site or sites.

Refer to Appendix A for locality maps of the selected sites

7. SITE PHOTOGRAPHS

Colour photographs from the center of the site must be taken in at least the eight major compass directions with a description of each photograph. Photographs must be attached under the appropriate Appendix. It should be supplemented with additional photographs of relevant features on the site, where applicable.

Refer to Appendix B for site photographic images

8. FACILITY ILLUSTRATION

A detailed illustration of the activity must be provided at a scale of 1:200 for activities that include structures. The illustrations must be to scale and must represent a realistic image of the planned activity. The illustration must give a representative view of the activity to be attached in the appropriate Appendix.

Refer to Appendix C for structures layout plans

1 SECTION B: DESCRIPTION OF RECEIVING ENVIRONMENT

Note: Complete Section B for the proposal and alternative(s) (if necessary)

Instructions for completion of Section B for linear activities

- 1) For linear activities (pipelines etc) it may be necessary to complete Section B for each section of the site that has a significantly different environment.
- 2) Indicate on a plan(s) the different environments identified
- 3) Complete Section B for each of the above areas identified
- 4) Attach to this form in a chronological order
- 5) Each copy of Section B must clearly indicate the corresponding sections of the route at the top of the next page.

Section B has been duplicated for sections of the route times

Instructions for completion of Section B for location/route alternatives

- 1) For each location/route alternative identified the entire Section B needs to be completed
- 2) Each alternative location/route needs to be clearly indicated at the top of the next page
- 3) Attach the above documents in a chronological order

Section B has been duplicated for location/route alternatives times (complete only when appropriate)

Instructions for completion of Section B when both location/route alternatives and linear activities are applicable for the application

Section B is to be completed and attachments order in the following way

- All significantly different environments identified for Alternative 1 is to be completed and attached in a chronological order; then
- All significantly different environments identified for Alternative 2 is to be completed and attached chronological order, etc.

Section B - Section of Route (complete only when appropriate for above)

Section B – Location/route Alternative No. (complete only when appropriate for above)

1. PROPERTY DESCRIPTION

Application process followed (BA OR Scoping & EIA)	Basic Assessment Process
Selected Site A: Vorna Valley Wetland Area	
Site locality:	Located between Le Roux Avenue and M39 main road (Allandale road) in Vorna Valley, Midrand, Gauteng Province. This non-perennial stream forms a tributary of the Jukskei River.
Physical Address:	Vorna Valley, Midrand,
Water Management Unit:	Kyalami Water Management Unit
Co-ordinates:	28.109304° East -26.001621° South
Farm/ Erf names, number or portion, and registration division:	Erf 740, Vorna Valley
Property aerial extent in hectares (ha):	20.738039 ha

Proposed development extent (ha):	20.738039 ha
Property aerial extent (m ²)	207380.4 m ²
SG Digit Code:	T0JR0566000000007400000000
Current zoning:	Reservation of land
Property owner	City of Johannesburg Metropolitan Municipality
Selected Site B: Cottesmore Park	
Site locality:	Located within Bryanston, Sandton, Gauteng Province. Access to the site is via Cottesmore road. This non-perennial stream form a tributary of the Klein-Jukskei River.
Physical Address:	Cottesmore Road, Bryanston, Sandton
Water Management Unit:	Braamfonteinspruit Water Management Unit
Co-ordinates:	28.007677° East -26.046976° South
Farm/ Erf names, number or portion, and registration division:	Erf 4592, Bryanston Erf 894, Bryanston Erf RE/4561, Bryanston
Property aerial extent in hectares (ha):	5.688116 ha 1.828692 ha 0.5976626 ha Total Aerial Extent: 8.1144706 ha
Proposed development extent (ha):	8.1144706 ha
Property aerial extent (m ²)	81144.71 m ²
SG Digit Code:	T0IR0114000000045920000000 T0IQ0087052000008940000000 T0IR01140000000456100000RE
Current zoning:	Public open space
Property owner	City of Johannesburg Metropolitan Municipality
Selected Site C: Bryanston (Bryanston Drive)	
Site locality:	Located between the River Road and Brooke Avenue in Bryanston, Gauteng Province. This site is located downstream of the Braamfonteinspruit. The Braamfonteinspruit Trail on the left part of the site. Access to the site via Bryanston Drive crossing both the River Road and the Brooke Avenue.
Physical Address:	Bryanston Drive, Bryanston, Sandton
Water Management Unit:	Braamfonteinspruit Water Management Unit
Co-ordinates:	28.047848° East -26.060508° South 28.047007° East -26.061116° South

Farm/ Erf names, number or portion, and registration division:	Erf 2187, Bryanston Erf 2188, Bryanston
Property aerial extent in hectares (ha):	5.99849 ha 10.40662 ha Total aerial extent: 16.405511 ha
Proposed development extent (ha):	16.405511 ha
Property aerial extent (m ²)	164055.1 m ²
SG Digit Code:	T0IR0114000000021870000000 T0IR0114000000021880000000
Current zoning:	Public open space
Property owner	City of Johannesburg Metropolitan Municipality
Selected Site D: Craighall Park	
Site locality:	Located within Craighall Park and Oerder Park residential areas in Randburg, Gauteng Province
Physical Address:	Athole Avenue, Craighall Park, Randburg
Water Management Unit:	Braamfonteinspruit Water Management Unit
Co-ordinates:	28.020453° East -26.111655° South 28.020134° East -26.111493° South
Farm/ Erf names, number or portion, and registration division:	Erf 711, Craighall Park, Randburg Erf 13, Oerder Park, Randburg
Property aerial extent in hectares (ha):	0.5841564 ha 0.3816048 ha Total aerial extent: 0.9702044 ha
Proposed development extent (ha):	0.9702044 ha
Property aerial extent (m ²)	9702.044 m ²
SG Digit Code:	T0IQ0064000000007110013800
Current zoning:	Public open space
Property owner	City of Johannesburg Metropolitan Municipality
Selected Site E: Carel Venter Park (Greymont)	
Site locality:	Located within Greymont, Randburg, Gauteng Province. This site is located upstream on unnamed tributary of the Braamfonteinspruit. Montgomery Park is located approximately 2 km north-east from the site. Access to the site is either via the 5 th or 8 th streets.
Physical Address:	8 th Street, Greymont, Randburg
Water Management Unit:	Braamfonteinspruit Water Management Unit
Co-ordinates:	27.964657° East -26.164979° South

Farm/ Erf names, number or portion, and registration division:	Remaining extent (RE) of the farm Waterval 211 IQ
Property aerial extent in hectares (ha):	7.875 ha
Proposed development extent (ha):	7.875 ha
Property aerial extent (m ²)	78750 m ²
SG Digit Code:	T0IQ00002110000021100000RE
Current zoning:	Unknown
Property owner	City of Johannesburg Metropolitan Municipality
Selected Site F: Roseacre	
Site locality:	<p>Located within Roseacre, Johannesburg, Gauteng Province. The project area is bordered on the eastern side by Moffat View residential area. The site is located within an unnamed stream forming a tributary of the Natalspruit. Access to the northern part of the site is via Park Road, whilst the southern parts can be accessed via Nephin Road.</p> <p>The sites fall within Region F of ward 57.</p>
Physical Address:	Park Road, Roseacre, Johannesburg
Water Management Unit:	Natalspruit Water Management Unit
Co-ordinates:	28.084866° East -26.238244° South
Farm/ Erf names, number or portion, and registration division:	Erf 254, Roseacre, Johannesburg Erf 83, Roseacre, Johannesburg Erf 36, Klipriviersberg, Johannesburg
Property aerial extent in hectares (ha):	0.9829446 ha 0.8329039 ha 0.7519179 ha Total aerial extent: 2.5639015 ha
Proposed development extent (ha):	2.5639015 ha
Property aerial extent (m ²)	25639.01 m ²
SG Digit Code:	T0IR0573003000002540000000 T0IR0573000000000830000000 T0IR0370000000000360000000
Current zoning:	Public open space
Property owner	City of Johannesburg Metropolitan Municipality

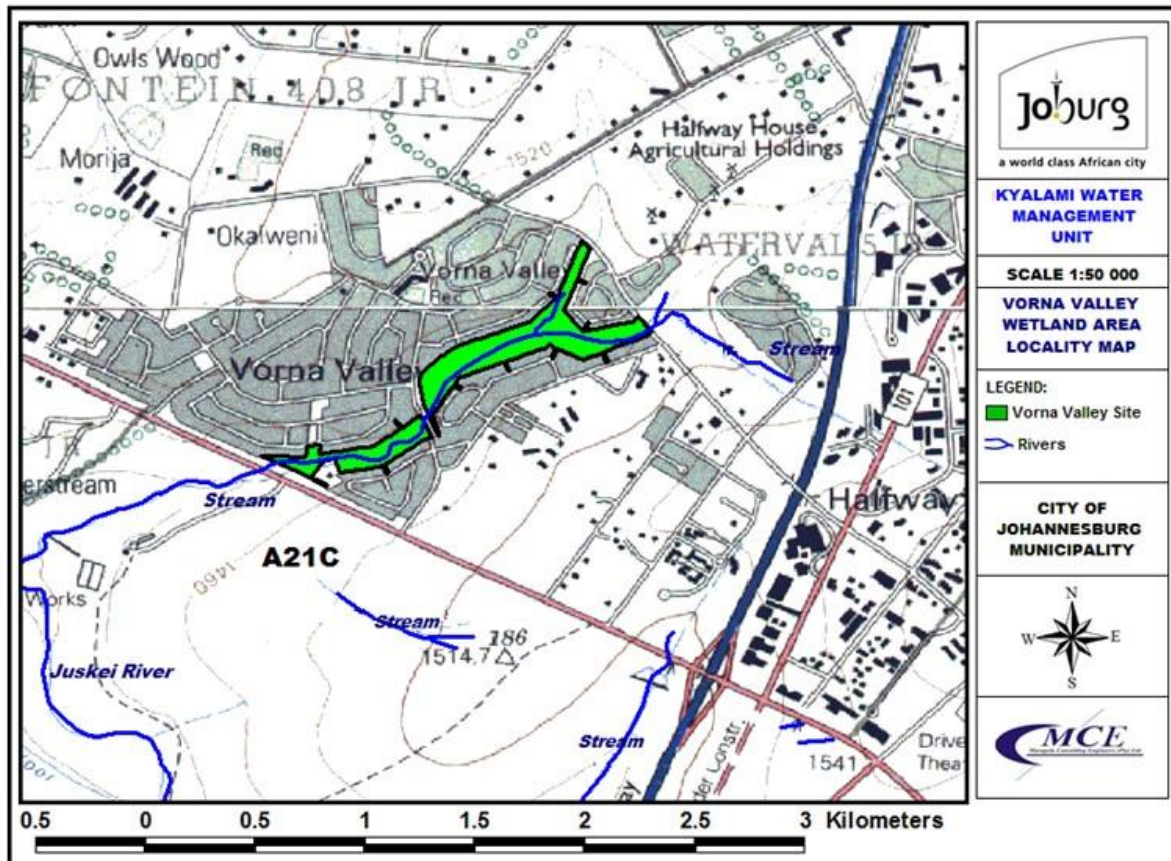


Figure 1-1: Vorna Valley Wetland Locality Map

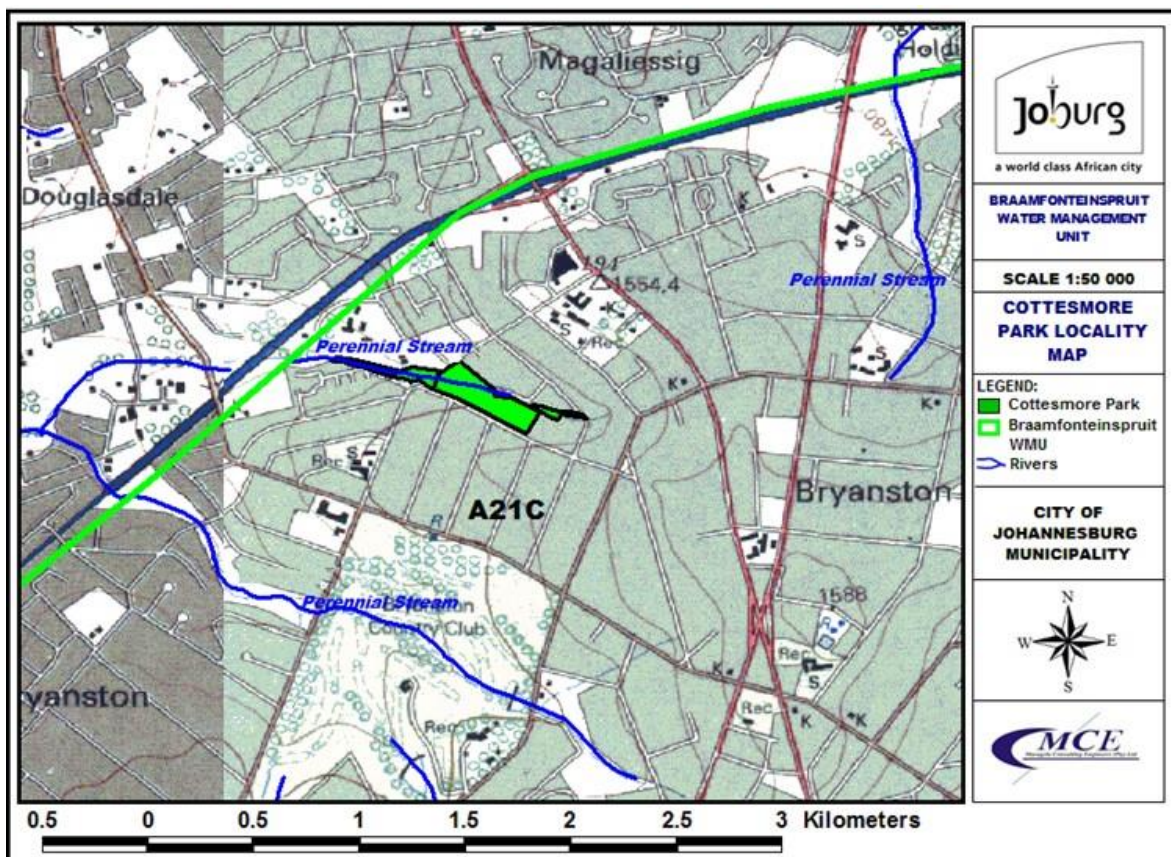


Figure 1-2: Cottesmore Park Locality Map

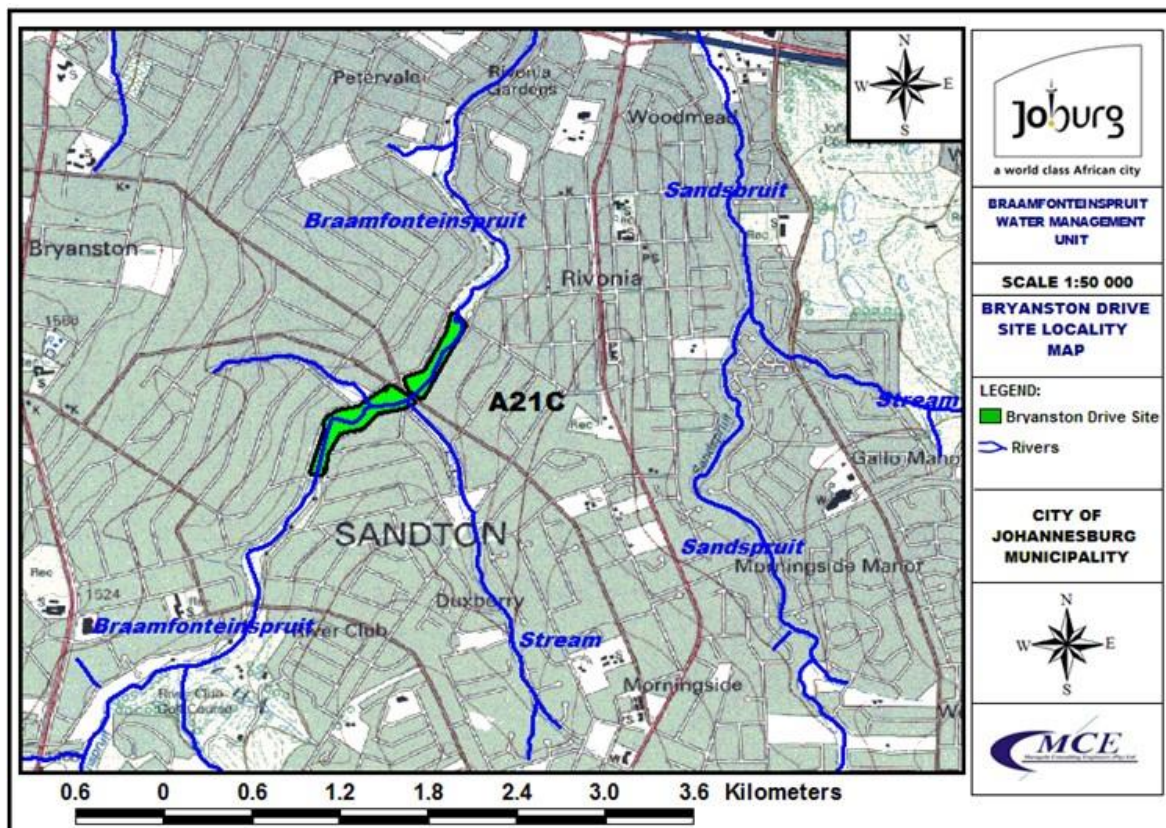


Figure 1-3: Bryanston Drive Site Locality Map

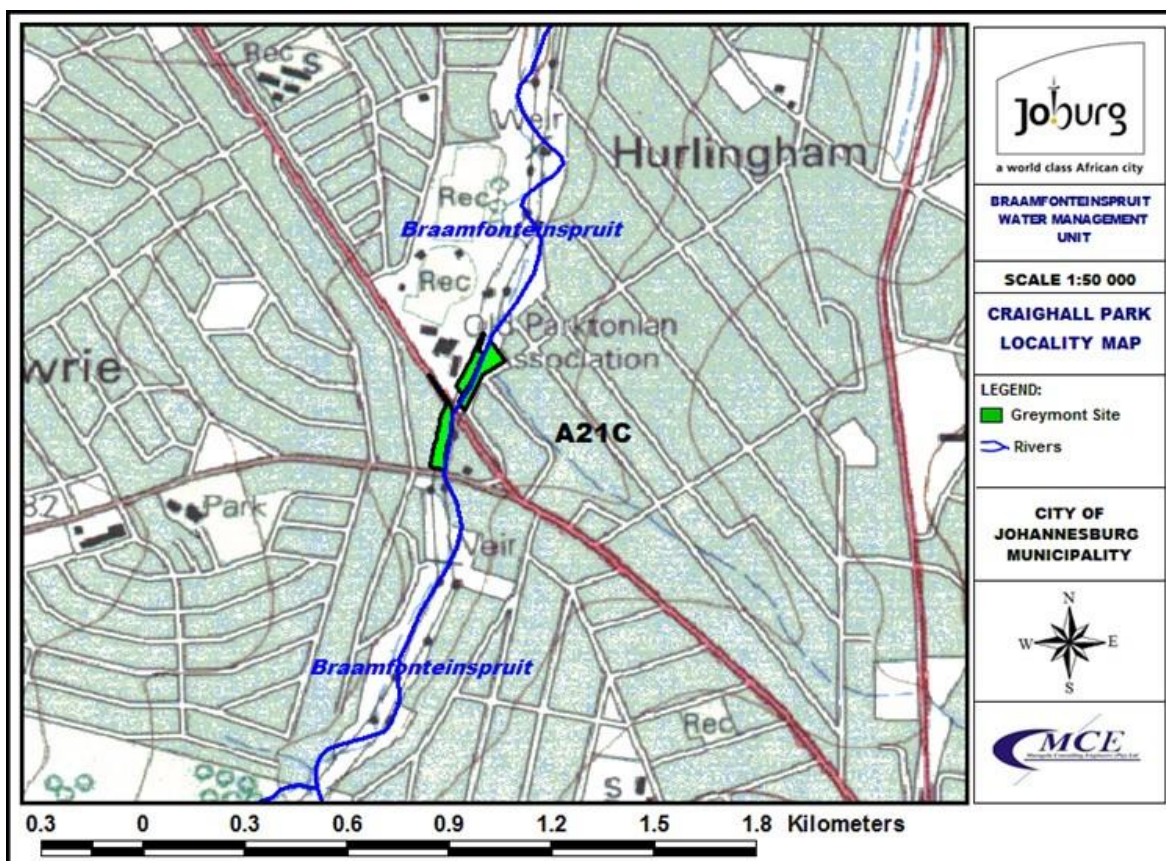


Figure 1-4: Craighall Park Site Locality Map

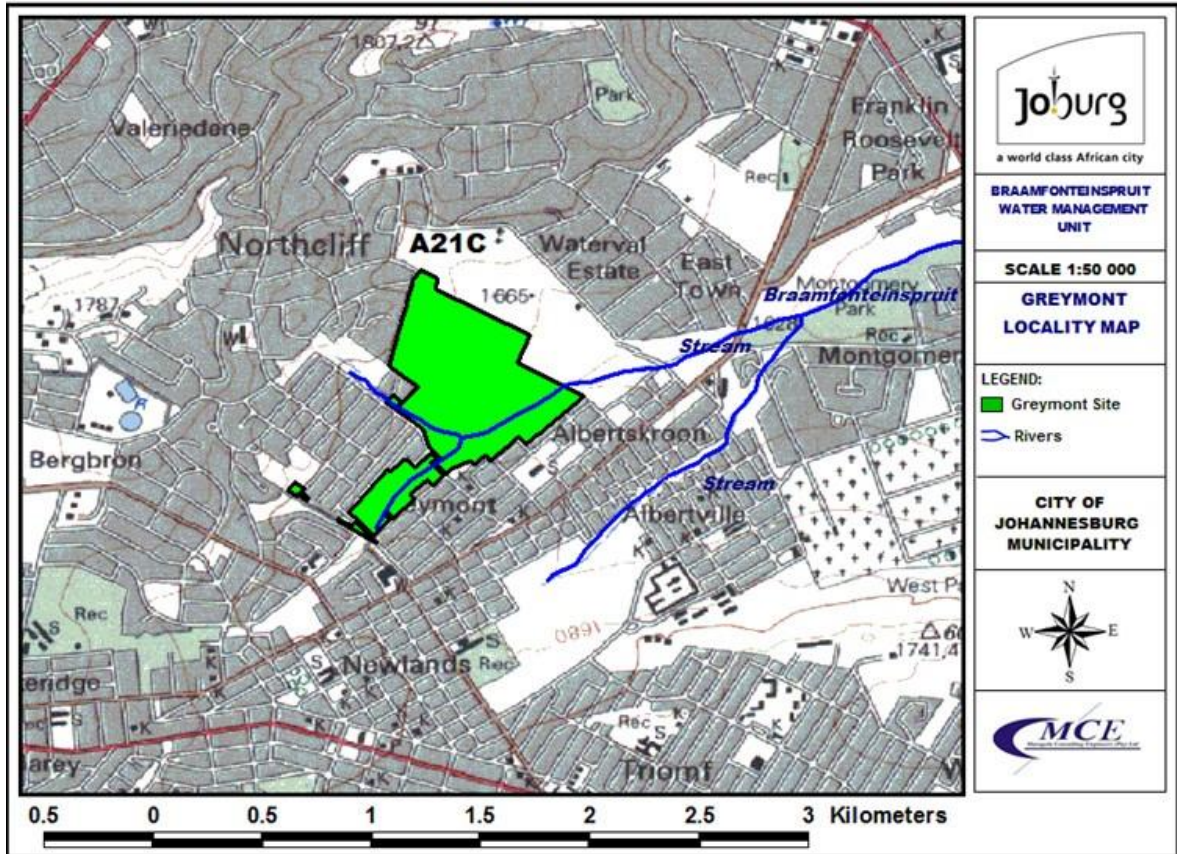


Figure 1-5: Greymont Site Locality Map

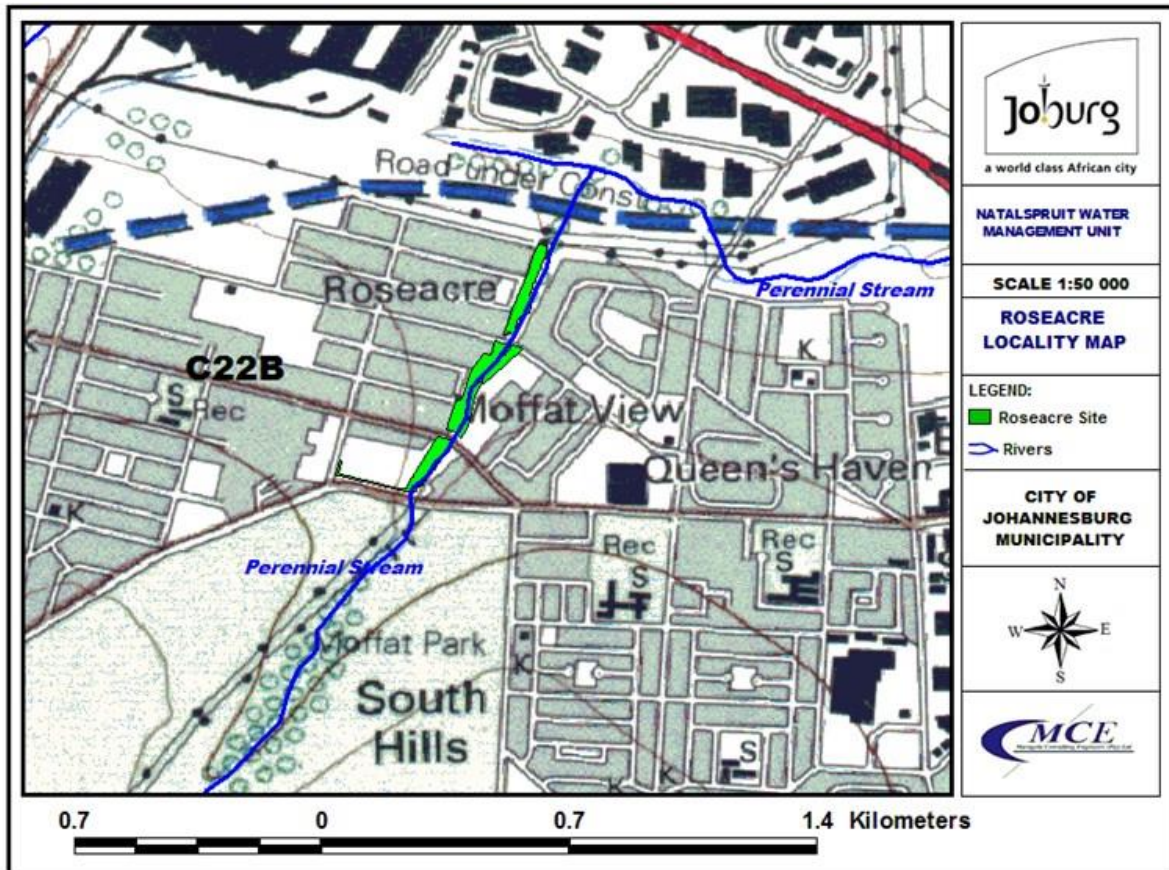


Figure 1-6: Roseacre Site Locality Map

2. ACTIVITY POSITION

Indicate the position of the activity using the latitude and longitude of the centre point of the site for each alternative site. The co-ordinates should be in decimal degrees. The degrees should have at least six decimals to ensure adequate accuracy. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection.

Alternative: **Latitude (S):** **Longitude (E):**

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In the case of linear activities:

Alternative:

- Starting point of the activity
- Middle point of the activity
- End point of the activity

Latitude (S):	Longitude (E):

For route alternatives that are longer than 500m, please provide co-ordinates taken every 250 meters along the route and attached in the appropriate Appendix

Addendum of route alternatives attached

The 21 digit Surveyor General code of each cadastral land parcel

VORNA VALLEY	T	0	J	R	0	5	6	6	0	0	0	0	0	0	0	0	7	4	0	0	0
COTTESMORE PARK	T	0	I	R	0	1	1	4	0	0	0	0	0	0	0	4	5	9	2	0	0
	T	0	I	Q	0	0	8	7	0	5	2	0	0	0	0	0	8	9	4	0	0
	T	0	I	R	0	1	1	4	0	0	0	0	0	0	0	4	5	6	1	0	0
BRYANSTON (BRYANSTON DRIVE)	T	0	I	R	0	1	1	4	0	0	0	0	0	0	0	2	1	8	7	0	0
	T	0	I	R	0	1	1	4	0	0	0	0	0	0	0	2	1	8	8	0	0
CRAIGHALL PARK	T	0	I	Q	0	0	6	4	0	0	0	0	0	0	0	0	7	1	1	0	0
GREYMONT	T	0	I	Q	0	0	0	0	2	1	1	0	0	0	0	0	2	1	1	0	0
ROSEACRE	T	0	I	R	0	5	7	3	0	0	3	0	0	0	0	0	2	5	4	0	0
	T	0	I	R	0	5	7	3	0	0	0	0	0	0	0	0	0	3	6	0	0
	T	0	I	R	0	3	7	0	0	0	0	0	0	0	0	0	0	3	6	0	0

DESCRIPTION OF THE RECEIVING ENVIRONMENT

2 Climate

The Kyalami Water Management Unit (WMU) falls within Quaternary Catchment A21B (Hennops River catchment) and A21C (Jukskei River catchment), with the Braamfonteinspruit WMU situated from the central part of the A21C catchment to the northern border of the C22A (Klip River catchment). The Natalspruit WMU which is located south of the Johannesburg central business district (CBD) lies within the C22A, C22B (Natalspruit catchment), and C22D (Klip River catchment) Quaternary Catchments.

The project areas falls within the warm temperate summer rainfall region which characterizes the typical Highveld climate north-central interior. According to Schulze *et. al* (1997), the mean annual temperature is in a range of 16 °C to 18°C, with daily mean temperatures in the range of 20°C to 22°C from October to March and 10°C to 12°C in winter season (July).

Daily mean relative humidity falls in the range of 58 % to 60 % in winter and 66 % to 68 % in summer, with daily minimum in the range of 32 % to 34 % and 46 % to 48 % for these seasons, respectively.

2.1 Regional Climate

The proposed project areas lies within the summer rainfall region of South Africa, which occurs generally in the form of thunderstorms, lightening, and occasional hail. Approximately 90 percent of the Mean Annual Precipitation (MAP) occurs within the six month period between October and March, with only five percent of the MAP occurring between April and September.

2.2 Rainfall

Climatic conditions in the study area are temperate, with strongly seasonal rainfall patterns. Most rainfall occurs as thunderstorms during the summer period of October to April. The mean annual precipitation (MAP) for Quaternary Catchments A21C, C22A, C22B, and C22D is in the range between 600-700 mm as determined from the Water Research Commission (WRC2005).

Furthermore, historical rainfall and evaporation records obtained from the South African Weather Station (SAWS) number A2E011 (Observatory Johannesburg and Union Observatory), were used to compute the mean annual precipitation and evaporation for both the Braamfonteinspruit and Natalspruit WMU. This meteorological gauging station located approximately 6 km north-west from the Rosherville selected site in the Natalspruit WMU, and 11 km south-east from the Greymont selected site in the Braamfonteinspruit WMU.

According to the rainfall data obtained, the vicinity of both the WMU receives a mean annual precipitation of approximately 658.39 mm as shown in the tabulation below.

The figure below shows average rainfall depth (mm) for the vicinity of the study area. The monthly rainfall trend is in line with the seasonal rainfall distribution with the summer months having the highest rainfall intensity (92.2-44.96 mm).

Table 2—1: Average Monthly Rainfall Depth (mm)

Month	Mean Annual Rainfall (mm)
Jan	100,97
Feb	92,54286

Mar	79,1
Apr	44,95714
May	32,97143
Jun	6,671429
Jul	7,442857
Aug	8,328571
Sep	28,45714
Oct	36,17143
Nov	92,2
Dec	128,5714
Total	658.39

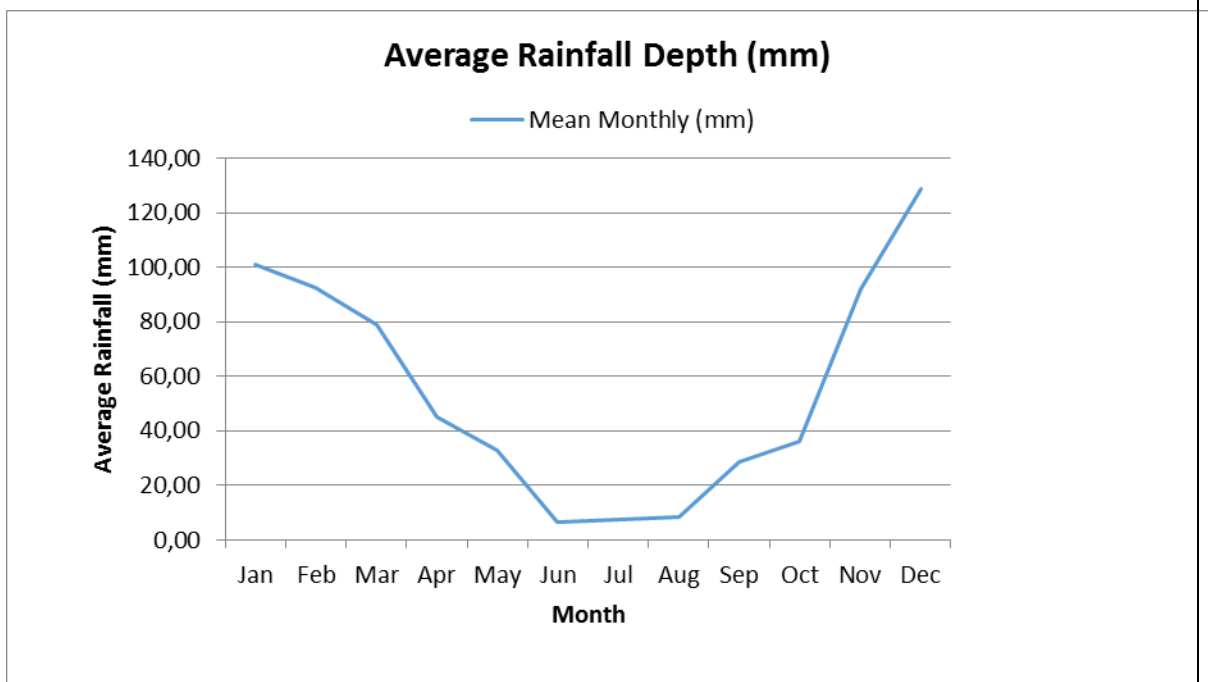


Figure 2-1: Average Monthly Rainfall Depth (mm)

2.3 Evaporation

According to the SAWS data for station number A2E011 (Observatory Johannesburg and Union Observatory), the study areas receives a mean annual potential evaporation of approximately 1270 mm determined from an S-class pan. This value is in line with mean annual evaporation as quantified from an S-pan by Water Research Commission (WRC 2005), which is in the range of 1600-1700 mm/yr.

Table 2—2: Average Monthly Evaporation (mm)

Month	Mean Annual Evaporation (mm)
Jan	133,19
Feb	103,5571

Mar	115,2571
Apr	86,44286
May	82,25714
Jun	62,91429
Jul	60,31429
Aug	88,91429
Sep	116,6286
Oct	137,7
Nov	148,6143
Dec	134,1429
Total	1269,93

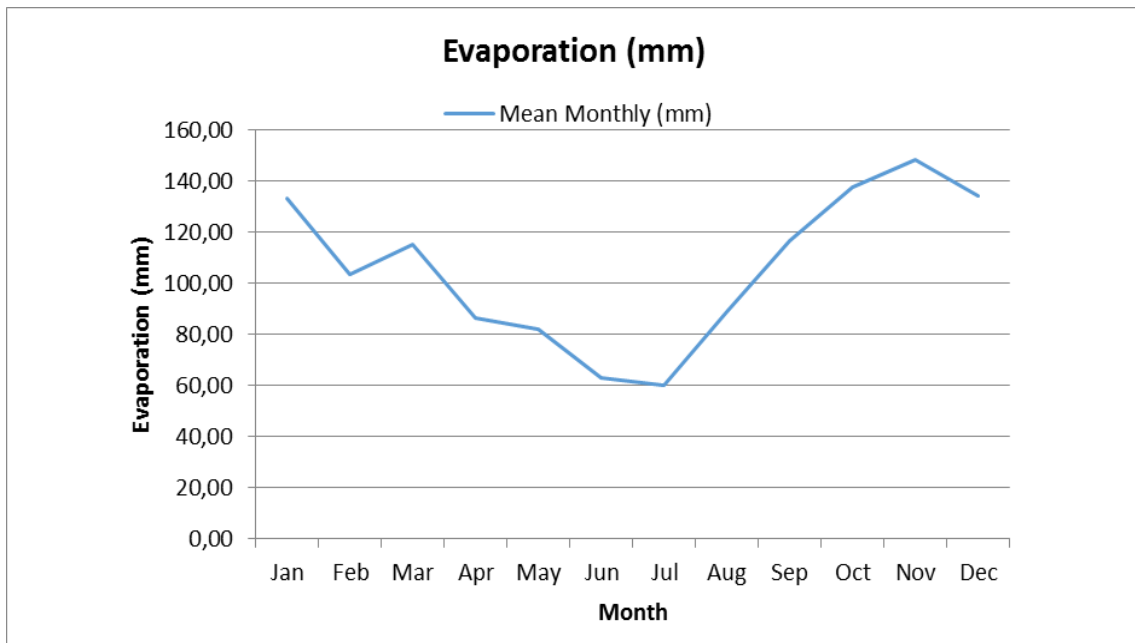


Figure 2-2: Average Monthly Evaporation

2.4 Wind

The study areas experience consistent pattern of wind mainly from the NW to N during Summer and SSW during Autumn and Winter. Strong winds are normally experienced during August and September from NNW.

3 Water Management Areas

The Kyalami WMU and larger parts of the Braamfonteinspruit WMU falls in the Crocodile (West) and Marico Water Management Area, with a small portion in the southern parts of

this WMU located within the Upper Vaal WMA. The entirely area of the Natalspruit WMU falls within the Upper Vaal WMA. Figure 1-3 below shows the locality of the Upper Vaal and Crocodile (West) and Marico WMA.

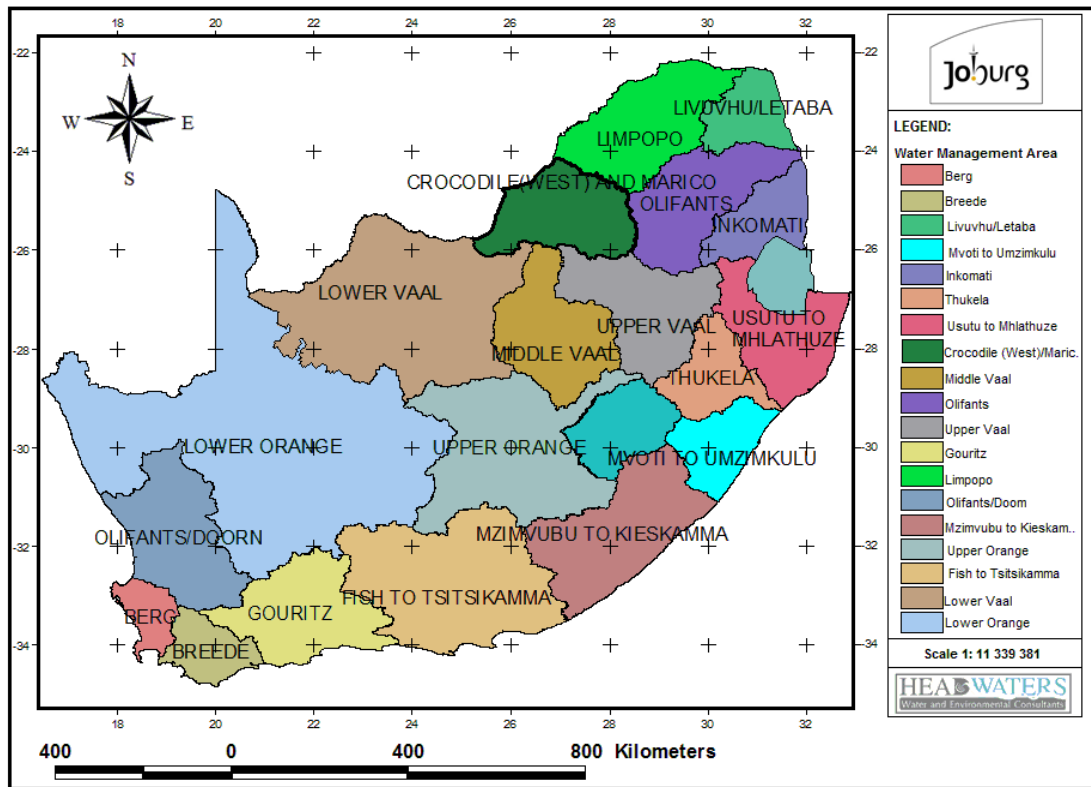


Figure 3-1: Upper Vaal and Crocodile (West) and Marico WMA Locality Map

3.1 Crocodile (West) and Marico Water Management Area

The Crocodile (West) and Marico Water Management Area lies primarily within the North West Province with parts of it in the northern region of Gauteng and the south-western periphery of the Limpopo Province. The Crocodile and Marico rivers are the two main rivers in this WMA, which at their confluence forms the Limpopo River that flows eastwards to the Indian Ocean.

The Crocodile (West) and Marico WMA comprises of Sub-WMA's, that is, the Lower Crocodile, Apies/Pienaars, Elands, Upper Crocodile, Upper Molopo, and Marico. The Braamfontienspruit WMU is located within the Upper (Hartbeespoort) Sub-WMA.

The upper Crocodile River has four main tributaries, namely the Magalies River, Jukskei River, Klein- Jukskei River and Hennops River, which join the Crocodile River north of the site.

More than half of the total water use in the Crocodile (West) and Marico WMA comprises urban, industrial and mining use, approximately a third is used by irrigation and the remainder of the water requirements is for rural water supplies and power generation.

In order to meet the current demand, much of the water in the WMA is being imported

mainly from the Vaal River system for domestic and industrial use purposes. Rand Water, which is the largest water board in South Africa, together with Magalies Water and Botshelo Water (the North West Water Supply Authority), are the three water boards that supply water in this WMA.

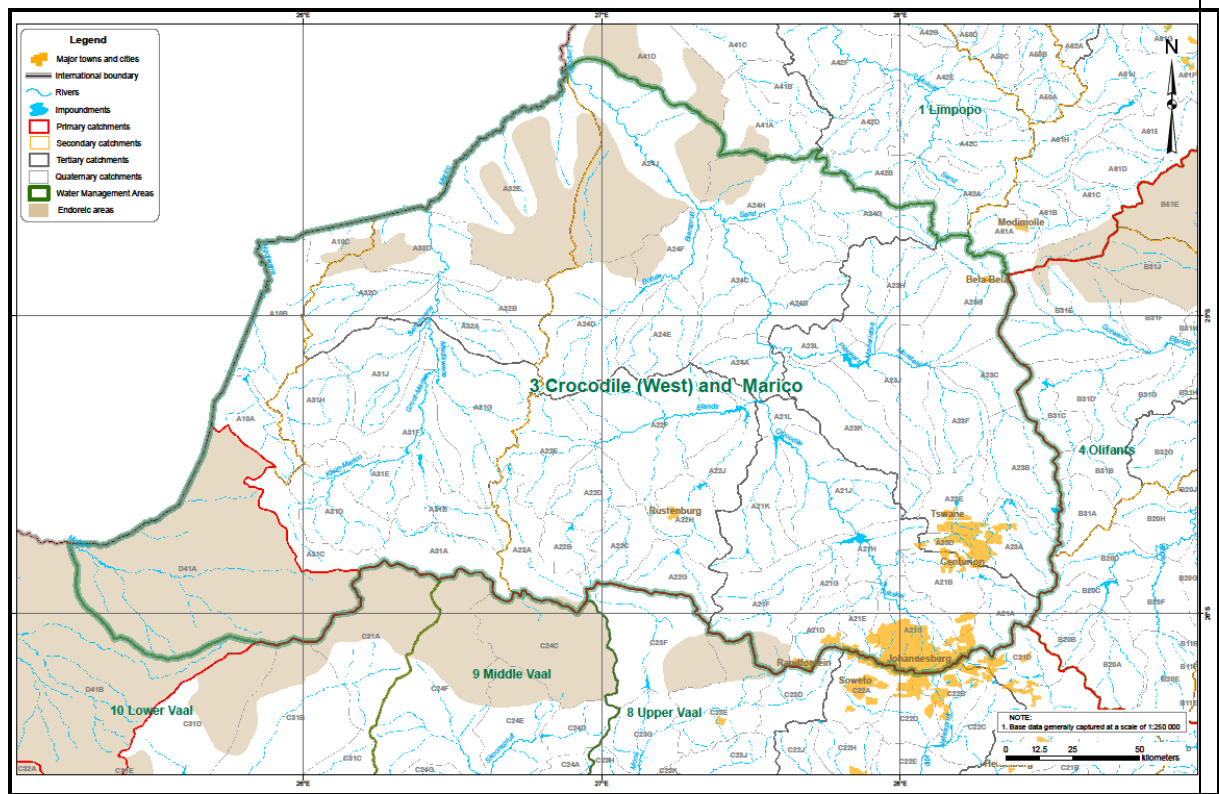


Figure 3-2: Crocodile (West) and Marico WMA

3.2 Upper Vaal Water Management Area

The Upper Vaal Catchment Area includes the Vaal, Klip, Wilge, Liebenbergsvlei and Mooi Rivers and extends to the confluence of the Mooi and Vaal Rivers. It covers a catchment area of 55 565 km². This area includes the very important dams Vaal Dam, Grootdraai Dam and Sterkfontein Dam. The southern half of the area extends over the Free State, the north-east mainly falls within Mpumalanga and the northern and western parts in Gauteng and North West provinces respectively. Mean annual run-off from the Upper Vaal catchment area is 3125-4570 X10⁶ m³. The largest proportion (46%) of the surface flow in the area is contributed by the Vaal River upstream of Vaal Dam, together with its main tributary the Klip River. The Wilge River and the Liebenbergsvlei River contribute 36 %, with the remaining 18% originating from the tributaries downstream of Vaal Dam.

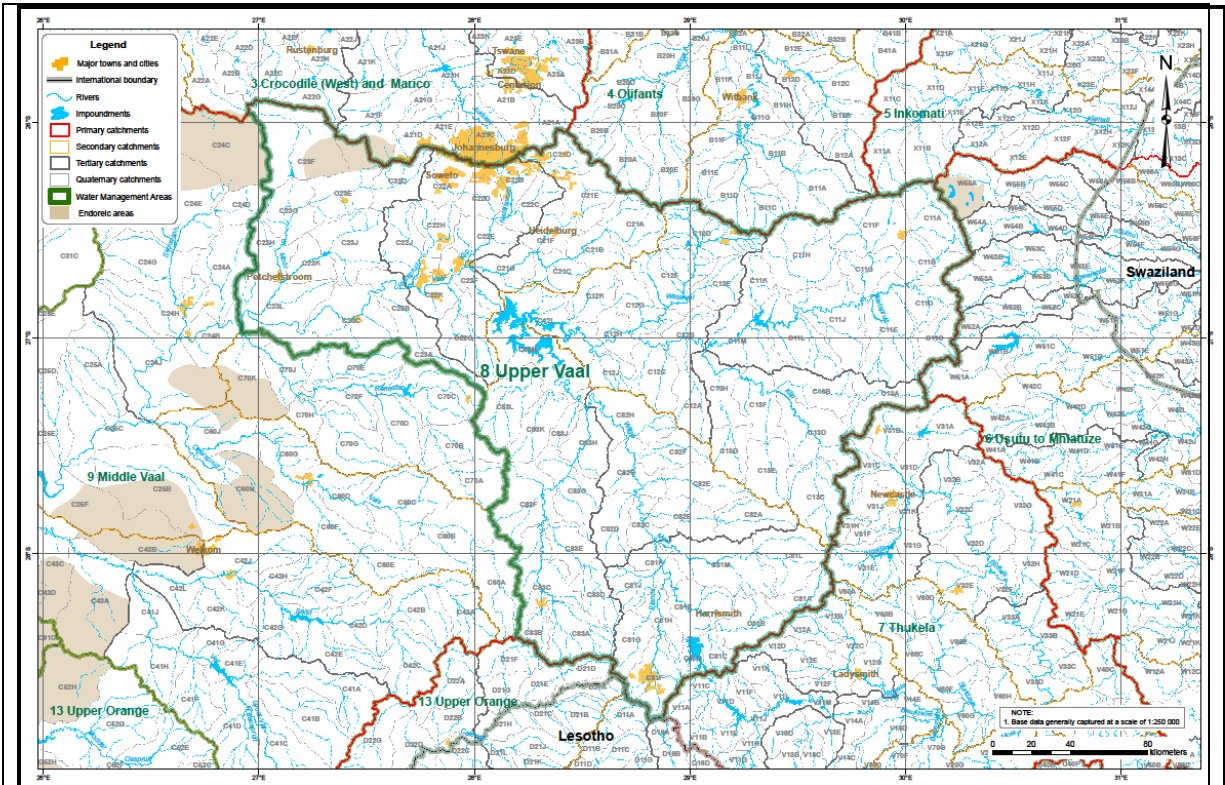


Figure 3-3: Upper Vaal WMA

4 Water Quality

5 Geology

5.1 Braamfonteinspruit WMU Geological Formations

The Braamfonteinspruit WMU is underlain by the Halfway House Granite Formation (FM), Hospital Hill Subgroup, and the Government Subgroup (SBGRP). The Halfway House Granite FM covers almost the entire WMU, whilst the Hospital Hill and Government SBGRP are prevalent on the southern parts of the WMU.

Halfway House Granite Formation

This formation is comprised of transported sandy and gravel soils overlying strongly cemented residual soils which are underlain by weathered granite (strictly speaking transitional zone gneisses and migmatites, homogenous and porphyritic with pegmatites common according to Anhausser 1973) belonging to Halfway House Granite Dome of Archaean Age. The oldest granites of the Halfway House Dome formed 3 100 million years ago.

Hospital Hill and Government Subgroup Geological Formations

The Hospital Hill and Government Subgroups form part of the West Rand Group, which is the lower subdivision of the Witwatersrand Supergroup. The Precambrian Witwatersrand

Basin (2800 to 200 m.y) was created by synclinal warping of the Kaapvaal Craton, covers an area of about 39 000 km² and is filled almost entirely by clastic deposits, consisting of quartzites, shales, and conglomerates. Associated with the clastics are occasional widespread lava flows. These deposits make up the Witwatersrand Supergroup which overlies Basement Complex granites and high grade metamorphics, and is overlain by Ventersdorp lavas and clastic sediments. The Witwatersrand succession is conventionally divided into a lower division (West Rand Group) and an upper division (Central Rand Group). The lower division (about 4 500m thick) is finer-grained and consists mainly of sandstones and shales with rare conglomerates (quartzite, banded ironstones, and Tillite are also present), while the coarser-grained upper division (about 3 000m thick) consists mainly of sandstones and conglomerates with one prominent shale horizon, known as the Kimberley shale.

The West Rand Group is divided into three subgroups namely the Hospital Hill, Government Reef and Jeppestown. This Group comprises of up to 4 000m of epiclastic sediments. At the base, the Hospital Hill Subgroup (1 600 m thick) is characterized by mature quartz-arenites, mudstones, siltstones, and minor chemical sediments. The immature, gold-bearing sandstones and conglomerates are generally interpreted as fluvial deposits.

The predominantly arenaceous Government Subgroup attains a maximum thickness of 900 m. It is characterised by basal and upper formations, which are dominated by mature quartz arenites, separated by an essentially-argillaceous unit, with minor arkoses and chemical sediments.

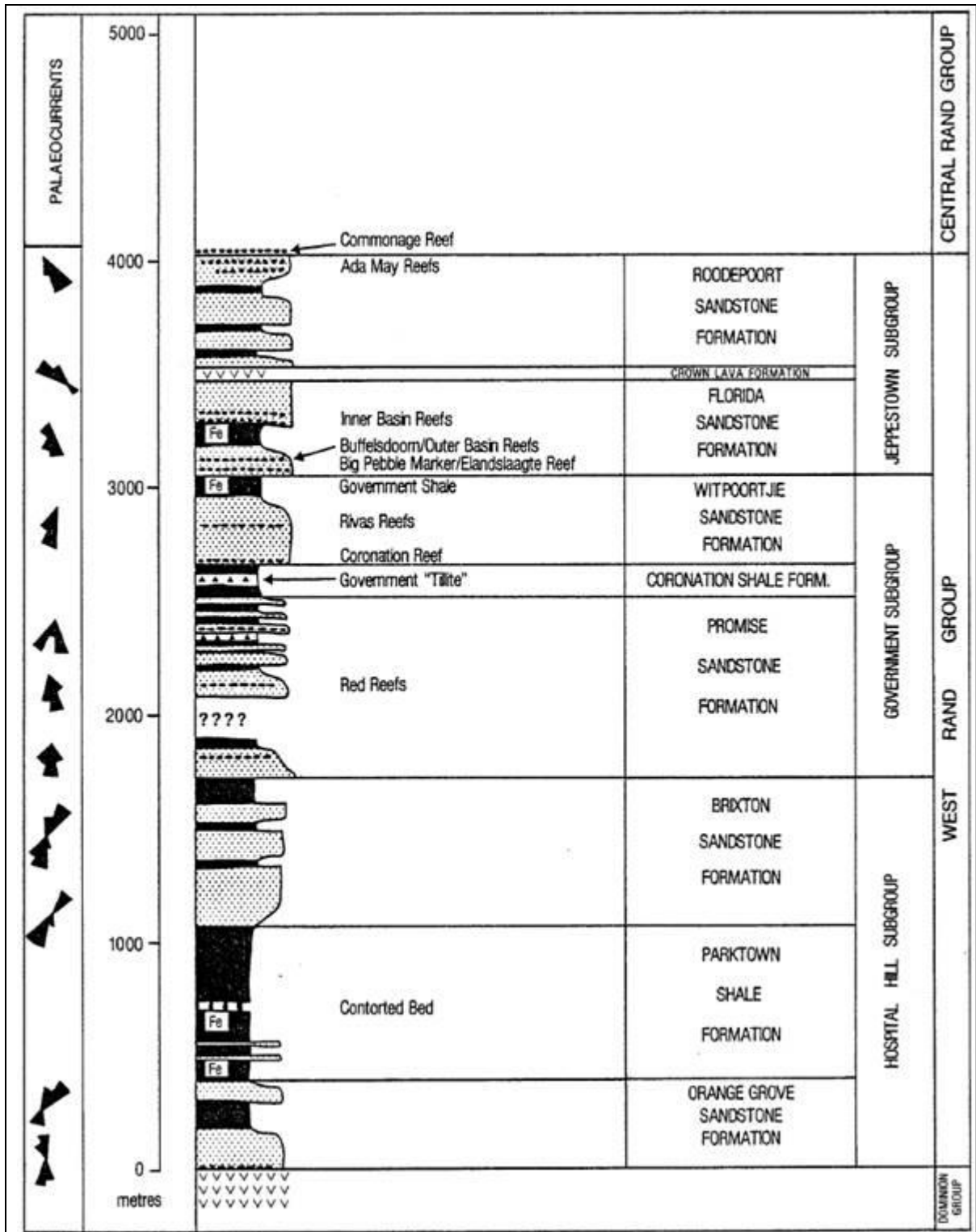


Figure 5-1: Stratigraphic representation of the Hospital Hill and Government Subgroups in the West Rand Group of the Witwatersrand Supergroup.

5.2 Natalspruit Water Management Unit Geological Formations

The northern parts of this WMU dominated by Gold mining operations is overlain by the Johannesburg and Booyens FM, while Turffontein Subgroup exist in the central, eastern and southern parts in the vicinity of Elandspark, The Hill, Oakdene, and Robertsham. These geological formations form part of the Central Rand Group in the Witwatersrand Supergroup.

The Vryheid FM and the Dwyka Group of the Karoo Supergroup forms the western part of the Natalspruit WMU in the Turffontein residential areas.

Johannesburg, Booyens and Turffontein Geological Formations

The Central Rand Group is divided into the Johannesburg and Turffontein Subgroups is composed largely of quartzite, within which there are numerous conglomerate zones. The conglomerate zones may contain any number of conglomerate bands, with individual bands inter-bedded with quartzite. The upper conglomerates are usually thicker with coarser fragments. An argillaceous zone known as the Booyens Shale (also known as Kimberley Shale) separates the Johannesburg and Turffontein Subgroups.

Vryheid Formation and Dwyka Group

The Karoo Supergroup is lithostratigraphically subdivided into the Dwyka, Eccca, and Beaufort Groups, succeeded by the Molteno, Elliot and Clarens Formations and the Drakensburg Formation. All known coal deposits in South Africa are hosted in sedimentary rocks of the Karoo Basin- a large retro-foreland basin which developed on the Kaapvaal Craton and filled between the Late Carboniferous and Middle Jurassic periods. The coals range in age from Early Permian (Eccca Group) through to Late Triassic (Molteno Formation) and are predominantly bituminous to anthracite in rank, which is classified in terms of metamorphism under the influence of temperature and pressure.

The coal bearing Eccca Group has been divided into three sub-units: the Pietermaritzburg, Vryheid, and Volksrust Formations. The Vryheid Formation rests non-conformably on sedimentary rocks of the Dwyka Group, which interpreted to be the products of glacial, fluvio-glacial-lacustrine depositional environments.

5.2.1 Site Specific Geology

The geological formations at the selected sites within the Kyalami, Braamfonteinspruit, and Natalspruit WMUs are shown in the tabulation below:

Table 5—1: Geological Formations for the selected sites within the WMUs

WATER RESOURCE	LOCALITY	GEOLOGICAL FORMATION	MINERAL DEPOSITS
Kyalami	Vorna Valley	Halfway House Granite FM	Gneiss, Migmatite, Granodiorite
Braamfonteinspruit	Montgomery Park	Hospital Hill Subgroup	Shale and Quartzite
Braamfonteinspruit	Bryanston Drive	Halfway House Granite FM	Gneiss, Migmatite, Granodiorite

Braamfonteinspruit	Cottesmore Park	Halfway House Granite FM	Gneiss, Migmatite, Granodiorite
Natalspruit MU	Natalspruit tributary (Roseacre)	Johannesburg, Booyens, and Turffontein Subgroups	Quartzite, Conglomerate, Shale, Lutaceous Arenite

5.3 Soils

According to the City of Johannesburg Wetland and Riparian Protection and Management Plan (2009) by Wetland Consulting Services (Pty) Ltd, the dominant soils contributing to the Kyalami and Braamfonteinspruit WMUs are summarized in the tabulation below. They are dominated by soils having sandy loam/sandy clay loam texture with moderate to high permeability and stability. The Kroonstad soil form dominates the WMUs with approximately 45.1 % in coverage.

Table 5—2: Soil forms within the Kyalami and Braamfonteinspruit WMUs

Soil	Percentage (%)	General Description
Avalon	22.0	Orthic A over YB Apedal over soft plinthic horizon
Kroonstad	45.1	Orthic over E over Gleycutanic
Glenrosa	6.4	Orthic over lithocutanic
Shortland	1.7	Orthic over red structured
Longlands	7.2	Orthic over E over soft plinthic
Wasbank	1.5	Orthic over E over hard plinthic (Ferricrete)
Hutton	16.1	Orthic over red Apedal

The Natalspruit WMU which has been heavily transformed through mining, urbanization, and industrialization is dominated by the following soil forms. From the tabulation, The Hutton and Mispah soil forms dominate the entire Natalspruit WMUs, accounting for an aerial extent of approximately 40.3 % and 44.0 %, respectively. Soils with a plinthic horizon, namely Avalons, Wasbank, and Longlands made up approximately 9 % of the WMU.

Table 5—3: Soil forms within the Natalspruit WMU

Soil	Percentage (%)	General Description
Avalon	8.3	Orthic A/Yellow-Brown Apedal B/Soft Plinthic
Dundee	4.0	Deep brown/grey structureless, stratified loamy sand/sand, non-calcareous
Hutton	40.3	Orthic A/Red Apedal B
Katspruit	1.8	Deep, grey hydromorphic clay, calcareous
Longlands	0.4	Orthic over E over soft plinthic
Mispah	44.0	Orthic A/Hard Rock

Wasbank	0.9	Orthic over E over hard plinthic (Ferricrete)
---------	-----	---

5.4 Avifauna

The following avifauna species were identified at the selected sites:

Greymont site

Three bird species were observed at the site and include, *Bostrychia hagedash*, *Threskiornis aethiopicus* and *Alopochen aegyptiaca*.

Craighall Park

Bostrychia hagedash avifaunal species were identified at this site.

Bryanston Drive site

Several bird nests were observed on *Morus alba* trees as well as an African monarch (*Danaus chrysippus*) butterfly.

Roseacre site

The river was observed to support a diversity of Avifauna including *Threskiornis aethiopicus* (African sacred ibis), the *Egretta garzetta* (Little egret) and the *Anas erythrorhyncha* (Red-billed teal).

Vorna Valley Wetland Area

Avifaunal species identified in the Vorna Valley wetland area include the *Vanellus armatus* and juveniles of *Bostrychia hagedash*

3. GRADIENT OF THE SITE

Indicate the general gradient of the site.

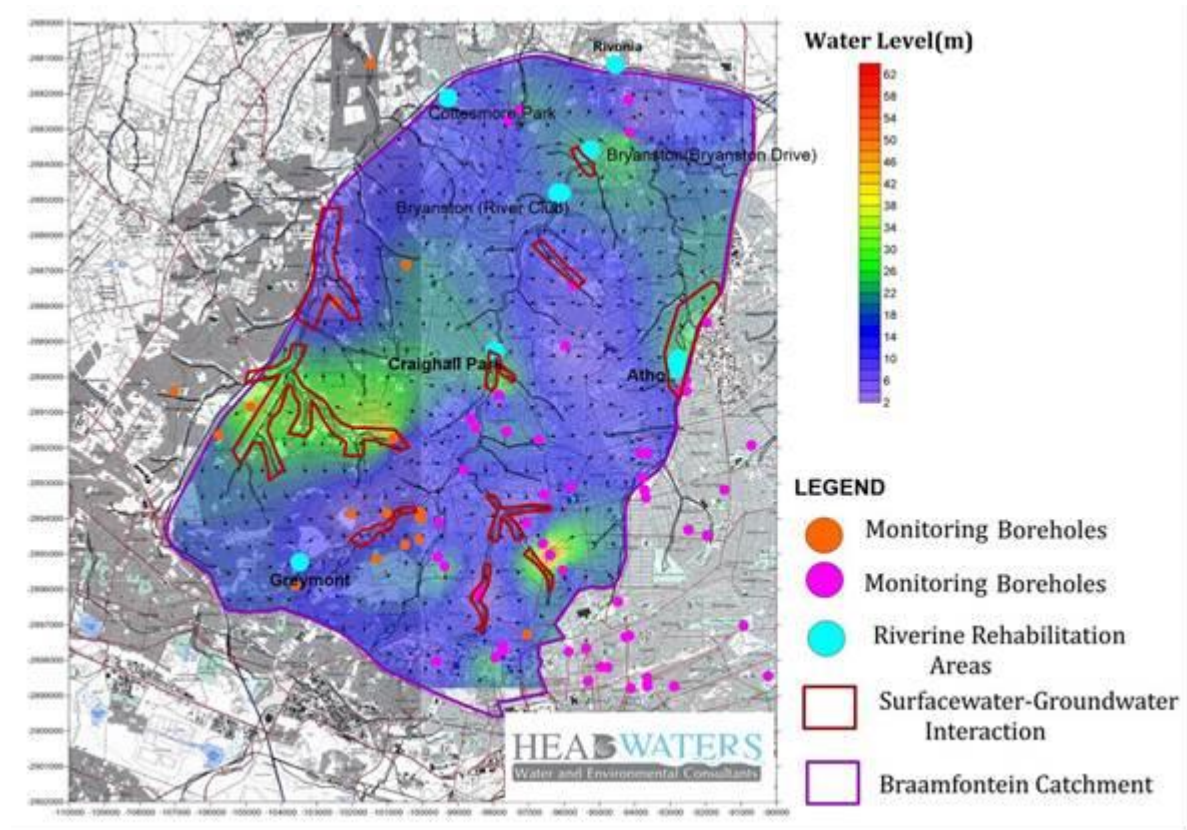
Vorna Valley Wetland Area: 1480 amsl -1445 amsl, over a distance of 1690 m						
Flat	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5
Cottesmore Park: 1515 amsl - 1465 amsl, over a distance of 1062 m						
Flat	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5
Bryanston Drive Site: 1450 amsl - 1435 amsl, over a distance of 950 m						
Flat	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5
Craighall Park Site: 1530 amsl - 1525 amsl, over a distance of 130 m						
Flat	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5
Greymont Site: 1675 amsl - 1660 amsl, over a distance of 450 m						
Flat	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5
Roseacre Site: 1675 amsl-1660 amsl, over a distance of 821 m						
Flat	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5

4. LOCATION IN LANDSCAPE

Indicate the landform(s) that best describes the site.

Vorna Valley Wetland Area						
Ridgeline	Plateau	Side slope of hill/ridge	Valley	Plain	Undulating plain/low hills	River front
Cottesmore Park						
Ridgeline	Plateau	Side slope of hill/ridge	Valley	Plain	Undulating plain/low hills	River front
Bryanston Drive Site						
Ridgeline	Plateau	Side slope of hill/ridge	Valley	Plain	Undulating plain/low hills	River front
Craighall Park Site						
Ridgeline	Plateau	Side slope of hill/ridge	Valley	Plain	Undulating plain/low hills	River front
Carel Venter Park (Greymont Site)						
Ridgeline	Plateau	Side slope of hill/ridge	Valley	Plain	Undulating plain/low hills	River front
Roseacre Site						
Ridgeline	Plateau	Side slope of hill/ridge	Valley	Plain	Undulating plain/low hills	River front

5. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE



a) Is the site located on any of the following?

Vorna Valley Wetland Area

Shallow water table (less than 1.5m deep)

YES

NO
X

Dolomite, sinkhole or doline areas	YES	NO X
Seasonally wet soils (often close to water bodies)	YES	NO X
Unstable rocky slopes or steep slopes with loose soil	YES X	NO
Dispersive soils (soils that dissolve in water)	YES	NO X
Soils with high clay content (clay fraction more than 40%)	YES X	NO
Any other unstable soil or geological feature (Granite of the Halfway House Geological Formation)	YES X	NO
An area sensitive to erosion	YES X	NO

Cottesmore Park

Shallow water table (less than 1.5m deep)	YES	NO X
Dolomite, sinkhole or doline areas	YES	NO X
Seasonally wet soils (often close to water bodies)	YES	NO X
Unstable rocky slopes or steep slopes with loose soil	YES X	NO
Dispersive soils (soils that dissolve in water)	YES	NO X
Soils with high clay content (clay fraction more than 40%)	YES X	NO
Any other unstable soil or geological feature (Granite of the Halfway House Geological Formation)	YES X	NO
An area sensitive to erosion	YES X	NO

Identifier	Latitude (S)	Longitude (E)	Water Level (m)
2628AA00213	-26,05277°	28,0247°	12,19
2628AA01112	-26,050000°	28,027780°	22,00

Bryanston Drive Site

Shallow water table (less than 1.5m deep)	YES	NO X
Dolomite, sinkhole or doline areas	YES	NO X
Seasonally wet soils (often close to water bodies)	YES	NO X
Unstable rocky slopes or steep slopes with loose soil	YES X	NO
Dispersive soils (soils that dissolve in water)	YES	NO X
Soils with high clay content (clay fraction more than 40%)	YES X	NO

Any other unstable soil or geological feature (**Granite of the Halfway House Geological Formation**)

YES X	NO
YES X	NO

An area sensitive to erosion

Identifier	Latitude	Longitude	Water Level(m)
2628AA00205	-26,05611	28,05887	13,11
2628AA00207	-26,05611	28,05888	7,62
2628AA00183	-26,04777	28,05859	9,14

Craighall Park

Shallow water table (less than 1.5m deep)

YES	NO X
-----	---------

Dolomite, sinkhole or doline areas

YES	NO X
-----	---------

Seasonally wet soils (often close to water bodies)

YES	NO X
-----	---------

Unstable rocky slopes or steep slopes with loose soil

YES X	NO
----------	----

Dispersive soils (soils that dissolve in water)

YES	NO X
-----	---------

Soils with high clay content (clay fraction more than 40%)

YES X	NO
----------	----

Any other unstable soil or geological feature (**Granite of the Halfway House Geological Formation**)

YES X	NO
----------	----

An area sensitive to erosion

YES X	NO
----------	----

Identifier	Latitude	Longitude	Water Level(m)
2628AA01054	-26,13208	28,02345	20,00
2628AA00108	-26,13112	28,0147	17,07
2628AA00107	-26,13111	28,0147	25,60
2628AA01053	-26,12888	28,01331	12,00
2628AA00515	-26,12851	28,19428	5,00
2628AA00607	-26,12691	28,19053	10,00
2627BB00157	-26,12526	27,9512	34,00
2628AA00129	-26,12279	28,02137	9,14
2628AA00127	-26,12278	28,02137	27,43
2628AA01058	-26,15549	28,02901	6,40
2628AA01020	-26,14827	28,03403	10,00

Greymont Site

Shallow water table (less than 1.5m deep)

YES	NO X
-----	---------

Dolomite, sinkhole or doline areas

YES	NO X
-----	---------

Seasonally wet soils (often close to water bodies)

YES	NO X
YES	NO X
YES	NO X
YES X	NO
YES X	NO
YES X	NO

Unstable rocky slopes or steep slopes with loose soil

Dispersive soils (soils that dissolve in water)

Soils with high clay content (clay fraction more than 40%)

Any other unstable soil or geological feature (**Granite of the Halfway House Geological Formation**)

An area sensitive to erosion

Identifier	Latitude	Longitude	Water Level (m)
2628AA01071	-26,19055	28,00323	10,00
2628AA01030	-26,18972	28,01989	26,00
2628AA00115	-26,18667	28,02193	18,29
2628AA00114	-26,18666	28,02193	12,19
2628AA01070	-26,17352	28,01484	7,00
2627BB00061	-26,17082	27,96356	16,46
2628AA01042	-26,1663	28,00576	26,00
2627BB00170	-26,16443	27,98653	19,00
2628AA01065	-26,16405	28,00373	16,00
2627BB00169	-26,16073	27,99461	16,00
2627BB00173	-26,15935	27,99856	13,00
2627BB00174	-26,15276	27,97939	5,20
2627BB00159	-26,15276	27,98956	10,00

Roseacre

Shallow water table (less than 1.5m deep)

YES	NO X
YES	NO X
YES	NO X
YES X	NO
YES	NO X
YES	NO
YES	NO X

Dolomite, sinkhole or doline areas

Seasonally wet soils (often close to water bodies)

Unstable rocky slopes or steep slopes with loose soil

Dispersive soils (soils that dissolve in water)

Soils with high clay content (clay fraction more than 40%)

Any other unstable soil or geological feature

An area sensitive to erosion

YES	NO X
-----	---------

(Information in respect of the above will often be available at the planning sections of local authorities. Where it exists, the 1:50 000 scale Regional Geotechnical Maps prepared by Geological Survey may also be used).

b) are any caves located on the site(s)

YES	NO X
-----	---------

If yes to above provide location details in terms of latitude and longitude and indicate location on site or route map(s)

Latitude (S):	Longitude (E):
°	°

c) are any caves located within a 300m radius of the site(s)

YES	NO X
-----	---------

If yes to above provide location details in terms of latitude and longitude and indicate location on site or route map(s)

Latitude (S):	Longitude (E):
°	°

d) are any sinkholes located within a 300m radius of the site(s)

YES	NO X
-----	---------

If yes to above provide location details in terms of latitude and longitude and indicate location on site or route map(s)

Latitude (S):	Longitude (E):
°	°

If any of the answers to the above are "YES" or "unsure", specialist input may be requested by the Department

6. AGRICULTURE

Does the site have high potential agriculture as contemplated in the Gauteng Agricultural Potential Atlas (GAPA 4)?

YES	NO X
-----	---------

Please note: The Department may request specialist input/studies in respect of the above.

7. GROUNDCOVER

To be noted that the location of all identified rare or endangered species or other elements should be accurately indicated on the site plan(s).

Indicate the types of groundcover present on the site and include the estimated percentage found on site

Vorna Valley Wetland Area

Natural veld - good condition % = 30	Natural veld with scattered aliens % =	Natural veld with heavy alien infestation % = 70	Veld dominated by alien species % =	Landscaped (vegetation) % =
Sport field % =	Cultivated land % =	Paved surface (hard landscaping) % =	Building or other structure % =	Bare soil % =

Cottesmore Park

Natural veld - good condition % = 20	Natural veld with scattered aliens % =	Natural veld with heavy alien infestation % = 60	Veld dominated by alien species % =	Landscaped (vegetation) % = 20
Sport field % =	Cultivated land % =	Paved surface (hard landscaping) % =	Building or other structure % =	Bare soil % =

Rivonia Site

Natural veld - good condition % = 40	Natural veld with scattered aliens % =	Natural veld with heavy alien infestation % = 50	Veld dominated by alien species % =	Landscaped (vegetation) % = 10
Sport field % =	Cultivated land % =	Paved surface (hard landscaping) % =	Building or other structure % =	Bare soil % =

Bryanston Drive Site

Natural veld - good condition % = 10	Natural veld with scattered aliens % =	Natural veld with heavy alien infestation % =50	Veld dominated by alien species % =	Landscaped (vegetation) % =20
Sport field % =	Cultivated land % =	Paved surface (hard landscaping) % =	Building or other structure % =	Bare soil % =20

Bryanston River Club Site

Natural veld - good condition % = 40	Natural veld with scattered aliens % =	Natural veld with heavy alien infestation % =40	Veld dominated by alien species % =	Landscaped (vegetation) % =20
Sport field % =	Cultivated land % =	Paved surface (hard landscaping) % =	Building or other structure % =	Bare soil % =

Craighall Park

Natural veld - good condition % =	Natural veld with scattered aliens % =	Natural veld with heavy alien infestation % =50	Veld dominated by alien species % =	Landscaped (vegetation) % =
Sport field % =	Cultivated land % =	Paved surface (hard landscaping) % =	Building or other structure % =10	Bare soil % =40

Greymont Site

Natural veld - good condition % =	Natural veld with scattered aliens % =	Natural veld with heavy alien infestation % =50	Veld dominated by alien species % =	Landscaped (vegetation) % =
Sport field % =	Cultivated land % =	Paved surface (hard landscaping) % =	Building or other structure % =10	Bare soil % =40

Roseacre

Natural veld - good condition % =30	Natural veld with scattered aliens % =	Natural veld with heavy alien infestation % =40	Veld dominated by alien species % =	Landscaped (vegetation) % =30
Sport field % =	Cultivated land % =	Paved surface (hard landscaping) % =	Building or other structure % =	Bare soil % =

Please note: The Department may request specialist input/studies depending on the nature of the groundcover and potential impact(s) of the proposed activity/ies.

VEGETATION

Egoli Granite Grassland Vegetation Unit

The Vorna Valley wetland area, Cottesmore Park, Bryanston Drive, and Craighall Park selected sites falls within the Egoli Granite Grassland (Gm10) within the Grassland Biome of the Mesic Highveld Grassland Bioregion. This vegetation unit occurs from the Johannesburg Dome, extending north towards Centurion and westward towards Muldersdrif and the eastern parts near Tembisa.

It occurs on gently to moderately undulating landscape on the Highveld plateau, supporting short to medium-high, dense, tufted grassland dominated almost entirely by *Themeda triandra*.

According to Mucina and Rutherford (2006), this vegetation unit support tall *Hyparrhenia hirta* grassland, with some wood species on rocky outcrops or rock sheets. The rocky habitats shows a high diversity of woody species, which occurs in the form of scattered shrub groups or solitary small trees. The *Egoli Granite Grassland* vegetation unit is classified as **Endangered**. Approximately 24% of this vegetation unit has been transformed mostly by urbanization, cultivation, and development of roads.

Vorna Valley Wetland Area

The vegetation dominating the wetland were *Phragmites australis*, *Bidens Pilosa*, *Salix babylonica* and young and mature *Populus x canescens*. *Paspalum urvillei* was also present in the riparian zone with *Bacopa monnieri*.

Cottesmore Park

The riparian zone within the Cottesmore Park is dominated by the alien invasive Spanish reed, *Arundo donax*. The alien invasive weed *Ipomoea purpurea* and *Ipomoea tuberosa* also dominates larger parts of the riparian zone. *Conyza bonariensis*, *Tagetes minuta*, *Bidens pilosa*, *Agave Americana*, *Verbena bonariensis*, *Tecoma capensis*, *Polygala virgate*, *Peltandra virginica* were also dominant in some section of the riverine. Tree species observed on the riparian zone were mostly alien invasive species such as *Salix babylonica*, *Melia azedarach*, *Morus alba*, *Solanum mauritianum*, *Acacia* and *Eucalyptus* species.

Craighall Park

Alien invasive tree species such as *Salix babylonica*, *Solanum mauritianum*, *Morus alba*, *Acacia* and *Eucalyptus* dominates the site. The herb *Bacopa monieri (brahmi)* was also dominant with patches of *Conyza bonariensis*, and *Ipomoea purpurea*. Small patches of alien invasive reed species, *Arundo donax* (juvenile) were evident. The grass *Cortaderia selloana* were present in clumps in along the watercourse.

Bryanston (Bryanston Drive)

The woody species layer are dominated by exotic tree species such as *Morus alba*, *Salix babylonica* and *Populus x canescens* with very low diversity of indigenous species. Young *Eucalyptus camaldulensis* were observe on the river banks. *Bacopa monieri (brahmi)* and *Berkheya maritima* were also dominant in the riverine. Clumps of *Phragmites australis* on the banks as well as *Typha capensis* are evident on site.

Soweto Highveld Grassland Vegetation Unit

The Carel Venter Park (Greymont) and Roseacre selected sites are situated within the Soweto Highveld Grassland vegetation unit. Larger extent of the Greymont selected site

falls within the Soweto Highveld Grassland vegetation unit, whilst the north-eastern boundary of the site towards Montgomery Park lies within the Egoli Granite Grassland vegetation.

According to the threatened terrestrial ecosystem database of 2011, this ecosystem is regarded as vulnerable due to irreversible loss of natural habitat where 60% of natural habitat remains. However, Mucina and Rutherford (2006) classified the Soweto Highveld Grassland vegetation as Endangered, with approximately 50% transformation due to cultivation, urban sprawl, mining and road development.

This ecosystem is roughly delimited by the N17 road between Ermelo and Johannesburg in the north, Perdekop in the southeast and the Vaal River (border with the Free State) in the south. It extends further westwards along the southern edge of the Johannesburg Dome (including part of Soweto) as far as the vicinity of Randfontein. In southern Gauteng it includes the surrounds of Vanderbijlpark and Vereeniging as well as Sasolburg in the northern Free State

The Soweto Highveld Grassland vegetation is short, dense grassland dominated by a mixture of common Highveld grasses such as *Themeda triandra*, *Heteropogon contortus*, *Elionurus muticus*, and a number of *Eragrotis* species. Most prominent forbs are of the families *Asteraceae*, *Rubiaceae*, *Malvaceae*, *Lamiaceae* and *Fabaceae*. Disturbance of this vegetation unit leads to an increase in the abundance of the grasses *Hyparrhenia hirta* and *Eragrotis chloromelas*.

Carel Venter Park (Greyfontein)

According to the City of Johannesburg Wetland Delineation and Assessment for the Kyalami, Braamfonteinspruit, and Natalpruit WMUs (Sazi Environmental, 2015), the site consist mostly of alien and invasive tree species along the river as well as exotic forbs and grass species. Dominant alien tree species include *Salix babylonica*, *Morus alba*, *Populus x canescens*, *Eucalyptus camaldulensis*, *Melia azedarach* and *Solanum mauritianum*. Grass and sedge species were present in downstream areas of the riparian zone as well as in the channeled valley bottom wetland and included occasional clumps of *Phragmites australis*, *Cyperus marginatus*, *Cyperus dives*, *Arundo donax* and *Hyporhena species*. Alien herb species such as *Bidens pilosa*, *Tagetes minuta*, *Ipomoea purpurea* and *Verbena bonariensis* were dominant as well as the flowering plant *Rumex crispus*.

Roseacre

The river was highly dominated by the declared weed, *Tagetes minuta*. Riparian vegetation was low in indigenous species diversity. Tree species dominant on site (dominating most of the woody layer of riparian tree species) included *Solanum*

mauritianum and patches of *Eucalyptus camaldulensis* and *Salix babylonica*. The tree species identified are all alien invasive species with *Salix* species known for using large amounts of water. Herbs identified at this particular point included *Bidens Pilosa*, *Tagetes minuta*, *Datura ferox* and *Argemone ochroleuca* all of which are alien species or declared weeds. *Datura ferox* is an alien invasive species that is present in large quantities close to the riparian zone of the river together with *Argemone ochroleuca* and *Tagetes minuta*. Dense stands of the grass *Pennisetum macrourum* were found on the margins of the river and this grass is known for protecting watercourses from flooding.

Are there any rare or endangered flora or fauna species (including red list species) present on the site

YES	NO X
-----	---------

If YES, specify and explain:

According to the City of Johannesburg Wetland Delineation and Assessment Report by Sazi Environmental (2016), no Red Data species were identified at the selected sites within the Kyalami, Braamfonteinspruit, and Natalspruit WMUs.

Are there any rare or endangered flora or fauna species (including red list species) present within a 200m (if within urban area as defined in the Regulations) or within 600m (if outside the urban area as defined in the Regulations) radius of the site.

YES	NO X
-----	---------

If YES, specify and explain:

--

Are there any special or sensitive habitats or other natural features present on the site?

YES	
-----	--

If YES, specify and explain:

Sensitive Landscapes

The selected proposed project areas within the Kyalami, Braamfonteinspruit, and Natalspruit WMU are situated within the Critical Biodiversity Areas (CBA) in terms of the Gauteng Conservation Plan (Gauteng C-Plan v3.3) (March, 2014) conducted by the Gauteng Nature Conservation under the Gauteng Department of Agriculture and Rural Development (GDARD). According to the Gauteng C-Plan, CBA includes the following:

Natural or near-natural terrestrial and aquatic features that were selected based on an areas biodiversity characteristics, spatial configuration and requirement for meeting both biodiversity pattern and ecological process targets. CBAs include irreplaceable sites where no other options exist for meeting targets for biodiversity features, as well as best-design sites which represent an efficient configuration of sites to meet targets in an ecologically sustainable way that is least conflicting with other land uses and activities. These areas need be maintained in the appropriate condition for their category. Some CBAs are degraded or irreversibly modified but are still required for achieving specific targets.

The City of Johannesburg Wetland Delineation and Assessment Study undertaken by Sazi Environmental (2016) identified Hydro-Geomorphic (HGM) units within the following selected sites:

- Cottesmore Park
- The entire length of the Braamfonteinspruit
- Vorna Valley Wetland Area

The HGM represent wetland areas according to the Nation Wetland Classification System (SANBI, 2009). Identification and delineation of the wetlands was based on the procedure as set out in the “A practical field procedure for the delineation of wetlands and riparian areas” document, developed by Kotze and Marneweck (1990) and the Department of Water and Sanitation (2005). According to the assessment by Sazi Environmental, a channeled valley bottom wetland exist in the above mentioned areas.

The Present Ecological Status (PES), which is the health of the wetland or a measure of the change in the wetland`s form and function from a reference condition, usually set as pristine (City of Johannesburg Metropolitan Municipality, 2009). The PES was determined using the Wet-Health Tool developed by Macfarlane *et al.*, 2008. The Wet-Health Tool assesses the following four factors that influence the health or condition of the wetlands:

- Hydrology
- Geomorphology
- Vegetation, and
- Water quality

The water quality assessment of the study area has been discussed in section 4 of the baseline environmental situation, while the vegetation units of the selected sites are discussed in the above section. The hydrology and geomorphology of the proposed project area are as follows:

Cottesmore Park

Hydrology

The perennial stream that flows through the Cottesmore Park site forms a tributary of the Klein Jukskei drainage catchment. This catchment highly developed with dense urban development. This infers a large extent of hardened surfaces where surface runoff is increased during rainfall events and soil infiltration decreased. This puts pressure on the receiving streams as they cannot handle the increased volumes of water. Consequently bank erosion is experienced as in the case of Cottesmore Park unnamed perennial stream.

Geomorphology

Sedimentation processes in wetlands include erosion, deposition, and transport of sediments within and through the boundaries of the wetland (WRP Technical Note, 1994). Active erosion was observed on site. This is an environmental and safety concern as the erosion appears to quickly extend towards the residential development.

Present Ecological Status

Table 7-1: Present Ecological Status for the Cottesmore Park wetland

	Hydrology		Geomorphology		Vegetation	
	Impact Score	Change Score	Impact Score	Change Score	Impact Score	Change Score
Area weighted impact scores	7,0	-2,0	4,2	-2,0	6,4	-2,0
PES Category	E	↓↓	D	↓↓	E	↓↓
OVERALL IMPACT SCORE	6,0					
WETLAND PES	E (Seriously modified)					

Vorna Valley Wetland Area

Hydrology

This perennial stream forms a tributary of the Jukskei River. The main hydrological impact on the Kyalami priority site is the increased flows from stormwater discharges. Additional flows are estimated to be approximately equal to the natural situation. The natural water distribution and retention network has been compromised by the increased flows, with evidence of erosion on site.

Geomorphology

The site is underlain by the granite rock of the Halfway House Formation. The urban infrastructure around the channels have altered the morphology of the river system as the system tries to readjust with the changes in the environment.

Present Ecological Status

Table 7-2: Present Ecological Status for the Vorna Valley wetland system

	Hydrology		Geomorphology		Vegetation	
	Impact Score	Change Score	Impact Score	Change Score	Impact Score	Change Score
Area weighted impact scores	7	-2	2,4	-2	6,1	-2
PES Category	E	↓↓	C	↓↓	E	↓↓
OVERALL IMPACT SCORES	5,4					
PES SCORE	D (Largely modified)					

Bryanston Drive Site

Hydrology

The Braamfonteinspruit flows through the Bryanston suburbs, where the dominant land use consists of residential development. The river is still channeled at this point and flows through a park for hiking and bicycle trails (Braamfonteinspruit Trail). Domestic waste was

found on the river banks, including electronics. Waste water discharge point was observed, which presented with a pungent odour.

Geomorphology

The site is underlain by the granite rock of the Halfway House Formation. Bedrock was exposed in some sections of the river and no sediment depositional features were observed.

Craighall Park

Hydrology

Hurlingham site is located downstream of the Montgomery Park area. In addition to the upstream volumes received by this site, a number of stormwater drains were observed to discharge to this area. These increased flows have resulted to negative impacts on site including failure of a gabion structure and sustained continuous bank erosion.

Geomorphology

Similar to the Bryanston Drive, this site is underlain by the granite rock of the Halfway House Formation. Bedrock was exposed in some sections of the river and no sediment depositional features were observed.

Carel Venter Park (Greymont)

Hydrology

Due to the urban nature of the surrounding areas, stormwater runoff collects onto the river at high volumes and causes active erosion of the river banks. Attempts have been made in the past to stabilise the banks and slow down the velocity of runoff. It was observed on site that these efforts are currently failing with evidence of side-cutting of gabion structures, and collapse of a bridge. Alien invasive species were also abundant in this area.

Geomorphology

The site is underlain by shale and quartzite soil of the Hospital Hill Subgroup. The changes in hydrology due to additional water from discharge points (stormwater) changes the morphology of the system and sedimentation as erosion take place to downstream areas. Sedimentation around the collapse bridge due to increase volume of water upstream weakened the structure and thus structural failure. The lateral erosion and side cutting around the collapse structure have caused sediment loss in the system.

Present Ecological Status

Table 7-3: Present Ecological Status for the Braamfonteinspruit wetland system

	Hydrology		Geomorphology		Vegetation	
	Impact Score	Change Score	Impact Score	Change Score	Impact Score	Change Score
Area weighted impact scores	9,5	-2	3,6	-2	8,5	-2
PES Category	F	⇓	C	⇓	F	⇓
OVERALL IMPACT SCORES	7,5					
PES SCORE	E (Seriously modified)					

Roseacre

Hydrology

The water resource has been canalised in some areas, which compromises the flood attenuation function of the wetland. This is compounded by the stormwater discharges where additional flows appear to equal or exceed natural flows, with the evidence of erosion of river banks. The water quality improvement function has been compromised with illegal dumping, sewer discharge, and removal of wetland vegetation.

Geomorphology

Sediment has mostly been exported from site. The bed and sides of the wetland are poorly vegetated. Canalisation has also compromised the geomorphic integrity of the site.

Present Ecological Status

Table 7-4: Present Ecological Status for the Roseacre wetland

	Hydrology		Geomorphology		Vegetation	
	Impact Score	Change Score	Impact Score	Change Score	Impact Score	Change Score
Area weighted impact scores	9,5	-2	3,6	-2	8,5	-2
PES Category	F	⇓	C	⇓	F	⇓
OVERALL IMPACT SCORES	7,5					
PES SCORE	E (Seriously modified)					

Ecological Importance and Sensitivity (EIS)

The Ecological Importance and Sensitivity (EIS) of the wetlands was assessed using the Department of Water and Sanitation Reserve Tool, which is dependent on the results of the Wet-Health Tool, Field PES and variable gathered during site reconnaissance visit as well as desktop assessments. The EIS of a watercourse is an expression of its importance to the maintenance of ecological diversity and functioning on local and wider scale (City of Johannesburg Metropolitan Municipality, 2009). The EIS of the wetlands at the selected sites is as follows:

Vorna Valley Wetland Area

Table 7-5: Ecological Importance and Sensitivity for the Vorna Valley wetland system

SUMMARY	Score (0-4)	Confidence
		(1-5)
Ecological Importance and Sensitivity	1,3	5,0
Hydro-Functional Importance	1,0	5,0
Direct Human Benefits	0,0	5,0
Overall EIS Category	0,8	5,0
	LOW	

Cottesmore Park

Table 7-6: Ecological Importance and Sensitivity for the Cottesmore Park wetland area

SUMMARY	Score (0-4)	Confidence
		(1-5)
Ecological Importance and Sensitivity	0,6	4,8
Hydro-Functional Importance	0,5	5,0
Direct Human Benefits	0,0	4,2
Overall EIS Category	0,4	4,6
	LOW	

Braamfonteinspruit System

Table 7-7: Ecological Importance and Sensitivity for the Braamfonteinspruit wetland system

SUMMARY	Score (0-4)	Confidence
		(1-5)
Ecological Importance and Sensitivity	1,0	5,0
Hydro-Functional Importance	0,4	5,0
Direct Human Benefits	0,0	5,0
Overall EIS Category	0,5	5,0
	LOW	

Roseacre

Table 7-8: Ecological Importance and Sensitivity for the Roseacre wetland area

SUMMARY	Score (0-4)	Confidence
		(1-5)
Ecological Importance and Sensitivity	0,6	4,8
Hydro-Functional Importance	0,5	5,0
Direct Human Benefits	0,0	4,2
Overall EIS Category	0,4	4,6
	LOW	

According to the tabulation above, the PES or wetland health for Cottesmore Park, Roseacre, and the entire Braamfonteinspruit system has been classified as **Seriously Modified** (Category E), whilst the Vorna Valley wetland is classified as **Largely Modified** (Category D). The Ecological Importance and Sensitivity of all the wetland systems is **Low**. The following impacts contributing largely to the change in PES and EIS for these sites are stipulated below.

Cottesmore Park and Greymont

Cottesmore Park and the Carel Venter Park (Greymont) experience similar impacts. The impacts in these areas include:

- High velocities of urban runoff into the watercourse
- Alien vegetation infestation
- Stormwater discharge
- Riverbank erosion
- Informal river crossings (footpaths)
- Illegal dumping of waste
- Collapse and side-cutting of gabion
- Collapsed energy dissipation structures (weirs)

Vorna Valley Wetland Area

The impacts associated with this wetland area include:

- Heavy alien vegetation infestation
- Sewage runoff into the wetland area
- Erosion (sedimentation)
- High velocities of urban runoff into the river

Craighall Park

The following impacts influence the PES for the Craighall Park site:

- High velocities of urban runoff into the river due to stormwater canals in some section of the watercourse
- Heavy alien invasive vegetation infestation
- Riverbank erosion

Bryanston Drive

Impacts experienced at the Bryanston Drive site include:

- Riverbank erosion
- Alien invasive vegetation infestation
- Illegal dumping of waste
- High velocities of urban runoff into the watercourse

Roseacre

The following impacts exist at Roseacre:

- High velocities of urban runoff into the watercourse
- Alien vegetation infestation
- Stormwater discharge
- Riverbank erosion
- Illegal dumping of waste
- Raw sewage flowing into the stream

Refer to **Appendix B** for site photographic images showing the current status of the selected sites

Was a specialist consulted to assist with completing this section

YES X	NO
------------------------	-----------

If yes complete specialist details

Name of the specialist:

Ms. Nonkanyiso Zungu

Qualification(s) of the specialist:

MSc. Environmental Management, Pr. Sci. Nat. (Ecology)

Postal address:

B16 Lone Creek, Waterfall Office Park, 43 Montrose Street,
Vorna Valley, Midrand

Postal code:

1684

Telephone:

(+27) 11 312 4582

Cell:

(+27) 84 800 0187

E-mail:

nzungu@sazienviromental.co.za

Fax:

(+27) 11 312 7208

Are any further specialist studies recommended by the specialist?

YES	NO X
------------	-----------------------

If YES, specify:

--

If YES, is such a report(s) attached?

YES	NO
------------	-----------

If YES list the specialist reports attached below

--

Signature of specialist:



Date:

06 June 2016

Please note: If more than one specialist was consulted to assist with the filling in of this section then this table must be appropriately duplicated

8. LAND USE CHARACTER OF SURROUNDING AREA

Using the associated number of the relevant current land use or prominent feature from the table below, fill in the position of these land-uses in the vacant blocks below which represent a 500m radius around the site

1. Vacant land	2. River, stream, wetland	3. Nature conservation area	4. Public open space	5. Koppie or ridge
6. Dam or reservoir	7. Agriculture	8. Low density residential	9. Medium to high density residential	10. Informal residential
11. Old age home	12. Retail	13. Offices	14. Commercial & warehousing	15. Light industrial
16. Heavy industrial ^{AN}	17. Hospitality facility	18. Church	19. Education facilities	20. Sport facilities
21. Golf course/polo fields	22. Airport ^N	23. Train station or shunting yard ^N	24. Railway line ^N	25. Major road (4 lanes or more) ^N
26. Sewage treatment plant ^A	27. Landfill or waste treatment site ^A	28. Historical building	29. Graveyard	30. Archeological site
31. Open cast mine	32. Underground mine	33. Spoil heap or slimes dam ^A	34. Small Holdings	
Other land uses (describe):				

NOTE: Each block represents an area of 250m X 250m, if your proposed development is larger than this please use the appropriate number and orientation of hashed blocks

Vorna Valley Wetland Area

NORTH					
	9	9	9	2	
	9	9	9		9
WEST	9	9			9
				9	13
	9		9	9	13
	25	9	1	13	13
SOUTH					
EAST					

Cottesmore Park

NORTH						
	13	9	20	20	13	12
				9	9	
WEST	1		13	13	9	9
	15					
	25	2			2	2
				9	9	
	9		9	9	9	9
	18	9	9	9	9	9
SOUTH						
EAST						

			21		
--	--	--	----	--	--

SOUTH

Bryanston Drive Site

NORTH

	9	9	9	9	9	
	9	9	9	9	9	
WEST	9	9	12	9	9	
	9	9	9	9	9	EAST
	9	9	9	9	9	
			2	9		

SOUTH

Carel Venter Park (Greymont)

NORTH

	9	9	2	9	9	9	
	9	9	20	2	9	9	9
WEST	9	9	2	12	12	12	EAST
			2	9	9	9	
	9	9	2	9	9	9	
	9	9	2	9	9	9	

SOUTH

Greymont Site

NORTH

	2	9	9	9	4	9	
	9	1	1	9	9		EAST
WEST	9	9		9	29		
	9	9	9	9	29	29	
	9	9	9	9	9		
							SOUTH

Roseacre Site

								NORTH
	15	15	33	33	33			
	24	24	24	24	24			
	15	33	2	15	8	25	33	EAST
WEST	15	33		33	25	15		
	25	25	25	25	25	9		
	9	15	9	15	1			
	9	9	9	9	25	9		
								SOUTH

Note: More than one (1) Land-use may be indicated in a block

Please note: The Department may request specialist input/studies depending on the nature of the land use character of the area and potential impact(s) of the proposed activity/ies. Specialist reports that look at health & air quality and noise impacts may be required for any feature above and in particular those features marked with an "A" and with an "N" respectively.

Have specialist reports been attached

YES X	NO
-----------------	-----------

If yes indicate the type of reports below

City of Johannesburg Wetland Delineation and Assessment: Priority Wetland and Rehabilitation Sites: Braamfonteinspruit, Kyalami, and Natalspruit Water Management Units (Sazi Environmental Consulting, 2016). **Refer to Appendix F.**

9. SOCIO-ECONOMIC CONTEXT

Describe the existing social and economic characteristics of the area and the community condition as baseline information to assess the potential social, economic and community impacts.

The 2014/15 City of Johannesburg Integrated Development Plan (IDP) was used to discuss the socio-economic status of the city.

Socio-economic Development

Johannesburg is the economic powerhouse of South Africa and generates 17% of the country's gross domestic product, mostly through the manufacturing, retail and service industry sectors. With all the major banks and Africa's largest stock exchange (the Johannesburg Stock Exchange in Sandton) it is considered to be the seat of the financial sector in South Africa. According to the global ranking of "Most Expensive Cities of the World" of 2013 (by Mercer, the Swiss Bank UBS, the ECA International and the Intelligence Unit), City of Johannesburg is ranked number 154 making it relatively least expensive out of a total of 209 cities surveyed.

Employment

Johannesburg also continues to fight unemployment, which is one of the major problems facing South Africa as a whole. The overall city's unemployment is approximately 25%. Youth unemployment is of particular concern and is estimated to be around 32%. The finance sector is the biggest employer in the City accounting for 26.6% of total employment, followed by the trade sector which employs 21.1% of the formal sector workers. The agricultural sector employs the smallest share of the formal sector workers with only 0.4%.

Age Distribution and Population

The City's population is predominantly young, concentrated in the working age group between 20 years and 39 years. The City of Johannesburg had a population of 3,225,307 in 2001 and 4,434,827 in 2011. This implies a population growth rate of 37.5% between 2001 and 2011, while average population growth for Metro Municipalities in South Africa over the same period was 21.4%. The population of the City is currently projected to be 4,676,731 based on 3.1% growth rate per annum since 2011.

10. CULTURAL/HISTORICAL FEATURES

Please be advised that if section 38 of the National Heritage Resources Act 25 of 1999 is applicable to your proposal or alternatives, then you are requested to furnish this Department with written comment from the South African Heritage Resource Agency (SAHRA) – Attach comment in appropriate annexure

38. (1) Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as-

- (a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;
- (b) the construction of a bridge or similar structure exceeding 50m in length;
- (c) any development or other activity which will change the character of a site-
 - (i) exceeding 5 000 m2 in extent; or
 - (ii) involving three or more existing erven or subdivisions thereof; or
 - (iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or
 - (iv) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;
- (d) the re-zoning of a site exceeding 10 000 m2 in extent; or
- (e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.

Are there any signs of culturally (aesthetic, social, spiritual, environmental) or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including archaeological or palaeontological sites, on or close (within 20m) to the site?

If YES, explain:

YES	NO X
-----	---------

No sites of archaeological or cultural interest were identified at the selected sites. However, as a matter of precaution, should any further information confirm the existence of archaeological, cultural or palaeontological sites, steps will be taken to put measures in place for preservation thereof in line with the National Heritage Resources Act, 1999 (Act No. 25 of 1999). The South African Heritage Resources Agency will also be notified of such findings.

Furthermore, a heritage case will also be created in the SAHRA SAHRIS program for statutory comment of this Basic Assessment Report in terms of section 38(8) of the NHRA (1999).

If uncertain, the Department may request that specialist input be provided to establish whether there is such a feature(s) present on or close to the site.

Briefly explain the findings of the specialist if one was already appointed:

Will any building or structure older than 60 years be affected in any way?

YES	NO X
YES	NO X

Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?

If yes, please attached the comments from SAHRA in the appropriate Appendix

SECTION C: PUBLIC PARTICIPATION (SECTION 41)

1. The Environmental Assessment Practitioner must conduct public participation process in accordance with the requirement of the EIA Regulations, 2014.

2. LOCAL AUTHORITY PARTICIPATION

Local authorities are key interested and affected parties in each application and no decision on any application will be made before the relevant local authority is provided with the opportunity to give input. The planning and the environmental sections of the local authority must be informed of the application at least thirty (30) calendar days before the submission of the application to the competent authority.

Was the draft report submitted to the local authority for comment?

YES	NO
X	

If yes, has any comments been received from the local authority?

YES	NO
	X

If "YES", briefly describe the comment below (also attach any correspondence to and from the local authority to this application):

--

If "NO" briefly explain why no comments have been received or why the report was not submitted if that is the case.

No comments from interested and affected parties have been received to date. This Draft Basic Assessment Report (BAR) will be available for public review and comment from the 10 th of June 2016 to the 13 th of July 2016. Comments from I and APs will be incorporated in the Final Basic Assessment Report.

3. CONSULTATION WITH OTHER STAKEHOLDERS

Any stakeholder that has a direct interest in the activity, site or property, such as servitude holders and service providers, should be informed of the application at least **thirty (30) calendar days** before the submission of the application and be provided with the opportunity to comment.

Has any comment been received from stakeholders?

YES	NO
	X

If "YES", briefly describe the feedback below (also attach copies of any correspondence to and from the stakeholders to this application):

--

If "NO" briefly explain why no comments have been received

No comments from interested and affected parties have been received to date. This Draft Basic Assessment Report (BAR) will be available for public review and comment from the 10 th of June 2016 to the 13 th of July 2016. Comments from I and APs will be incorporated in the Final Basic Assessment Report.

4. GENERAL PUBLIC PARTICIPATION REQUIREMENTS

The Environmental Assessment Practitioner must ensure that the public participation process is adequate and must determine whether a public meeting or any other additional measure is appropriate or not based on the particular nature of each case. Special attention should be given to the involvement of local community structures such as Ward Committees and ratepayers associations. Please note that public concerns that emerge at a later stage that should have been addressed may cause the competent authority to withdraw any authorisation it may have issued if it becomes apparent that the public participation process was flawed.

The EAP must record all comments and respond to each comment of the public / interested and affected party before the application report is submitted. The comments and responses must be captured in a Comments and Responses Report as prescribed in the regulations and be attached to this application.

5. APPENDICES FOR PUBLIC PARTICIPATION

All public participation information is to be attached in the appropriate Appendix. The information in this Appendix is to be ordered as detailed below

Appendix 1 – Proof of site notice

Appendix 2 – Written notices issued as required in terms of the regulations

Appendix 3 – Proof of newspaper advertisements

Appendix 4 – Communications to and from interested and affected parties

Appendix 5 – Minutes of any public and/or stakeholder meetings

Appendix 6 - Comments and Responses Report

Appendix 7 –Comments from I&APs on Basic Assessment (BA) Report

Appendix 8 –Comments from I&APs on amendments to the BA Report

Appendix 9 – Copy of the register of I&APs

Appendix E.1- E.9

SECTION D: RESOURCE USE AND PROCESS DETAILS

Note: Section D is to be completed for the proposal and alternative(s) (if necessary)

Instructions for completion of Section D for alternatives

- 1) For each alternative under investigation, where such alternatives will have different resource and process details (e.g. technology alternative), the entire Section D needs to be completed
- 4) Each alternative needs to be clearly indicated in the box below
- 5) Attach the above documents in a chronological order

Section D has been duplicated for alternatives
when appropriate)

N/A

times

(complete only)

Section D Alternative No.

N/A

(complete only when appropriate for above)

1. WASTE, EFFLUENT, AND EMISSION MANAGEMENT

Solid waste management

Will the activity produce solid construction waste during the construction/initiation phase?

YES X	NO
Less than 50 m ³ (Estimated)	

If yes, what estimated quantity will be produced per month?

How will the construction solid waste be disposed of (describe)?

There is evidence of illegal dumping sites in some of the selected sites within the WMU such as the Cottessmore Park. The construction or operational phase of the riverine rehabilitation or remedial works will involve removal of existing waste such as papers, plastics, glass bottles, food waste, scrap metals, cement material from the collapsed bridges and sewage outfalls will be collected by a contractor (Pikitung) and disposed of at a licensed disposal site such as the Interwaste Environmental Solution's FG Landfill Site located in Olifantsfontein, Tembisa, Gauteng Province.

Soils that have been contaminated with hydrocarbons (oils, grease, diesel, and petrol) due to spillages or leakages at the construction site will be removed, stored in containers for disposal to an off-site authorised hazardous waste facility such as the Holfontein hazardous waste site. Furthermore, the following actions will be undertaken:

- The contractor will develop and implement a comprehensive system (colour-coded bin waste separation system) for waste separation and recycling at source before removal to the landfill sites
- Safe disposal certificates on waste produced and removed from the selected sites will be kept for inspection and made available to regulatory bodies when required.

Topsoil removed along the riverbanks during remedial works will be stockpiled separately at an appropriate height and reused for slope stabilization.

Where will the construction solid waste be disposed of (describe)?

All domestic, commercial, industrial waste, rubble and other waste classified as General Waste under the South African Minimum Requirements for Waste Disposal by Landfill (DWS, 1998) will be removed from the site by an appropriately licensed waste removal contractor and disposed of at a licensed general waste facility. The FG Landfill Site is located in corner Olifantsfontein road and R562 main road in Tembisa, Gauteng Province. This facility is operated by Interwaste Environmental Solutions with Pikitup as the City of Johannesburg waste management contractor.

Recyclable Waste:

Provision for recycling of waste will be considered and all recyclable waste material will be disposed of at the Pikitup`s two Rabie Ridge facilities, namey Falcon Street Garden Site and Spreeu Street Garden Site. These facilities recycle plastics, glasses, papers, scrap metals, cardboard boxes, tins and cans.

Will the activity produce solid waste during its operational phase?

YES X	NO
Less than 50 m ³ (estimated)	

If yes, what estimated quantity will be produced per month?

How will the solid waste be disposed of (describe)?

Existing municipal waste collection services which remove solid waste material from community parks (open spaces) within the vicinity of the selected sites should be considered. Removal will be on a regular basis to the nearest landfill sites within the area of jurisdiction of the City of Johannesburg Metropolitan Municipality. Moreover, colour-coded waste bins as shown in the figure below will be provided at the sites during construction or operational phase for waste separation/sorting.



Figure 0-1: Proposed Waste Separation on site

Has the municipality or relevant service provider confirmed that sufficient air space exists for treating/disposing of the solid waste to be generated by this activity?

YES	NO X
-----	---------

Where will the solid waste be disposed if it does not feed into a municipal waste stream (describe)?

Not applicable

Note: If the solid waste (construction or operational phases) will not be disposed of in a registered landfill site or be taken up in a municipal waste stream, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

Can any part of the solid waste be classified as hazardous in terms of the relevant legislation?

YES	NO X
-----	---------

If yes, inform the competent authority and request a change to an application for scoping and EIA.

Is the activity that is being applied for a solid waste handling or treatment facility?

YES	NO X
-----	---------

If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

Describe the measures, if any, that will be taken to ensure the optimal reuse or recycling of materials:

Waste Separation and Handling
General domestic wastes at the selected sites will be disposed of through a colour coded bin system for different types of waste material. Domestic waste and scrap metals will be collected in rubbish bins.

Recycling
Provision for recycling of waste will be considered and all recyclable waste material will be disposed of at the Pikitup's two Rabie Ridge facilities, namey Falcon Street Garden Site and Spreu Street Garden Site. These facilities recycle plastics, glasses, papers, scrap metals, cardboard boxes, tins and cans.

Liquid effluent (other than domestic sewage)

Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system?

YES	NO X
m ³	

If yes, what estimated quantity will be produced per month?

If yes, has the municipality confirmed that sufficient capacity exist for treating / disposing of the liquid effluent to be generated by this activity(ies)?

YES	NO
-----	----

Will the activity produce any effluent that will be treated and/or disposed of on site?

Yes	NO X
m ³	

If yes, what estimated quantity will be produced per month?

If yes describe the nature of the effluent and how it will be disposed.

Not applicable

Note that if effluent is to be treated or disposed on site the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA

Will the activity produce effluent that will be treated and/or disposed of at another facility?

YES	NO X
-----	---------

If yes, provide the particulars of the facility:

Facility name:			
Contact person:			
Postal address:			
Postal code:			
Telephone:		Cell:	
E-mail:		Fax:	

Describe the measures that will be taken to ensure the optimal reuse or recycling of waste water, if any:

Not applicable

Liquid effluent (domestic sewage)

Will the activity produce domestic effluent that will be disposed of in a municipal sewage system?

YES	NO X
-----	---------

If yes, what estimated quantity will be produced per month?

If yes, has the municipality confirmed that sufficient capacity exist for treating / disposing of the domestic effluent to be generated by this activity(ies)?

m ³	
YES	NO

Will the activity produce any effluent that will be treated and/or disposed of on site?

YES	NO
-----	----

If yes describe how it will be treated and disposed off.

Not applicable

Emissions into the atmosphere

Will the activity release emissions into the atmosphere?

YES	NO X
-----	---------

If yes, is it controlled by any legislation of any sphere of government?

YES	NO
-----	----

If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

If no, describe the emissions in terms of type and concentration:

Not applicable

2. WATER USE

Indicate the source(s) of water that will be used for the activity

Municipal X	Directly from water board	groundwater	river, stream, dam or lake	other	the activity will not use water
----------------	---------------------------------	-------------	-------------------------------	-------	------------------------------------

If water is to be extracted from groundwater, river, stream, dam, lake or any other natural feature, please indicate the volume that will be extracted per month:

liters

If Yes, please attach proof of assurance of water supply, e.g. yield of borehole, in the appropriate Appendix

Does the activity require a water use permit from the Department of Water Affairs?

YES X	NO
----------	----

If yes, list the permits required

The proposed development or remedial works entails working within the floodline or the watercourse and as such requires water use authorisation in terms 40 of the National Water Act, 1996 (Act No. 36 of 1998) for the following identified section 21 water use activities. Water Use Licence Application will be submitted to the Department of Water and Sanitation (DWS) North West Regional Office.

Section 21 of NWA, 1998 (Act No. 36 of 1998)

Section 21 (c)- Impeding or diverting the flow of water in a watercourse

Section 21 (i)- Altering the bed, banks, course or characteristics of a watercourse

Water use technical forms DW763 and DW768 for section 21 (c) and (i) water use activities have been included in the application for a water use licence.

If yes, have you applied for the water use permit(s)?

YES X	NO
----------	----

If yes, have you received approval(s)? (attached in appropriate appendix)

YES	NO X
-----	---------

3. POWER SUPPLY

Please indicate the source of power supply eg. Municipality / Eskom / Renewable energy source

Diesel generators will be used during the construction or operational phase of

the remedial works.

All open spaces will be provided with lighting for the safety of all citizen of the City of Johannesburg. The lights will be powered with electricity sourced from Eskom or Municipality.

If power supply is not available, where will power be sourced from?

Not applicable

4. ENERGY EFFICIENCY

Describe the design measures, if any, that have been taken to ensure that the activity is energy efficient:

Low energy LED lighting will be used in the open spaces and servitudes such as pedestrian pathways and river crossings.

Describe how alternative energy sources have been taken into account or been built into the design of the activity, if any:

Not applicable

SECTION E: IMPACT ASSESSMENT

The assessment of impacts must adhere to the minimum requirements in the EIA Regulations, 2014, and should take applicable official guidelines into account. The issues raised by interested and affected parties should also be addressed in the assessment of impacts as well as the impacts of not implementing the activity (Section 24(4)(b)(i)).

1. ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

Summarise the issues raised by interested and affected parties.

No issues or comments have been raised by interested and affected parties date. This Draft Basic Assessment Report (BAR) will be available for public review and comment from the 10th of June 2016 to the 13th of July 2016. Comments, issues, and suggestions from I and APs will be incorporated in the Final Basic Assessment Report.

Summary of response from the practitioner to the issues raised by the interested and affected parties (including the manner in which the public comments are incorporated or why they were not included)

(A full response must be provided in the Comments and Response Report that must be attached to this report):

No issues or comments have been raised by interested and affected parties to date. This Draft Basic Assessment Report (BAR) will be available for public review and comment from the 10th of June 2016 to the 13th of July 2016. Comments, issues, and suggestions from I and APs will be incorporated in the Final Basic Assessment Report.

2. IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION AND OPERATIONAL PHASE

Briefly describe the methodology utilised in the rating of significance of impacts

The impacts anticipated to occur as a result of the proposed development are assessed/ evaluated to determine their significance. The following assessment criteria are used:

Extent (how far the impact extends):

- **(1) Very low:** within the site only
- **(2) Low:** within the local neighbourhoods
- **(3) Medium:** within the region
- **(4) High:** Nationally
- **(5) Very high:** Internationally

Duration (the timeframe over which the effects of the impact will be felt):

- **Very short:** 0-2 years
- **Short:** 2-5 years
- **Medium:** 5-15 years
- **Long:** >15 years
- **(5) Permanent**

Magnitude (the severity or size of the impact):

- **(0) None**
- **(2) Minor**
- **(4) Low**
- **(6) Moderate**
- **(8) High**
- **(10) Very High**

Probability (the likelihood of the impact actually occurring):

- **(1) Very improbable:** Less than 20% sure of the likelihood of an impact occurring
- **(2) Improbable:** 20-40% sure of the likelihood of an impact occurring
- **(3) Probable:** 40-60% sure of the likelihood of an impact occurring
- **(4) Highly probable:** 60-80% sure of the likelihood of that impact occurring
- **(5) Definite:** More than 80% sure of the likelihood of that impact occurring

The significance of the potential visual impact is determined by the sum of the individual scores for extent, duration and magnitude multiplied by the probability of the impact occurring i.e. **significance = (extent + duration + magnitude) x probability**.

The significance rating scale is interpreted as follows:

- **(2-12) Negligible:** Impact would be of a very low order. In the case of negative impacts, almost no mitigation and or remedial activity would be needed, and any minor steps, which might be needed, would be easy, cheap, and simple. In the case of positive impacts, alternative means would almost all likely be better, in one or a number of ways, than this means of achieving the benefit.
- **(13-30) Low:** Impact would be of a low order and with little real effect. In the case of negative impacts, mitigation and / or remedial activity would be either easily achieved or little would be required, or both. In case of positive impacts alternative means for achieving this benefit would likely be easier, cheaper, more effective, less time-consuming, or some combination of these.
- **(31-56) Moderate:** Impact would be real but not substantial. In the case of negative impacts, mitigation and / or remedial activity would be both feasible and fairly easily possible. In the case of positive impacts, other means of achieving these benefits would be about equal in time, cost, and effort.
- **(57-90) High:** Impacts of a substantial order. In the case of negative impacts, mitigation and / or remedial activity would be feasible but difficult, expensive, time-consuming or some combination of these. In the case of positive impacts, other means of achieving this benefit would be feasible, but these

would be more difficult, expensive, time-consuming or some combination of these.

- **(91-100) Very High:** Of the highest order possible. In the case of negative impacts, there would be no possible mitigation and / or remedial activity and in the case of positive impacts, there is no real alternative to achieving the benefit.

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 construction phase for the various alternatives of the proposed development. This must include an assessment of the significance of all impacts.

Proposal

Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation:	Risk of the impact and mitigation not being implemented
Groundwater				
(a) Pollution and contamination of ground water due to: <ul style="list-style-type: none"> ▪ Hydrocarbon (petrol, diesel, oil, grease) leaks and spills ▪ Unmanaged sewage leaks and spills 	33 M	<ul style="list-style-type: none"> ▪ Hydrocarbon leaks and spillages must be minimized ▪ Sewage outfall/ pipelines must be inspected for leaks and maintained regularly ▪ Construction related wastes (solid and hazardous) must be collected regularly from the site and disposed of at an appropriate registered landfill site ▪ Construction machinery and vehicle should be kept in good condition and maintained regularly 	16 L	

Surface Water

<p>(a) Disturbance to the hydrological and ecological function of the wetlands and rivers or streams</p> <ul style="list-style-type: none"> ▪ Loss of wetland habitat due to construction activities ▪ Uncontrolled discharge into the watercourse (stormwater) ▪ Removal of stabilizing vegetation ▪ Impact on the wetland state and functionality due to transformation of the wetland habitat as a result of construction activities ▪ Increase of alien invasive trees and plants infestation ▪ Sedimentation and siltation from erosion ▪ Removal of topsoil along the riverbanks for slope stabilization <p>(b) Construction of pedestrian bridges over the wetlands or rivers/streams</p> <p>(c) Pollution and contamination of surface water due to:</p> <ul style="list-style-type: none"> ▪ Hydrocarbon leaks and spills ▪ Litter and other construction waste ▪ Unmanaged runoff of cement into rivers/streams and wetlands 	<p>48 M</p>	<ul style="list-style-type: none"> ▪ Avoid unnecessary encroachment on unplanned area ▪ Construction machinery is prohibited from the wetland areas ▪ No cement batching or any other similar activities must be conducted within 50 m of the watercourse and wetland boundary ▪ Stockpiling of excavated or other material must occur no closer than 50 m to the boundary of the watercourse and wetland ▪ Construction machinery and vehicle should be kept in good condition and maintained regularly ▪ Hydrocarbon leaks and spillages must be minimized ▪ Stormwater management must be practiced on the construction site ▪ Construction related wastes 	<p>30 L</p>	
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		<p>(solid and hazardous) must be collected regularly from the site and disposed of at an appropriate registered landfill site</p> <ul style="list-style-type: none">▪ Alien invasive species eradication must be practiced▪ The construction site must be fenced off with barricade tape that will serve as access control		
Soil				

<p>(a) Soil contamination and pollution due to:</p> <ul style="list-style-type: none"> ▪ Unmanaged surface runoff (cement) ▪ Hydrocarbon leaks and spills ▪ Litter and other construction waste ▪ Unmanaged sewage leaks and spills <p>(b) Soil erosion due to the removal of stabilizing vegetation</p> <ul style="list-style-type: none"> ▪ Disturbance of sensitive wetland soils ▪ Removal of topsoil along the riverbanks for slope stabilization <p>(c) Soil compaction by movement of construction vehicles and equipment</p> <ul style="list-style-type: none"> ▪ Decrease in water infiltration and increase in surface runoff in construction areas 	<p>36 M</p>	<ul style="list-style-type: none"> ▪ Topsoil removed along the riverbanks during remedial works must be stockpiled separately at an appropriate height and reused for slope stabilization ▪ Construction related wastes (solid and hazardous) must be collected regularly from the site and disposed of at an appropriate registered landfill site ▪ Construction machinery and vehicle should be kept in good condition and maintained regularly ▪ Hydrocarbon leaks and spillages must be minimized ▪ Attend hydrocarbon spillages instantly- absorbents ▪ Sewage outfall/pipelines must be inspected for 	<p>21 L</p>	
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		<p>leaks and maintained regularly</p> <ul style="list-style-type: none"> ▪ Re-vegetate all disturbed areas within construction site 		
Heritage/Archeological Resources				
There are no heritage or archeological resources identified at the selected sites. Therefore no heritage impacts have been identified.	N/A	It is recommended that should there be any heritage artefacts or features uncovered during the construction phase, the South African Heritage Resources Agency (SAHRA) will be contacted.	N/A	
Air Quality				
(a) Generation of dust and gaseous emissions from movement of construction machinery, equipment and vehicles	24 L	<ul style="list-style-type: none"> ▪ Dust suppression will be conducted as and when required to minimize the use of water 	18 L	

		<ul style="list-style-type: none"> ▪ All operations vehicle will be kept in good conditions, maintained, and fitted with modern exhaust systems. ▪ Speed limit will be established and enforced 		
Biodiversity (Flora)				
<p>(a) Loss of Egoli Granite Grassland and the Soweto Highveld Grassland vegetation, all classified as Endangered due to:</p> <ul style="list-style-type: none"> ▪ General construction activities and movement of vehicles ▪ Site clearance during construction (weirs, cascades, attenuation ponds, and slope stabilization) <p>(b) Disturbance of sensitive environments, especially wetland vegetation habitat due to:</p> <ul style="list-style-type: none"> ▪ General construction activities and movement of vehicles ▪ Site clearance during construction (weirs, cascades, attenuation ponds, and slope stabilization) ▪ Hydrocarbon spillages and leakages ▪ Littering ▪ Unmanaged sewage leaks and spillages <p>(c) Increase in alien</p>	48 M	<ul style="list-style-type: none"> ▪ All stockpiles, construction vehicles, equipment, and machinery should be situated away from sensitive biodiversity areas (wetlands and site natural vegetation) ▪ Disturbance of vegetation must be limited only to areas of construction ▪ Prevent contamination of natural grassland and/or wetlands activities or any source of pollution ▪ Construction machinery and vehicle should be kept in good condition and maintained regularly ▪ Hydrocarbon leaks and spillages must be 	27 L	

<p>vegetation infestation in disturbed areas due to the construction activities</p>		<p>minimized</p> <ul style="list-style-type: none"> ▪ Attend hydrocarbon spillages instantly-absorbents ▪ Sewage outfall/pipelines must be inspected for leaks and maintained regularly ▪ Topsoil removed along the riverbanks during remedial works must be stockpiled separately at an appropriate height and reused for slope stabilization ▪ Develop veld fire management plan ▪ Avoid unnecessary encroachment on unplanned area ▪ Construction machinery is prohibited from the wetland areas ▪ No cement batching or any other similar activities must be conducted within 50 m of the watercourse 		
Biodiversity (Fauna)				
(a) Loss of faunal habitat and biodiversity during	40 M	<ul style="list-style-type: none"> ▪ Site activities will be conducted 	24 L	

<p>construction</p> <p>(b) Contamination of sensitive areas such as wetland habitat and limitation on faunal migratory connectivity</p> <p>(c) Changes to the faunal community due to habitat loss and transformation</p>		<p>during day time hours</p> <ul style="list-style-type: none"> ▪ It must be ensured that none of the construction activities influence the natural faunal habitats of the sites ▪ Demarcate all sensitive faunal habitat areas and ensure that these areas are off-limits to construction vehicles and all personnel ▪ Ensure fire breaks on the property are in compliance with the South African National Veld and Forest Fire Act (Act no. 101, 1998) ▪ Avoid unnecessary encroachment on unplanned area ▪ Develop veld fire management plan 		
Socio-economics				
<p>(a) Creation of short-term employment, skills opportunities, and business opportunities (Positive Impact)</p> <p>(b) Increase in social problems for the</p>	24 L	<ul style="list-style-type: none"> ▪ No camping or accommodation at the sites will be provided and allowed for the contractor and other workers 	16 L	

community: <ul style="list-style-type: none"> ▪ An increase in crime levels 		<ul style="list-style-type: none"> ▪ The construction site must be fenced off with barricade tape that will serve as access control ▪ Site activities will be conducted during day time hours ▪ Security will be provided for at the sites ▪ Keeping in contact will all interested and affected parties 		
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Alternative 1

(REPEAT THIS TABLE FOR EACH ALTERNATIVE)

Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation:	Risk of the impact and mitigation not being implemented

No Go

Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation:	Risk of the impact and mitigation not being implemented

List any specialist reports that were used to fill in the above tables. Such reports are to be attached in the appropriate Appendix.

City of Johannesburg Wetland Delineation and Assessment: Priority Wetland and Rehabilitation Sites: Braamfonteinspruit, Kyalami, and Natalspruit Water Management Units (Sazi Environmental Consulting, 2016). **Refer to Appendix F.**

Describe any gaps in knowledge or assumptions made in the assessment of the environment and the impacts associated with the proposed development.

The following assumptions have been made:

The rehabilitation of the selected sites can only be achieved when undertaken via an integrated rehabilitation plan such as flood attenuation and energy dissipation of rivers or streams in privately owned property such as golf courses before reaching the watercourse. Addressing poor infrastructure such as sewage outfalls/pipelines and proper stormwater management can assist enhancing the health (Present Ecological Status) and ecological functions of the wetlands and stream or rivers.

3. IMPACTS THAT MAY RESULT FROM THE DECOMMISSIONING AND CLOSURE PHASE

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 decommissioning and closure phase for the various alternatives of the proposed development. This must include an assessment of the significance of all impacts.

The proposed project entails riverine remedial works. It is not foreseen that the proposed development would reach a decommissioning and closure phase due to the type of development. Impacts associated with the decommissioning phase were therefore not assessed.

Proposal

Potential impacts:	Significance rating of impacts(positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation:	Risk of the impact and mitigation not being implemented

Alternative 1

Potential impacts:	Significance rating of impacts(positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation:	Risk of the impact and mitigation not being implemented

Alternative 2

Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation:	Risk of the impact and mitigation not being implemented

List any specialist reports that were used to fill in the above tables. Such reports are to be attached in the appropriate Appendix.

Not Applicable

Where applicable indicate the detailed financial provisions for rehabilitation, closure and ongoing post decommissioning management for the negative environmental impacts.

Not applicable

4. CUMULATIVE IMPACTS

Describe potential impacts that, on their own may not be significant, but is significant when added to the impact of other activities or existing impacts in the environment. Substantiate response:

Cumulative impacts can result from actions which may not be significant on their own, but which are significant when added to the impacts of other similar actions. The anticipated cumulative impacts of this development includes the following:

Negative impacts:

Surface water pollution

- Construction works may result in exposed soil surfaces which may be prone to erosion (sedimentation and siltation)
- Spillages of oil and fuels from construction vehicles and machinery have the potential to contaminate the soil and rivers or stream
- Alien plant species infestation due to disturbed land surfaces

Social

- Cumulative increase in the number and frequency of vehicles (construction vehicles and machinery) and the resultant dust generation, noise, and safety impacts for other road users and the residents of the local communities during construction phase (remedial works) of this proposed project.

Biodiversity

- Should the area be poorly rehabilitated, this may result in a cumulative loss of the **Egoli Granite Grassland** vegetation and the **Soweto Highveld Grassland** vegetation, all classified as Endangered.

Positive impacts:

- Improved water quality throughout the water management units or catchments. This is depended not only with the proposed remedial works, however, improved maintenance of municipal infrastructure such as sewage outfall and other services such as waste collection in the WMUs.
- Community upliftment, employment opportunities, and an opportunity to

increase the skills level in the area.

- Improve Present Ecological Status (PES) or wetland health of the hydro-geomorphic units (HGM).
- Reduced risk of flooding and erosion
- Enhanced growth of both the **Egoli Granite Grassland** vegetation and the **Soweto Highveld Grassland** vegetation which thereby provide provision for faunal habitats
- Increase fauna migration

5. ENVIRONMENTAL IMPACT STATEMENT

Taking the assessment of potential impacts into account, please provide an environmental impact statement that sums up the impact that the proposal and its alternatives may have on the environment after the management and mitigation of impacts have been taken into account with specific reference to types of impact, duration of impacts, likelihood of potential impacts actually occurring and the significance of impacts.

Proposal

The proposed alternative falls within both the Egoli Granite Grassland and Soweto Highveld Grassland vegetation types, all classified as Endangered. The selected sites are characterised as Critical Biodiversity Areas (CBA) in terms of the Gauteng Conservation Plan (Gauteng C-Plan v3.3) (March, 2014).

No heritage or archaeological artefacts or features were identified at the selected sites.

All the selected sites have low agricultural potential and are susceptible to erosion.

According to the wetland delineation and assessment report undertaken by Sazi Environmental (2016), three hydro-geomorphic units were identified and classified as channelled valley bottom wetlands. The Present Ecological Status (PES) or wetland health of both Cottessmore and Greymont sites have been classified as **Seriously Modified** (Category E), whilst the Vorna Valley wetland is classified as **Largely Modified** (Category D). The Ecological Importance and Sensitivity (EIS) values of these HGM range between **low to Moderate**.

Environmental Impact Statement:

The proposed remedial works during construction phase will result in a number of negative impacts to the rivers and sensitive riparian vegetation. However, should the proposed mitigation measures be appropriately implemented (together with the Environmental Management Programme (EMP), the resultant impacts will have low

significant rating.

Operational phase impacts are anticipated to be positive provided that sewage leakages/spillages, stormwater runoff, as well as illegal dumping of wastes are managed.

The potential positive impacts of the proposed remedial works include the following:

- Improved water quality
- Enhanced ecological function of the wetlands
- Reduce land erosion (siltation and sedimentation)
- Creation and improvement of faunal habitat
- Increased faunal migration
- Improved overall visual quality of the selected sites
- Reduced flood risk (flow energy dissipation through weirs and attenuation ponds)
- Removal and reduced spreading of alien plant species infestation
- Centralised and easily accessible waste collection points
- Public safety
- Employment opportunities and skills transfer
- Improve health of the wetlands and ecological importance
- Proper and safe pedestrian bridge crossings over the watercourse
- Revived and increase growth of the natural vegetation (**Egoli Granite Grassland** and the **Soweto Highveld Grassland** vegetation types)

It is not foreseen that the proposed development would reach a decommissioning and closure phase due to the type of development. Impacts associated with the decommissioning phase were therefore not assessed.

Alternative 1

Not applicable

Alternative 2

Not applicable

No-go (compulsory)

No-go alternative implies that the proposed riverine rehabilitation works for the selected sites within the Kyalami, Braamfonteinspruit, and Natalspruit WMUs will not take place. This implies that land use change and development will continue within the WMUs, however, sustainability of the rivers and sensitive riparian areas will not be adequately achieved. Furthermore, it should be noted that the following positive impacts (discussed above) will not be realized:

- Improved water quality
- Enhanced ecological function of the wetlands
- Reduce land erosion (siltation and sedimentation)
- Creation and improvement of faunal habitat
- Increased faunal migration
- Improved overall visual quality of the selected sites
- Reduced flood risk
- Removal and reduced spreading of alien plant species infestation
- Centralised and easily accessible waste collection points
- Public safety
- Employment opportunities and skills transfer
- Improve health of the wetlands and ecological importance
- Proper and safe pedestrian bridge crossings over the watercourse
- Revived and increase growth of the natural vegetation (**Egoli Granite Grassland** and the **Soweto Highveld Grassland** vegetation types)

6. IMPACT SUMMARY OF THE PROPOSAL OR PREFERRED ALTERNATIVE

For proposal:

Overall, the construction impacts, if effectively mitigated according to the measures outlined in this BAR and EMPr, will be of **low** significance. The full assessment of significance in terms of extent, magnitude, duration and likelihood may be found in **Appendix I**. The most significant of these short-term impacts relate to biodiversity, surface water, and soil.

It is not foreseen that the proposed development would reach a decommissioning and closure phase due to the type of development. Impacts associated with the decommissioning phase were therefore not assessed.

In light of the above, it is concluded that the potential positive impacts and benefits of the project far outweigh any negative impacts that could result. In this respect, it is recommended that the proposal or preferred alternative be supported on condition that mitigation as recommended in the wetland specialist study and summarized in the EMPr is followed throughout the project lifecycle.

Lack of municipal services i.e. waste collection (resulting in dumping in open space) and lack of maintenance of municipal infrastructure be addressed in the areas surrounding the site prior to the commencement of rehabilitation works.

For alternative:

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Having assessed the significance of impacts of the proposal and alternative(s), please provide an overall summary and reasons for selecting the proposal or preferred alternative.

7. SPATIAL DEVELOPMENT TOOLS

Indicate the application of any spatial development tool protocols on the proposed development and the outcome thereof.

The Spatial Development Framework (SDF)

The City of Johannesburg Spatial Development Framework (SDF) is a key legislative mechanism and integral component of the IDP providing a citywide perspective of spatial challenges and interventions. The SDF and associated Regional Spatial Development Frameworks (RSDFs) seek to guide, direct and facilitate both public and private development, investment and growth within the City in a manner that will expand opportunities and contribute towards the visible upliftment of all communities in the City (City of Johannesburg, Spatial Development Framework, 2010-2011). As such the City of Johannesburg SDF suggests the following undertakings:

- Set-aside land for social amenity / open space as an integral component of any development proposal;
- Emphasis on public space i.e. pedestrian environment, public parks and facilities;
- An interconnected system of green open spaces supporting viable ecological systems;
- Protect wetland systems, riparian zones, and key natural drainage areas;
- Protect priority habitats and biodiversity areas;
- Pedestrian movement should be dominant within the design of open spaces; and
- Establish a network of open spaces that contribute to social and environmental opportunities.

The Johannesburg Metropolitan Open Space System (JMOSS)

The City of Johannesburg Environmental Planning and Management Department together Johannesburg City Parks appointed Strategic Environmental Focus to develop the Johannesburg Metropolitan Open Space System (2002). The Johannesburg Metropolitan Open Space System (JMOSS) lays the foundation of an interconnected and managed network of open spaces supporting interactions between social, economic and ecological activities, sustaining and enhancing both ecological processes and human settlements.

The objectives of JMOSS are important considerations for spatial planning processes to ensure sustainable development. JMOSS suggests that such inter-connected open spaces should have the following qualities:

- Enhance ecological diversity by providing habitats for the City's fauna and flora;
- Minimize storm-water run-off and therefore help to protect the City's rivers and streams;
- Be located throughout a community for all residents to access;
- Be able to meet local or regional needs;
- Be ecologically productive by exploring the potential of the site to improve the microclimate, air and water quality, recharge the groundwater regime, prevent flooding and reduce the impact of stormwater run-off, and to increase biological diversity;
- Provide opportunity for environmental education, which will increase an understanding of the biophysical systems that influence the city;
- Provide concrete opportunity for urban agriculture such as food gardens, woodlots, medicinal plant materials, handcraft projects, agriculture, rabbit farming etc.
- Suitable for use by multiple generations and differing cultures; and
- Safely accessible for individuals of various physical and cognitive abilities.

Community Open Space Policy

According to the Community Open Space Policy (2000), quality open spaces should be:

Equitable/Accessible:

Every neighbourhood should have open spaces that are:

- inviting and accommodating;
- located throughout a community for all residents to access
- able to meet local or regional needs
- accessible
- suitable for use by multiple generations and differing cultures
- safely accessible for individuals of various physical and cognitive abilities

Safe:

Open spaces should not only be structured physically for safety, but perceived as havens for people of all backgrounds and abilities. Open spaces should not be centres of criminal activity.

Diverse:

All community residents and visitors should be able to access a variety of open spaces that support diverse uses. Open spaces should support a variety of uses and purposes and

accommodate diverse user groups and thus have different sizes. Open space designs must be adaptable over time to meet changing local and regional needs, without diminishing the experience of a coherent and unified space.

Connected:

A network of spaces enhances other public places and civic amenities. Communities and regions that have networks of open spaces provides greater opportunities and more diverse experiences. Connected spaces enhance ecological diversity and functions.

Ecological:

Open spaces provide environmental benefits at multiple scales. Open spaces provide habitats, minimize storm water runoff, infiltrate groundwater and offer the community the opportunity to connect with nature.

Engaging:

Open spaces promote cultural understanding, interpret environmental and cultural identities and foster community pride. The design, materials and uses of an open space can reflect elements rooted in community values, history and cultural linkages. Open spaces help define a community and positively impact the physical, emotional, cognitive and spiritual growth of citizens.

Cared for:

Open spaces engender a sense of committed appreciation of nature in neighbourhoods, with many citizens devoting their time and resources to open space planning and management.

Funded:

Open spaces, like wetlands, require investments to reap community benefits. The long-term success of open space also requires long-term commitment and maintenance to protect the quality of the environment and visitor enjoyment.

The proposed riverine rehabilitation project`s outcome are in line with City of Johannesburg SDF, JMOSS`s objectives and the Community Open Space Policy. The proposed remedial works takes into considerations legislative framework guiding the protection and conservation of the environment. These legislative frameworks include, among others:

The National Environment Management Act, 1998 (Act No. 107 of 1998)

The NEMA (Act No.107 of 1998) is regarded as one of the important piece of general environmental legislation as it provide a framework for environmental law reform. The main

objectives of this act is to ensure that ecosystem services and biodiversity are protected and maintained for sustainable development. Furthermore, Section 28 (1) of the NEMA requires that *“every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring”*.

The National Environmental Management Waste Act (Act No. 59 of 2008) under the NEMA (Act No.107 of 1998) is the statutory regulator of all hazardous wastes generated by any form of development. This act further provides the identification of activities which will cause environmental degradation through the promulgation of GNR 983, GNR 984, and GNR 984 Listed Activities published on the 4th of December 2014 under the Environmental Impact Regulation (2014).

The Bill of Rights

The South African Constitution (Act 108 of 1996) constitute the supreme law of the country and guarantee the right of all people in South Africa. Furthermore, the Bill of Rights (Chapter 2- Section 24 (a) (b) under the South African Constitution (Act 108 of 1996) emphasize that *“Everyone has the right (b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that-*

- (i) Prevent pollution and ecological degradation;*
- (ii) Promote conservation; and*
- (iii) Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development”*

The National Water Act, 1998 (Act No 36 of 1998)

The NWA (Act No. 36 of 1998) objectively ensures that water or water resources are protected, used, developed, conserved, managed and controlled in a sustainable and equitable manner for the benefit of all people. Water use refers to all activities that have direct or indirect impact on the source, environment, quality, and quantity of water. Authorisation of water use for any designated activities above Schedule 1 of the NWA (Act No. 36 of 1998), is subjected IWULA. The conditions of IWULA are based in terms of Section 21 principles of the NWA (Act No. 36 of 1998), which includes:

- (a) Taking water from a water resource;*
- (b) Storing water;*
- (c) Impeding or diverting the flow of water in a watercourse;*
- (d) Engaging in a stream flow reduction activity contemplated in section 36;*
- (e) Engaging in a controlled activity identified as such in section 37(1) or declared*

under section 38(1);

- (f) Discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit;*
- (g) Disposing of waste in a manner which may detrimentally impact on a water resource;*
- (h) Disposing in any manner of water which contains waste from, or which has been heated in, any industrial or power generation process;*
- (i) Altering the bed, banks, course or characteristics of a watercourse;*
- (j) Removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people; and*
- (k) Using water for recreational purposes.*

8. RECOMMENDATION OF THE PRACTITIONER

Is the information contained in this report and the documentation attached hereto sufficient to make a decision in respect of the activity applied for (in the view of the Environmental Assessment Practitioner as bound by professional ethical standards and the code of conduct of EAPASA).

YES X	NO
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If "NO", indicate the aspects that require further assessment before a decision can be made (list the aspects that require further assessment):

Not applicable

If "YES", please list any recommended conditions, including mitigation measures that should be considered for inclusion in any authorisation that may be granted by the competent authority in respect of the application:

- It is recommended that all proposed remedial works or construction phase of the project must be undertaken as per the Environmental Management Programme;
- Specialist report recommendations must be adhered to;
- The species used in rehabilitation of the proposed development should be endemic and indigenous to lessen the impact of exotic plant species on existing fauna and flora systems.
- Legislative framework or regulations in the EMP should be adhered to, to protect receiving landscape.
- Poor municipal infrastructure such as sewage outfalls, waste collection services and stormwater runoffs in areas surrounding the selected sites must be addressed prior to the commencement of the construction phase for effective functioning of the proposed remedial works and to reach an integrated rehabilitation plan.
- It is recommended that employment opportunities and skills development be provided to the local residents or community. The list of interested and affected parties may be used as a preliminary employment database to be utilised throughout the project lifecycle going forward.

- All issues, comments, and suggestion raised by interested and affected parties should be captured and incorporated in the Final Basic Assessment Report;
- Monitoring should take place after construction activities in order to determine whether the current diversity increases with successful rehabilitation, as well as, if any additional intervention are needed to further improve the biodiversity functioning of the area.
- It is recommended that the applicant must apply for a Water use Licence from the Department of Water and Sanitation (DWS) in areas where water resources are impacted (streams and wetland crossing) before commencement of the project;
- An independent ECO should be present during construction to monitor the implementation of the EMP.

9. THE NEEDS AND DESIREBILITY OF THE PROPOSED DEVELOPMENT (as per notice 792 of 2012, or the updated version of this guideline)

The main objective of this project is provide riverine remedial works within the Kyalami, Braamfonteinspruit, and Natalspruit WMUs. The rehabilitation works aims at reducing the impact of pollution, land use, and to promote sustainable development through conservation and protection of the environment. These will allow for the best positive change in the health of the wetlands, streams, rivers, and thereby increasing their Ecological Importance.

Furthermore, the need of the proposed project is to develop open space systems (that are safe, accessible, and well managed) that integrated into the daily lives of the City of Johannesburg community.

Need and Desirability of the Proposed Project include among others:

- Addressing alien plant species infestation
- Water quality
- Addressing the community`s safety concerns with regard to flash floods and erosion along the rivers and wetland systems
- Ensure public safety through formalizing of movement routes, access points and crossings along the river systems
- Reinstate ecological systems and environment to provide faunal habitats, faunal migration, increase growth of the natural vegetation, positive change in the PES and EIS

- Job creations and skills transfer

10. THE PERIOD FOR WHICH THE ENVIRONMENTAL AUTHORISATION IS REQUIRED
(CONSIDER WHEN THE ACITIVITY IS EXPECTED TO BE CONCLUDED)

Six (6) years are required for environmental authorisation for the proposed riverine rehabilitation project.

11. ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr) (must include post construction monitoring requirements and when these will be concluded.)

If the EAP answers "Yes" to Point 7 above then an EMP is to be attached to this report as an Appendix

EMPr attached

YES

SECTION F: APPENDIXES

The following appendixes must be attached as appropriate (this list is inclusive, but not exhaustive):

It is required that if more than one item is enclosed that a table of contents is included in the appendix

Appendix A: Site plan(s) – *(must include a scaled layout plan of the proposed activities overlain on the site sensitivities indicating areas to be avoided including buffers)*

Appendix B: Photographs

Appendix C: Facility illustration(s)

Appendix D: Route position information

Appendix E: Public participation information

Appendix F: Water use license(s) authorisation, SAHRA information, service letters from municipalities, water supply information

Appendix G: Specialist reports

Appendix H: EMPr

Appendix I: Other information

CHECKLIST

To ensure that all information that the Department needs to be able to process this application, please check that:

- Where requested, supporting documentation has been attached;
- All relevant sections of the form have been completed.