



# DRAFT BASIC ASSESSMENT REPORT



## PROPOSED AGRICULTURAL DEVELOPMENT AND ASSOCIATED INFRASTRUCTURE ON PORTIONS 238 AND 335 OF FARM BETHESDA 38, LOUISVALE.

DENC Reference no

October 2019

JC Strauss Eiendomme (Pty) Ltd &

Johan Strauss Familie Trust.

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## QUALITY CONTROL

| Revision | Date         | Author      | Checked         | Status            | Approved |
|----------|--------------|-------------|-----------------|-------------------|----------|
| 01       | October 2019 | Elanie Kuhn | Lia Labuschagne | Draft for comment |          |
| 02       |              |             |                 |                   |          |
|          |              |             |                 |                   |          |
|          |              |             |                 |                   |          |
|          |              |             |                 |                   |          |

### EAP Qualifications:

#### **Pieter Badenhorst**

The consultant has 44 years of experience in project management and report writing. This includes 16 years of environmental and estuarine management at the CSIR. During that time, he was part of the team that developed coastal management guidelines and undertook numerous environmental studies for DEAT in collaboration with a team of ecologists. He has worked extensively in environmental control and environmental impact assessments and has completed EIAs for many projects (see attached CV Appendix H: Details of EAP and expertise). He has also undertaken an EIA peer review on a major development for DEAT and is a member of IAIAAsa.

The consultant has participated in and organised numerous meetings, workshops and open days to identify issues or similar for projects at the CSIR, Blue Flag for DEAT, and other DEAT projects. The Blue Flag and other projects required collaboration and interaction with large groups of stakeholders.

#### **Elanie Kühn**

The consultant has 13 years of experience in project management and report writing. She completed her BSc degree and gained an Honours Degree in Environmental Management from the North-West University in Potchefstroom. She has been working with Pieter Badenhorst for the last nine years, working on environmental impact assessments and Water Use License Applications. She is also a member of IAIAAsa. She has worked for two other environmental assessment companies prior to her present position (see attached CV in Appendix H: Details of EAP and expertise).



## the denc

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| File Reference Number:                      |  |                         |              |
| Application Number:                         |  |                         |              |
| Date Received:                              |  |                         |              |

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

Kindly note that:

This **basic assessment report** is a standard report that may be required by a competent authority in terms of the EIA Regulations, 2014 and is meant to streamline applications. Please make sure that it is the report used by the particular competent authority for the activity that is being applied for.

This report format is current as of **08 December 2014**. It is the responsibility of the applicant to ascertain whether subsequent versions of the form have been published or produced by the competent authority

The report must be typed within the spaces provided on 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.

Where applicable **tick** the boxes that are applicable in the report.

An incomplete report may be returned to the applicant for revision.

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 rejection of the application as provided for in the regulations.

This report must be handed in at offices of the relevant competent authority as determined by each authority.

No faxed or e-mailed reports will be accepted.

The signature of the EAP on the report must be an original signature.

The report must be compiled by an independent environmental assessment practitioner.

Unless protected by law, all information in the report will become public information on receipt by the competent authority. Any interested and affected party should be provided with the information contained in this report on request, during any stage of the application process.

A competent authority may require that for specified types of activities in defined situations only parts of this report need to be completed.

Should a specialist report or report on a specialised process be submitted at any stage for any part of this application, the terms of reference for such report must also be submitted.

List of abbreviations

|           |   |
|-----------|---|
| BAR       | Basic Assessment Report   |
| CBA       | Critical Biodiversity Area  |
| DEA       | National Department of Environmental Affairs  |
| DENC      | Northern Cape: Department of Environment and Nature Conservation                                |
| DWS       | National Department of Water and Sanitation   |
| EA        | Environmental Authorisation   |
| EAP       | Environmental Assessment Practitioner   |
| ECO       | Environmental Control Officer   |
| EIA       | Environmental Impact Assessment   |
| EIS       | Ecological Importance and Sensitivity   |
| ELU       | Existing Lawful Use   |
| EMPr      | Environmental Management Programme  |
| ESA       | Ecological Support Area   |
| ERW       | Ecological Release Water  |
| EWR       | Existing Water Rights   |
| FEPA      | Fresh Water Ecosystem Priority Areas  |
| HWC       | Heritage Western Cape   |
| &AP's     | Interested and Affected Parties   |
| MAR       | Mean Annual Run-off   |
| MMP       | Maintenance Management Plan   |
| NFEPA     | National Freshwater Ecology Priority Areas  |
| NEMA      | National Environmental Management Act, 1998 (Act No. 107 of 1998)                               |
| NEM: AQA  | National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004)                   |
| NEM: ICMA | National Environmental Management: Integrated Coastal Management Act, 2008 (Act No. 24 of 2008) |
| NEM: WA   | National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)                         |
| NHRA      | National Heritage Resources Act, 1999 (Act No. 25 of 1999)                                      |
| PA        | Protected Area  |
| PES       | Present Ecological Status   |
| PPP       | Public Participation Process  |
| RE        | Resident Engineer   |
| SANBI     | South African National Biodiversity Institute   |
| SAHRA     | South African Heritage Resource Agency  |
| SAHRIS    | South Africa Heritage Resource Information System   |
| SWMP      | Storm Water Management Plan   |
| S24G      | Section 24G Process   |
| V&V       | Validation and Verification   |
| WCBSP     | Western Cape Biodiversity Spatial Plan  |
| WMA       | Water Management Area   |
| WULA      | Water Use Licence Application   |

# Contents

|  |    |
|--|----|
| EXECUTIVE SUMMARY  | i  |
| Section A: Activity Information                            | 1  |
| 1) Activity Description                                    | 1  |
| 2) Feasible and Reasonable Alternatives                    | 10 |
| 3) Physical size of the activity                           | 17 |
| 4) Site Access   | 18 |
| 5) Locality Map  | 18 |
| 6) Layout/Route Plan                                       | 19 |
| 7) Sensitivity Map   | 19 |
| 8) Site Photographs  | 20 |
| 9) Facility Illustration                                   | 20 |
| 10) Activity Motivation                                    | 20 |
| 11) Applicable Legislation, Policies and/or Guidelines     | 25 |
| 12) Waste, Effluent, Emission and Noise Management         | 26 |
| 13) Water Use  | 28 |
| 14) Energy Efficiency                                      | 28 |
| Section B: SITE/area/PROPERTY description                  | 29 |
| 15) Gradient of The Site                                   | 30 |
| 16) Location in Landscape                                  | 31 |
| 17) Groundwater, Soil and Geological Stability of The Site | 31 |
| 18) Groundcover  | 32 |
| 19) Surface Water  | 34 |
| 20) Land Use Character of Surrounding Area                 | 36 |
| 21) Cultural/Historical Features                           | 38 |
| 22) Socio-Economic Character                               | 39 |
| 23) Biodiversity   | 41 |
| Section C: public participation                            | 46 |
| 24) Advertisement and Notice                               | 46 |
| 25) Determination of Appropriate Measures                  | 46 |
| 26) Issues Raised by Interested and Affected Parties       | 47 |
| 27) Comments and Response Report                           | 47 |
| 28) Authority Participation                                | 47 |
| 29) Consultation with Other Stakeholders                   | 48 |

|  |     |
|--|-----|
| Section D: Impact Assessment   | 49  |
| 30) Impacts that may result from the planning and design, construction, operational, decommissioning and closure phases, as well as proposed management of identified impacts and proposed mitigation measures | 49  |
| 31) Environmental Impact Statement   | 64  |
| Section E. Recommendation of practitioner  | 69  |
| Section F: Appendixes  | 71  |
| Appendix A: Maps   | 71  |
| Appendix A1: Locality map  | 71  |
| Appendix A2: Proposed development Layout   | 72  |
| Appendix A3: Sensitivity map (Critical Biodiversity Areas)   | 73  |
| Appendix A4: Vegetation occurring at and near the proposed development area.   | 74  |
| Appendix B: Photographs  | 75  |
| Appendix C: Facility illustration(s)   | 79  |
| Appendix C1: Alternatives:   | 79  |
| Appendix C2: Design Layout   | 80  |
| Appendix C3: Dam Design Layout:  | 81  |
| Appendix D: Specialist reports (including terms of reference)  | 82  |
| Appendix D1: Botanical Report  | 82  |
| Appendix D2: Archaeology Report  | 119 |
| Appendix D3: Palaeontology Report  | 139 |
| Appendix D4: Water Use License Report  | 145 |
| Appendix E: Public Participation   | 193 |
| Appendix E1: Public Participation Report for DBAR  | 193 |
| Appendix E2: I&AP'S List   | 194 |
| Appendix E3: Advertisement   | 199 |
| Appendix E4: Site Notice and Locality  | 201 |
| Appendix E5: Proof of Notifications  | 203 |
| Appendix E5.1.2. Proof of letters sent for fBAR  | 204 |
| Appendix E5.2: Notification letters sent   | 205 |
| Appendix E 5.2.1: Notification letter sent to I&AP for official dBAR   | 205 |
| Appendix E5.2.2: Notification letter sent to Authorities for official dBAR   | 206 |
| Appendix E 5.2.3: Notification letter sent to I&AP for official fBAR   | 207 |
| Appendix E 5.2.4: Notification letter sent to Authorities for official fBAR  | 208 |

|   |     |
|---|-----|
| Appendix E6: Comments Received                        | 209 |
| Appendix E7: Comments and Response Table              | 211 |
| Appendix E8: Meeting minutes and attendance registers | 212 |
| Appendix G: Environmental Management Programme (EMPr) | 213 |
| Appendix H: Details of EAP and expertise              | 288 |
| Appendix I: Specialist’s declaration of interest      | 289 |
| Appendix J: Additional Information                    | 292 |

List of Figures:

|   |    |
|---|----|
| Figure 1: Locality .....  | 2  |
| Figure 2. Proposed development area on Portions 238 and 335 of Farm Bethesda 38. .... | 3  |
| Figure 3: Dam .....   | 4  |
| Figure 4: Dam and Pipelines.....  | 4  |
| Figure 5: Vineyard layout - alternatives on Portion 335.....                          | 12 |
| Figure 6: Dam and pipeline alternatives on Portion 238. ....                          | 12 |
| Figure 7: Geological map of the study area (purple boundary line).....                | 32 |
| Figure 8: Sensitivity map of the study area .....                                     | 34 |
| Figure 9: Location of the canal and streams.....                                      | 35 |
| Figure 10: Land use character of the surroundings. ....                               | 37 |
| Figure 11: Sensitivity map of the study area .....                                    | 43 |
| Figure 12: Critical Biodiversity Area .....   | 44 |



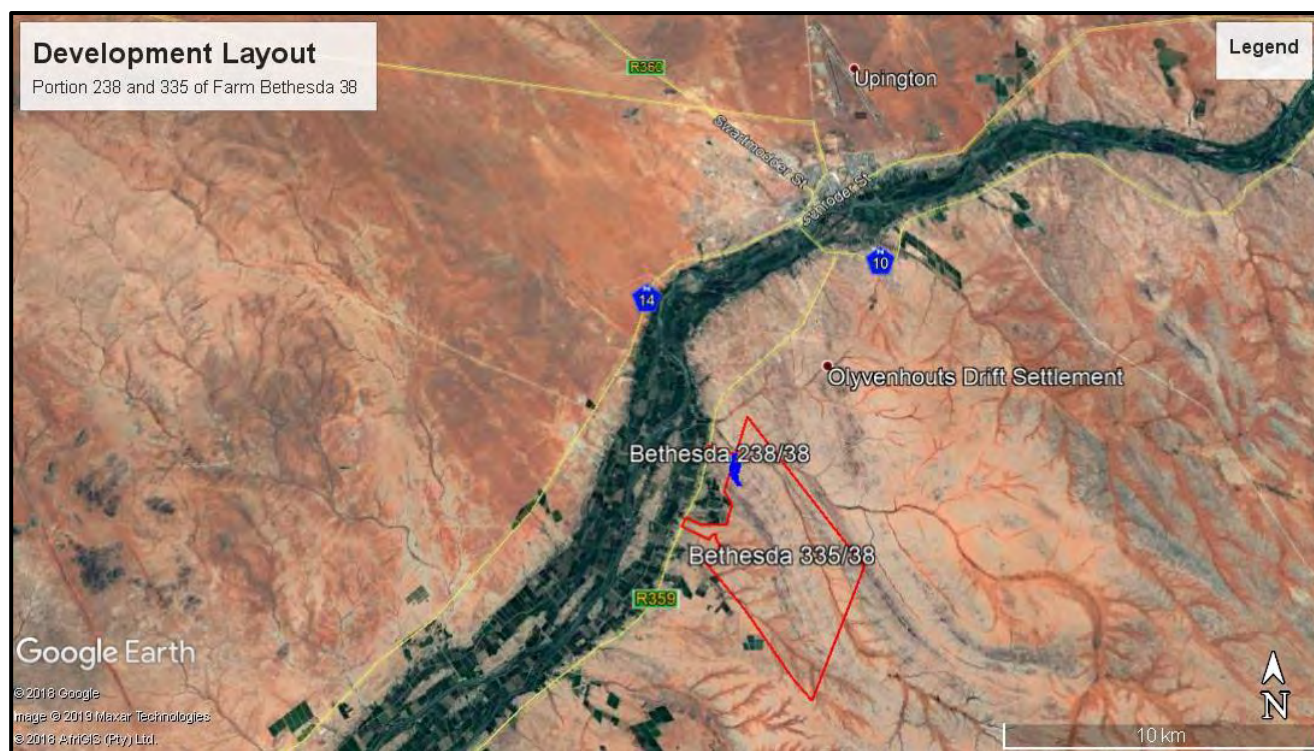
## EXECUTIVE SUMMARY

### Locality:

The proposed properties on which the agricultural activities will take place is situated on Portions 238 and 335 of Farm Bethesda 38 in the Louisvale area just outside of Upington, Northern Cape. It is located in the ZF Mgcawu District Municipality. The farm lies west of the Orange River, and north of Louisvale (see Figure A).

Access to the farm is via the R359 and is approximately 3 km south-west from Louisvale. Portion 335 of Farm 38 is owned by Johan Strauss Familie Trust and Portion 238 of Farm 38 is owned by J.C. Strauss Eiendomme (Pty) Ltd. Both properties are zoned as agricultural land.

The applicant has appointed PBPS as the independent consultant to undertake the environmental process.



**Figure A: Locality**

### Proposed Development:

The proposed development is to establish an agricultural area for the cultivation of vineyards on Portion 335 of Farm 38. The development further includes a small storage dam and pipeline for irrigation on Portion 238 on Farm 38 (see Figure B), to provide water for the agricultural area. The development will consist of the following:

1. The proposed 13.4 ha vineyard development area that will cross the small streams (green polygon);
2. A small storage dam, with a capacity of approximately 4000 m<sup>3</sup>, covers an area of 1500 m<sup>2</sup> and has a wall height of 4.9m (pink polygon); and

- Pipelines – Construction of 838 m pipeline with a diameter of 315 mm to be installed (light blue line).

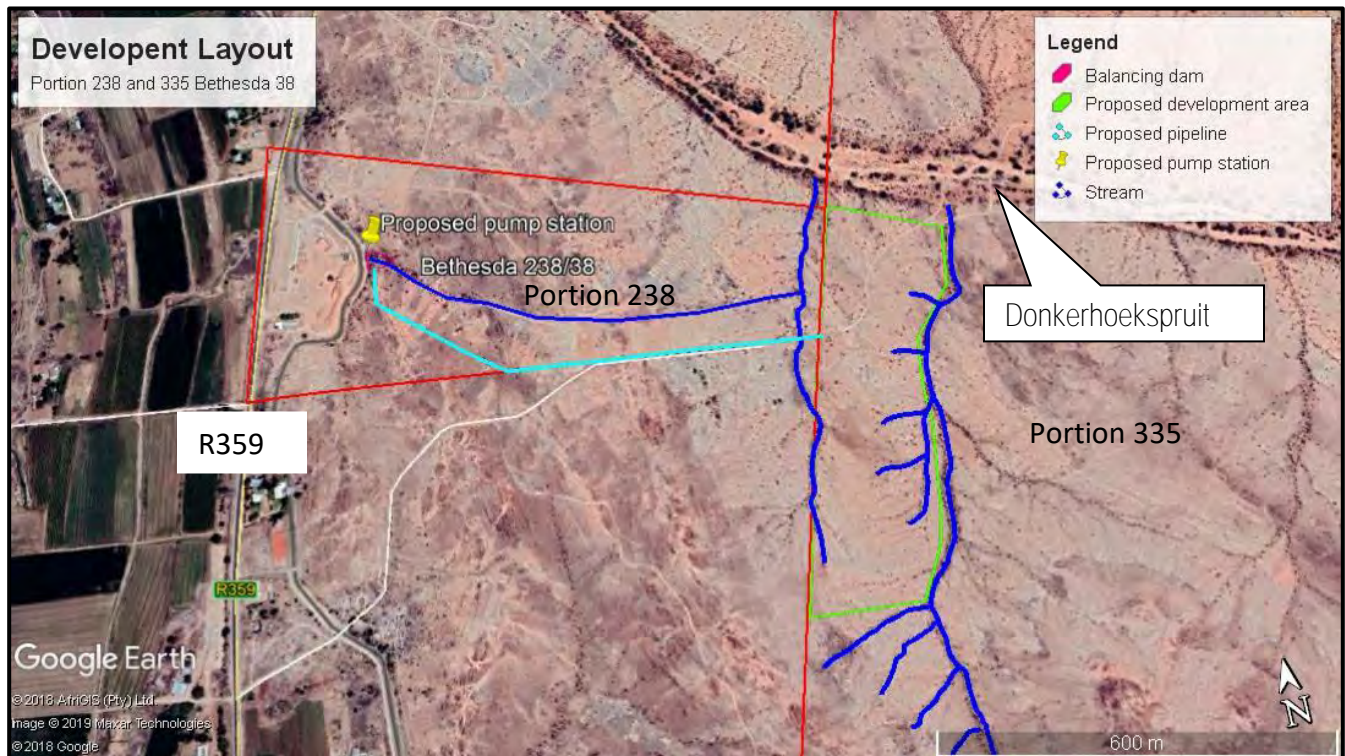
**Table 1: Property details**

| Property details                | Property size | SG 21-digit codes    | Ha of the proposed new development area    |
|---------------------------------|---------------|----------------------|--|
| Portion 238 on Farm Bethesda 38 | 34.7 ha       | C0360000000003800238 | Dam: 1500 m <sup>2</sup><br>Pipeline: 838m |
| Portion 335 of Farm Bethesda 38 | 2544 ha       | C0360000000003800335 | 13.4 ha vineyards                          |

**Details of the development:**

**1. Proposed agricultural development**

The proposal is to clear an area of 13.4 ha covered with indigenous vegetation, with small streams to develop vineyards for agricultural use. All proposed cultivation areas have existing access (see Figure B for more detail).



**Figure B. Proposed development area on Portions 238 and 335 of Farm Bethesda 38**

## 2. Dam:

The proposed dam is a small balancing dam. Water will be abstracted directly from the canal and pumped into the small dam (Figure C ), from where it will be distributed to the vineyards via the proposed pipeline as described below. The dam will have the following dimensions:

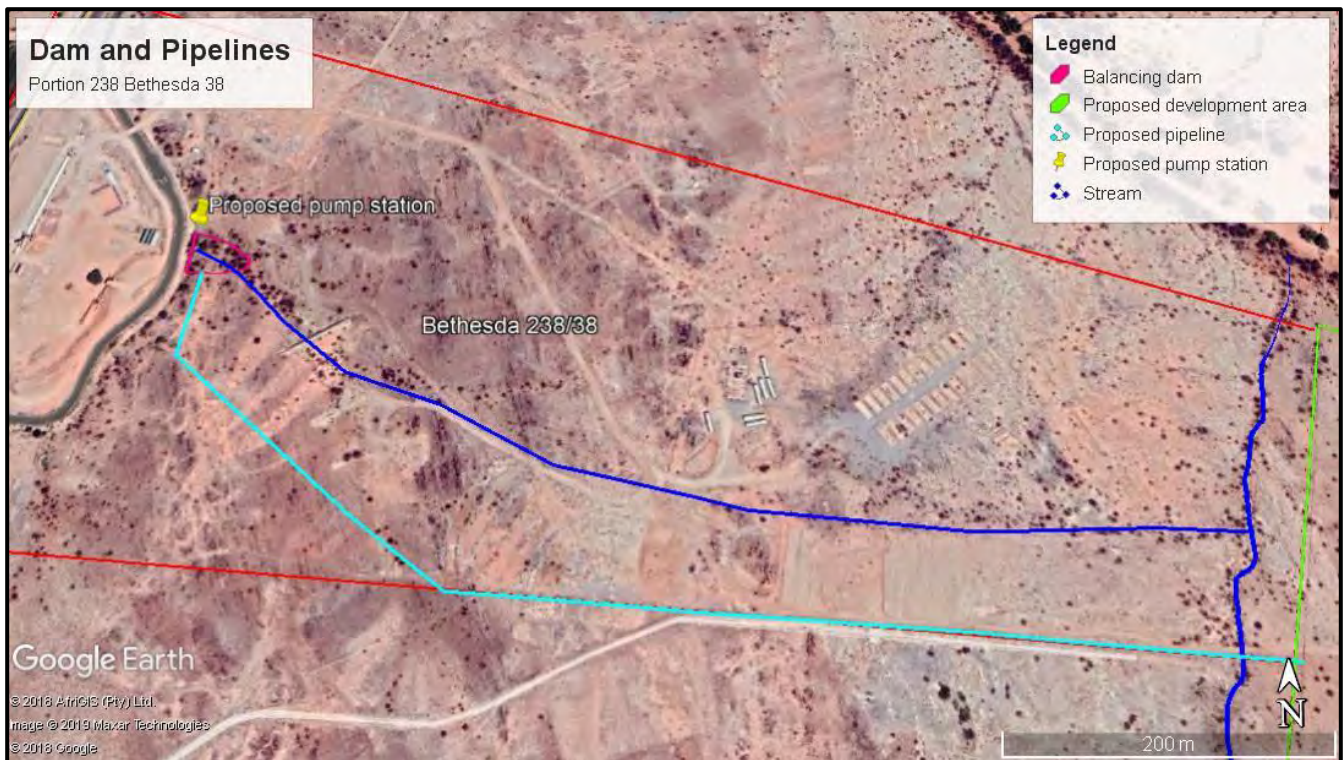
- Wall length 30 m
- Wall breadth 3 m
- Wall height 4.9 m
- Cover an area of 1500 m<sup>2</sup>
- Capacity of 4000 m<sup>3</sup>



Figure C: Dam

## 3. Pipelines:

Pipelines (315 mm diameter and 838 m total length) will be built on Portion 238 of Farm Bethesda 38. The water will be extracted from an existing canal (adjacent to the small dam), located at the blue dropped pin marked “Proposed pump station” in Figure D. The water will then be fed to the neighbouring farm (Portion 335 of Farm 38), where it will be utilised for irrigation purposes.



**Figure D: Dam and Pipelines**

**Additional information:**

*Electricity:*

An existing ESKOM overhead line runs through the property and the proposed agricultural development areas. Existing electrical connections will be used. No additional electricity is necessary.

*Water use rights:*

The property has existing water use rights allocated for approximately 10 ha (150 000 m<sup>3</sup>/a) from the Louisvale Water Users Association. A Water Use License Application (WULA) will be lodged with the Department of Water and Sanitation in Upington for the following activities:

1. 21 c and i for agricultural development across streams, development of a dam in the stream and pipeline crossing the streams
2. 21 b for the storage of water taken from a resource.

*Access:*

Access to Portion 238 of Farm Bethesda 38 is via the R359. Access to Portion 335 of Farm Bethesda 38 is via a gravel road across Portion 238 Farm Bethesda 38.

## **Impacts:**

The following impacts are outlined:

### **Botanical:**

- Taken together, the assessment of impacts and the desired area proposed for cultivation indicate that it would be optimal to apply Alternative 1. This would be the best compromise to ensure the protection of the watercourses, while offering adequate area for cultivation;
- The impact of Alternative 1 can be mitigated from **medium negative** to **low negative** by relocating the protected plant species;
- Cumulative impacts would be **low negative** at most, and even as low as **very low negative**, since Bushmanland Arid Grassland is not threatened in any way and is unlikely to be threatened in the future since it is very widespread; and
- Buffering of the drainage lines and search & rescue of protected plants and geophytes must be a condition of environmental authorisation. It is strongly recommended that the seasonal drainage lines should be buffered, and that no agricultural development takes place that would affect them.

### **Archaeology:**

- The results of the study indicate that the proposed cultivation of 13.4 ha vineyards on Farm 238/38, and a storage dam, pipeline and pump station on Farm 338/38, will **not have an impact** of great significance on the archaeological heritage. No archaeological mitigation is required.

### **Palaeontology:**

- Given the **low palaeontological sensitivity**, small area and disturbed character of the study area, it is concluded that the proposed Louisvale agricultural development is very unlikely to have significant impacts on local palaeontological heritage resources.

### **Impeding the flow of the stream:**

- **Low negative** impact after mitigation; and
- Canalised flow surrounding the agricultural area, taking into account the Donkerhoekspruit and ephemeral streams surrounding the sites, with a 32 m buffer area.

### **Socio-Economic:**

- **Medium positive** impact on job security and income for locals;
- Job security for current employers; and
- Job creation for new employees during the operational phase.

Visual:

- Temporary **low negative** visual impact during construction. However, the overall visual impacts are in line with the surrounding land use, which is agricultural.

Noise:

- Temporary **low negative** impact during construction. Minimal noise during construction of the storage dam and clearing of vegetation during construction.

Conclusion:

An overall **low negative** impact on the environment may result due to the removal of native indigenous vegetation and the impediment of the flow of the canal. However, if proper mitigation and management measurements are adhered to, the impact will be minimal. Most of the impacts will also only be of short duration, namely during the construction phase.

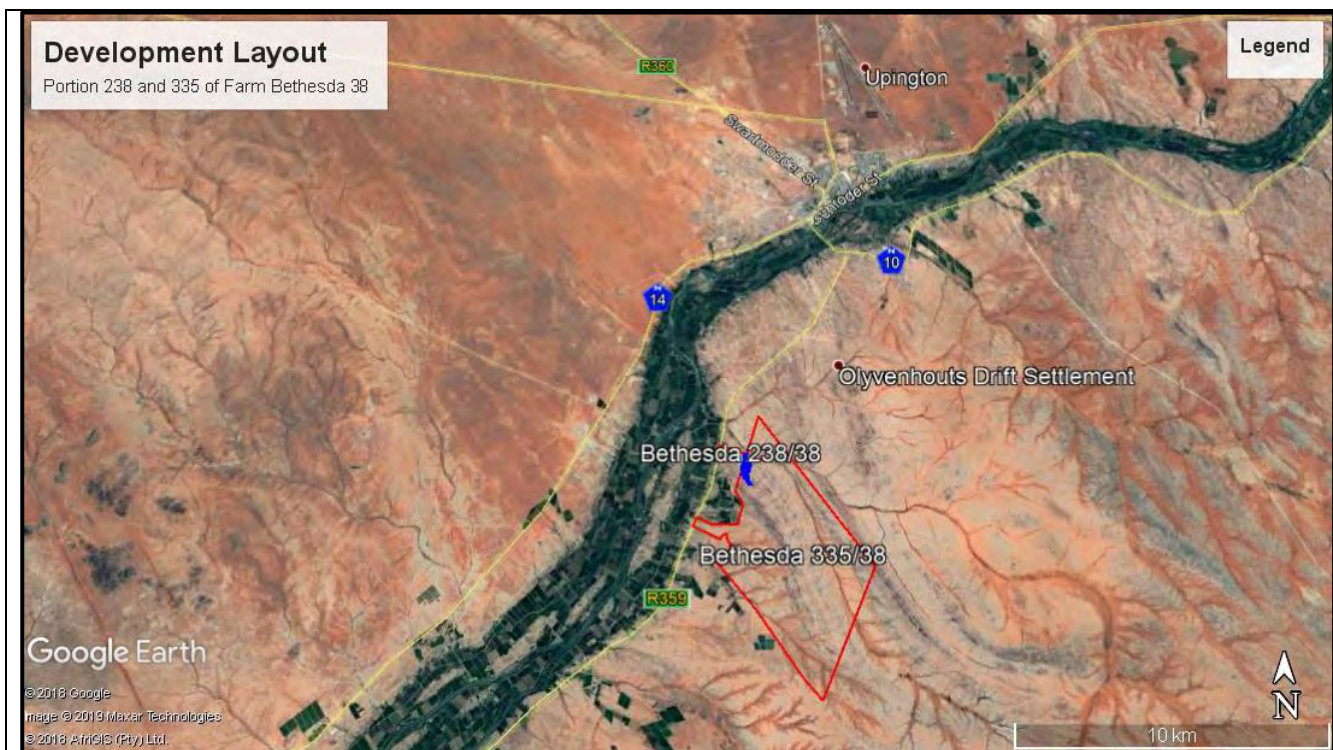
## SECTION A: ACTIVITY INFORMATION

|  |            |           |
|--|------------|-----------|
| Has a specialist been consulted to assist with the completion of this section?   | <b>YES</b> | <b>NO</b> |
| If YES, please complete the form entitled "Details of specialist and declaration of interest" for the specialist appointed and attach in Appendix I: Specialist's declaration of interest. |            |           |

### 1) Activity Description

- a) Describe the project associated with the listed activities applied for.

|   |
|---|
| <p><b>Locality:</b></p> <p>The proposed properties on which the agricultural activities will take place is situated on Portions 238 and 335 of Farm Bethesda 38 in the Louisvale area just outside of Upington within the Northern Cape. It is located in the ZF Mgcawu District Municipality. The farm lies west of the Orange River, and north of Louisvale (see Figure 1).</p> <p>Access to the farm is via the R359 and it is approximately 3 km south-west from Louisvale. Portion 335 of Farm 38 is owned by Johan Strauss Familie Trust and Portion 238 of Farm 38 is owned by J.C. Strauss Eiendomme (Pty) Ltd. Both properties are zoned for agricultural use.</p> <p>The applicant has appointed PBPS as the independent consultant to undertake the environmental process.</p> |
|---|



**Figure 1: Locality**

**Proposed Development:**

The proposed development is to establish an agricultural area for the cultivation of vineyards on Portion 335 of Farm 38. The development further includes a small storage dam and pipeline for irrigation on Portion 238 on Farm 38 (see Figure 2), to provide water for the agricultural area. The development will consist of the following:

1. The proposed 13.4 ha vineyard development area, that will cross the small streams (green polygon);
2. A small storage dam, with a capacity of approximately 4000 m<sup>3</sup>, covers an area of 1500 m<sup>2</sup> and has a wall height of 4.9 m (pink polygon); and
3. Pipelines: construction of 838 m pipeline with a diameter of 315 mm to be installed (light blue line).

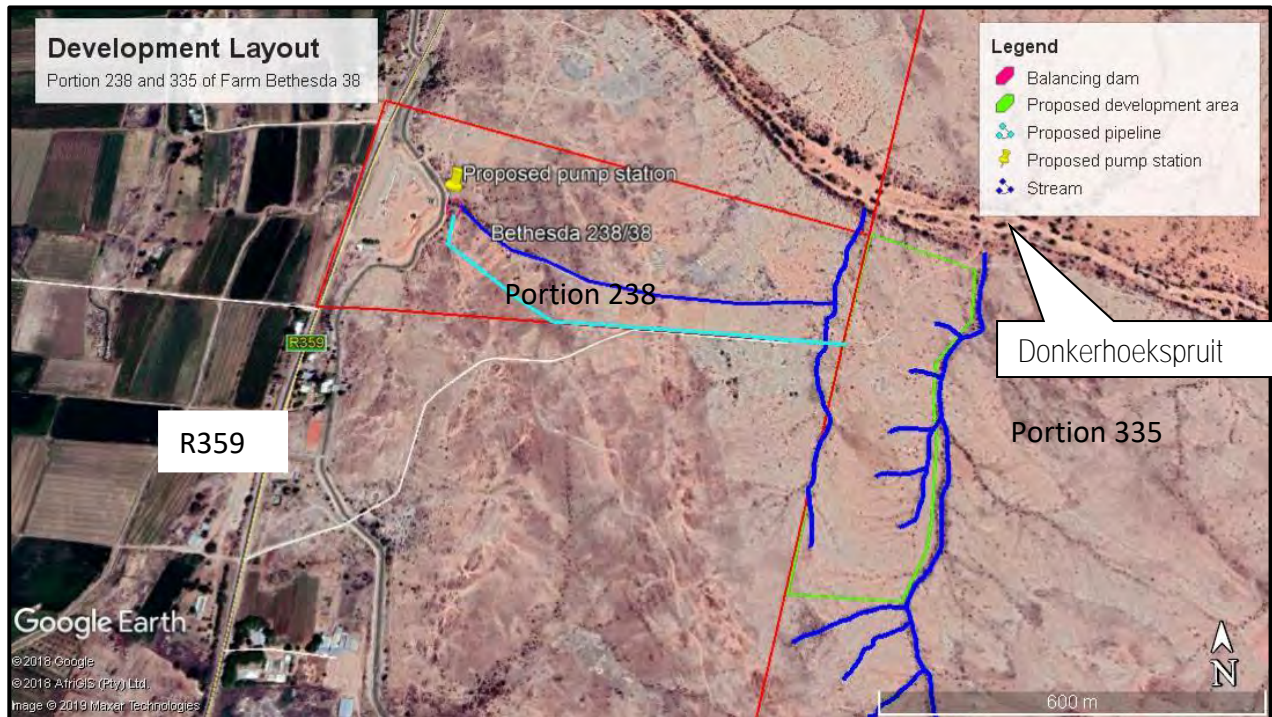
**Table 2: Property details**

| Property details                | Property size | SG 21-digit codes    | Ha of the proposed new development area     |
|---------------------------------|---------------|----------------------|---|
| Portion 238 on Farm Bethesda 38 | 34.7 ha       | C0360000000003800238 | Dam: 1500 m <sup>2</sup><br>Pipeline: 838 m |
| Portion 335 of Farm Bethesda 38 | 2544 ha       | C0360000000003800335 | 13.4 ha vineyards                           |



## 1. Proposed agricultural development

The proposal is therefore to clear an area of 13.4 ha covered with indigenous vegetation with small streams, to develop vineyards for agricultural use. All proposed cultivation areas have existing access (see Figure 2 for more detail).



**Figure 2. Proposed development area on Portions 238 and 335 of Farm Bethesda 38.**

## 2. Dam:

The proposed dam is a small balancing dam. Water will be abstracted directly from the canal and pumped into the small dam (Figure 3), from where it will be distributed to the vineyards via the proposed pipeline as described below. The dam will have the following dimensions:

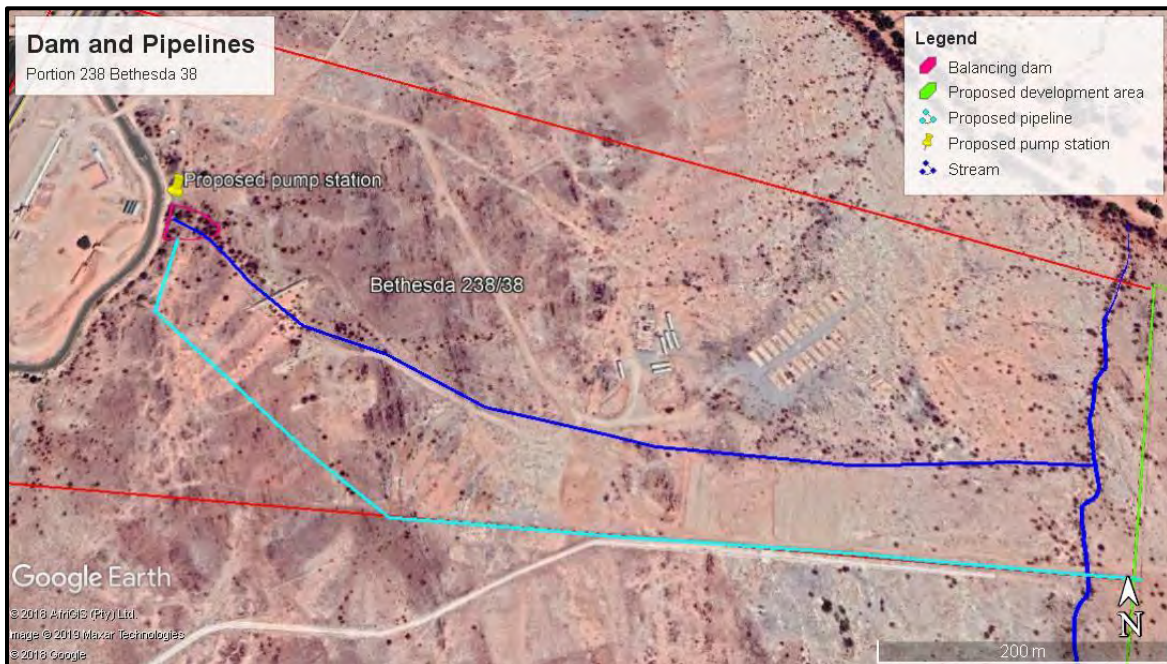
- Wall length 30 m
- Wall breadth 3 m
- Wall height 4.9 m
- Cover an area of 1500 m<sup>2</sup>
- Capacity of 4000 m<sup>3</sup>



**Figure 3: Dam**

### 3. Pipelines:

Pipelines (315 mm diameter and 838 m total length) will be built on Portion 238 of Farm Bethesda no 38. The water will be extracted from an existing canal (adjacent to the small dam), located at the blue dropped pin marked “Proposed pump station” in Figure 4. The water will then be fed to the neighbouring farm (Portion 335 of Farm 38), where it will be utilised for irrigation purposes.



**Figure 4: Dam and Pipelines**

**Additional information:**

*Electricity:*

An existing Eskom overhead line runs through the property and the proposed agricultural development areas. Existing electrical connections will be used. No additional electricity was necessary.

*Water use rights:*

The property has existing water use rights allocated for approximately 10 ha (150 000 m<sup>3</sup>/a) from the Louisvale Water Users Association. A Water Use License Application will be lodged with the Department of Water and Sanitation in Upington for the following activities:

- 21 c and i for agricultural development across streams, development of a dam in the stream and pipeline crossing the streams
- 21 b for the storage of water taken from a resource

Find the Water Use License Application included in Appendix D4: Water Use License Report.

*Access:*

Access to Portion 238 of Farm Bethesda 38 is via the R359. Access to Portion 335 of Farm Bethesda 38 is via a gravel road across Portion 238 Farm Bethesda 38.

b) Provide a detailed description of the listed activities associated with the project as applied for.

| Listed activity as described in GN R.327, 325 and 324.  | Description of project activity  |
|---|--|
| Example:<br>GN 734 Item xx xx): The construction of a bridge where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line. | A bridge measuring 5 m in height and 10 m in length, no wider than 8 meters, will be built over the Orange river |
| GN 327 Item 12:<br>The development of—<br><br>i. canals exceeding 100 square metres in size;<br>ii. channels exceeding 100 square metres in size;   | <b>Construction of a dam, as well as pipelines and vineyards within 32 m of a watercourse.</b>                   |

- iii. bridges exceeding 100 square metres in size;
- iv. dams, where the dam - including infrastructure and water surface area - exceeds 100 square metres in size;
- v. weirs, where the weir - including infrastructure and water surface area - exceeds 100 square metres in size;
- vi. bulk stormwater outlet structures exceeding 100 square metres in size;
- vii. marinas exceeding 100 square metres in size;
- viii. jetties exceeding 100 square metres in size;
- ix. slipways exceeding 100 square metres in size;
- x. buildings exceeding 100 square metres in size;
- xi. boardwalks exceeding 100 square metres in size; or
- xii. infrastructure or structures with a physical footprint of 100 square metres or more;**

where such development occurs—

- a) within a watercourse;
- b) in front of a development setback; or
- c) **if no development setback exists, within 32 metres of a watercourse**, measured from the edge of a watercourse;

excluding—

(aa) the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour;

(bb) where such development activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies;

(cc) activities listed in Activity 14 in Listing Notice 2 of 2014 or activity 14 in

|   |   |
|---|---|
| <p>Listing Notice 3 of 2014, in which case that activity applies;</p> <p>(dd) where such development occurs within an urban area; or</p> <p>(ee) where such development occurs within existing roads or road reserves.</p>  |   |
| <p>GN 327 Item 19:</p> <p>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—</p> <p>a watercourse;<br/>the seashore; or<br/>the littoral active zone, an estuary or a distance of 100 metres inland of the high-water mark of the sea or an estuary, whichever distance is the greater – but excluding where such infilling, depositing, dredging, excavation, removal or moving will occur behind a development setback;<br/>is for maintenance purposes undertaken in accordance with a maintenance management plan; or<br/>falls within the ambit of activity 21 in this Notice, in which case that activity applies.</p> | <p><b>Infilling of ephemeral streams/drainage areas on Portion 335 of Farm Bethesda 38.</b></p>   |
| <p>GN 327 Item 27:</p> <p>The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for —</p> <p>the undertaking of a linear activity; or<br/>maintenance purposes undertaken in accordance with a maintenance management plan.</p>   | <p><b>The clearance of 13.4 ha of indigenous vegetation.</b></p>  |
| <p>GN 324 Item 12:</p> <p>The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is</p>  | <p><b>As indicated by the botanical specialist, the proposed development lies within a critically biodiverse area (CBA)2 and therefore this</b></p> |

|   |  |
|---|--|
| <p>required for maintenance purposes undertaken in accordance with a maintenance management plan.</p> <p>(a) In Northern Cape:</p> <p>i. Within any critically endangered or endangered ecosystem listed in terms of section 52 of the National Environmental Management: Biodiversity Act, 2004 (NEMBA) or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004;</p> <p><b>ii. Within critical biodiversity areas identified in bioregional plans;</b></p> <p>iii. Within the littoral active zone or 100 metres inland from the high watermark of the sea or an estuary, whichever distance is the greater, excluding where such removal will occur behind the development setback line on erven in urban areas; or</p> <p>iv. On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning.</p> | <p><b>activity is triggered for the removal of 300 square meters or more of vegetation within a CBA.</b></p>   |
| <p>GN 324 Item 14:</p> <p>The development of—</p> <p>(i) <b>dams or weirs, where the dam or weir – including infrastructure and water surface area – exceeds 10 square metres; or</b></p> <p>(ii) <b>infrastructure or structures with a physical footprint of 10 square metres or more;</b></p> <p>where such development occurs—</p> <p>(a) <b>within a watercourse;</b></p> <p>(b) in front of a development setback; or</p> <p>(c) if no development setback has been adopted, within 32 metres of a</p>  | <p><b>As indicated by the botanical specialist, the proposed development lies within a CBA2 and therefore this activity is triggered for the removal of 10 square meters or more of vegetation within a CBA.</b></p> |

watercourse, measured from the edge of a watercourse;

excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour.

**a. Northern Cape**

i. In an estuary;

ii. Outside urban areas:

(aa) A protected area identified in terms of NEMPAA, excluding conservancies;

(bb) National Protected Area Expansion Strategy Focus areas;

(cc) World Heritage Sites;

(dd) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;

(ee) Sites or areas identified in terms of an international convention;

**(ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;**

(gg) Core areas in biosphere reserves;

(hh) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve;

(ii) Areas seawards of the development setback line or within 1 kilometre from the high-water mark of the sea if no such development setback line is determined; or

iii. Inside urban areas:

(aa) Areas zoned for use as public open space;

|  |  |
|--|--|
| <p>(bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority, zoned for a conservation purpose; or</p> <p>(cc) Areas seawards of the development setback line.</p> |  |
|--|--|

**2) Feasible and Reasonable Alternatives**

**“alternatives”**, in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to –

- (a) the property on which or location where it is proposed to undertake the activity;
- (b) the type of activity to be undertaken;
- (c) the design or layout of the activity;
- (d) the technology to be used in the activity;
- (e) the operational aspects of the activity; and
- (f) the option of not implementing the activity.

Describe alternatives that are considered in this application as required by Appendix 1 (3)(h), Regulation 2014. Alternatives should include a consideration of all possible means by which the purpose and need of the proposed activity (NOT PROJECT) could be accomplished in the specific instance, taking account of the interest of the applicant in the activity. The no-go alternative must in all cases be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed.

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. 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.

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 degrees, minutes and seconds. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection.

**Alternatives Summary**

One site (S) and three layout (L) Alternatives were investigated (refer to Figure 5).

Site/property alternative: No site/property alternatives available.

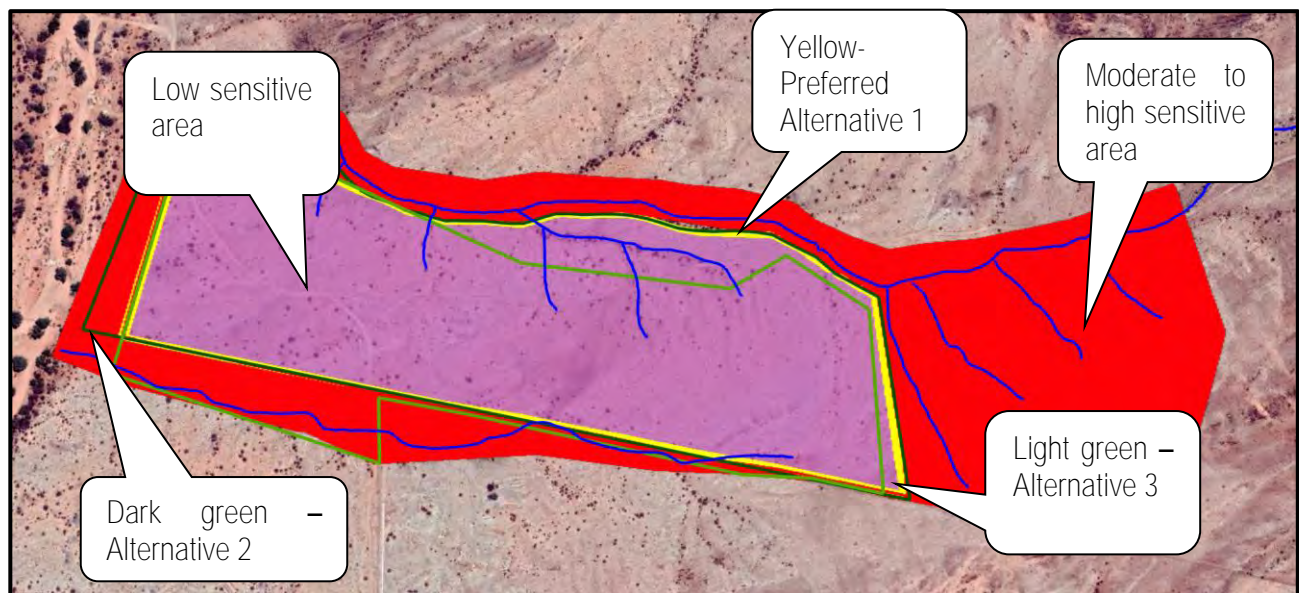
Technology alternative: No technology alternatives available. Possible technology alternatives could be the types of irrigation systems. The proposed development will use drip irrigation for the most effective water use.

Type of activity alternative: No activity alternatives available.

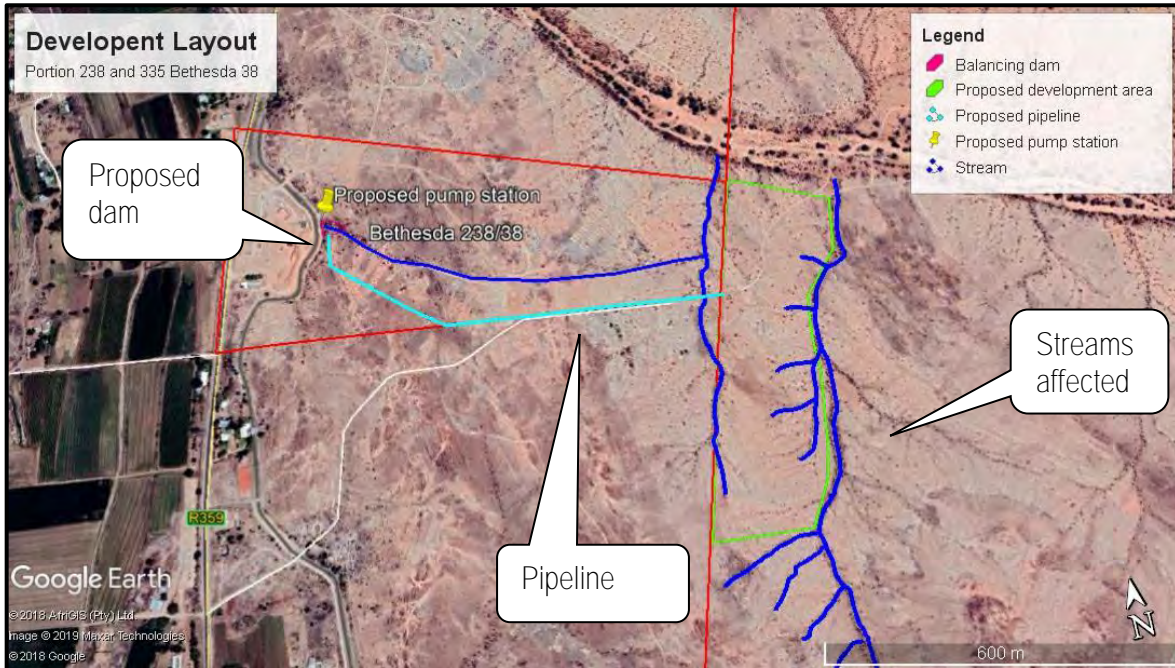


Design/layout alternative:

- Alternative 1 (the preferred layout alternative for the vineyards, dam and pipelines) is situated on Portions 238 and 335 of Farm Bethesda 38 in the agricultural area of Louisvale within the Northern Cape. Access to Portion 238 is via the R359. Access to Portion 335 is via a gravel road across Portion 238. The preferred alternatives for the dam and irrigation pipeline are proposed/located on Portion 238, shown in Figure 6. For the vineyard, the preferred alternative site is proposed on Portion 335 (Figure 5). The areas are shown in the yellow block in Figure 5, with development footprint of 13.4 ha. The pink polygon refers to the low sensitive botanical area and therefore is preferred. This alternative is also considered the preferred alternative because it is located as far as possible from the Donkerhoekspruit and will have the lowest impact on the vegetation, streams and archaeological aspects of the site.
- Alternative 2 (for the vineyards) is shown in the dark green boundary in Figure 5 with the development size of 14 ha. It would be situated in more or less the same area as Alternative 1. Even though the development footprint is the required size, this alternative is not considered preferred. As it falls within 32 m of Donkerhoekspruit, it is therefore not suitable.
- Alternative 3 (for the vineyard) is shown in the light green boundary in Figure 5, with development size 12.8 ha. It would be situated in more or less the same area as Alternative 1. Even though this alternative is considered of low sensitivity in terms of its environmental footprint, this alternative is not considered preferred, as it extends onto the adjacent property and from an agricultural perspective would be more difficult to farm.
- Alternative 4 (for the vineyard) is the no-go alternative which would lead to no development taking place. The status quo would persist and there would be no farming of the designated site. No additional work opportunities for the local community of Louisvale.



**Figure 5: Vineyard layout - alternatives on Portion 335.**



**Figure 6: Dam and pipeline alternatives on Portion 238.**

a) Site/Property alternatives

|   |              |               |
|---|--------------|---------------|
| Alternative 1 (preferred alternative)             |              |               |
| Description                                       | Lat (DDMMSS) | Long (DDMMSS) |
| No site/property alternatives will be considered. |              |               |
| Alternative 2                                     |              |               |
| Description                                       | Lat (DDMMSS) | Long (DDMMSS) |
| N/A   |              |               |
| Alternative 3                                     |              |               |
| Description                                       | Lat (DDMMSS) | Long (DDMMSS) |
| N/A   |              |               |

In the case of linear activities:

|              |               |                |
|--------------|---------------|----------------|
| Alternative: | Latitude (S): | Longitude (E): |
|--------------|---------------|----------------|

|   |               |               |
|---|---------------|---------------|
| <b>Alternative S1 (preferred): PIPELINES</b>  |               |               |
| Starting point of the activity                | 28°32'36.86"S | 21°12'23.13"E |
| Middle/Additional point of the activity       | 28°32'37.44"S | 21°12'23.01"E |
| Middle/Additional point of the activity       | 28°32'44.33"S | 21°12'27.83"E |
| End point of the activity                     | 28°32'46.36"S | 21°12'48.81"E |
| Alternative S2 (if any) <b>NOT APPLICABLE</b> |               |               |
| Starting point of the activity                |               |               |
| Middle/Additional point of the activity       |               |               |
| End point of the activity                     |               |               |
| Alternative S3 (if any) <b>NOT APPLICABLE</b> |               |               |
| Starting point of the activity                |               |               |
| Middle/Additional point of the activity       |               |               |
| End point of the activity                     |               |               |

For route alternatives that are longer than 500 m, please provide an addendum with co-ordinates taken every 250 meters along the route for each alternative alignment.

In the case of an area being under application, please provide the co-ordinates of the corners of the site as indicated on the lay-out map provided in Appendix A of this form.

b) Layout alternatives

|  |               |               |
|--|---------------|---------------|
| <p>The preferred Alternative 1, see Figure 4 and 5, consists of the transformation of 13.4ha of indigenous vegetation for the development of vineyards.</p> <p>The project is proposed to include the following developments:</p> <ol style="list-style-type: none"> <li>1. Clearance and relocation of 13.4 ha of indigenous vegetation for the development of a vineyard on Portion 335.</li> <li>2. Construction of a 4000 m<sup>3</sup> dam next to a canal, with a wall height of 4.9 m; and</li> <li>3. Construction of approximately 0.8 km of pipelines (315 mm) from the new dam to the new development (vineyard) area at the boundary of the two properties.</li> </ol> | 28°32'51.27"S | 21°12'50.35"E |
|--|---------------|---------------|

|   |               |               |
|---|---------------|---------------|
| <p>Alternative 1 is considered as preferred for the following reasons:</p> <ul style="list-style-type: none"> <li>• This application pertains to the agricultural development of a vineyard on an area that can be utilised for other agricultural purposes. The latter is more practical and would bring about financial benefits and better water use management practices;</li> <li>• This alternative took into consideration the features located at this area and development of the blocks more than 32 m from the watercourse (Donkerhoekspruit);</li> <li>• The authorisation of this agricultural development will bring about a higher rate of job security to those currently employed, as well as those still to be employed;</li> <li>• From a botanical perspective, the proposed development would be acceptable, with generally low negative impacts if mitigation measures are successfully implemented; and</li> <li>• Potential heritage impacts are anticipated to be of very low to negligible significance.</li> </ul> |               |               |
| Alternative 2   |               |               |
| Description   | Lat (DDMMSS)  | Long (DDMMSS) |
| <p>Alternative 2 (see Figure 3, dark green border) consists of the transformation of 14 ha of indigenous vegetation for the development of vineyards. It would be situated in more or less the same area as Alternative 1.</p> <p>Alternative 2 is considered as NOT preferred for the following reasons:</p> <ul style="list-style-type: none"> <li>• This alternative did not take into consideration the features located at this area and development of the blocks within 32 m from the watercourse (Donkerhoekspruit); and</li> <li>• From a botanical perspective, the proposed development would not be acceptable as it is located in an environmentally sensitive area, which will result in a high negative impact.</li> </ul>   | 28°32'51.27"S | 21°12'50.35"E |
| Alternative 3   |               |               |

| Description  | Lat (DDMMSS)  | Long (DDMMSS) |
|--|---------------|---------------|
| <p>Alternative 3 (see Figure 3, light green border) consists of the transformation of 12.8 ha of indigenous vegetation for the development of vineyards. It would be situated in more or less the same area as Alternative 1. However, a small section crosses over onto Portion 238.</p> <ul style="list-style-type: none"> <li>• Even though this alternative is considered of low sensitivity in terms of its environmental footprint, this alternative is not considered preferred, as the development footprint is too small.</li> </ul> <p>Alternative 3 is considered as NOT preferred for the following reasons:</p> <ul style="list-style-type: none"> <li>• This application pertains to the agricultural development of a vineyard on an area that can be utilised for other agricultural purposes. The latter is less practical and would bring about fewer financial benefits than Alternative 1; and</li> <li>• The development footprint is too small.</li> </ul> | 28°32'51.27"S | 21°12'50.35"E |
| Alternative 4  |               |               |
| Description  | Lat (DDMMSS)  | Long (DDMMSS) |
| <p>Alternative 4, is the no-go alternative and therefore not preferred because:</p> <ul style="list-style-type: none"> <li>• No agricultural development or pipeline and dam development will take place, resulting in no financial benefits and no improvement in water use management practices;</li> <li>• Lower rate of job security to those currently employed; and</li> <li>• No new job opportunities for local residents of Louisvale.</li> </ul>   |               |               |

c) Technology alternatives

|                                       |
|---------------------------------------|
| Alternative 1 (preferred alternative) |
|---------------------------------------|

|  |
|--|
| A drip irrigation system will be used for watering the vineyard. This will limit the use and wastage of water resulting in the farming being more water-wise. No technology alternatives will be considered. |
| Alternative 2  |
|  |
| Alternative 3  |

d) Other alternatives (e.g. scheduling, demand, input, scale and design alternatives)

|   |  |  |
|---|--|--|
| Alternative 1 (preferred alternative)     |  |  |
| No other alternatives will be considered. |  |  |
| Alternative 2                             |  |  |
|   |  |  |
| Alternative 3                             |  |  |
|   |  |  |

e) No-go alternative

|   |
|---|
| <p>This alternative suggests that no development occurs.</p> <p>This option has been considered but is not a viable option for the following reasons:</p> <ul style="list-style-type: none"> <li>• The applicant will not be gaining financial benefits from the additional agricultural area;</li> <li>• Better management of both water resources and water use will not be achieved;</li> <li>• No job security for existing workers and future workers; and</li> <li>• No new job opportunities for locals from Louisvale.</li> </ul> <p>Therefore, this alternative is not deemed preferred.</p> |
|---|

Paragraphs 3 to 13 below should be completed for each alternative.

### 3) Physical size of the activity

a) Indicate the physical size of the preferred activity/technology as well as alternative activities/technologies (footprints):

| Alternative:                                   | Activity        | Size of the activity:                                |
|--|-----------------|--|
| Alternative 1 (preferred activity alternative) | <b>Vineyard</b> | 13.4 ha  |
|  | <b>Pipeline</b> | 838 m  |
|  | <b>Dam</b>      | 4000 m <sup>3</sup> /a; 1500 m <sup>2</sup> in size. |
| Alternative 2 (if any)                         | <b>Vineyard</b> | 14 ha  |
|  | <b>Pipeline</b> | 838 m  |
|  | <b>Dam</b>      | 4000 m <sup>3</sup> /a; 1500 m <sup>2</sup> in size. |
| Alternative 3 (if any)                         | <b>Vineyard</b> | 12.8 ha  |
|  | <b>Pipeline</b> | 838 m  |
|  | <b>Dam</b>      | 4000 m <sup>3</sup> /a; 1500 m <sup>2</sup> in size. |

or, for linear activities:

| Alternative:                                    |                 | Length of the activity: |
|---|-----------------|-------------------------|
| Alternative A1 (preferred activity alternative) | <b>Pipeline</b> | 838M                    |
| Alternative A2 (if any)                         |                 | M                       |
| Alternative A3 (if any)                         |                 | M                       |

b) Indicate the size of the alternative sites or servitudes (within which the above footprints will occur):

| Alternative:                                   | Activity                 | Size of the site/servitude: |
|--|--------------------------|-----------------------------|
| Alternative 1 (preferred activity alternative) |                          |                             |
| <b>Portion 238 Bethesda 38</b>                 | <b>Pipeline and dam</b>  | <b>2600 m<sup>2</sup></b>   |
| <b>Portion 335 Bethesda 38</b>                 | <b>Agricultural area</b> | <b>13.4 ha</b>              |
| Alternative 2 (if any)                         |                          |                             |
| <b>Portion 238 Bethesda 38</b>                 | <b>Pipeline and dam</b>  | <b>2600 m<sup>2</sup></b>   |
| <b>Portion 335 Bethesda 38</b>                 | <b>Agricultural area</b> | <b>14 ha</b>                |
| Alternative 3 (if any)                         |                          |                             |
| <b>Portion 238 Bethesda 38</b>                 | <b>Pipeline and dam</b>  | <b>2600 m<sup>2</sup></b>   |
| <b>Portion 335 Bethesda 38</b>                 | <b>Agricultural area</b> | <b>12.8ha</b>               |

#### 4) Site Access

|   |            |               |
|---|------------|---------------|
| Does ready access to the site exist?                                    | <b>YES</b> | <del>NO</del> |
| If NO, what is the distance over which a new access road will be built. | m          |               |

Describe the type of access road planned:

|  |
|--|
| Not applicable.  |
| Access to Portion 238 of Farm Bethesda 38 is via the R359. Access to Portion 335 of Farm Bethesda 38 is via a gravel road across Portion 238 Farm Bethesda 38. |

Include the position of the access road on the site plan and required map, as well as an indication of the road in relation to the site.

#### 5) Locality Map

An A3 locality map must be attached to the back of this document, as **Appendix A**. The scale of the locality map must be relevant to the size of the development (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 map must indicate the following:



- an accurate indication of the project site position as well as the positions of the alternative sites, if any;
- indication of all the alternatives identified;
- closest town(s);
- road access from all major roads in the area;
- road names or numbers of all major roads as well as the roads that provide access to the site(s);
- all roads within a 1 km radius of the site or alternative sites; and
- a north arrow;
- a legend; and
- locality GPS co-ordinates (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 degrees and decimal minutes. The minutes should have at least three decimals to ensure adequate accuracy. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection).

## 6) Layout/Route Plan

A detailed site or route plan(s) must be prepared for each alternative site or an alternative activity. It must be attached as **Appendix A** to this document.

The site or route plans must indicate the following:

- the property boundaries and numbers of all the properties within 50 metres of the site;
- the current land use as well as the land-use zoning of the site;
- the current land use as well as the land-use zoning each of the properties adjoining the site or sites;
- the exact position of each listed activity applied for (including alternatives);
- servitude(s) indicating the purpose of the servitude;
- a legend; and
- a north arrow.

## 7) Sensitivity Map

The layout/route plan as indicated above must be overlain with a sensitivity map that indicates all the sensitive areas associated with the site, including, but not limited to:

- watercourses;
- the 1:100-year flood line (where available or where it is required by DWS);
- ridges;
- cultural and historic features;
- areas with indigenous vegetation (even if it is degraded or infested with alien species); and
- critical biodiversity areas.

The sensitivity map must also cover areas within 100m of the site and must be attached in **Appendix A**.

## 8) Site Photographs

Colour photographs from the centre 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 **Appendix B** to this report. It must be supplemented with additional photographs of relevant features on the site, if applicable.

## 9) Facility Illustration

A detailed illustration of the activity must be provided at a scale of at least 1:200 as **Appendix C** 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.

## 10) Activity Motivation

Motivate and explain the need and desirability of the activity (including demand for the activity):

|  |                |               |                |
|--|----------------|---------------|----------------|
| 1) Is the activity permitted in terms of the property's existing land use rights?  | YES            | <del>NO</del> | Please explain |
| The applicant is the landowner and the activity will form part of the agriculture activities on the farm. The surrounding land use and current land use of the site is agriculture and therefore is in line with the existing rights.        |                |               |                |
| Will the activity be in line with the following?   |                |               |                |
| (a) Provincial Spatial Development Framework (PSDF)  | YES            | <del>NO</del> | Please explain |
| The activity will be of agricultural benefit.  |                |               |                |
| (b) Urban edge/edge of built environment for the area  | YES            | <del>NO</del> | Please explain |
| The proposed development is not within the Urban Edge.<br>Not applicable.  |                |               |                |
| (c) Integrated Development Plan (IDP) and Spatial Development Framework (SDF) of the local municipality (e.g. would the approval of this application compromise the integrity of the existing approved and credible municipal IDP and SDF?). | YES            | <del>NO</del> | Please explain |
| The proposed development will not compromise the integrity of the municipal SDF or IDP, as it is situated within a non-urban area.   |                |               |                |
| (d) Approved Structure Plan (ASP) of the municipality  | <del>YES</del> | NO            | Please explain |
| Not applicable.  |                |               |                |

|   |                |               |                |
|---|----------------|---------------|----------------|
| (e) An Environmental Management Framework (EMF) adopted by the Department (e.g. Would the approval of this application compromise the integrity of the existing environmental management priorities for the area and if so, can it be justified in terms of sustainability considerations?)   | <del>YES</del> | <b>NO</b>     | Please explain |
| Not applicable.   |                |               |                |
| (f) Any other plans (e.g. Guide Plan)   | <del>YES</del> | <b>NO</b>     | Please explain |
| Not applicable.   |                |               |                |
| 2) Is the land use (associated with the activity being applied for) considered as within the timeframe intended by the existing approved SDF agreed to by the relevant environmental authority (i.e. is the proposed development in line with the projects and programmes identified as priorities within the credible IDP)?                              | <del>YES</del> | <b>NO</b>     | Please explain |
| The proposed development is in line with the existing use of the property, which is agricultural. The development of the vineyards is, therefore, an expansion of the existing uses and the continuation of the existing use.   |                |               |                |
| 3) Does the community/area need the activity and the associated land use concerned (is it a societal priority)? This refers to the strategic level as well as the local level (e.g. development is a national priority, but within a specific local context it could be inappropriate.)   | <b>YES</b>     | <del>NO</del> | Please explain |
| The proposed agricultural development is not a societal priority. However, if the agricultural development on the property will ensure that the applicant will be able to secure existing jobs and provide more job opportunities, it could become available for unemployed from the local communities.   |                |               |                |
| 4) Are the necessary services with adequate capacity currently available (at the time of application), or must additional capacity be created to cater for the development? (Confirmation by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as Appendix I.)   | <del>YES</del> | <b>NO</b>     | Please explain |
| A WULA (Water Use Licence Application) will be applied for Section 21 c and i for the developments across the streams and Section 21 b for the storage of water. The property has existing water use rights from the Louisvale Water Users Association for 10 ha (150 00 m <sup>3</sup> /a). Existing electricity infrastructure from Eskom will be used. |                |               |                |
| 5) Is this development provided for in the infrastructure planning of the municipality, and if not, what the implication will be on the infrastructure planning of the municipality (priority and placement of services and opportunity costs)? (Comment by   | <b>YES</b>     | <del>NO</del> | Please explain |

|   |                |               |                |
|---|----------------|---------------|----------------|
| the relevant municipality in this regard must be attached to the final Basic Assessment Report as Appendix I.)  |                |               |                |
| The proposed development is not affected or will not affect infrastructure planning within the municipality. The development is for agricultural development.   |                |               |                |
| 6) Is this project part of a national programme to address an issue of national concern or importance?  | <del>YES</del> | <b>NO</b>     | Please explain |
| Not applicable.   |                |               |                |
| 7) Do location factors favour this land use (associated with the activity applied for) at this place? (This relates to the contextualisation of the proposed land use on this site within its broader context.)   | <b>YES</b>     | <del>NO</del> | Please explain |
| The proposed development will be located on agricultural land. The activities will further contribute to job creation, therefore favouring this land use.   |                |               |                |
| 8) Is the development of the best practicable environmental option for this land/site?  | <b>YES</b>     | <del>NO</del> | Please explain |
| The site is the only possible area for the agricultural activities, as the alternative areas will have a larger environmental impact in comparison to the preferred option. Most of the site is considered as “barren”. The proposed development will have a low negative impact on vegetation for the construction of agricultural development if the mitigation measures are implemented. |                |               |                |
| 9) Will the benefits of the proposed land use/development outweigh the negative impacts of it?  | <b>YES</b>     | <del>NO</del> | Please explain |
| No, the small environmental impact will not outweigh the financial gains and the social impacts of additional work opportunities within this area.  |                |               |                |
| 10) Will the proposed land use/development set a precedent for similar activities in the area (local municipality)?   | <b>YES</b>     | <del>NO</del> | Please explain |
|   |                |               |                |
| 11) Will any person’s rights be negatively affected by the proposed activity/activities?  | <del>YES</del> | <b>NO</b>     | Please explain |
|   |                |               |                |
| 12) Will the proposed activity/activities compromise the “urban edge” as defined by the local municipality?   | <del>YES</del> | <b>NO</b>     | Please explain |
| The development is within an agricultural area.   |                |               |                |
| 13) Will the proposed activity/activities contribute to any of the 17 Strategic Integrated Projects (SIPS)?   | <del>YES</del> | <b>NO</b>     | Please explain |
| Not applicable.   |                |               |                |
| 14) What will the benefits be to society in general and to the local communities?   | Please explain |               |                |

There is no doubt that the water will be used in an efficient and beneficial manner, as well as in public interest.

Efficient drip and sprinkler irrigation are practised in conjunction with the use of neutron moisture measures to forecast irrigation scheduling programs. Thus, the water is used sparingly, and the latest irrigation technology and scheduling methods are always implemented.

The applicant, who is well established in the production industry, has the skills, knowledge and financial capability to make a success of this new development.

The applicant also sees the ongoing socio-economic development of the workers on the farm as an integral part of their business model.

|  |                |
|--|----------------|
| 15) Any other need and desirability considerations related to the proposed activity? | Please explain |
|--|----------------|

None.

|   |                |
|---|----------------|
| 16) How does the project fit into the National Development Plan for 2030? | Please explain |
|---|----------------|

It contributes to the following:

- Provides temporary job opportunities for local residents;
- Promotes job security;
- Ensures minimum negative environmental impacts; and
- Contributes to the local economy.

17) Please describe how the general objectives of Integrated Environmental Management as set out in section 23 of NEMA have been taken into account.

| Section 23 of NEMA  | Implementation for this proposed development  |
|---|---|
| (a) Promote the integration of the principles of environmental management, as set out in section 2, into the making of all decisions which may have a significant effect on the environment;  | The needs of people, the economy of the area and the environment were considered in developing the preferred option.  |
| (b) Identify, predict and evaluate the actual and potential impact on the environment, socio-economic conditions and cultural heritage, the risks and consequences and alternatives and options for mitigation of activities, with a view to minimising negative impacts, maximising benefits, and promoting compliance with the principles of environmental management set out in section 2; | The selected development area was chosen due to the low impact on the environment. Even though the socio-economic conditions were not maximised directly, temporary and possibly permanent job opportunities will be created. |
| (c) Ensure that the effects of activities on the environment receive adequate consideration before actions are taken in connection with them;   | The selected development option ensured minimal impacts on the natural environment.   |

|   |   |
|---|---|
| (d) Ensure adequate and appropriate opportunity for public participation in decisions that may affect the environment;  | The public will be kept informed through the distribution of information as required by the regulations.  |
| (e) Ensure the consideration of environmental attributes in management and decision-making which may have a significant effect on the environment; and  | Attributes such as natural vegetation, freshwater features, archaeology and socio-economy were identified, which aided the identification of the proposed development.  |
| (f) Identify and employ the modes of environmental management best suited to ensuring that a particular activity is pursued in accordance with the principles of environmental management set out in section 2. | Environmental management principles were used to identify the type of project which, in this case, will contribute to the economy of the region while at the same time have minimal negative impacts on the natural environment. In other words, the proposed development is in line with the opportunities and constraints of the land, the surrounding area and the region's economy. |

18) Please describe how the principles of environmental management as set out in section 2 of NEMA have been taken into account.

In achieving sustainable development, the focus, therefore, may not be restricted to environmental or nature conservation factors only. It should include economic and social realities and also consider social factors such as those that determine income, quality of life, social networks, and other means aimed at maintaining and improving the well-being of people. Economic factors deal with the affordability of processes, their potential to generate an income over an extended period (into future generations) and to maintain its ability to support both the environmental and social needs of an area.

In short, if people are impoverished, there will be no environment to protect; if a project is not attractive economically, it will not be launched.

One way of testing whether a project meets with the demands of sustainability in development is to establish whether or not a project increases environmental, social, and economic values. Sustainable development mainly has as its aim the maintenance of environmental capital. This is achieved if the project that will be established in the developmental process is likely to provide at least the same value as is likely to be destroyed by its development.

Looking at the three tiers of NEMA principles, this development should be socially, environmentally, and economically viable. They are summarised for this project as follows:

**Social viability:**

The development will meet the local and regional needs through securing job opportunities, as the proposed new development will provide additional working opportunities. In addition to this, the visual aspect and sense of place are in line with the surroundings, which are all agriculture-related activities.

**Economic viability:**

The development will have a positive impact by improving the economy of local workers through the provision of job opportunities during construction. The proposed development will also secure the financial viability of the company by increasing its income through farming. The proposed new development area will ensure long-term economic viability as well as the sustainability of the project. The proposed development will create some permanent employment opportunities, and will contribute positively to the local economy.

**Environmental viability:**

The development will have a low negative impact on the natural vegetation and limited impact on aquatic ecosystems, with no impact on archaeology. The impacts will be mitigated as far as possible to reduce the impacts as far as possible.

In summary, it will have many positive impacts that include:

- Will provide temporary job opportunities for local workers during construction;
- Provide the farmer to fully utilise the land for agricultural use; and
- Secure current employees’ jobs and create new job opportunities.

**11) 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, if applicable:

| Title of legislation, policy or guideline  | Applicability to the project                      | Administering authority              | Date  |
|--|---|--------------------------------------|---|
| National Environmental Management Act  | Department of Environment and Nature Conservation | Environmental authorisation          | Pending                                       |
| Heritage Resources Act   | South African Heritage Resource Association.      | Comments under Section 38 (1)        | Pending                                       |
| CARA   | Department of Agriculture: Land Care Unit         | Ploughing Certificate                | Pending                                       |
| National Water Act, 1998   | Department of Water Affairs                       | Water Use Licence Application (WULA) | Pending                                       |
| Northern Cape Nature Conservation Act, 2009 (Act No. 9 of 2009) and Regulations (2011) | Department of Nature Conservation                 | Nature Conservation Permit           | After approval of Environmental Authorisation |
| National Forests Act (Act no 84 of 1998)   | Department of Agriculture, Forestry and Fisheries | DAFF Permit                          | After approval of                             |

|  |  |  |                                |
|--|--|--|--------------------------------|
|  |  |  | Environmental<br>Authorisation |
|--|--|--|--------------------------------|

## 12) Waste, Effluent, Emission and Noise Management

### a) Solid waste management

|  |                  |               |
|--|------------------|---------------|
| Will the activity produce solid construction waste during the construction/initiation phase? | <b>YES</b>       | <del>NO</del> |
| If YES, what estimated quantity will be produced per month?                                  | 2 m <sup>3</sup> |               |

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

|  |
|--|
| The associated waste will be for the cultivation of land, removal of rocks and trees etc. On Portion 238 of Bethesda 38, there is an existing crusher. All rocks will be crushed. All associated rubble will be taken to an approved landfill site in Uppington. |
|--|

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

|            |
|------------|
| See above. |
|------------|

|  |                    |           |
|--|--------------------|-----------|
| Will the activity produce solid waste during its operational phase?  | <del>YES</del>     | <b>NO</b> |
| If YES, what estimated quantity will be produced per month?  | Very small amounts |           |
| How will the solid waste be disposed of (describe)?  |                    |           |
| If the solid waste will be disposed of into a municipal waste stream, indicate which registered landfill site will be used.  |                    |           |
| All associated rubble will be taken to an approved landfill site in Uppington.   |                    |           |
| Where will the solid waste be disposed of if it does not feed into a municipal waste stream (describe)?  |                    |           |
|  |                    |           |
| 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, then 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 NEM:WA?  | <del>YES</del> | <b>NO</b> |
| If YES, inform the competent authority and request a change to an application for scoping and EIA. An application for a waste permit in terms of the NEM:WA must also be submitted with this application. |                |           |

|   |                |           |
|---|----------------|-----------|
| Is the activity that is being applied for a solid waste handling or treatment facility? | <del>YES</del> | <b>NO</b> |
|---|----------------|-----------|



If YES, then the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA. An application for a waste permit in terms of the NEM:WA must also be submitted with this application.

b) Liquid effluent

|   |                |           |
|---|----------------|-----------|
| Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system?                                    | <del>YES</del> | <b>NO</b> |
| If YES, what estimated quantity will be produced per month?   | m <sup>3</sup> |           |
| Will the activity produce any effluent that will be treated and/or disposed of on-site?   | <del>YES</del> | <b>NO</b> |
| 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. |                |           |

|   |                |           |
|---|----------------|-----------|
| Will the activity produce effluent that will be treated and/or disposed of at another facility? | <del>YES</del> | <b>NO</b> |
| 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 wastewater, if any:

A drip irrigation system will be used to irrigate the vineyard, thereby conserving water.

c) Emissions into the atmosphere

|   |                |               |
|---|----------------|---------------|
| Will the activity release emissions into the atmosphere other than exhaust emissions and dust associated with construction phase activities?          | <del>YES</del> | <b>NO</b>     |
| If YES, is it controlled by any legislation of any sphere of government?  | <del>YES</del> | <del>NO</del> |
| If YES, the applicant must 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:   |                |               |
|   |                |               |

d) Waste permit

|  |                |           |
|--|----------------|-----------|
| Will any aspect of the activity produce waste that will require a waste permit in terms of the NEM:WA? | <del>YES</del> | <b>NO</b> |
|--|----------------|-----------|

If YES, please submit evidence that an application for a waste permit has been submitted to the competent authority

e) Generation of noise

|   |                |               |
|---|----------------|---------------|
| Will the activity generate noise?   | <del>YES</del> | <b>NO</b>     |
| If YES, is it controlled by any legislation of any sphere of government?  | <del>YES</del> | <del>NO</del> |
| Describe the noise in terms of type and level:  |                |               |
| The noise will be short term during the construction of the dam and agricultural areas. During the operational phase of the development, no additional noise will be generated. Noise levels associated with agricultural uses, as within the surrounding area. |                |               |

**13) Water Use**

Please indicate the source(s) of water that will be used for the activity by ticking the appropriate box(es):

|                      |                       |                        |                                   |                  |  |
|----------------------|-----------------------|------------------------|-----------------------------------|------------------|--|
| <del>Municipal</del> | <del>Waterboard</del> | <del>Groundwater</del> | <b>River, stream, dam or lake</b> | <del>Other</del> | <del>The activity will not use water</del> |
|----------------------|-----------------------|------------------------|-----------------------------------|------------------|--|

|   |                           |               |
|---|---------------------------|---------------|
| 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:<br>Does the activity require a water use authorisation (general authorisation or water use license) from the Department of Water Affairs?   | 150 000 m <sup>3</sup> /a |               |
|   | <b>YES</b>                | <del>NO</del> |
| If YES, please provide proof that the application has been submitted to the Department of Water Affairs.<br><br>The property has existing water use rights allocated for approximately 10ha (150 000m <sup>3</sup> /a) from the Louisvale Water Users Association. A Water Use License Application will be lodged with the Department of Water and Sanitation in Upington for the following activities:<br><br><ul style="list-style-type: none"> <li>4. 21 c and i for agricultural development across streams, development of a dam in the stream and pipeline crossing the streams</li> <li>5. 21 b for the storage of water taken from a resource</li> </ul><br>Find the Water Use License Application included in Appendix D4: Water Use License Report. |                           |               |

**14) Energy Efficiency**

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

|                 |
|-----------------|
| Not applicable. |
|-----------------|

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

|                |
|----------------|
| Not applicable |
|----------------|

## SECTION B: SITE/AREA/PROPERTY DESCRIPTION

Important notes:

For linear activities (pipelines, etc) as well as activities that cover very large sites, it may be necessary to complete this section for each part of the site that has a significantly different environment. In such cases please complete copies of Section B and indicate the area, which is covered by each copy No. on the Site Plan.

|                              |  |
|------------------------------|--|
| Section B Copy No. (e.g. A): |  |
|------------------------------|--|

Paragraphs 1 - 6 below must be completed for each alternative.

Has a specialist been consulted to assist with the completion of this section?

|     |    |
|-----|----|
| YES | NO |
|-----|----|

If YES, please complete the form entitled "Details of specialist and declaration of interest" for each specialist thus appointed and attach it in Appendix I: Specialist's declaration of interest. All specialist reports must be contained in Appendix D: Specialist reports (including terms of reference).

|  |  |  |     |
|--|--|--|-----|
| Property description/physical address:                         | Province   | Northern Cape  |     |
|  | District Municipality  | ZF Mgcawu District Municipality                          |     |
|  | Local Municipality   | Dawid Kruiper Municipality                               |     |
|  | Ward Number(s)   | Not applicable.  |     |
|  | Farm name and number   | Farm Bethesda 38   |     |
|  | Portion number   | Portion 238 and 335                                      |     |
|  | SG Code  | 238: C03600000000003800238<br>335: C03600000000003800335 |     |
|  | Where a large number of properties are involved (e.g. linear activities), please attach a full list to this application including the same information as indicated above.                       |  |     |
| Current land-use zoning as per local municipality IDP/records: | Agriculture  |  |     |
|  | In instances where there is more than one current land-use zoning, please attach a list of current land use zonings that also indicate which portions each use pertains to, to this application. |  |     |
| Is a change of land-use or a consent use application required? |  |  |     |
|  |  |  | YES |
|  |  |  | NO  |

### 15) Gradient of The Site

Indicate the general gradient of the site:

The site slopes at a moderate gradient downwards from south to north and is located on a shallowly convex terrain.

Alternative 1:

|      |             |             |             |              |             |                  |
|------|-------------|-------------|-------------|--------------|-------------|------------------|
| 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 |
|------|-------------|-------------|-------------|--------------|-------------|------------------|

Alternative 2 (if any):

|      |             |             |             |              |             |                  |
|------|-------------|-------------|-------------|--------------|-------------|------------------|
| 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 |
|------|-------------|-------------|-------------|--------------|-------------|------------------|

Alternative 3 (if any):

|      |             |             |             |              |             |                  |
|------|-------------|-------------|-------------|--------------|-------------|------------------|
| 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 |
|------|-------------|-------------|-------------|--------------|-------------|------------------|

### 16) Location in Landscape

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

|                                 |  |                   |                                     |                                  |                                     |
|---------------------------------|--|-------------------|-------------------------------------|----------------------------------|-------------------------------------|
| 2.1 Ridgeline                   |  | 2.4 Closed valley |                                     | 2.7 Undulating plain / low hills | <input checked="" type="checkbox"/> |
| 2.2 Plateau                     |  | 2.5 Open valley   | <input checked="" type="checkbox"/> | 2.8 Dune                         |                                     |
| 2.3 Side slope of hill/mountain |  | 2.6 Plain         |                                     | 2.9 Seafront                     |                                     |
| 2.10 At sea                     |  |                   |                                     |                                  |                                     |

### 17) Groundwater, Soil and Geological Stability of The Site

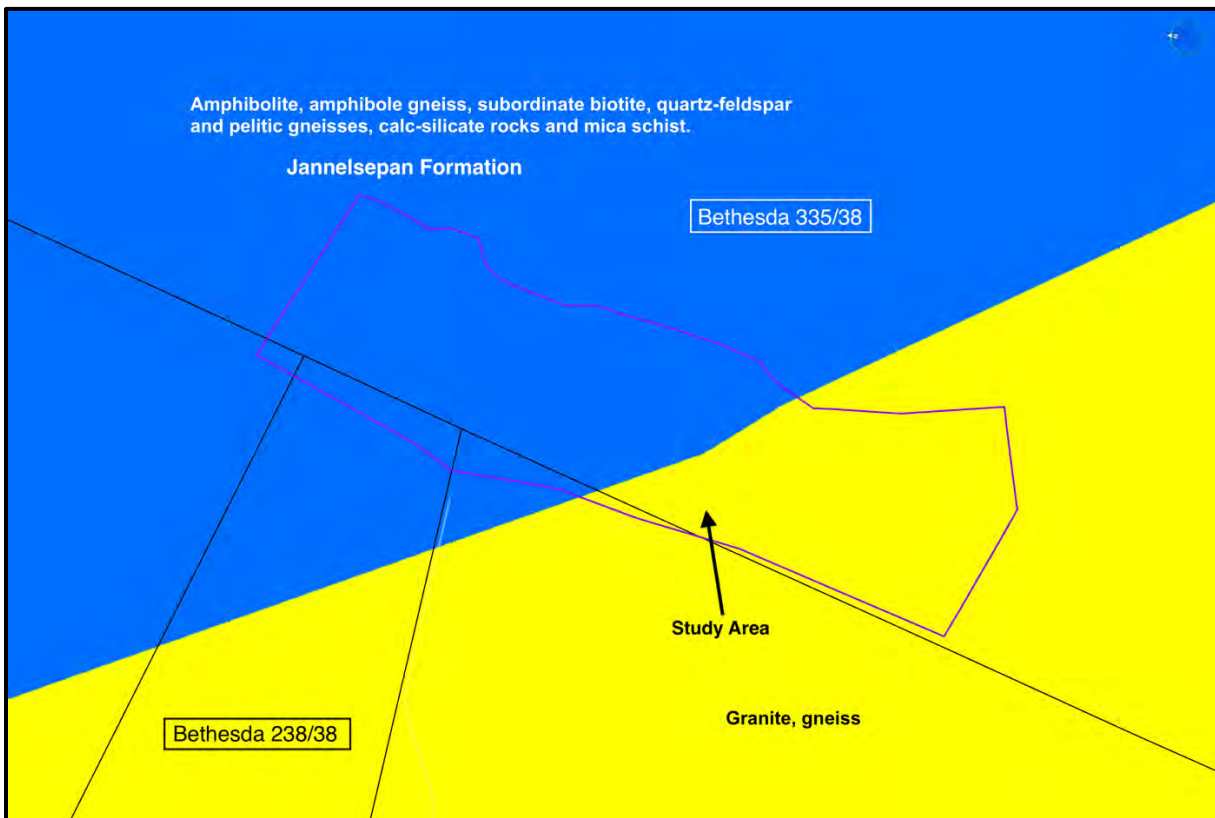
Is the site(s) located on any of the following?

|  | Alternative 1: |    | Alternative 2 (if any): |    | Alternative 3 (if any): |    |
|--|----------------|----|-------------------------|----|-------------------------|----|
|  | <del>YES</del> | NO | <del>YES</del>          | NO | <del>YES</del>          | NO |
| Shallow water table (less than 1.5m deep)                  | <del>YES</del> | NO | <del>YES</del>          | NO | <del>YES</del>          | NO |
| Dolomite, sinkhole or doline areas                         | <del>YES</del> | NO | <del>YES</del>          | NO | <del>YES</del>          | NO |
| Seasonally wet soils (often close to water bodies)         | <del>YES</del> | NO | <del>YES</del>          | NO | <del>YES</del>          | NO |
| Unstable rocky slopes or steep slopes with loose soil      | <del>YES</del> | NO | <del>YES</del>          | NO | <del>YES</del>          | NO |
| Dispersive soils (soils that dissolve in water)            | <del>YES</del> | NO | <del>YES</del>          | NO | <del>YES</del>          | NO |
| Soils with high clay content (clay fraction more than 40%) | <del>YES</del> | NO | <del>YES</del>          | NO | <del>YES</del>          | NO |
| Any other unstable soil or geological feature              | <del>YES</del> | NO | <del>YES</del>          | NO | <del>YES</del>          | NO |
| An area sensitive to erosion                               | <del>YES</del> | NO | <del>YES</del>          | NO | <del>YES</del>          | NO |

If you are unsure about any of the above or if you are concerned that any of the above aspects may be an issue of concern in the application, an appropriate specialist should be appointed to assist in the completion of this section. Information in respect of the above will often be available as part of the project information or at the planning sections of local authorities. Where it exists, the 1:50 000 scale Regional Geotechnical Maps prepared by the Council for GeoScience may also be consulted.

Geology:

The geology consists of migmatitic amphibolites and calc-silicate rocks of the Jannelsepan Formation (blue in Figure 7) and granite-gneisses (yellow in Figure 7) all within the Areachap Group of the Namaqua-Natal Geological Province (Cornell *et al.* 2006). The soils that are the weathered products of these rocks are gravelly and well-drained. Refer to the Botanical Assessment Report included in Appendix D1: Botanical Report.



**Figure 7: Geological map of the study area (purple boundary line)**

**18) Groundcover**

Indicate the types of groundcover present on the site. The location of all identified rare or endangered species or other elements should be accurately indicated on the site plan(s).

|   |   |  |  |         |
|---|---|--|--|---------|
| Natural veld in good condition <sup>E</sup> | Natural veld with scattered aliens <sup>E</sup> | Natural veld with heavy alien infestation <sup>E</sup> | Veld dominated by alien species <sup>E</sup> | Gardens |
|---|---|--|--|---------|

|             |                 |               |  |                      |
|-------------|-----------------|---------------|--|----------------------|
| Sport field | Cultivated land | Paved surface | <del>Building or other structure</del> | <del>Bare soil</del> |
|-------------|-----------------|---------------|--|----------------------|

If any of the boxes marked with an “E” is ticked, please consult an appropriate specialist to assist in the completion of this section if the environmental assessment practitioner doesn’t have the necessary expertise.

Botany:

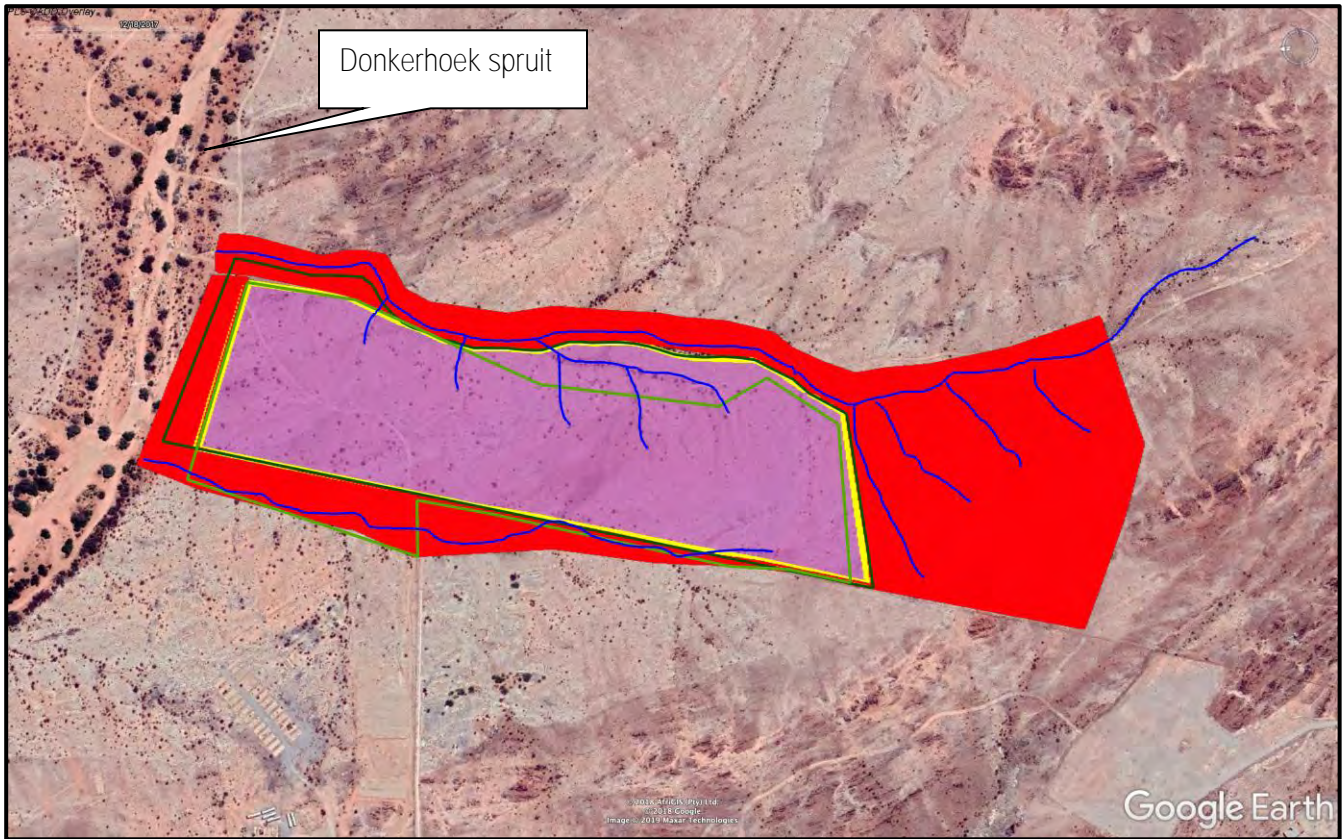
The entire Bethesda Farm study area falls within an extensive vegetation unit that was mapped by Mucina et al. (2005) and SANBI (2012) as Bushmanland Arid Grassland. It is widespread in the Bushmanland Bioregion and has a Least Threatened conservation status (Government Gazette, 2011; Driver et al. 2012). This vegetation type is characteristically dominated by ‘white grasses’ in the genus *Stipagrostis* but also has a complement of low shrubs.

The vegetation, in essence, is a low, open grassy shrubland with emergent small trees. The drainage lines that have a higher concentration of blackthorn trees (*Vachellia mellifera* subsp. *detinens*) would be buffered and would not be directly impacted by agricultural development.

Only one specimen of *Aloe gariensis* (Orange River aloe) was found, but numerous clusters of *Aloe claviflora* (canon aloe) occur, mainly in the southern part of the study area. These species are protected.

A number of small trees of *Boscia foetida* were found and recorded. However, significantly no protected *Boscia albitrunca* (shepherd’s tree) trees were found. In addition, no protected *Vachellia erioloba* (camel thorn) trees were recorded, since the substrate is not suitable for them.

The vegetation does not display a high level of sensitivity over most of the site, but the southern part is rocky, with exposed bedrock, and this area is ecologically sensitive, with many niches resulting in high plant species richness. The southern part of the area investigated should, therefore, be avoided and not disturbed. A sensitivity map is given in Figure 8, showing that the ‘central’ part of the area investigated (shaded pink) would be acceptable for cultivation whereas the boundary zone should be avoided, and the Donkerhoekspruit buffered by 32 m.



**Figure 8: Sensitivity map of the study area**

A sensitivity map of the study area showing the pink area as an area of low sensitivity. The zone between the pink area and the outer (red) boundary is considered to have moderate to high sensitivity. The dark green boundary indicates the Alternative 1 (Alternative 2 according to BAR) development area; the light-green boundary indicates the Alternative 2 (Alternative 3 according to BAR) development area and the yellow boundary indicates the Alternative 3 (Alternative 1, preferred, according to BAR) development area. Refer to the Botanical Assessment Report included in Appendix D1: Botanical Report.

### 19) Surface Water

Indicate the surface water present on and or adjacent to the site and alternative sites.

|                            |     |    |        |
|----------------------------|-----|----|--------|
| Perennial River            | YES | NO | UNSURE |
| Non-Perennial River        | YES | NO | UNSURE |
| Permanent Wetland          | YES | NO | UNSURE |
| Seasonal Wetland           | YES | NO | UNSURE |
| Artificial Wetland         | YES | NO | UNSURE |
| Estuarine/Lagoonal wetland | YES | NO | UNSURE |

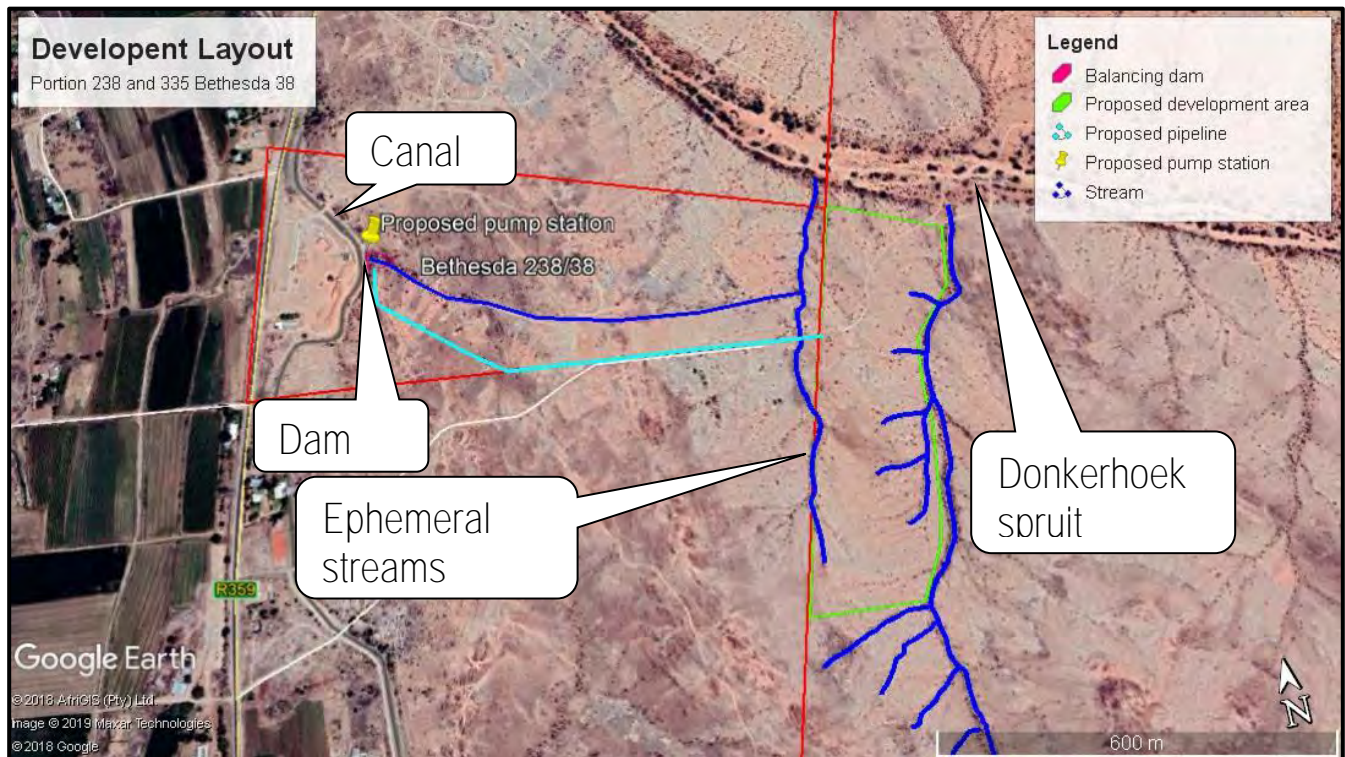


If any of the boxes marked YES or UNSURE is ticked, please provide a description of the relevant watercourse.

Freshwater features:

The proposed development falls within the Lower Orange River Water Management area, within the D73F quaternary catchment area. The Portion 238 and 355 of Farm Bethesda 38 is located in a sub-catchment of a stream locally known as the Donkerhoekspruit (see Figure 9). The Donkerhoekspruit is not really a river, but rather fits the description of a mostly dry drainage line. Most of the drainage lines in the area have been straightened and engineered into ditches for least flow resistance and optimal drainage. However, the Donkerhoekspruit has escaped this and it still in a morphologically natural state. The impact is local, on the spot where the drainage lines are diverted. It is not foreseen that that the current impact or the planting of the envisaged additional vineyard would make a noticeable hydrological difference to the existing situation in the Donkerhoekspruit or the Orange River.

A canal is present on a section of the development site (where the dam is to be built on Portion 238 and from which water will be supplied for irrigation purposes). A pipeline (indicated in the light blue line in Figure 9) will run from the dam towards the vineyard development area from where it will intersect a dried up stream on Portion 238. A few dry streams on the vineyard development area (on Portion 335) will also be impeded.



**Figure 9: Location of the canal and streams.**

## 20) Land Use Character of Surrounding Area

Indicate land uses and/or prominent features that currently occur within a 500 m radius of the site and give a description of how this influences the application or maybe impacted upon by the application:

|  |   |                                  |
|--|---|----------------------------------|
| <b>Natural area</b>                      | Dam or reservoir                            | Polo fields                      |
| Low density residential                  | Hospital/medical centre                     | Filling station <sup>H</sup>     |
| Medium density residential               | School                                      | Landfill or waste treatment site |
| High density residential                 | Tertiary education facility                 | Plantation                       |
| Informal residential <sup>A</sup>        | Church                                      | <b>Agriculture</b>               |
| Retail commercial & warehousing          | Old age home                                | <b>River, stream or wetland</b>  |
| <b>Light industrial</b>                  | Sewage treatment plant <sup>A</sup>         | Nature conservation area         |
| Medium industrial <sup>AN</sup>          | Train station or shunting yard <sup>N</sup> | Mountain, koppie or ridge        |
| Heavy industrial <sup>AN</sup>           | Railway line <sup>N</sup>                   | Museum                           |
| Power station                            | Major road (4 lanes or more) <sup>N</sup>   | Historical building              |
| Office/consulting room                   | Airport <sup>N</sup>                        | Protected Area                   |
| Military or police base/station/compound | Harbour                                     | Graveyard                        |
| Spoil heap or slimes dam <sup>A</sup>    | Sport facilities                            | Archaeological site              |
| Quarry, sand or borrow pit               | Golf course                                 | Other land uses (describe)       |

### Location:

The site is located on two properties. Portion 238 of Farm Bethesda has existing light industrial activities taking place. The rest of the site is highly disturbed. Portion 335 of Farm Bethesda is largely natural and is surrounded by natural areas, and to the north of the property is the Donkerhoekspruit. Large-scale agricultural developments are situated to the west of the site along the banks of the Orange River. See Figure 10.

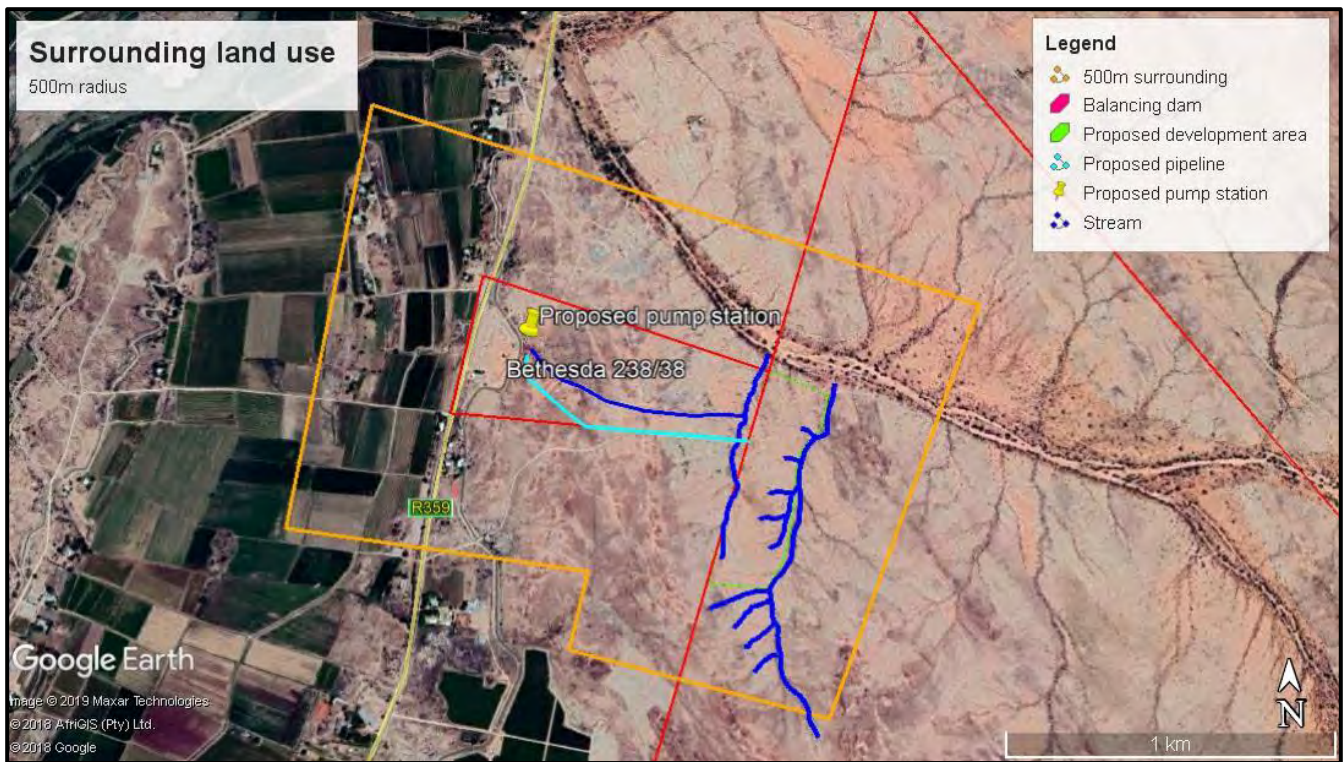


Figure 10: Land use character of the surroundings.

If any of the boxes marked with an "N" are ticked, how will this impact/be impacted upon by the proposed activity? Specify and explain:

N/A

If any of the boxes marked with an "An" are ticked, how will this impact/be impacted upon by the proposed activity? Specify and explain:

N/A

If any of the boxes marked with an "H" are ticked, how will this impact/be impacted upon by the proposed activity? Specify and explain:

N/A

Does the proposed site (including any alternative sites) fall within any of the following?

|  |     |    |
|--|-----|----|
| Critical Biodiversity Area (as per provincial conservation plan) | YES | NO |
|--|-----|----|

|  |                |           |
|--|----------------|-----------|
| Core area of a protected area?   | <del>YES</del> | <b>NO</b> |
| Buffer area of a protected area?   | <del>YES</del> | <b>NO</b> |
| Planned expansion area of an existing protected area?                        | <del>YES</del> | <b>NO</b> |
| Existing offset area associated with a previous Environmental Authorisation? | <del>YES</del> | <b>NO</b> |
| Buffer area of the SKA?  | <del>YES</del> | <b>NO</b> |

If the answer to any of these questions was YES, a map indicating the affected area must be included in Appendix A.

## 21) Cultural/Historical Features

|   |            |               |
|---|------------|---------------|
| Are there any signs of culturally or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including archaeological or paleontological sites, on or close (within 20 m) to the site? If YES, explain:          | <b>YES</b> | <del>NO</del> |
|   | Uncertain  |               |
| An archaeological study revealed that some lithics were found, but due to the sparsity of the locations as well as the limited number of items found, the specialist deemed the site of low archaeological significance. Refer to Appendix D2: Archaeology Report, for the full report. |            |               |

|  |
|--|
| If uncertain, conduct a specialist investigation by a recognised specialist in the field (archaeology or palaeontology) to establish whether there is such a feature(s) present on or close to the site. Briefly explain the findings of the specialist:   |
| <p>The following is taken from the Archaeological Assessment, included in Appendix D2: Archaeology Report:</p> <p><i>Impact statement</i></p> <p>Overall, the results of the study indicate that the proposed activity (i. e. the cultivation of vineyards) and associated activities (i. e. a storage reservoir, pump station &amp; water pipeline), will not have an impact of great significance on the archaeological heritage, as these are expected to be limited. Therefore, there are no objections to the authorisation of the proposed development.</p> <p><i>Conclusion</i></p> <p>The study has captured a good record of the archaeological heritage present on the proposed development site, which has been graded as having <i>low</i> (Grade 3C) significance.</p> <p><i>Recommendations</i></p> <ol style="list-style-type: none"> <li>1. No archaeological mitigation is required.</li> <li>2. Should any unmarked human burials/remains or ostrich eggshell water flask caches be uncovered, or exposed during the preparation of the lands for cultivation, these must immediately</li> </ol> |

be reported to the archaeologist (Jonathan Kaplan, 082 321 0172), or the South African Heritage Resources Agency (Ms Natasha Higgitt, 021 462 4502). Burials, etc. must not be removed or disturbed until inspected by the archaeologist.”

The following is taken from the Paleontological Assessment, included in Appendix D3: Palaeontology Report Appendix D2: Archaeology Report:

“Given the low palaeontological sensitivity, small area and disturbed character of the study area, it is concluded that the proposed Louisvale agricultural development is very unlikely to have significant impacts on local palaeontological heritage resources.

It is therefore recommended that pending the discovery of significant new fossils remains before or during development, exemption from further specialist palaeontological studies and mitigation be granted for the proposed agricultural development on Farm Bethesda 38 near Upington, Northern Cape.”

|   |                |           |
|---|----------------|-----------|
| Will any building or structure older than 60 years be affected in any way?  | <del>YES</del> | <b>NO</b> |
| Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?               | <del>YES</del> | <b>NO</b> |
| If YES, please provide proof that this permit application has been submitted to SAHRA or the relevant provincial authority. |                |           |

## 22) Socio-Economic Character

### a) Local Municipality

Please provide details on the socio-economic character of the local municipality in which the proposed site(s) are situated.

#### Overview

Louisvale forms part of the Dawid Kruiper Local Municipality (LM), ZF Mgcuwa District Municipality (DM), in the Northern Cape. Louisvale is 23 km away from its closest town, Upington. Population demographics show an increase in a number of people from 81 851 in 1996 to 107 161 in 2016, of which more than 50 per cent is female. In comparison to the rest of the DM, Dawid Kruiper LM accounted for the highest population, equating to 42.4 per cent of the DM. A number of households also increased tremendously from 17 973 in 1996 to 28 702 in 2016.

#### Level of unemployment:

Actual statistics of unemployment rate in the LM is uncertain. It has been mentioned that unemployment and poverty levels are high and remain a challenge. During the financial year of 2017/02018, 35 unemployed youth have, however, been trained by the LM in services such as water servicing.

Economic profile of local municipality:

Looking at basic services, the number of people with access to waste removal services increased from 1996 to 2016 by 7.4 per cent (from 73.5 per cent in 1996 to 80.9 in 2016), the number of people with access to a flush or chemical toilet increased slightly from 72.2 per cent to 72.3 per cent (1996 to 2016) and the number of people with access to electricity increased. In the 2017/ 2018 financial year, 94 per cent of households had access to water and 86 per cent of households had access to a functional sanitation service.

Level of education:

In the entire LM, the educational improvement was observed from 1996 to 2016, with a steep decline in persons over the age of 20 with no schooling. A decline from 15.7 per cent in 1996 to 4.6 per cent in 2016 was observed. In addition to this, there was also an increase in number of persons with higher education, from 2993 in 1996 to 3989 in 2016.

b) The socio-economic value of the activity

|   |                       |           |
|---|-----------------------|-----------|
| What is the expected capital value of the activity on completion?   | R4.2 million          |           |
| What is the expected yearly income that will be generated by or as a result of the activity?                                | R1.92 million (Bruto) |           |
| Will the activity contribute to service infrastructure?   | <del>YES</del>        | <b>NO</b> |
| Is the activity a public amenity?   | <del>YES</del>        | <b>NO</b> |
| How many new employment opportunities will be created in the development and construction phase of the activity/activities? | 16                    |           |
| What is the expected value of the employment opportunities during the development and construction phase?                   | R64k/month            |           |
| What percentage of this will accrue to previously disadvantaged individuals?  | 100%                  |           |
| How many permanent new employment opportunities will be created during the operational phase of the activity?               | 3                     |           |
| What is the expected current value of employment opportunities during the first 10 years?                                   | R5,088,000.00         |           |

|  |      |
|--|------|
| What percentage of this will accrue to previously disadvantaged individuals? | 100% |
|--|------|

### 23) Biodiversity

Please note: The Department may request specialist input/studies depending on the nature of the biodiversity occurring on the site and potential impact(s) of the proposed activity/activities. To assist with the identification of the biodiversity occurring on-site and the ecosystem status, consult <http://bgis.sanbi.org> or [BGIShelp@sanbi.org](mailto:BGIShelp@sanbi.org). Information is also available on compact disc (cd) from the Biodiversity-GIS Unit, Ph (021) 799 8698. This information may be updated from time to time and it is the applicant/ EAP's responsibility to ensure that the latest version is used. A map of the relevant biodiversity information (including an indication of the habitat conditions as per (b) below) and must be provided as an overlay map to the property/site plan as Appendix D to this report.

a) Indicate the applicable biodiversity planning categories of all areas on-site and indicate the reason(s) provided in the biodiversity plan for the selection of the specific area as part of the specific category)

| Systematic Biodiversity Planning Category |                               |                          |  | If CBA or ESA, indicate the reason(s) for its selection in biodiversity plan   |
|---|-------------------------------|--------------------------|--|--|
| <b>Critical Biodiversity Area (CBA)</b>   | Ecological Support Area (ESA) | Other Natural Area (ONA) | <b>No Natural Area Remaining (NNA)</b> | <p><b>The site sits within an area classified as CBA2.</b></p> <p><b>Areas in a natural condition, and are required to meet biodiversity targets for species, ecosystems or ecological processes and infrastructure.</b></p> |

b) Indicate and describe the habitat condition on site

| Habitat Condition | Percentage of habitat condition class (adding up to 100%) | Description and additional comments and observations (including additional insight into the condition, e.g. poor land management practices, presence of quarries, grazing, harvesting regimes etc).   |
|-------------------|---|---|
| <b>Natural</b>    | <b>90%</b>  | <b>Little to no disturbance has been noted upon site inspection by the botanist, other than a few tracks that traverse the site, as well as some trampling in the area of an informal shooting range and the light industrial zone at the entrance of Portion 238 of Bethesda 38. The</b> |

|  |     |   |
|--|-----|---|
|  |     | remainder of the site where the development will take place is natural.   |
| Near Natural<br>(includes areas with low to moderate level of alien invasive plants) | %   |   |
| <b>Degraded</b><br>(includes areas heavily invaded by alien plants)                  | 10% | A few tracks traverse the site, while there is also some trampling in the area of an informal shooting range and the light industrial zone at the entrance of Portion 238 of Bethesda 38. |
| Transformed<br>(includes cultivation, dams, urban, plantation, roads, etc)           | %   |   |

c) Complete the table to indicate:

- (i) the type of vegetation, including its ecosystem status, present on the site; and
- (ii) whether an aquatic ecosystem is present on site.

| Terrestrial Ecosystems  |                         | Aquatic Ecosystems  |           |        |         |           |           |           |
|---|-------------------------|---|-----------|--------|---------|-----------|-----------|-----------|
| Ecosystem threat status as per the National Environmental Management: Biodiversity Act (Act No. 10 of 2004) | Critical                | Wetland (including rivers, depressions, channelled and unchannelled wetlands, flats, seep pans, and artificial wetlands). |           |        | Estuary |           | Coastline |           |
|   | Endangered              |   |           |        |         |           |           |           |
|   | Vulnerable              |   |           |        |         |           |           |           |
|   | <b>Least Threatened</b> |   |           |        |         |           |           |           |
|   |                         | YES   | <b>NO</b> | UNSURE | YES     | <b>NO</b> | YES       | <b>NO</b> |

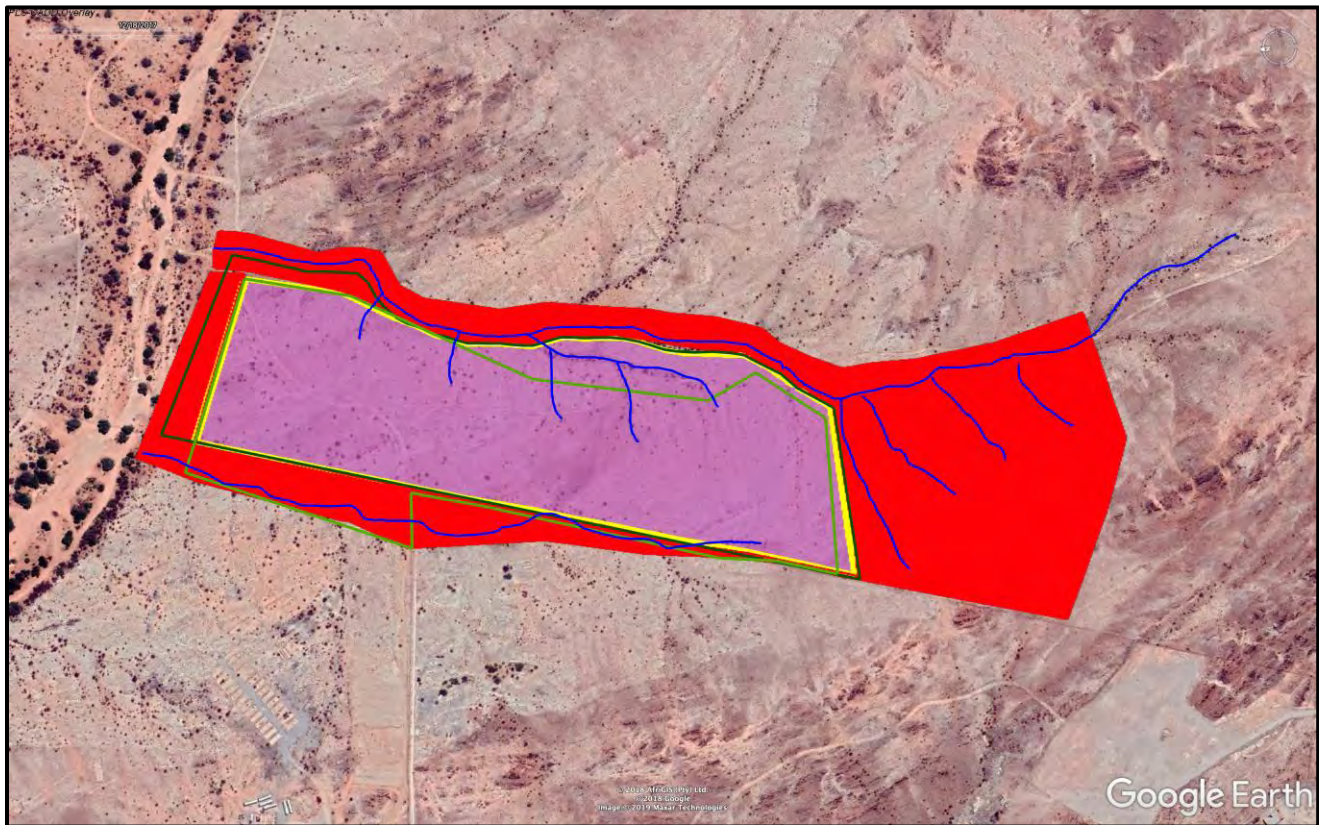
d) Please provide a description of the vegetation type and/or aquatic ecosystem present on site, including any important biodiversity features/information identified on-site (e.g. threatened species and special habitats)

Botanical Summary: (Refer to Appendix D1: Botanical Report)



The area is classified as Bushmanland Arid Grassland, a low, open grassy shrubland with emergent small trees. Blackthorn trees (*Vachellia mellifera* subsp. *detinens*) are present in higher concentration in the drainage areas. Upon site visit by the botanical specialist, only one specimen of *Aloe gariopensis* (Orange River aloe) and numerous clusters of *Aloe claviflora* (canon aloe) were found. These species are protected. A number of small trees of *Boscia foetida* were found and recorded. However, significantly no protected *Boscia albitrunca* (shepherd's tree) trees were found. In addition, no protected *Vachellia erioloba* (camel thorn) trees were recorded since the substrate is not suitable for them.

It was noted by the botanist that the vegetation does not display a high level of sensitivity over most of the site, but the southern part is rocky, with exposed bedrock, and this area is ecologically sensitive, with many niches resulting in high plant species richness. The southern part of the area investigated should, therefore, be avoided and not disturbed. A sensitivity map is given in Figure 11: Sensitivity map of the study area, showing that the 'central' part of the area investigated (shaded pink) would be acceptable for cultivation, whereas the boundary zone should be avoided and the drainage lines buffered by 32 m.

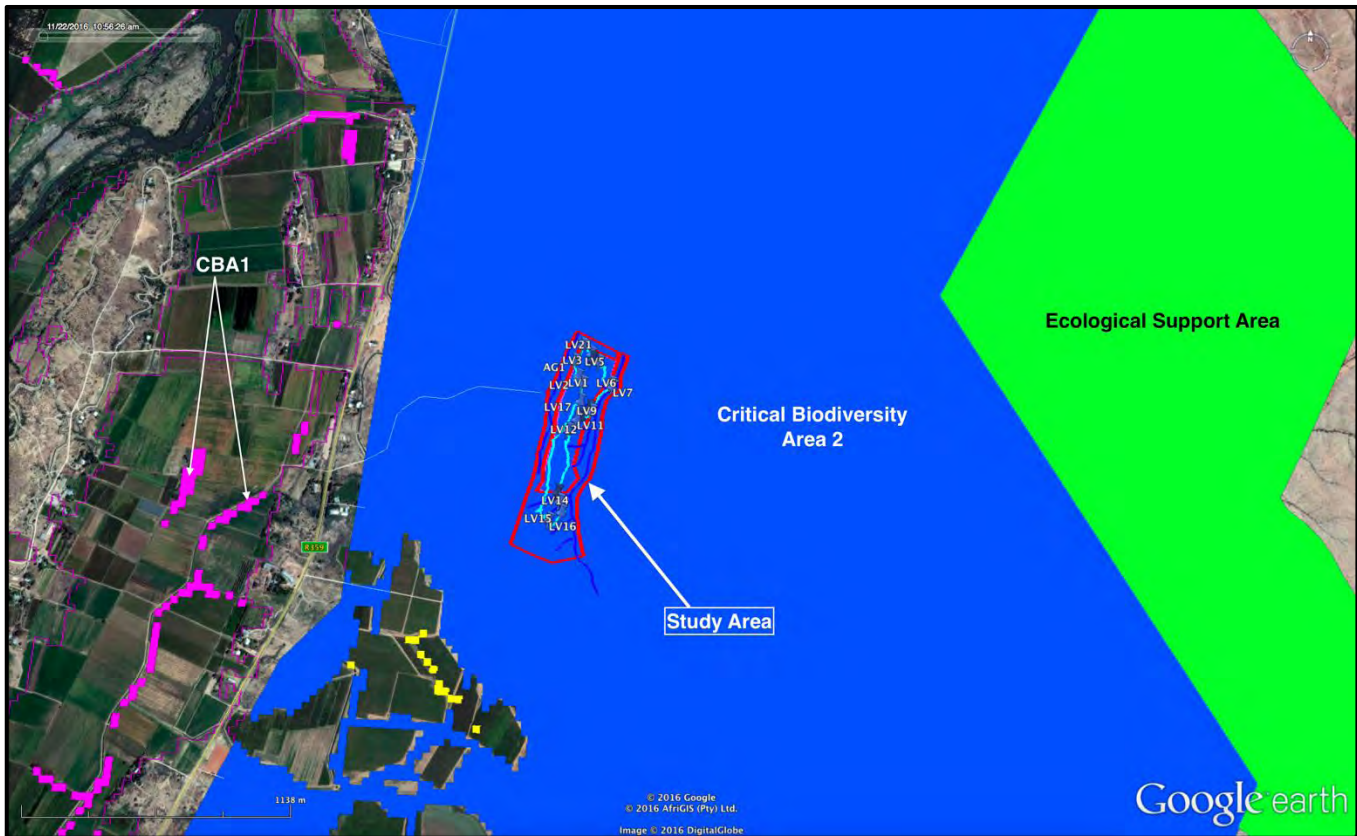


**Figure 11: Sensitivity map of the study area**

The pink area is an area of low sensitivity. The zone between the pink area and the outer (red) boundary is considered to have moderate to high sensitivity. The dark green boundary indicates the Alternative 2 development area; the light-green boundary indicates the Alternative 3 development area and the yellow boundary indicates the Alternative 1 (preferred) development area. (Note the orientation of the image with north to the left).

Critical biodiversity areas and ecological support areas have been mapped for the whole of the Northern Cape Province, including the ZF Mgcawu District Municipality where Louisvale is located.

The available CBA shapefiles (Enrico Oosthuysen pers. comm.) for the Northern Cape Province were overlaid on Google Earth™ which allowed determination of the CBA classification of the area around Louisvale. The study area on farm Bethesda 238 & 335 is located in an area classified as CBA2 (Figure 12).



**Figure 12: Critical Biodiversity Area**

**Mitigation:**

Proposed mitigation:

- (1) Avoidance of seasonal drainage lines (accepting that those within the development area would be lost); the drainage lines outside the development area must be buffered by at least 32 m.
- (2) Search and rescue of all *Aloe gariensis* and *Aloe claviflora* plants.
- (3) Search and rescue of *Ledebouria* sp. – a perennial geophyte.

**Indirect impacts:**

By definition, indirect impacts occur away from the ‘action source’ i.e. away from the development site. The impact assessed here is specifically how the proposed agricultural development would have an

indirect impact on vegetation and flora away from the development site. No indirect impacts were identified.

### Cumulative impacts

The receiving environment into which the proposed agricultural development would be imposed is not altered. In terms of the great extent of Bushmanland Arid Grassland, the cumulative impact would be very small. It would not lead to irreversible loss of resources, and even though it would be located in an area designated as a CBA2, it would not result in the national conservation target not being met. Consequently, the cumulative impacts would **low negative**.

### General Assessment and Recommendations:

A single vegetation type, Bushmanland Arid Grassland, occurs in the study area. It is generally not sensitive, but the site harbours protected species (aloes and geophytes) that would need to be relocated to safe sites prior to development.

No protected trees such as *Boscia albitrunca* (Shepherd's tree) and *Vachellia erioloba* (camel thorn) were found in the study area.

It is strongly recommended that the seasonal drainage lines should be buffered and that no agricultural development takes place that would affect them.

The assessment of impacts, together with the desired area proposed for cultivation, indicates that it would be optimal to apply Alternative 1. This would be the best compromise to ensure the protection of the watercourses, while offering adequate area for cultivation.

The impact of Alternative 1 can be mitigated from **medium negative** to **low negative** by relocating the protected plant species.

Cumulative impacts would be **low negative** at the most and even as low as **very low negative**, since Bushmanland Arid Grassland is not threatened in any way and is unlikely to be threatened in the future since it is very widespread.

Buffering of the drainage lines and search & rescue of protected plants and geophytes must be a condition of environmental authorisation.

### Conclusions:

Vineyards under irrigation have been successfully established in the Louisvale area, and the proposed agricultural development would not likely encounter any problems. The short, cold winters (when the vines need to go into complete dormancy) and long, hot summers are ideal for this type of agriculture. In general, therefore, the site proposed for the vineyard is suitable for this purpose.

Despite the chosen area being within a CBA2, from a botanical perspective it is suitable, acceptable and supported as developable, as long as the recommended mitigation measures are applied.

## SECTION C: PUBLIC PARTICIPATION

### 24) Advertisement and Notice

|                      |                 |               |
|----------------------|-----------------|---------------|
| Publication name     | Die Gemsbok     |               |
| Date published       | 04 October 2019 |               |
| Site notice position | Latitude        | Longitude     |
|                      | 28°32'38.36"S   | 21°12'15.12"E |
| Date placed          | 04 October 2019 |               |

Include proof of the placement of the relevant advertisements and notices in Appendix E3: Advertisement.

### 25) Determination of Appropriate Measures

Provide details of the measures taken to include all potential I&APs as required by Regulation 41(2)(e) and 41(6) of GN 733.

Key stakeholders (other than organs of state) identified in terms of Regulation 41(2)(b) of GN 733

| Title, Name and Surname                              | Affiliation/ key stakeholder status | Contact details (Tel. number or e-mail address) |
|--|-------------------------------------|---|
| To be included in the Final Basic Assessment Report. |                                     |   |
|  |                                     |   |
|  |                                     |   |

Include proof that the key stakeholder received written notification of the proposed activities as Appendix E5: Proof of Notifications. This proof may include any of the following:

- e-mail delivery reports;
- registered mail receipts;
- courier waybills;
- signed acknowledgements of receipt; and/or
- or any other proof as agreed upon by the competent authority.

## 26) Issues Raised by Interested and Affected Parties

|  |                              |
|--|------------------------------|
| Summary of main issues raised by I&APs                 | Summary of response from EAP |
| Will be included in the Final Basic Assessment Report. |                              |
|  |                              |

## 27) Comments and Response Report

The practitioner must record all comments received from I&APs and respond to each comment before the Draft BAR is submitted. The comments and responses must be captured in comments and response report as prescribed in the EIA regulations and be attached to the Final BAR as Appendix E6: Comments Received.

## 28) Authority Participation

Authorities and organs of state identified as key stakeholders:

| Authority/Organ of State                  | Contact person (and Surname) | Contact person (Title, Name) | Tel. No      | Fax No       | e-mail               | Postal address   |
|---|------------------------------|------------------------------|--------------|--------------|----------------------|--|
| Dawid Kruiper Local Municipality Manager  | Ntoba                        | Mr E                         | 054 338 7000 | 054 338 7350 |                      | Private Bag X6003, Upington, 8800  |
| Dawid Kruiper LM Ward Councillor          |                              |                              |              |              |                      | Private Bag X6003, Upington, 8800  |
| ZF Mgcawu District Municipality           | Lategan                      | Mr G                         | 054 337 2800 | 054 337 2888 |                      | Private Bag X6039, Upington, 8800  |
| Department of Agriculture and Land Reform | October                      | L                            |              |              |                      | P. O. Box 18, Springbok, 8240  |
| DENC: NC                                  | Riba                         | Ordain                       | 060 991 4817 | 027 718 8814 | oriba.denc@gmail.com | Corner of River and Nelson Mandela Road, Provincial Building, 1stfloor<br><br>Private Bag x 6102, Kimberley 8300 |

|  |                |   |                               |  |                         |   |
|--|----------------|---|-------------------------------|--|-------------------------|---|
| Department of Water Affairs                      | White          | C | 082 887 8866/<br>054 338 5819 |  | TowellJ@dws.gov.za      | Private Bag X5912   |
| Nature Conservation                              | De la Fontaine | S | 054 338 4800                  |  | sdelafontaine@gmail.com | Evelina De Bruin (former Provincial) Building, Corner of Rivier & Nelson Mandela Road, Upington, 8800 |
| Department of Agriculture Forestry and Fisheries | Mans           | J | 054 338 5909                  |  | jacolinema@daff.gov.za  | P. O. Box 2782, Upington, 8800  |

Include proof that the Authorities and Organs of State received written notification of the proposed activities as Appendix E5: Proof of Notifications.

In the case of renewable energy projects, Eskom and the SKA Project Office must be included in the list of Organs of State.

## 29) Consultation with Other Stakeholders

Note that, for any activities (linear or other) where deviation from the public participation requirements may be appropriate, the person conducting the public participation process may deviate from the requirements of that sub-regulation to the extent and in the manner as may be agreed to by the competent authority.

Proof of any such agreement must be provided, where applicable. Application for any deviation from the regulations relating to the public participation process must be submitted prior to the commencement of the public participation process.

A list of registered I&APs must be included as Appendix E2: I&AP'S List.

Copies of any correspondence and minutes of any meetings held must be included in Appendix E8: Meeting minutes and attendance registers.

## SECTION D: 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.

### 30) Impacts that may result from the planning and design, construction, operational, decommissioning and closure phases, as well as proposed management of identified impacts and proposed mitigation measures

Provide a summary and anticipated significance of the potential direct, indirect and cumulative impacts that are likely to occur as a result of the planning and design phase, construction phase, operational phase, decommissioning and closure phase, including impacts relating to the choice of site/activity/technology alternatives as well as the mitigation measures that may eliminate or reduce the potential impacts listed. This impact assessment must be applied to all the identified alternatives to the activities identified in Section A (2) of this report.

| Legend                                  |                  |                  |
|---|------------------|------------------|
| Significance Ratings (after mitigation) | Negative Impacts | Positive Impacts |
| Low                                     |                  |                  |
| Medium                                  |                  |                  |
| High                                    |                  |                  |

## CONSTRUCTION PHASE

| Activity   | Impact summary   | Significance                   | Proposed mitigation  |
|--|--|--------------------------------|--|
| <b>Alternative 1 (preferred alternative) – for the vineyard as well as the dam and the pipeline.</b> |  |                                |  |
| Geology and geohydrological aspects.   | Direct impacts:<br>Clearing of topsoil to include the complete transformation of 13.4 ha, which currently has indigenous vegetation. Minimal impacts on surroundings, as the vegetation that will be removed has a least threatened conservation status. | Low negative after mitigation. | Plants of significance will be removed and relocated. Topsoil will be utilised for the new agricultural areas. |
|  | Indirect impacts:<br>No geohydrological aspects will be impacted, streams identified are small ephemeral streams.  | None                           | Not applicable   |

|                          |   |   |  |
|--------------------------|---|---|--|
|                          | Cumulative impacts:<br>None   | None  | Not applicable   |
| Botanical aspects.       | Direct impacts:<br>Loss of vegetation type and habitat due to establishment of cultivation areas  | Locally Medium negative prior to mitigation.<br><br>Locally Low negative after to mitigation. | (1) Avoidance of seasonal drainage lines (accepting that those within the development area would be lost); the drainage lines outside the development area must be buffered by at least 32 m.<br><br>(2) Search and rescue of all <i>Aloe gariensis</i> and <i>Aloe claviflora</i> plants.<br><br>(3) Search and rescue of <i>Ledebouria</i> sp. – a perennial geophyte. |
|                          | Indirect impact:<br>No indirect impacts were identified.  | None  | Not applicable   |
|                          | Cumulative impacts:<br>The receiving environment into which the proposed agricultural development would be imposed is not altered, but in terms of the great extent of Bushmanland Arid Grassland, the cumulative impact would be very small. It would not lead to irreversible loss of resources and even though it would be located in an area designated as a CBA2, it would not result in the national conservation target not being met. | Low Negative  | None   |
| Continuous alien removal | Direct impacts:<br>None   | High positive   | This is the mitigation.  |
|                          | Indirect impact:  | None  | Not applicable   |



|       |  |  |  |
|-------|--|--|--|
|       | Cumulative impacts:  | None   | Not applicable   |
| Noise | <p>Direct impacts:</p> <p>Minimal noise during construction of the storage dam and clearing of vegetation during construction.</p> | Low negative, but only for a short period of time. | <ul style="list-style-type: none"> <li>Working hours will be restricted to daily normal working hours.</li> <li>All noise and sounds generated by plant or machinery must adhere to SABS 0103 specifications for the maximum permissible noise levels for residential areas.</li> <li>All plant and machinery are to be fitted with adequate silencers.</li> <li>No sound amplification equipment such as sirens, loud hailers or hooters may be used on site after normal working hours, except in emergencies.</li> <li>If work is to be undertaken outside of normal work hours, permission must be obtained from the landowner. Prior to commencing any such activity, the contractor is also to advise the potentially affected neighbouring residents. Dates, times and the nature of the work to be undertaken are to be provided. The notification could include letter-drops.</li> </ul> <p>The acceptable noise level according to SABS 10103 Code of Practice is 45dBA in the rural district during the day and 35dBA at night. The applicant must comply/adhere to these requirements.</p> |
|       | Indirect impacts:  | None   | Not applicable   |
|       | Cumulative impacts:  | None   | Not applicable   |

|                                  |  |                 |  |
|----------------------------------|--|-----------------|--|
| Visual                           | Direct impacts:<br><br>During construction, there will be a period during which development activities will be visual, but this will only be for a short period. | Low negative    | Visual impacts will contribute to the surrounding land use which is agricultural   |
|                                  | Indirect impacts:  | None            | Not applicable   |
|                                  | Cumulative impacts:  | None            | Not applicable   |
| Job creation                     | Direct impacts:<br><br>Temporary job creation during the construction phase  | Medium positive | This is the mitigation.  |
|                                  | Indirect impacts:  | None            | Not applicable   |
|                                  | Cumulative impacts:  | None            | Not applicable   |
| Job security                     | Direct impacts:<br><br>Job security for current employees and job creation for new employees during the operational phase  | Medium positive | This is the mitigation.  |
|                                  | Indirect impacts:  | None            | Not applicable   |
|                                  | Cumulative impacts:  | None            | Not applicable   |
| Heritage and cultural-historical | Direct impacts:<br><br>The potential loss of archaeological artefacts (localised permanent impact).  | Low negative.   | No archaeological mitigation is required. Low probability of impact on archaeological heritage. Should any unmarked human burials/remains or ostrich eggshell water flask caches be uncovered, or exposed during construction activities, these must immediately be reported to the archaeologist (Jonathan Kaplan 082 321 0172), or the South African Heritage Resources Agency (SAHRA – Att: Natasha Higgitt). Burials must not be |

|                                  |  |   |   |
|----------------------------------|--|---|---|
|                                  |  |   | removed or disturbed until inspected by the archaeologist.  |
|                                  | Indirect impacts:  | None  | Not applicable  |
|                                  | Cumulative impacts:  | None  | Not applicable  |
| Paleontological                  | Direct impacts:<br><br>Given the low palaeontological sensitivity, small area and disturbed character of the study area, it is concluded that the proposed Louisvale agricultural development is very unlikely to have significant impacts on local palaeontological heritage resources. | None  | None  |
|                                  | Indirect impacts:  | None  | Not applicable  |
|                                  | Cumulative impacts:  | None  | Not applicable  |
| Impeding the flow of the stream. | Direct impacts:<br><br>Changing/altering the flow of the ephemeral streams. Possible impact on Donkerhoekspruit.   | Medium negative, prior to mitigation.<br><br>Low negative after mitigation. | Canalise flow surrounding the agricultural area.<br><br>Taken into account the Donkerhoekspruit, with a 32 m buffer area.   |
|                                  | Indirect impacts:<br><br>Impact on the Donkerhoekspruit.   | Medium negative, prior to mitigation.<br><br>Low negative after mitigation. | A buffer area of 32 m, therefore prevents impact on the Donkerhoekspruit.   |
|                                  | Cumulative impacts:<br><br>Construction of a pipeline that runs across the ephemeral streams and the construction of an instream dam.  | Medium negative, prior to mitigation.                                       | The ephemeral stream is already cut off from the Orange River via the canal. The dam is within the stream adjacent to the canal, therefore existing impact within the area. |

|                                      |  |                                |   |
|--------------------------------------|--|--------------------------------|---|
|                                      |  | Low negative after mitigation. |   |
| <b>Alternative 2</b>                 |  |                                |   |
| Geology and geohydrological aspects. | Direct impacts:<br>Clearing of topsoil to include the complete transformation of an area of 14 ha, which currently has indigenous vegetation.  | High negative                  | Small effect on Bushmanland Arid Grassland as a whole. Plants of significance will be removed and relocated.<br><br>Is located within the areas outlined by the specialist as highly sensitive. |
|                                      | Indirect impacts:<br>No geohydrological aspects will be impacted; streams identified are small ephemeral streams.  | None                           | Not applicable  |
|                                      | Cumulative impacts:<br>None  | None                           | Not applicable  |
| Botanical aspects.                   | Direct impacts:<br>Clearing of vegetation to include the complete transformation of 14 ha which currently has indigenous vegetation; minimal impacts on surroundings, as the vegetation that will be removed has a least threatened conservation status. | High negative                  | Small effect on Bushmanland Arid Grassland as a whole. Plants of significance will be removed and relocated.<br><br>Is located within the areas outlined by the specialist as highly sensitive. |
|                                      | Indirect impact:<br>No indirect impacts were identified.   | None                           | Not applicable.   |
|                                      | Cumulative impacts:<br>The receiving environment into which the proposed agricultural development would be imposed is not altered but in terms of the great extent of Bushmanland Arid Grassland, the cumulative impact                                  | Low Negative                   | None.   |

|                          |  |  |   |
|--------------------------|--|--|---|
|                          | would be very small. It would not lead to irreversible loss of resources and even though it would be located in an area designated as a CBA2, it would not result in the national conservation target not being met. |  |   |
| Continuous alien removal | Direct impacts:<br>None  | High positive                                      | This is the mitigation.   |
|                          | Indirect impact:   | None   | Not applicable  |
|                          | Cumulative impacts:  | None   | Not applicable  |
| Noise                    | Direct impacts:<br><br>Minimal noise during construction of the storage dam and clearing of vegetation during construction.  | Low negative, but only for a short period of time. | <ul style="list-style-type: none"> <li>• Working hours will be restricted to daily normal working hours.</li> <li>• All noise and sounds generated by plant or machinery must adhere to SABS 0103 specifications for the maximum permissible noise levels for residential areas.</li> <li>• All plant and machinery are to be fitted with adequate silencers.</li> <li>• No sound amplification equipment such as sirens, loud hailers or hooters may be used on-site, after normal working hours, except in emergencies.</li> <li>• If work is to be undertaken outside of normal work hours, permission must be obtained from the landowner. Prior to commencing any such activity, the contractor is also to advise the potentially affected neighbouring residents. Dates, times and the nature of the</li> </ul> |

|              |  |                  |   |
|--------------|--|------------------|---|
|              |  |                  | work to be undertaken are to be provided. The notification could include letter-drops.<br><br>The acceptable noise level according to SABS 10103 Code of Practice is 45dBA in the rural district during the day and 35dBA at night. The applicant must comply/adhere to these requirements. |
|              | Indirect impacts:  | None             | Not applicable  |
|              | Cumulative impacts:  | None             | Not applicable  |
| Visual       | Direct impacts:<br><br>During construction, there will be a period during which development activities will be visual, but this will only be for a short period. | Low negative     | Visual impacts will contribute to the surrounding land use which is agricultural  |
|              | Indirect impacts:  | None             | Not applicable  |
|              | Cumulative impacts:  | None             | Not applicable  |
| Job creation | Direct impacts:<br><br>Temporary job creation during the construction phase  | Medium positive. | This is the mitigation.   |
|              | Indirect impacts:  | None             | Not applicable  |
|              | Cumulative impacts:  | None             | Not applicable  |
| Job security | Direct impacts:<br><br>Job security for current employees and job creation for new employees during the operational phase  | Medium positive. | This is the mitigation.   |
|              | Indirect impacts:  | None             | Not applicable  |
|              | Cumulative impacts:  | None             | Not applicable  |

|                                   |  |                  |   |
|-----------------------------------|--|------------------|---|
| Heritage and cultural-historical. | Direct impacts:<br><br>The potential loss of archaeological artefacts (localised permanent impact).  | Low negative.    | No archaeological mitigation is required. Low probability of impact on archaeological heritage. Should any unmarked human burials/remains or ostrich eggshell water flask caches be uncovered, or exposed during construction activities, these must immediately be reported to the archaeologist (Jonathan Kaplan 082 321 0172), or the South African Heritage Resources Agency (SAHRA – Att: Natasha Higgitt). Burials must not be removed or disturbed until inspected by the archaeologist. |
|                                   | Indirect impacts:  | None             | Not applicable  |
|                                   | Cumulative impacts:  | None             | Not applicable  |
| Paleontological                   | Direct impacts:<br><br>Given the low palaeontological sensitivity, small area and disturbed character of the study area, it is concluded that the proposed Louisvale agricultural development is very unlikely to have significant impacts on local palaeontological heritage resources. | None             | None  |
|                                   | Indirect impacts:  | None             | Not applicable  |
|                                   | Cumulative impacts:  | None             | Not applicable  |
| Impeding the flow of the stream.  | Direct impacts:<br><br>Changing /altering the flow of the ephemeral streams. Possible impact on Donkerhoekspruit.  | Medium negative. | Canalise flow surrounding the agricultural area.<br><br>Did not take into account the Donkerhoekspruit, with a 32 m buffer area.  |

|                                      |   |   |   |
|--------------------------------------|---|---|---|
|                                      | Indirect impacts:<br>Impact on the Donkerhoekspruit.  | Medium negative.  | No buffer area of 32 m, therefore not preventing the impact on the Donkerhoekspruit.  |
|                                      | Cumulative impacts:<br>Construction of a pipeline that runs across the ephemeral streams and the construction of an instream dam  | Medium negative, prior to mitigation.<br><br>Low negative after mitigation. | The ephemeral stream is already cut off from the Orange River via the canal. The dam is within the stream adjacent to the canal, therefore existing impact within the area.                     |
| <b>Alternative 3</b>                 |   |   |   |
| Geology and geohydrological aspects. | Direct impacts:<br>Clearing of topsoil to include the complete transformation of 12.8 ha which currently has indigenous vegetation.   | High negative   | Small effect on Bushmanland Arid Grassland as a whole. Plants of significance will be removed and relocated.<br><br>Is located within the areas outlined by the specialist as highly sensitive. |
|                                      | Indirect impacts:<br>No geohydrological aspects will be impacted; streams identified are small ephemeral streams.   | None  | Not applicable  |
|                                      | Cumulative impacts:<br>None   | None  | Not applicable  |
| Botanical aspects.                   | Direct impacts:<br>Clearing of vegetation to include the complete transformation of 14 ha which currently has indigenous vegetation; minimal impacts on surroundings, as the vegetation that will be removed has a least threatened conservation status | High negative   | Small effect on Bushmanland Arid Grassland as a whole. Plants of significance will be removed and relocated.<br><br>Is located within the areas outlined by the specialist as highly sensitive. |
|                                      | Indirect impact:  | None  | Not applicable.   |



|                          |  |   |   |
|--------------------------|--|---|---|
|                          | No indirect impacts were identified.   |   |   |
|                          | <p>Cumulative impacts:</p> <p>The receiving environment into which the proposed agricultural development would be imposed is not altered, but in terms of the great extent of Bushmanland Arid Grassland, the cumulative impact would be very small. It would not lead to irreversible loss of resources and even though it would be located in an area designated as a CBA2. It would not result in the national conservation target not being met.</p> | Low<br>Negative                                       | None.   |
| Continuous alien removal | Indirect impact:   | None  | Not applicable  |
|                          | Cumulative impacts:  | None  | Not applicable  |
|                          | <p>Direct impacts:</p> <p>Clearing of vegetation to include the complete transformation of 14 ha which currently has indigenous vegetation; minimal impacts on surroundings as the vegetation that will be removed has a least threatened conservation status.</p>   | High<br>negative                                      | <p>Small effect on Bushmanland Arid Grassland as a whole. Plants of significance will be removed and relocated.</p> <p>Is located within the areas outlined by the specialist as highly sensitive.</p>  |
| Noise                    | <p>Direct impacts:</p> <p>Minimal noise during construction of the storage dam and clearing of vegetation during construction.</p>   | Low<br>negative, but only for a short period of time. | <ul style="list-style-type: none"> <li>Working hours will be restricted to daily normal working hours.</li> <li>All noise and sounds generated by plant or machinery must adhere to SABS 0103 specifications for the maximum permissible noise levels for residential areas.</li> </ul> |

|        |   |              |  |
|--------|---|--------------|--|
|        |   |              | <ul style="list-style-type: none"> <li>• All plant and machinery are to be fitted with adequate silencers.</li> <li>• No sound amplification equipment such as sirens, loud hailers or hooters may be used on-site, after normal working hours, except in emergencies.</li> <li>• If work is to be undertaken outside of normal work hours, permission must be obtained from the landowner. Prior to commencing any such activity, the contractor is also to advise the potentially affected neighbouring residents. Dates, times and the nature of the work to be undertaken are to be provided. The notification could include letter-drops.</li> </ul> <p>The acceptable noise level according to SABS 10103 Code of Practice is 45dBA in the rural district during the day and 35dBA at night. The applicant must comply/adhere to these requirements.</p> |
|        | Indirect impacts:   | None         | Not applicable   |
|        | Cumulative impacts:   | None         | Not applicable   |
| Visual | <p>Direct impacts:</p> <p>During construction, there will be a period during which development activities will be visual, but this will only be for a short period.</p> | Low negative | Visual impacts will contribute to the surrounding land use, which is agricultural.   |
|        | Indirect impacts:   | None         | Not applicable   |
|        | Cumulative impacts:   | None         | Not applicable   |

|                                   |   |                 |   |
|-----------------------------------|---|-----------------|---|
| Job creation                      | Cumulative impacts:   | None            | Not applicable  |
|                                   | Direct impacts:<br>Temporary job creation during the construction phase   | Medium positive | This is the mitigation.   |
|                                   | Indirect impacts:   | None            | Not applicable  |
| Job security                      | Direct impacts:<br>Job security for current employees and job creation for new employees during the operational phase                         | Medium positive | This is the mitigation.   |
|                                   | Indirect impacts:   | None            | Not applicable  |
|                                   | Cumulative impacts:   | None            | Not applicable  |
| Heritage and cultural-historical. | Direct impacts:<br>The potential loss of archaeological artefacts (localised permanent impact).   | Low negative    | No archaeological mitigation is required. Low probability of impact on archaeological heritage. Should any unmarked human burials/remains or ostrich eggshell water flask caches be uncovered, or exposed during construction activities, these must immediately be reported to the archaeologist (Jonathan Kaplan 082 321 0172), or the South African Heritage Resources Agency (SAHRA – Att: Natasha Higgitt). Burials must not be removed or disturbed until inspected by the archaeologist. |
|                                   | Indirect impacts:   | None            | Not applicable  |
|                                   | Cumulative impacts:   | None            | Not applicable  |
| Paleontological                   | Direct impacts:<br>Given the low palaeontological sensitivity, small area and disturbed character of the study area, it is concluded that the | None            | None  |

|                                  |   |  |   |
|----------------------------------|---|--|---|
|                                  | <p>proposed Louisvale agricultural development is very unlikely to have significant impacts on local palaeontological heritage resources.</p>   |  |   |
|                                  | Indirect impacts:   | None   | Not applicable  |
|                                  | Cumulative impacts:   | None   | Not applicable  |
| Impeding the flow of the stream. | <p>Direct impacts:</p> <p>Changing / altering the flow of the ephemeral streams. Possible impact on Donkerhoekspruit.</p>   | Medium negative.   | <p>Canalise flow surrounding the agricultural area.</p> <p>Did not take into account the Donkerhoekspruit, with a 32 m buffer area.</p>                                     |
|                                  | <p>Indirect impacts:</p> <p>Impact on the Donkerhoekspruit.</p>   | Medium negative.   | No buffer area of 32 m, therefore not preventing the impact on the Donkerhoekspruit.  |
|                                  | <p>Cumulative impacts:</p> <p>Construction of a pipeline that runs across the ephemeral streams and the construction of an instream dam</p>   | <p>Medium negative, prior to mitigation.</p> <p>Low negative after mitigation.</p> | The ephemeral stream is already cut off from the Orange River via the canal. The dam is within the stream adjacent to the canal, therefore existing impact within the area. |
| No-go option                     |   |  |   |
| No impact                        | <p>Direct impacts:</p> <p>Botanical:</p> <p>In the case of the “No-Go” alternative, where there would be no change, the status quo would persist and there would be no farming of the designated site. The ‘no development’ alternative or ‘No-Go’ alternative would thus have a negligible impact on the natural vegetation with no significant further loss in the short- to long-term.</p> | None   | Negligible  |

|  |  |              |       |
|--|--|--------------|-------|
|  | <p>Archaeological/palaeontology:</p> <p>The results of the study indicate that the proposed cultivation of 13.4 ha vineyards on Farm 238/38, and a storage dam, pipeline and pump station on Farm 338/38, will not have an impact of great significance on the archaeological heritage or palaeontology.</p> |              |       |
|  | <p>Indirect impacts:</p> <p>No job security or job opportunities.</p>  | Low negative | None. |
|  | <p>Cumulative impacts:</p> <p>No foreign capital to the area.</p>  | Low negative | None. |

## OPERATIONAL PHASE

|   |  |            |   |
|---|--|------------|---|
| <p><b>Alternative 1 (preferred alternative) – for the vineyard as well as the dam and the pipeline.</b></p> <p><b>Alternative 2 &amp; 3.</b></p> <p><b>The same for all three alternatives.</b></p> |  |            |   |
| Heritage and cultural-historical.   | <p>Direct impacts:</p> <p>The potential loss of archaeological artefacts (localised permanent impact).</p> | Negligible | <p>Should any unmarked human burials/remains or ostrich eggshell water flask caches be uncovered, or exposed during construction activities, these must immediately be reported to the archaeologist (Jonathan Kaplan 082 321 0172), or the South African Heritage Resources Agency (SAHRA – (Att: Natasha Higgitt). Burials must not be removed or disturbed until inspected by the archaeologist.</p> |

|                 |   |            |   |
|-----------------|---|------------|---|
|                 | Indirect impacts:   | None       | Not applicable  |
|                 | Cumulative impacts:   | None       | Not applicable  |
| Paleontological | <p>Direct impacts:</p> <p>Given the low palaeontological sensitivity, small area and disturbed character of the study area, it is concluded that the proposed Louisvale agricultural development is very unlikely to have significant impacts on local palaeontological heritage resources.</p> | Negligible | <p>Should any substantial fossil remains (e.g. mammalian bones and teeth) be encountered during excavation, however, these should be safeguarded, preferably <i>in situ</i>, and reported by the ECO to the South African Heritage Resources Authority as soon as possible so that appropriate action can be taken by a professional palaeontologist, at the developer's expense (SAHRA contact details: Mrs Colette Scheermeyer, P.O. Box 4637, Cape Town 8000. Tel: 021 462 4502 email: cscheermeyer@sahra.org.za). Mitigation would normally involve the scientific recording and judicious sampling or collection of fossil material as well as associated geological data (e.g. stratigraphy, sedimentology, taphonomy) by a professional palaeontologist.</p> |
|                 | Indirect impacts:   | None       | Not applicable  |
|                 | Cumulative impacts:   | None       | Not applicable  |

A complete impact assessment in terms of Regulation 19(3) of GN 733 must be included as Appendix F.

### 31) Environmental Impact Statement

Taking the assessment of potential impacts into account, please provide an environmental impact statement that summarises the impact that the proposed activity 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.

### **Alternative 1 (preferred alternative)**

The following impacts are outlined:

#### Botanical:

- The assessment of combined impacts on the desired area proposed for cultivation indicate that it would be optimal to apply Alternative 1, since this would be the best compromise to ensure the protection of the watercourses while offering adequate area for cultivation;
- The impact of Alternative 1 can be mitigated from **medium negative** to **low negative** by relocating the protected plant species;
- Cumulative impacts would be **low negative** at the most, and even as low as **very low negative**, since Bushmanland Arid Grassland is not threatened in any way and is unlikely to be threatened in the future since it is very widespread; and
- Buffering of the drainage lines and search & rescue of protected plants and geophytes must be a condition of environmental authorisation. It is strongly recommended that the seasonal drainage lines should be buffered and that no agricultural development takes place that would affect them.

#### Archaeology:

- The results of the study indicate that the proposed cultivation of 13.4 ha vineyards on Farm 238/38, and a storage dam, pipeline and pump station on Farm 338/38, will **not have an impact** of great significance on the archaeological heritage. No archaeological mitigation is required.

#### Palaeontology:

- Given the **low palaeontological sensitivity**, small area and disturbed character of the study area, it is concluded that the proposed Louisvale agricultural development is very unlikely to have significant impacts on local palaeontological heritage resources.

#### Impeding the flow of the stream:

- **Low negative** impact after mitigation;
- Canalise flow surrounding the agricultural area;
- Taken into account the Donkerhoekspruit and ephemeral streams surrounding the sites, with a 32m buffer area.

#### Socio-Economic:

- **Medium positive** impact on job security and income for locals

- Job security for current employees;
- Job creation for new employees during the operational phase.

Visual:

- Temporary **low negative** visual impact during construction. However, the overall visual impacts are in line with the surrounding land use, which is agricultural.

Noise:

- Temporary **low negative** impact during construction. Minimal noise during construction of the storage dam and clearing of vegetation during construction.

An overall **low negative** impact on the environment may be present due to the removal of native indigenous vegetation and the impediment of the flow of the canal, but if proper mitigation and management measurements are adhered to, the impact will be minimal. Most of the impacts will also only be of short duration (during the construction phase).

**Alternative 2**

The following impacts are outlined:

Botanical:

- Direct impacts without mitigation would be locally **high negative** for Alternative 2. The proposed mitigation was to develop Alternative 1.

Archaeology:

- The results of the study indicate that the proposed cultivation of 13.4 ha vineyards on Farm 238/38, and a storage dam, pipeline and pump station on Farm 338/38, will **not have an impact** of great significance on the archaeological heritage. No archaeological mitigation is required.

Palaeontology:

- Given the **low palaeontological sensitivity**, small area and disturbed character of the study area, it is concluded that the proposed Louisvale agricultural development is very unlikely to have significant impacts on local palaeontological heritage resources.

Impeding the flow of the stream:

- **High negative** impact, as this alternative did not take into account the 32 m buffer area. The proposed mitigation was to develop Alternative 1



Socio-Economic:

- **Medium positive** impact on job security and income for locals
- Job security for current employees;
- Job creation for new employees during the operational phase.

Visual:

- Temporary **low negative** visual impact during construction. However, the overall visual impacts are in line with the surrounding land use, which is agricultural.

Noise:

- Temporary **low negative** impact during construction. Minimal noise during construction of the storage dam and clearing of vegetation during construction.

An overall **Medium negative** impact on the environment.

**Alternative 3**

The following impacts are outlined:

Botanical:

- Direct impacts without mitigation would be locally **medium negative** for Alternative 3. Alternative 3 is a slightly smaller area than Alternative 1, so the latter is recommended and from a botanical perspective becomes the preferred alternative.

Archaeology:

- The results of the study indicate that the proposed cultivation of 13.4 ha vineyards on Farm 238/38, and a storage dam, pipeline and pump station on Farm 338/38, will **not have an impact** of great significance on the archaeological heritage. No archaeological mitigation is required.

Palaeontology:

- Given the **low palaeontological sensitivity**, small area and disturbed character of the study area, it is concluded that the proposed Louisvale agricultural development is very unlikely to have significant impacts on local palaeontological heritage resources.

Impeding the flow of the stream:

- **Low negative** impact after mitigation;
- Canalise flow surrounding the agricultural area;

- Taken into account the Donkerhoekspruit and ephemeral streams surrounding the sites, with a 32 m buffer area.

Socio-Economic:

- **Medium positive** impact on job security and income for locals
- Job security for current employees;
- Job creation for new employees during the operational phase.

Visual:

- Temporary **low negative** visual impact during construction. However, the overall visual impacts are in line with the surrounding land use, which is agricultural.

Noise:

- Temporary **Low negative** impact during construction. Minimal noise during construction of the storage dam and clearing of vegetation during construction.

An overall **low negative** impact on the environment. This alternative was a small development area, and therefore not considered preferred.

No-go alternative (compulsory)

- No agricultural development of a vineyard and pipelines and dams will take place, resulting in no financial benefits and no improvement in water use management practices;
- Lower rate of job security to those currently employed; and
- No new job opportunities for local residents of Louisvale.

## SECTION E. RECOMMENDATION OF 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)? | YES | NO |
|--|-----|----|

If “NO”, indicate the aspects that should be assessed further as part of a Scoping and EIA process before a decision can be made (list the aspects that require a further assessment).

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.

### Botanical:

- Avoidance of seasonal drainage lines (accepting that those within the development area would be lost); the drainage lines outside the development area must be buffered by at least 32 m;
- Search and rescue of all *Aloe gariensis* and *Aloe claviflora* plants;
- Search and rescue of *Ledebouria* sp.– a perennial geophyte;
- Continuous removal of alien vegetation; and
- Following the guidelines of the EMPr.

### Archaeology:

- Should any unmarked human burials/remains or ostrich eggshell water flask caches be uncovered, or exposed during construction activities, these must immediately be reported to the archaeologist (Jonathan Kaplan 082 321 0172), or the South African Heritage Resources Agency (SAHRA - Att Ms Natasha Higgitt 021 462 4502). Burials must not be removed or disturbed until inspected by the archaeologist.

### Palaeontology:

- Should any substantial fossil remains (*e.g.* mammalian bones and teeth) be encountered during excavation, however, these should be safeguarded, preferably *in situ*, and reported by the ECO to the South African Heritage Resources Authority as soon as possible so that appropriate action can be taken by a professional palaeontologist, at the developer’s expense (SAHRA contact details: Mrs Colette Scheermeyer, P.O. Box 4637, Cape Town 8000. Tel: 021 462 4502. Email: cscheermeyer@sahra.org.za). Mitigation would normally involve the scientific recording and judicious sampling or collection of fossil material as well as associated geological data (*e.g.* stratigraphy, sedimentology, taphonomy) by a professional palaeontologist.

|                      |            |               |
|----------------------|------------|---------------|
| Is an EMPr attached? | <b>YES</b> | <del>NO</del> |
|----------------------|------------|---------------|

The EMPr must be attached as Appendix G: Environmental Management Programme (EMPr).

The details of the EAP who compiled the BAR and the expertise of the EAP to perform the Basic Assessment Process must be included as Appendix H: Details of EAP and expertise.

If any specialist reports were used during the compilation of this BAR, please attach the declaration of interest for each specialist in Appendix I: Specialist's declaration of interest.

Any other information relevant to this application and not previously included must be attached in Appendix J: Additional Information.

---

NAME OF EAP

---

SIGNATURE OF EAP

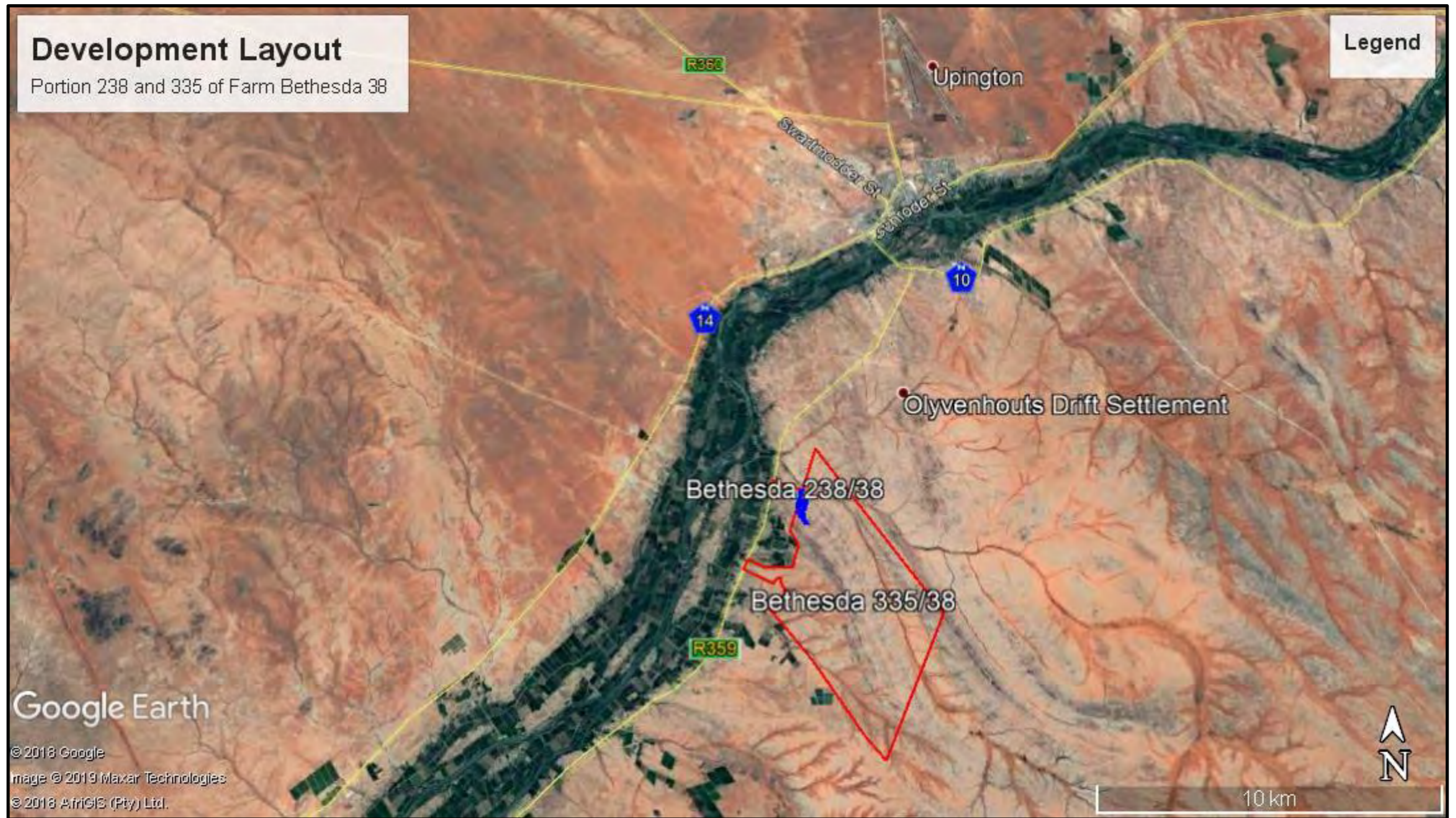
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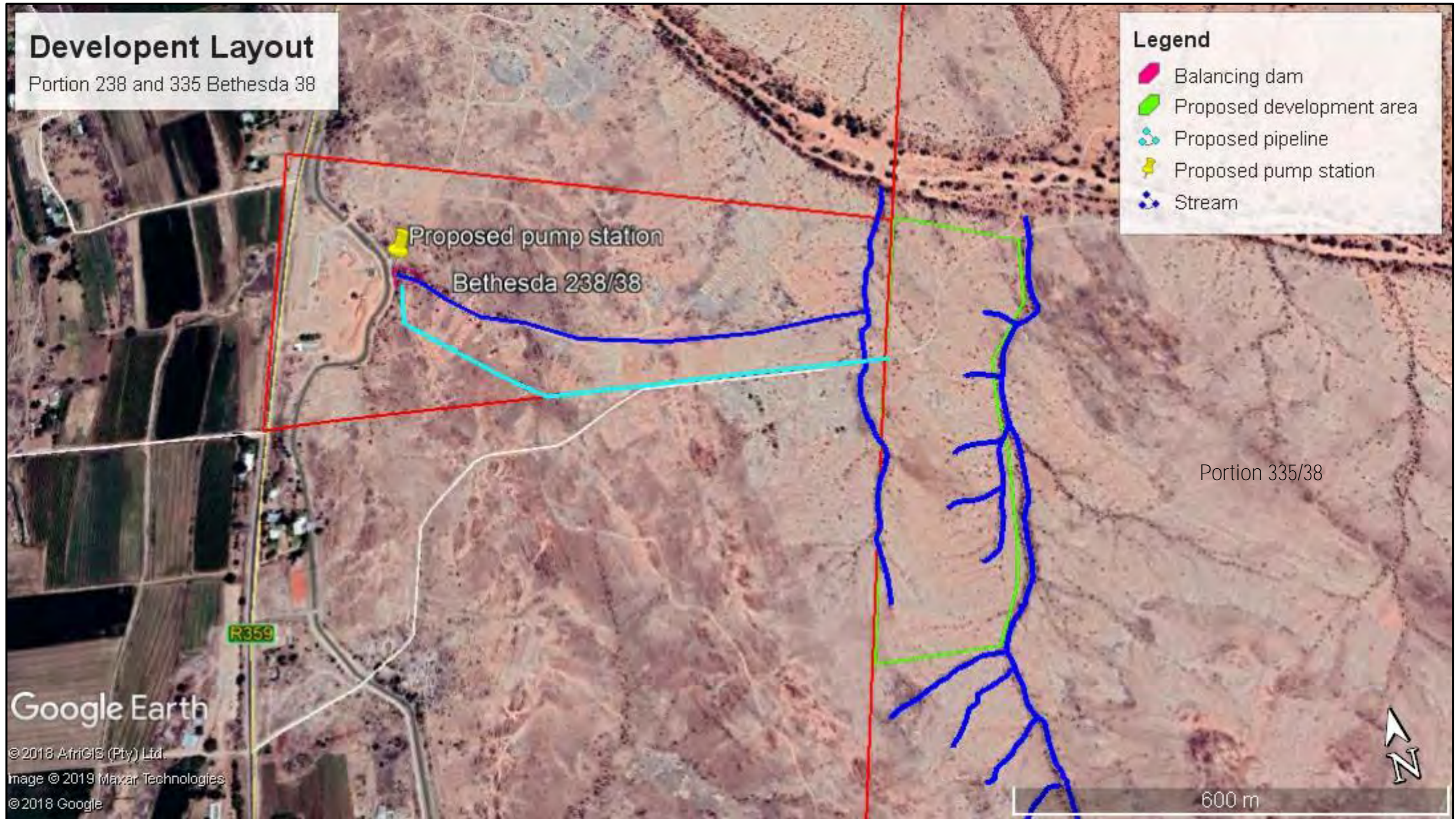
DATE

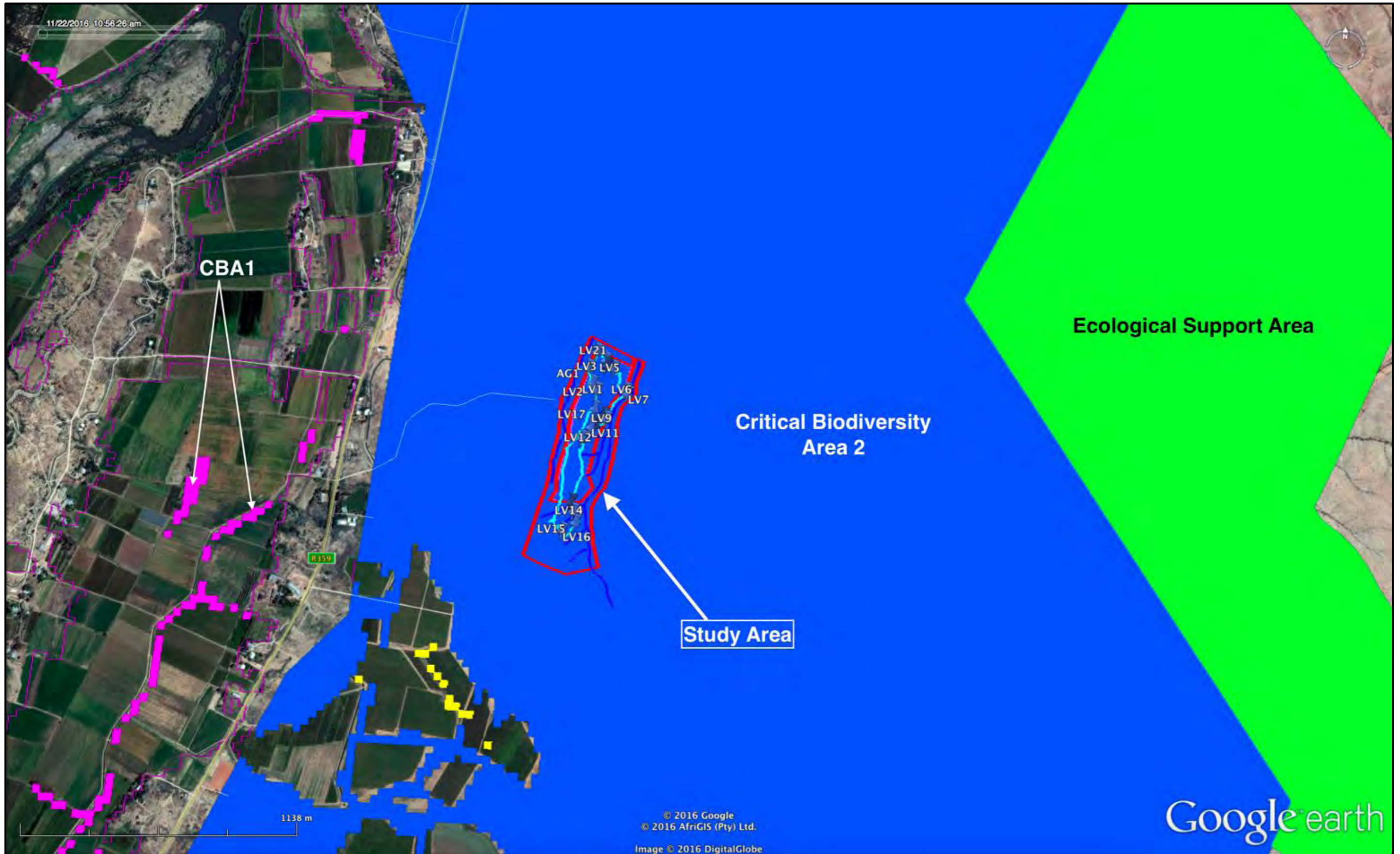
SECTION F: APPENDIXES

Appendix A: Maps

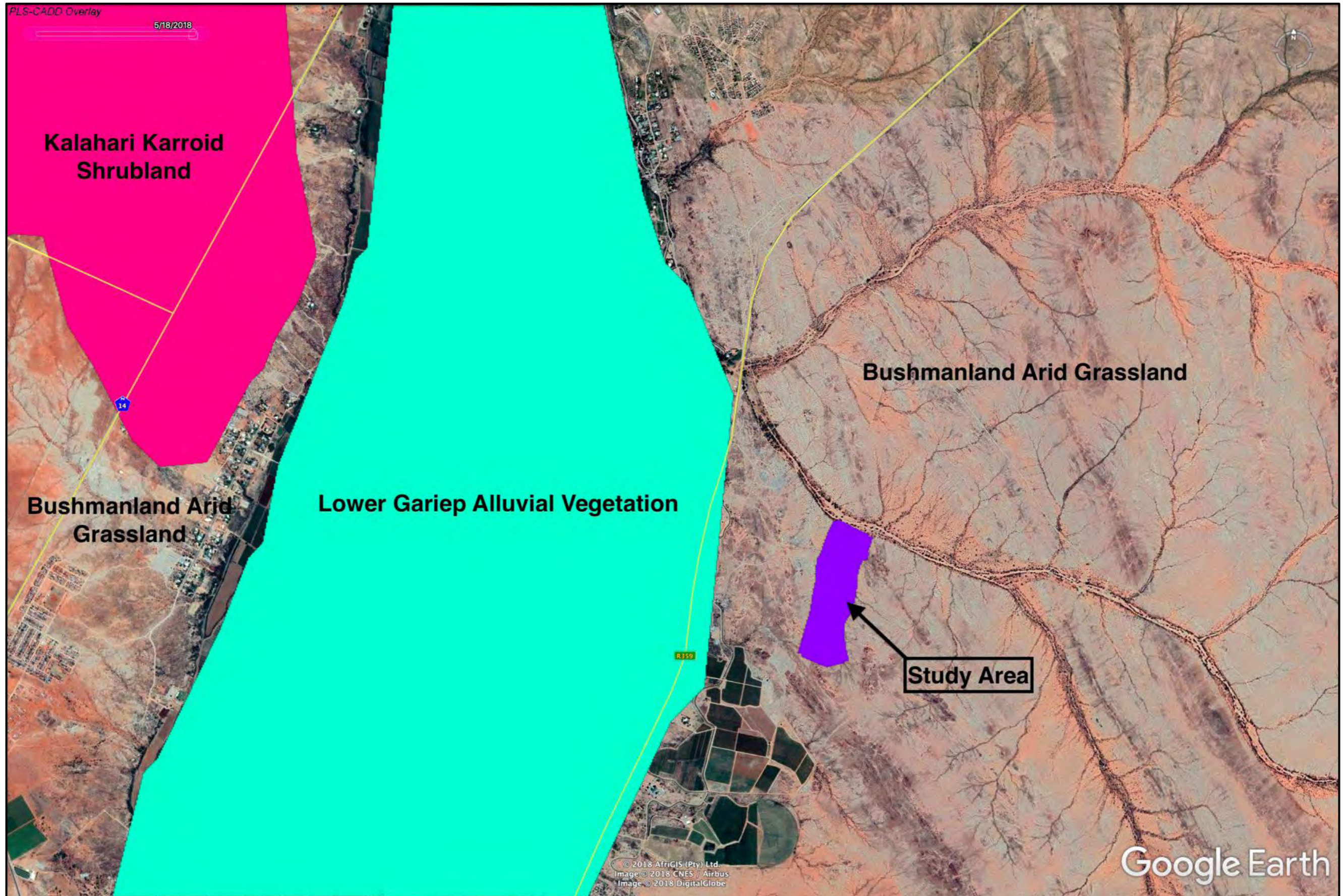
Appendix A1: Locality map







Appendix A4: Vegetation occurring at and near the proposed development area.





## Appendix B: Photographs



View north-eastwards over the eastern part of the study area. The dense stands of dark-green trees (*Vachellia mellifera* subsp. *detinens*) indicate the season drainage lines.



This location is on a low ridge where the vehicle was parked. Very shallow soil with bedrock and gravel. A two-spoor track runs through the site at this point.



At the northern end of the study area near the Donkerhoekspruit, a seasonal stream.



Dam Locality (black arrow)



Vegetation within the ephemeral streams.



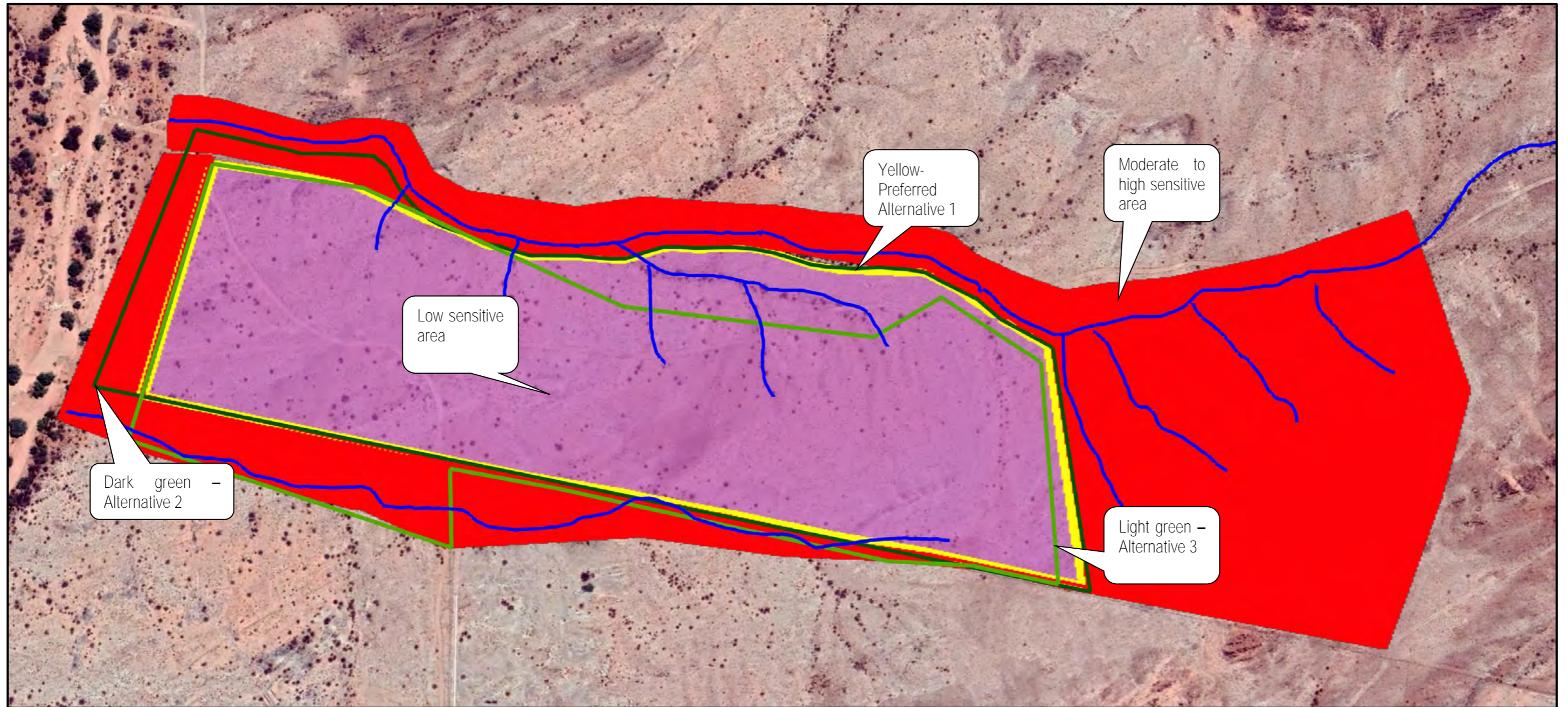
Canal at the point where the proposed new balancing dam will be constructed.



Development area, between the two larger ephemeral streams (black arrows), flowing towards the Donkerhoek spruit.

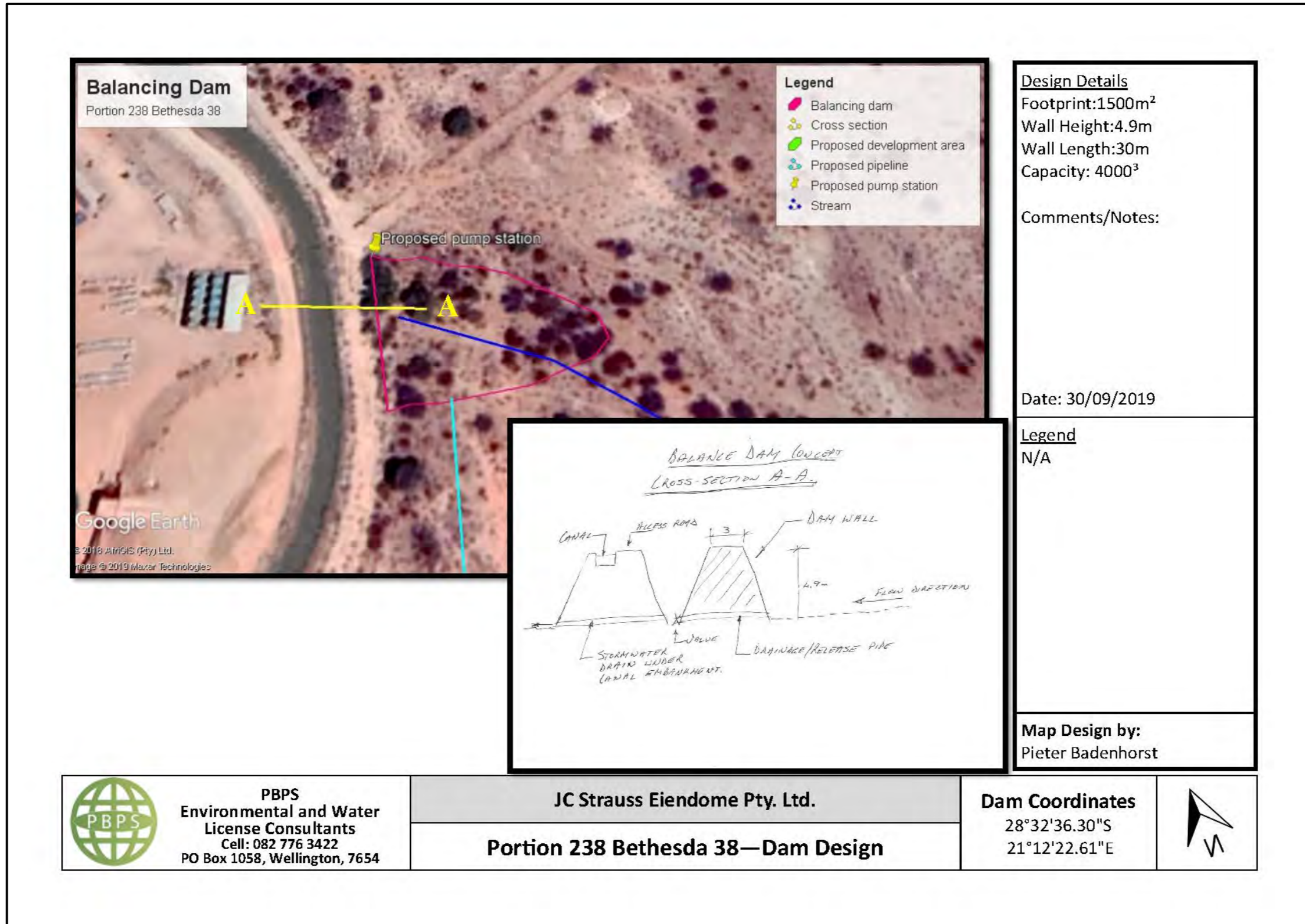
Appendix C: Facility illustration(s)

Appendix C1: Alternatives:





Appendix C3: Dam Design Layout:



**Appendix D: Specialist reports (including terms of reference)**

Appendix D1: Botanical Report

**Botanical Assessment  
for the proposed cultivation of vineyards,  
including associated infrastructure,  
on the Farm Bethesda 238/38 & 335/38  
Louisvale, Northern Cape Province**



***Dr David J. McDonald***  
***Bergwind Botanical Surveys & Tours CC.***  
***14A Thomson Road, Claremont, 7708***  
***Tel: 021-671-4056***  
***Fax: 086-517-3806***

**Prepared for Pieter Badenhorst Professional Services**

**July 2019**



## **National Legislation and Regulations governing this report**

This is a 'specialist report' and is compiled in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended, and the Environmental Impact Assessment Regulations, 2014, as amended.

## **Appointment of Specialist**

David J. McDonald of Bergwind Botanical Surveys & Tours CC was appointed by Pieter Badenhorst Professional Services, to provide specialist botanical consulting services for the assessment of the area proposed for agricultural development of vineyards, near Louisvale, Northern Cape Province.

## **Details of Specialist**

Dr David J. McDonald Pr. Sci. Nat.

Bergwind Botanical Surveys & Tours CC

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7708

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Fax: 086-517-3806

e-mail: [dave@bergwind.co.za](mailto:dave@bergwind.co.za)

Professional registration: South African Council for Natural Scientific Professions No. 400094/06

## **Expertise**

Dr David J. McDonald:

- Qualifications: BSc. Hons. (Botany), MSc (Botany) and PhD (Botany)
- Botanical ecologist with over 37 years' experience in the field of Vegetation Science.
- Founded Bergwind Botanical Surveys & Tours CC in 2006
- Has conducted over 400 specialist botanical / ecological studies.
- Has published numerous scientific papers and attended numerous conferences both nationally and internationally (details available on request)

Curriculum Vitae – Appendix 3

## **Independence**

The views expressed in the document are the objective, independent views of Dr McDonald and the study was carried out under the aegis of, Bergwind Botanical Surveys and Tours CC. Neither Dr McDonald nor Bergwind Botanical Surveys and Tours CC have any business, personal, commercial or other interest in the proposed development apart from fair remuneration for the work performed.

## **Conditions relating to this report**

The content of this report is based on the author's best scientific and professional knowledge as well as available information. Bergwind Botanical Surveys & Tours CC, its staff and appointed associates, reserve the right to modify the report in any way deemed fit should new, relevant or previously unavailable or undisclosed information become known to the author from on-going research or further work in this field, or pertaining to this investigation.

This report must not be altered or added to without the prior written consent of the author. This also refers to electronic copies of the report which are supplied for the purposes of inclusion as part of other reports, including main reports. Similarly, any recommendations, statements or conclusions drawn from or based on this report must reference it. If these form part of a main report relating to this investigation or report, this report must be included in its entirety as an appendix or separate section to the main report.

## **Declaration of independence:**

I David Jury McDonald, as the appointed Specialist hereby declare/affirm the correctness of the information provided or to be provided as part of the application, and that I:

- in terms of the general requirement to be independent:
  - other than fair remuneration for work performed in terms of this application, have no business, financial, personal or other interest in the development proposal or application and that there are no circumstances that may compromise my objectivity; or
  - am not independent, but another specialist (the "Review Specialist") that meets the general requirements set out in Regulation 13 has been appointed to review my work (Note: a declaration by the review specialist must be submitted);
- in terms of the remainder of the general requirements for a specialist, have throughout this EIA process met all of the requirements;
- have disclosed to the applicant, the EAP, the Review EAP (if applicable), the Department and I&APs all material information that has or may have the potential to influence the decision of the Department or the objectivity of any report, plan or document prepared or to be prepared as part of the application; and
- am aware that a false declaration is an offence in terms of Regulation 48 of the EIA Regulations, 2014 (as amended).



---

Signature of the specialist:

Bergwind Botanical Surveys & Tours CC

---

Name of company:

18 July 2019

---

Date:

## CONTENTS

|   |    |
|---|----|
| 1. Introduction.....  | 6  |
| 2. Terms of Reference.....  | 6  |
| 3. Limitations and Assumptions.....   | 7  |
| 4. Study Area.....  | 7  |
| 4.1 Locality.....   | 7  |
| 4.2 Topography and geology.....   | 11 |
| 4.3 Climate.....  | 12 |
| 5. Methods.....   | 12 |
| 5.1 Field Sampling.....   | 12 |
| 5.2 Desk-top analysis and reporting.....  | 12 |
| 6. Disturbance regime.....  | 13 |
| 7. The Vegetation.....  | 15 |
| 7.1 The vegetation in context.....  | 15 |
| 7.1 Vegetation at Bethesda Farm Study Area.....   | 15 |
| 7.2 Conservation Status & Critical Biodiversity Areas.....  | 28 |
| 7.3 Species of Conservation Concern.....  | 29 |
| 8. Proposed agricultural development.....   | 30 |
| 9. Impact Assessment.....   | 31 |
| 9.1 'No Go' Alternative.....  | 31 |
| 9.2 Direct Impacts.....   | 31 |
| 9.3 Indirect impacts.....   | 34 |
| 9.4 Cumulative impacts.....   | 34 |
| 10. General Assessment and Recommendations.....   | 34 |
| 12. Conclusions.....  | 35 |
| 13. References.....   | 35 |
| Appendix 1: Impact Assessment Methodology.....  | 37 |
| Appendix 2: Botanical Assessment Content Requirements of Specialist Reports, as<br>prescribed by Appendix 6 of GN R326..... | 40 |
| Appendix 3: Curriculum Vitae.....   | 42 |

## 1. Introduction

Pieter Badenhorst Professional Services (PBPS) was appointed by the Applicant, 'Strauss Groep' (Louisvale), to conduct the environmental assessment process for the development of vineyards at Farm Bethesda 238/38 & 335/38, Louisvale, Northern Cape Province. The study is conducted in terms of the National Environmental Management Act (NEMA) (No.7 of 1998) as amended and the 2014 Environmental Regulations. Bergwind Botanical Surveys & Tours CC was appointed by PBPS, on behalf of the Applicant, to carry out a botanical assessment of the area on the designated property to support the environmental impact assessment process. The purpose of the botanical impact assessment is to inform the environmental assessment on (a) the sensitivity of the site from a botanical viewpoint and (b) to determine any constraints that should be implemented to conserve the vegetation and flora while permitting the development to continue and (c) an assessment of impacts related to the proposed development.

The assessment takes careful note of the general requirements and recommendations of the Department of Environment and Nature Conservation (Northern Cape) and the Botanical Society of South Africa for proactive assessment of biodiversity of proposed development sites and follows published guidelines for evaluating potential impacts on the natural vegetation in an area earmarked for some form of development (Brownlie, 2005). **Particular note was taken of the Northern Cape Nature Conservation Act, 2009 (Act No. 9 of 2009) and Regulations (2011).**

## 2. Terms of Reference

The Terms of Reference are:

Undertake a site visit to the study area and compile a specialist report that addresses the following:

- Take cognizance of, and comply with, the substantive content requirements outlined within Appendix 6 of GN R982, as amended<sup>1</sup>, which outlines the legal minimum content requirements for specialist studies in terms of the 2014 NEMA EIA Regulations;
- The local and regional context of the vegetation communities and plant species within the affected areas, taking cognizance of the relevant biodiversity plans, bioregional planning documents, Environmental Management Frameworks etc.

- The ecosystem status and conservation value of the vegetation communities, including the whether the potentially affected areas comprise critically endangered or endangered ecosystem(s) listed in terms of section 52 of the NEMBA;
- Any rare or endangered species encountered or likely to be or have been present;
- Confirm the approximate area (m<sup>2</sup>) of indigenous vegetation (as defined in the NEMA EIA Regulations) that would be cleared for the proposed project.
- A description of the direct, indirect, residual and cumulative botanical impacts (both before and after mitigation) and an assessment of the significance of the impacts (on a nominal scale of Neutral/ Negligible, Very Low, Low, Medium, High) by evaluating: (a) nature of the impacts (positive/ negative), (b) extent of the impacts (zero/ site specific/local/ regional/ national/ international), (c) magnitude of the impacts (zero/ Very Low/Low/ Medium/ High), (d) duration of the impacts (none/ short/ medium/ long term) and (e) probability of occurrence of the impacts (none/ unlikely/ possible/ definite). In addition, (f) the level of confidence in findings relating to potential impacts, (g)reversibility of potential impacts (i.e. the degree to which the impact can be reversed); and (h) the degree to which the impact may cause irreplaceable loss of resources.
- An indication of the degree (very low/ low/ medium/ high) to which the impacts can be avoided, managed and mitigated, a description of the measures to mitigate any impacts, and an indication of whether or not the measures (if implemented) would change the significance of the impact, for the construction and operational phases of the project;
- Delineate the vegetation communities and sensitive areas from a floristic perspective using GPS to fix locations, and overlay onto aerial photography and /or site map (i.e. create a vegetation sensitivity map of the project area);

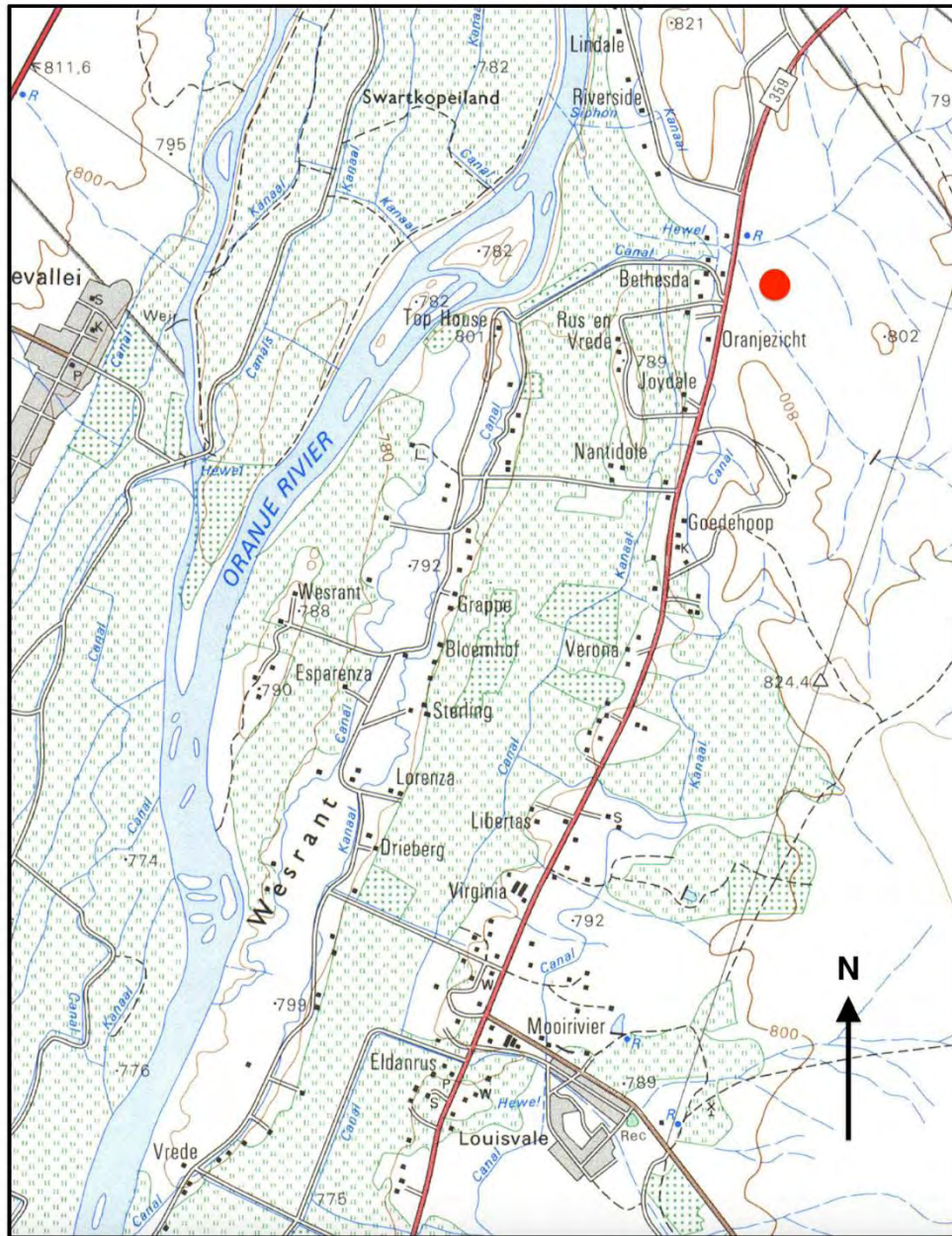
### **3. Limitations and Assumptions**

The vegetation was in fair to good condition at the time of the site visit so no limitations or assumptions applied to this study.

## **4. Study Area**

### **4.1 Locality**

The study area is close to the district road MR359, lying 1 km east of the road at the closest point and approximately 3 km northeast of the small town of Louisvale. It also lies approximately 3 km east of the Orange River but is out of any influence of the river i.e. it is not on alluvial soils (Figures 1 & 2).



**Figure 1.** Location (red dot) of the study area on the farm Bethesda northeast of Louisvale. Northern Cape Province (Map source: 1: 50 000 2821CA Kanoneiland. Chief Directorate: National Geo-spatial Information).

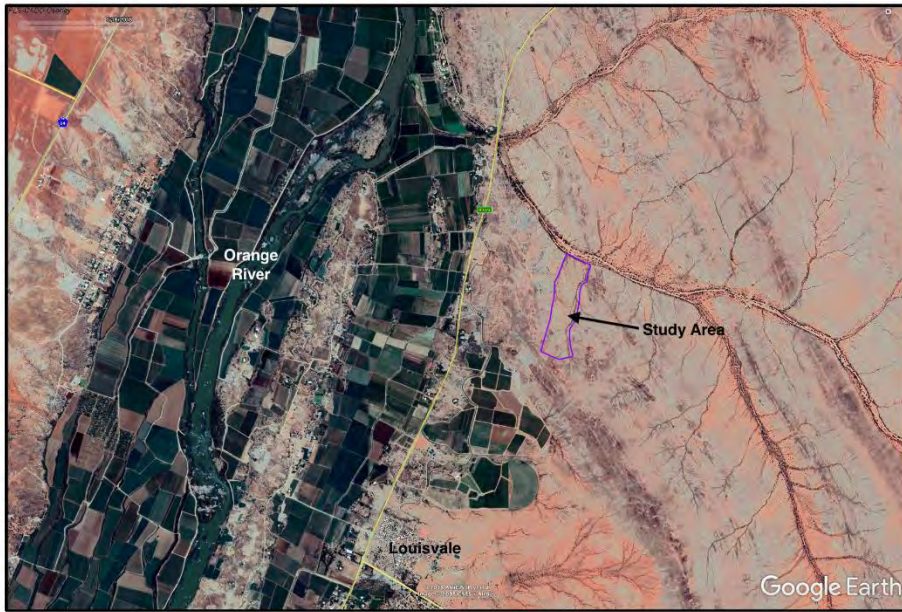


Figure 2. Aerial image from Google Earth™ showing the location of the study area (purple boundary) lying northeast of Louisvale and east of the Orange River.

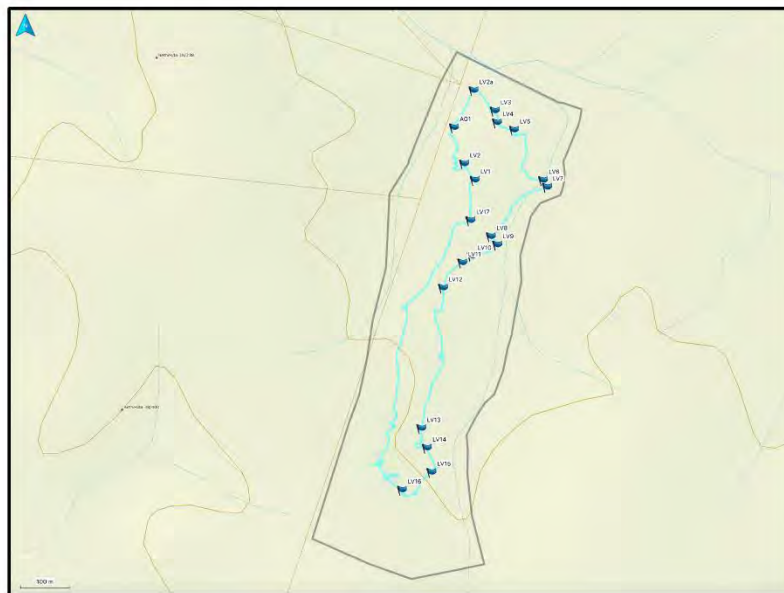


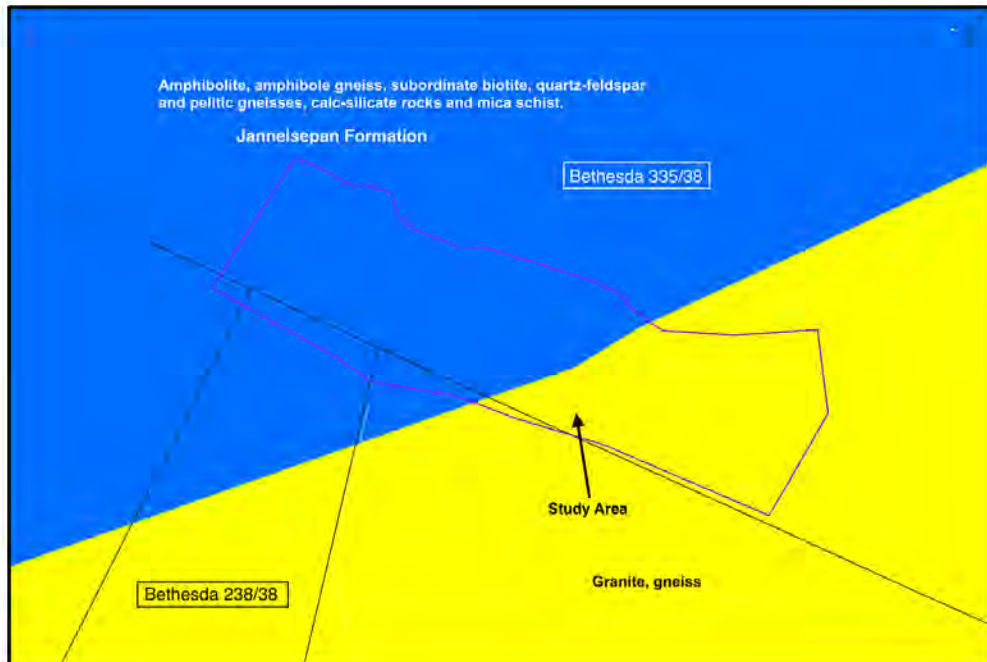
Figure 3. Topocadastral map of the area where the study area (grey boundary) is located on Farm Bethesda 238/38 & 335/38. The sample track is shown in blue with the sample waypoints (blue flags; LV#).



#### 4.2 Topography and geology

The site slopes at a moderate gradient downwards from south to north and is located on a shallowly convex terrain.

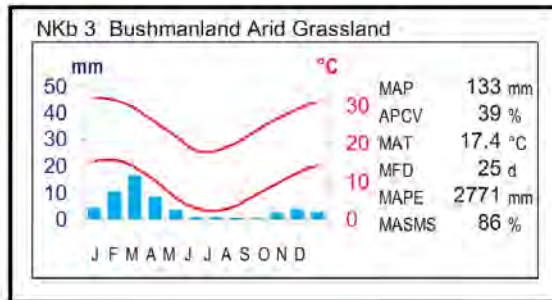
The geology consists of migmatitic amphibolites and calc-silicate rocks of the Jannelsepan Formation (blue in Figure 4) and granite-gneisses (yellow in Figure 4) all within the Areachap Group of the Namaqua-Natal Geological Province (Cornell *et al.* 2006). The soils that are the weathered products of these rocks are gravelly and well-drained.



**Figure 4.** Geological map of the study area (purple boundary line) that is underlain partly by granite-gneiss and partly by amphibolite, gneisses and calc-silicate rocks (Jannelsepan Formation). (Note the orientation of the image with North to the left).

### 4.3 Climate

The study area falls within the Summer Rainfall Region of the Northern Cape Province with the rainfall mostly occurring from late summer to autumn. Mean annual precipitation is low (133 mm) and maximum temperatures high in summer and low in winter resulting in high evaporative demand (MAPE) and consequently an arid climate (Figure 5). This has a strong bearing on the vegetation.



**Figure 5.** Climate diagram for Bushmanland Arid Grassland, the principal vegetation type in the study area (Mucina *et al.* 2006 in Mucina & Rutherford, 2006) showing MAP – Mean Annual Precipitation; APCV = Annual Precipitation Coefficient of Variance; MAT = Mean Annual Temperature; MFD = Mean Frost Days; MAPE = Mean Annual Potential Evaporation; MASMS = Mean Annual Soil Moisture Stress

## 5. Methods

### 5.1 Field Sampling

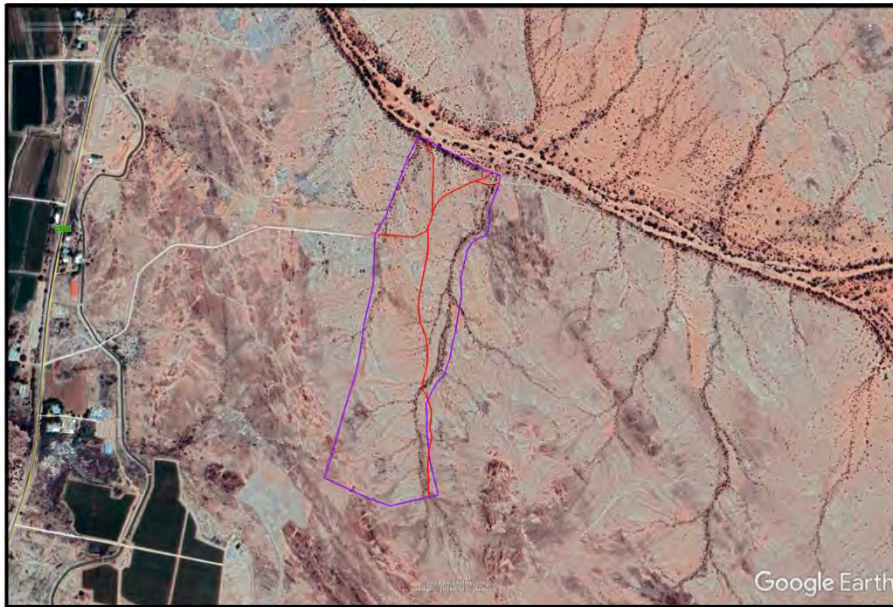
The study area was visited in fine weather. The survey was carried out on foot. A rapid assessment, plot-less method was employed as is standard practice in similar surveys. A hand-held Garmin ® GPSMap 62s was used to record 'sample' waypoints. The route followed (sample track) on the site is shown in Figure 3. At the 'sample waypoints' specific details of the surrounding vegetation and features of the habitat were recorded and photographs taken to support the general observations made. No attempt was made to cover the whole property but sampling was focused so as to obtain the best overall understanding of landscape and biodiversity conditions. Approximately 5 hours were spent on the site.

### 5.2 Desk-top analysis and reporting

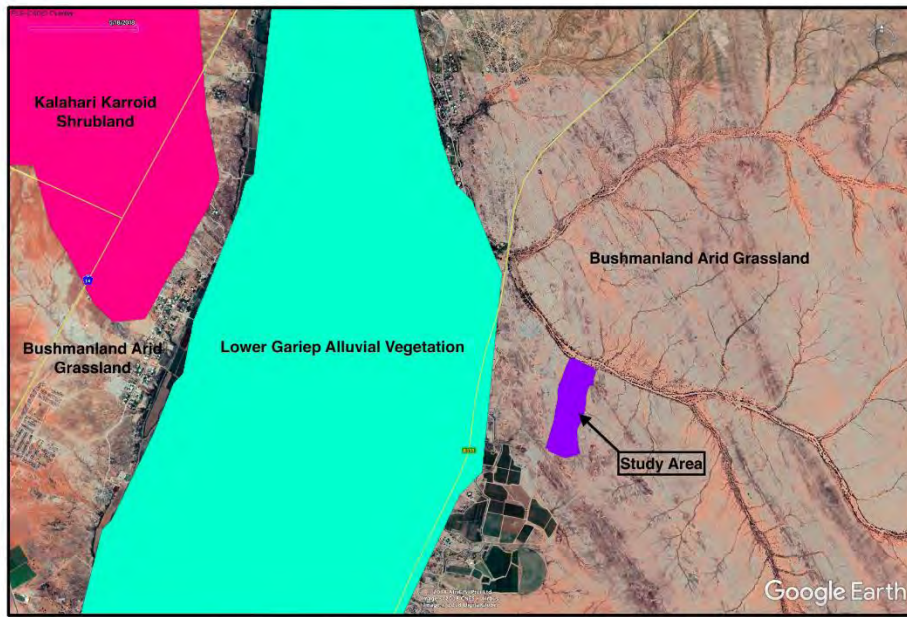
The photographs obtained in the field as well as available literature and Google Earth Pro™ were used for description of the vegetation presented in this report. The National Vegetation Map (SANBI, 2012) (referred to as VEGMAP) was used as the 'base-map' to determine the principal vegetation type.

## 6. Disturbance regime

There has been no agricultural activity in the study area in the past. The only disturbance is a few tracks that traverse the site as well as some trampling in the area of an informal shooting range. The study area is also not grazed. Existing negative impacts on the site are thus minimal (Figure 6).



**Figure 6.** Aerial image (Google Earth™) of the study area (purple boundary) with existing farm tracks indicated in red.



**Figure 7.** Portion of the Vegetation map of South Africa, Lesotho, and Swaziland (Mucina, Rutherford & Powrie 2005) showing the three vegetation types generally occurring at and near the study area.

## 7. The Vegetation

### 7.1 The vegetation in context

The Nama Karoo Biome covers an extensive area from the north-west through the central part of South Africa to the south and southeast of the country. It is an arid zone and is subdivided into three bioregions, the Upper Karoo Bioregion, Lower Karoo Bioregion and Bushmanland Bioregion. The Bethesda Farm study area near Louisvale is located in the Bushmanland Bioregion at a north-central location (Rutherford & Westfall, 1994; Rutherford *et al.* 2006; Mucina *et al.* 2006 in Mucina & Rutherford, 2006).

The entire Bethesda Farm study area falls within an extensive vegetation unit that was mapped by Mucina *et al.* (2005) and SANBI (2012) as Bushmanland Arid Grassland (Figure 7). It is widespread in the Bushmanland Bioregion and has a Least Threatened conservation status (Government Gazette, 2011; Driver *et al.* 2012). This vegetation type is characteristically dominated by 'white grasses' in the genus *Stipagrostis* but also has a complement of low shrubs.

The *Vegetation Map of South Africa, Lesotho & Swaziland* (Mucina *et al.* 2005) was mapped at a broad scale and therefore did not accommodate small-scale variation within the larger area of Bushmanland Arid Grassland. The greater part of the site is typical Bushmanland Arid Grassland although the substrate is either shallow coarse-grained soil over rock or exposed rock. Despite being present, the 'white grasses' are not dominant and the open, low stratum has a somewhat higher complement of low shrubs than at other localities where Bushmanland Arid Grassland occurs and where the soil is sandy.

### 7.1 Vegetation at Bethesda Farm Study Area

Details (descriptive notes with illustrations) of the vegetation found in the Bethesda Farm study area at the sample waypoints are given in Table 1. This provides an overview of the fine-scale pattern of the vegetation found on the site.

The vegetation in essence is an low, open grassy shrubland with emergent small trees. The drainage lines that have a higher concentration of black thorn trees (*Vachellia mellifera* subsp. *detinens*) would be buffered and would not be directly impacted by agricultural development.

Only one specimen of *Aloe gariiepensis* (Orange River aloe) was found but numerous clusters of *Aloe claviflora* (canon aloe) occur, mainly in the southern part of the study area. These species are protected (see below).

A number of small trees of *Boscia foetida* were found and recorded. However, significantly no protected *Boscia albitrunca* (shepherd's tree) trees were found. In addition, no protected *Vachellia erioloba* (camel thorn) trees were recorded since the substrate is not suitable for them.

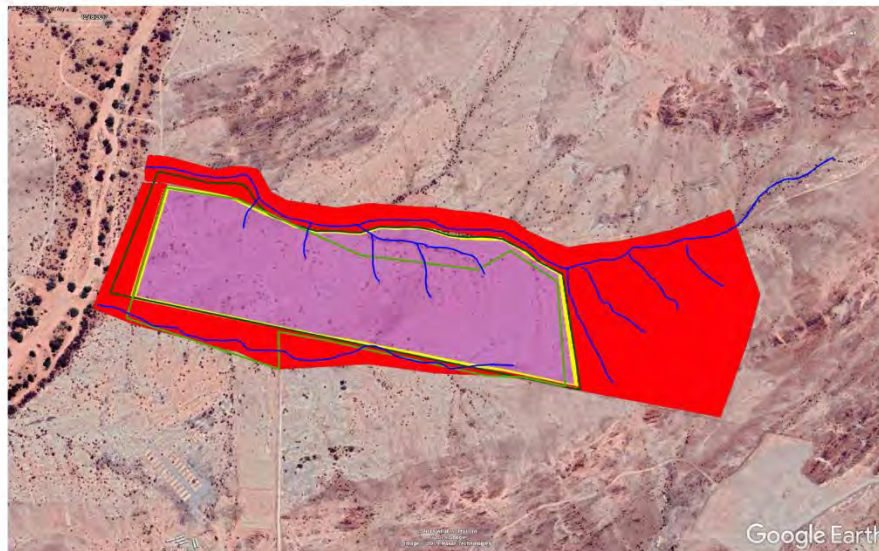
The vegetation does not display a high level of sensitivity over most of the site but the southern part is rocky, with exposed bedrock, and this area is ecologically sensitive, with many niches resulting in high plant species richness. The southern part of the area investigated should therefore be avoided and not disturbed. A sensitivity map is given in Figure 10, showing that the 'central' part of the area investigated (shaded pink) would be acceptable for cultivation whereas the boundary zone should be avoided and the drainage lines buffered by 32 m.



**Figure 8.** View northwards of the study area from waypoint LV16 at the southern extremity of the area investigated.





**Figure 9.** View northeastwards over the eastern part of the study area. The dense stands of dark-green trees (*Vachellia mellifera* subsp. *detinens*) indicate the season drainage lines.





**Figure 10.** Sensitivity map of the study area with the pink area being an area of low sensitivity. The zone between the pink area and the outer (red) boundary is considered to have moderate to high sensitivity. The dark green boundary indicates the Alternative 1 development area; the light-green boundary indicates the Alternative 2 development area and the yellow boundary indicates the Alternative 3 development area. (Note the orientation of the image with North to the left).

Table 1. Notes and illustrations recorded at the respective waypoints in the Bethesda Farm study area.



| Sample Waypoint                      | Descriptive Notes   | Illustration   |
|--------------------------------------|---|--|
| LV1: S 28° 32' 45.1" E 21° 12' 52.4" | This location is on a low ridge where the vehicle was parked. Very shallow soil with bedrock and gravel. A two-spoor track runs through the site at this point.   |  |
| LV2: S 28° 32' 44.0" E 21° 12' 51.7" | On NE-facing slope with moderate gradient. Substrate is very coarse gravel and boulders with granitic bedrock. Scattered <i>Vachellia mellifera</i> subsp. <i>detinens</i> up to 3 m tall. This is the only tree species present here. The low stratum < 1m consists of grasses and low shrubs that include, <i>Aloe claviflora</i> , <i>Aloe gariepensis</i> , <i>Aptosimum albomarginatum</i> , <i>Aptosimum spinescens</i> , <i>Asparagus</i> sp., <i>Eriocephalus</i> sp., <i>Geigeria ornativa</i> , <i>Hermannia</i> sp., <i>Ledebouria</i> sp., <i>Leucosphaera bainesii</i> , <i>Lycium</i> sp., <i>Monsonia salmoniflora</i> , <i>Rhigozum trichotomum</i> , <i>Sesamum triphyllum</i> , <i>Stipagrostis uniplumis</i> , <i>Tapinanthus oleifolius</i> , <i>Tetragonia</i> sp., <i>Tribulus cristatus</i> , <i>Zygophyllum microcarpum</i> . |  |



19

|                                      |   |  |
|--------------------------------------|---|--|
| LV2a S 28° 32' 39.2" E 21° 12' 52.3" | At the northern end of the study area near the Donkerhoekspruit, a seasonal stream. The stream will not be affected and the riparian trees would remain undisturbed. <i>Vachellia erioloba</i> (camel thorn) and <i>Ziziphus mucronata</i> (blinkblaar wag-'n-bietjie) occur along the watercourse. |  |
| LV3 S 28° 32' 40.6" E 21° 12' 53.8"  | At an old, short <i>Boscia foetida</i> tree. This tree should not be removed. It is growing on a rocky slope with moderate gradient sloping towards the river.  |  |



20



|  |   |  |
|--|---|--|
| <p>LV4 S 28° 32' 41.3" E 21° 12' 54.0"</p> | <p>At this location a <i>Boscia foetida</i> tree of 2 m tall is located.</p>  |  |
| <p>LV5 S 28° 32' 41.8" E 21° 12' 55.1"</p> | <p>This waypoint is on the track that runs along a low ridge and through the drift of a shallow seasonal stream. This ridge has very shallow soil, is rocky and the plant community is uniform throughout. A low field-stratum dominated by <i>Zygophyllum microcarpum</i> and grasses is the typical vegetation here. A few forbs and geophytes are present. <i>Aloe claviflora</i> is occasional and scattered plants are found throughout the landscape.</p> |  |

|  |   |  |
|--|---|--|
| <p>LV6 S 28° 32' 45.1" E 21° 12' 57.2"</p> | <p><i>Boscia foetida</i> – a sizable specimen on hard granite-gneiss bedrock</p>  |  |
| <p>LV7 S 28° 32' 45.6" E 21° 12' 57.4"</p> | <p>At the watercourse on the boundary of the study area on the east side. The watercourse is lined with <i>Vachellia mellifera</i> subsp. <i>definens</i> trees. A few opportunistic species occur in the dry streambed. They include <i>Monechma genistifolium</i> subsp. <i>australe</i> and <i>Rhigozum trichotomum</i>.</p> |  |

Botanical Assessment: Agricultural development at Farm Bethesda 238/38 & 335/38, Louisvale,  
Northern Cape Province



|  |  |  |
|--|--|--|
| <p>LV8 S 28° 32' 48.8" E 21° 12' 53.5"</p> | <p>Small <i>Boscia foetida</i> tree on gravel-bedrock slope.</p>       |  |
| <p>LV9 S 28° 32' 49.3" E 21° 12' 54.0"</p> | <p><i>Boscia foetida</i> tree 2m tall, spreading. On gravel slope.</p> |  |



23



Botanical Assessment: Agricultural development at Farm Bethesda 238/38 & 335/38, Louisvale,  
Northern Cape Province

|   |   |  |
|---|---|--|
| <p>LV10 S 28° 32' 50.1" E 21° 12' 52.2"</p> | <p><i>Aloe claviflora</i> very numerous in this vicinity, on shallow gravel soil. The dominant shrub is <i>Zygophyllum microcarpum</i>. Other forbs, sparse shrubs and grasses growing after rain.</p>                  |  |
| <p>LV11 S 28° 32' 50.5" E 21° 12' 51.5"</p> | <p>On the track where there is an informal shooting range on the slope. This has resulted in some trampling and disturbance. The vegetation here is typical of that of the site with <i>Aloe claviflora</i> common.</p> |  |

24

|  |   |  |
|--|---|--|
| <p>LV12 S 28° 32' 52.2" E 21° 12' 50.2"</p>  | <p>View SW towards a trigonometric beacon on the ridge. The vegetation is the same type. Two notable species are <i>Geranium</i> sp. (white flower) and <i>Euphorbia gariepina</i> subsp. <i>gariepina</i>.</p>   |  |
| <p>LV13 S 28° 33' 01.45" E 21° 12' 48.7"</p> | <p>At <i>Boscia foetida</i> – a low bush 1.5 m tall but old. This plant is near a seasonal drainage line that is lined with <i>Vachellia mellifera</i> subsp. <i>detinens</i>. A ridge of bedrock is found near the fence. The drainage line must be buffered and the cultivation must be north of the drainage line.</p> |  |

|   |   |  |
|---|---|--|
| <p>LV14 S 28° 33' 02.7" E 21° 12' 49.1"</p> | <p>A small but very old <i>Boscia foetida</i> near a very shallow drainage line.</p>  |  |
| <p>LV15 S 28° 33' 04.3" E 21° 12' 49.4"</p> | <p>On a granite ridge with bedrock and coarse gravel. Numerous clusters of <i>Aloe claviflora</i> occur here. The vegetation is all the same type. <i>Leucosphaera bainesii</i> was notable here as was <i>Ledebouria</i> sp. that had survived attempted predation of the bulb by a porcupine.</p> |  |

|   |  |  |
|---|--|--|
| <p>LV16 S 28° 33' 05.4" E 21° 12' 47.3"</p> | <p>No cultivation should occur south of this waypoint. The ridge is too rock and is ecologically sensitive. The forb <i>Barleria lichtensteiniana</i> occurs here.</p> |  |
| <p>LV17 S 28° 32' 47.7" E 21° 12' 52.1"</p> | <p>At an old, gnarled <i>Boscia foetida</i> alongside a track.</p>   |  |

## 7.2 Conservation Status & Critical Biodiversity Areas

As noted above, Bushmanland Arid Grassland is recognized as Least Threatened since it is not listed in the National List of Threatened Ecosystems (Government Gazette, 2011).

Critical Biodiversity Areas (CBAs) were delimited for the Namaqua District Municipality (NDM) by Desmet & Marsh (2008). The maps they compiled did not include the Louisvale area. However, more recently critical biodiversity areas and ecological support areas have been mapped for the whole of the Northern Cape Province including the ZF Mgcawu District Municipality where Louisvale is located.

The available CBA shapefiles (Enrico Oosthuysen pers. comm.) for the Northern Cape Province were overlaid on Google Earth™ which allowed determination of the CBA classification of the area around Louisvale. The study area on farm Bethesda 238 & 335 is located in an area classified as CBA2 (Figure 11).



**Figure 11.** Critical Biodiversity Area map indicating that the Bethesda Farm study area lies in an area classified as CBA2.

### 7.3 Species of Conservation Concern

No species of conservation concern or threatened species as per the Red List of South African Plants (Raimondo *et al.* 2009) were found in the study area. However, in terms of the Northern Cape Nature Conservation Act, 2009 (Act No. 9 of 2009) and Regulations (2011), all *Aloe* species are **protected**. Before any agricultural development, the numerous *Aloe claviflora* (Figure 12) and the single plant of *Aloe gariensis* (Figure 13) recorded in this study would require relocation to a safe site(s) where there would be no agricultural development in the future.



Figure 12. *Aloe claviflora*.



Figure 13. *Aloe gariensis*.



Figure 14. *Ledebouria* sp.

## 8. Proposed agricultural development

The landowner of Bethesda 238/8 & 335/8 wishes to cultivate 14 ha of vineyards. The intention is to place these trees under irrigation. Figure 10 shows the low sensitivity part of the study area shaded in pink. This area is 10 ha. In view of this, the project proponent, wishing to develop 14 ha proposed cultivation of the area within the dark green boundary in Figure 10 would exceed the area of low sensitivity and encroach into the area of moderate to high sensitivity. The 14 ha area desired by the proponent (referred to in the Impact Assessment below as Alternative 1) would impact on the buffer zone required for the seasonal drainage lines. Following the necessity of the buffering the drainage lines, a second alternative 'boundary' (Alternative 2), shown as a light-green line (Figure 10), encompassing 12.8 ha, was proposed by the environmental assessment practitioner (EAP). A third alternative (Alternative 3) is proposed here (black boundary in Figure 10). This layout would be a fair compromise between 14 ha area desired by the landowner (Alternative 1) and the 12.8 ha suggested by the EAP. The Alternative 3 area is 13.4 ha.

## 9. Impact Assessment

Impacts on the vegetation are assessed for the construction (clearing) and operation (farming of vineyards) in the study area.

### 9.1 'No Go' Alternative

In the case of the "No Go" alternative where there would be no change. The *status quo* would persist and there would be no farming of the designated site. The 'no development' alternative or 'No Go' alternative would thus have a **Negligible** impact on the natural vegetation with no significant further loss in the short- to long-term.

The 'No Go' alternative is included in Table 2.

### 9.2 Direct Impacts

Direct impacts are those that would occur directly on the vegetation of the site as a result of the proposed agricultural development. The rating system used is given in Appendix 1. In addition to determining the individual impacts using various criteria, mitigation is also brought into the assessment.

The impacts of the development of vineyards on the existing vegetation and habitat are considered with respect to loss of vegetation type and habitat including plant species. Ecological processes are intrinsic to the habitat and are not separated here for assessment. The assessment rather incorporates the effect on ecological processes as part of the affected habitat.

#### **9.2.1 Loss of vegetation type (Bushmanland Arid Grassland) and habitat including plant species due to clearing and development of vineyards.**

Bushmanland Arid Grassland is a widespread vegetation type and is found extensively east of the Orange River. There would be loss of no more than 14 ha at Bethesda Farm i.e. a local scale impact. However, this area is included in a Critical Biodiversity Area 2, so this is taken into consideration in the assessment of direct impacts. Given the species composition, lack of sensitive species but presence of protected species and proximity to seasonal drainage lines, the direct impacts without mitigation would be locally **High Negative** for Alternative 1 but **Medium Negative** for Alternative 2 and Alternative 3. Mitigation to lower



the impact of Alternative 1 would be to adopt Alternative 2 or 3, so avoiding the drainage lines and providing adequate buffering. Alternative 2 is a slightly smaller area than Alternative 3 so the latter is **recommended** and from a botanical perspective becomes the preferred alternative (Table 2).

**Table 2. Impact and Significance – Loss of natural Bushmanland Arid Grassland vegetation due to development (construction and operation) of vineyards.**

| CRITERIA   | 'NO GO' ALTERNATIVE                       |                    | PREFERRED ALTERNATIVE:<br>Alternative 1<br>Agricultural development at the<br>study area at Bethesda Farm |                    | Alternative 2<br>Agricultural development at the<br>study area at Bethesda Farm |                    | Alternative 3<br>Agricultural development at the<br>study area at Bethesda Farm |                    |
|--|---|--------------------|---|--------------------|---|--------------------|---|--------------------|
|  | WITHOUT<br>MITIGATION                     | WITH<br>MITIGATION | WITHOUT<br>MITIGATION   | WITH<br>MITIGATION | WITHOUT<br>MITIGATION   | WITH<br>MITIGATION | WITHOUT<br>MITIGATION   | WITH<br>MITIGATION |
| Nature of direct impact (local scale)                            | <b>Loss of Bushmanland Arid Grassland</b> |                    |   |                    |   |                    |   |                    |
| Extent   | Local                                     | Local              | Local   | Local              | Local   | Local              | Local   | Local              |
| Duration   | Long-term                                 | Long-term          | Long-term   | Long-term          | Long-term   | Long-term          | Long-term   | Long-term          |
| Intensity  | Low                                       | Low                | High  | Medium             | Medium  | Low                | Medium  | Low                |
| Probability of occurrence  | Probable                                  | Probable           | Probable  | Probable           | Probable  | Probable           | Probable  | Probable           |
| Confidence   | High                                      | High               | High  | High               | High  | High               | High  | High               |
| Significance   | Negligible                                | Negligible         | High negative   | Medium negative    | Medium negative   | Low negative       | Medium negative   | Low negative       |
| Nature of Cumulative impact                                      | <b>Loss of Bushmanland Arid Grassland</b> |                    |   |                    |   |                    |   |                    |
| Cumulative impact prior to mitigation                            | Negligible                                |                    | Medium negative   |                    | Low negative  |                    | Low negative  |                    |
| Degree to which impact can be reversed                           | Not applicable                            |                    | Low   |                    | Low   |                    | Low   |                    |
| Degree to which impact may cause irreplaceable loss of resources | Negligible                                |                    | Low   |                    | Low   |                    | Low   |                    |
| Degree to which impact can be mitigated                          | Not required                              |                    | Medium  |                    | Medium  |                    | Medium  |                    |
| Proposed mitigation  | Not required                              |                    | Adoption of Alternative 3; Search and rescue of protected plants  |                    | Search and rescue of protected plants   |                    | Search and rescue of protected plants   |                    |
| Cumulative impact post mitigation                                | Not applicable                            |                    | Small effect on Bushmanland Arid Grassland as a whole   |                    | Low negative  |                    | Low negative  |                    |
| Significance of cumulative impact (broad scale) after mitigation | Not applicable                            |                    | Low negative  |                    | Low negative  |                    | Low negative  |                    |

### 9.2.2 Mitigation

Proposed mitigation:

- (1) Avoidance of seasonal drainage lines (accepting that those within the development area would be lost); the drainage lines outside the development area must be buffered by at least 32 m.
- (2) Search and Rescue of all *Aloe gariepensis* and *Aloe claviflora* plants (Figures 12 & 13).
- (3) Search and Rescue of *Ledebouria* sp. (Figure 14)– a perennial geophyte.

### 9.3 Indirect impacts

By definition indirect impacts occur away from the 'action source' i.e. away from the development site. The impact assessed here is specifically how the proposed agricultural development would have an indirect impact on vegetation and flora away from the development site. No indirect impacts were identified.

### 9.4 Cumulative impacts

The receiving environment into which the proposed agricultural development would be imposed is not altered but in terms of the great extent of Bushmanland Arid Grassland the cumulative impact would be very small. It would not lead to irreversible loss of resources and even though it would be located in an area designated as a CBA2, it would not result in the national conservation target not being met. Consequently the cumulative impacts would be **Low Negative**.

## 10. General Assessment and Recommendations

- A single vegetation type, Bushmanland Arid Grassland, occurs in the study area. It is generally not sensitive but the site harbours protected species (aloes and geophytes) that would need to be relocated to safe sites prior to development.
- No protected trees such as *Boscia albitrunca* (Shepherd's tree) and *Vachellia erioloba* (camel thorn) were found in the study area.
- It is strongly recommended that the seasonal drainage lines should be buffered and that no agricultural development takes place that would affect them.
- The assessment of impacts together with the desired area proposed for cultivation taken together indicate that it would be optimal to apply Alternative 3 since this would

be the best compromise to ensure protection of the watercourses while offering adequate area for cultivation.

- The impact of Alternative 3 can be mitigated from **Medium negative** to **Low negative** by relocating the protected plant species.
- Cumulative impacts would be **Low negative** at the most and even as low as **Very low negative** since Bushmanland Arid Grassland is not threatened in any way and is unlikely to be threatened in the future since it is very widespread.
- Buffering of the drainage lines and Search & Rescue of protected plants and geophytes must be a condition of environmental authorisation.

## 12. Conclusions

Vineyards have been successfully established in the Louisvale area under irrigation and the proposed agricultural development would not likely encounter any problems. The short, cold winters (when the vines need to go into complete dormancy) and long, hot summers are ideal for this type of agriculture. In general, therefore, the site proposed for the vineyard is suitable for this purpose.

Despite the chosen area being within a CBA2, from a botanical perspective it is suitable, acceptable and is supported as developable as long as the recommended mitigation measures are applied.

## 13. References

- Brownlie, S. 2005. Guideline for involving biodiversity specialists in EIA processes: Edition 1. *CSIR Report No. ENV-S-C 2005-053 C*. Provincial Government of the Western Cape: Department of Environmental Affairs and Development Planning.
- Cornell, D.H., Thomas, R.J., Moen, H.F.G., Reid, D.L., Moore, J.M. & Gibson, R.L. 2006. The Namaqua-Natal Province. In: Johnson, M.R., Annhaesser, C.R. and Thomas, R.J. (eds). *The Geology of South Africa*, Published jointly by The Geological Society of South Africa (Johannesburg) and Council for Geoscience (Pretoria), pp. 325—379.
- Driver A., Sink, K.J., Nel, J.N., Holness, S., Van Niekerk, L., Daniels, F., Jonas, Z., Majiedt, P.A., Harris, L. & Maze, K. 2012. National Biodiversity Assessment 2011: An

assessment of South Africa's biodiversity and ecosystems. Synthesis Report. South African National Biodiversity Institute and Department of Environmental Affairs, Pretoria.

Government Gazette No. 34809. 2011. Threatened Terrestrial Ecosystems in South Africa.

Mucina, L., Rutherford, M.C., & Powrie, L.W. (Eds.). 2005. Vegetation map of South Africa, Lesotho, and Swaziland 1:1 000 000 scale sheet maps. South African National Biodiversity Institute, Pretoria. ISBN 1-919976-22-1.

Mucina, L. & Rutherford, M.C. 2006. (eds.) The Vegetation of South Africa. Lesotho & Swaziland. *Strelitzia* 19. South African National Biodiversity Institute, Pretoria.

Mucina, L., Rutherford, M.C., Palmer, A.R., Milton, S.J., Scott, L., Lloyd, J.W., Van der Merwe, B., Hoare, D.B., Bezuidenhout, H. Vlok, J.H.J., Euston-Brown, D.I.W., Powrie, L.W. and Dold, A.P. 2006. Nama-Karoo Biome. In: Mucina, L., & Rutherford, M.C. (Eds.). 2006. The Vegetation of South Africa, Lesotho and Swaziland. *Strelitzia* 19. South African National Biodiversity Institute, Pretoria.

Rutherford, M.C. & Westfall, R.H. 1994. Biomes of southern Africa – an objective categorization, edn 2. *Mem. Bot Surv. S. Afr.* No. 63: 1 – 94.

Rutherford, M.C., Mucina, L. & Powrie, L.W. 2006. Biomes and bioregions of Southern Africa. In: Mucina, L. & Rutherford, M.C. 2006. (eds.) The Vegetation of South Africa. Lesotho & Swaziland. *Strelitzia* 19. South African National Biodiversity Institute, Pretoria.

South African National Biodiversity Institute (SANBI) 2012, Vegetation Map of South Africa, Lesotho and Swaziland [vector geospatial dataset] 2012. Available from the Biodiversity GIS website <http://bgis.sanbi.org/SpatialDataset/Detail/18>.

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Report submitted: 9 December 2018; amended 18 July 2019

## Appendix 1: Impact Assessment Methodology

The assessment of impacts needs to include the determination of the following:

- The nature of the impact – see Table 1.1
- The magnitude (or severity) of the impact – see Table 1.2
- The likelihood of the impact occurring - see Table 1.2

The degree of confidence in the assessment must also be reflected.

**Table 1.1** *Impact assessment terminology*

| Term                 | Definition   |
|----------------------|--|
| <i>Impact nature</i> |  |
| Positive             | An impact that is considered to represent an improvement on the baseline or introduces a positive change.  |
| Negative             | An impact that is considered to represent an adverse change from the baseline, or introduces a new undesirable factor.   |
| Direct impact        | Impacts that result from a direct interaction between a planned project activity and the receiving environment/receptors (e.g. between occupation of a site and the pre-existing habitats or between an effluent discharge and receiving water quality). |
| Indirect impact      | Impacts that result from other activities that are encouraged to happen as a consequence of the Project (e.g. in-migration for employment placing a demand on resources).  |
| Cumulative impact    | Impacts that act together with other impacts (including those from concurrent or planned future third party activities) to affect the same resources and/or receptors as the Project.  |

### Assessing significance

There is no statutory definition of '*significance*' and its determination is, therefore, somewhat subjective. However, it is generally accepted that significance is a function of the magnitude of the impact and the likelihood of the impact occurring. The criteria used to determine significance are summarized in *Table 1.2*

**Table 1.2** *Significance criteria*

| <i>Impact magnitude</i> |   |
|-------------------------|---|
| Extent                  | <p><i>On-site</i> – impacts that are limited to the boundaries of the rail reserve, yard or substation site.</p> <p><i>Local</i> – impacts that affect an area in a radius of 20km around the development site.</p> <p><i>Regional</i> – impacts that affect regionally important environmental resources or are experienced at a regional scale as determined by administrative boundaries, habitat type/ecosystem.</p> <p><i>National</i> – impacts that affect nationally important environmental resources or affect an area that is nationally important/ or have macro-economic consequences.</p> |
| Duration                | <p><i>Temporary</i> – impacts are predicted to be of short duration and intermittent/occasional.</p> <p><i>Short-term</i> – impacts that are predicted to last only for the duration of the construction period.</p> <p><i>Long-term</i> – impacts that will continue for the life of the Project, but ceases when the Project stops operating.</p> <p><i>Permanent</i> – impacts that cause a permanent change in the affected receptor or resource (e.g. removal or destruction of ecological habitat) that endures substantially beyond the Project lifetime.</p>                                    |

|  |  |
|--|--|
| Intensity                              | <p>BIOPHYSICAL ENVIRONMENT: <i>Intensity can be considered in terms of the sensitivity of the biodiversity receptor (ie. habitats, species or communities).</i></p> <p><b>Negligible</b> – the impact on the environment is not detectable.<br/> <b>Low</b> – the impact affects the environment in such a way that natural functions and processes are not affected.<br/> <b>Medium</b> – where the affected environment is altered but natural functions and processes continue, albeit in a modified way.<br/> <b>High</b> – where natural functions or processes are altered to the extent that it will temporarily or permanently cease.</p> <p><i>Where appropriate, national and/or international standards are to be used as a measure of the impact. Specialist studies should attempt to quantify the magnitude of impacts and outline the rationale used.</i></p> |
|  | <p>SOCIO-ECONOMIC ENVIRONMENT: <i>Intensity can be considered in terms of the ability of project affected people/communities to adapt to changes brought about by the Project.</i></p> <p><b>Negligible</b> – there is no perceptible change to people's livelihood<br/> <b>Low</b> - People/communities are able to adapt with relative ease and maintain pre-impact livelihoods.<br/> <b>Medium</b> - Able to adapt with some difficulty and maintain pre-impact livelihoods but only with a degree of support.<br/> <b>High</b> - Those affected will not be able to adapt to changes and continue to maintain pre-impact livelihoods.</p>  |
| <i>Impact likelihood (Probability)</i> |  |
| Negligible                             | The impact does not occur.   |
| Low                                    | The impact may possibly occur.   |
| Medium                                 | Impact is likely to occur under most conditions.   |
| High                                   | Impact will definitely occur.  |

Once a rating is determined for magnitude and likelihood, the following matrix can be used to determine the impact significance.

**Table 7.5 Example of significance rating matrix**

| SIGNIFICANCE RATING |            |            |            |        |        |
|---------------------|------------|------------|------------|--------|--------|
|                     | LIKELIHOOD | Negligible | Low        | Medium | High   |
| MAGNITUDE           | Negligible | Negligible | Negligible | Low    | Low    |
|                     | Low        | Negligible | Negligible | Low    | Low    |
|                     | Medium     | Negligible | Low        | Medium | Medium |
|                     | High       | Low        | Medium     | High   | High   |

In Table 7.6, the various definitions for significance of an impact is given.

**Table 7.6 Significance definitions**

| Significance definitions |  |
|--------------------------|--|
| Negligible significance  | An impact of negligible significance (or an insignificant impact) is where a resource or receptor (including people) will not be affected in any way by a particular activity, or the predicted effect is deemed to be 'negligible' or 'imperceptible' or is indistinguishable from natural background variations. |

|                              |   |
|------------------------------|---|
| <b>Minor significance</b>    | An impact of minor significance is one where an effect will be experienced, but the impact magnitude is sufficiently small (with and without mitigation) and well within accepted standards, and/or the receptor is of low sensitivity/value.   |
| <b>Moderate significance</b> | An impact of moderate significance is one within accepted limits and standards. The emphasis for moderate impacts is on demonstrating that the impact has been reduced to a level that is as low as reasonably practicable (ALARP). This does not necessarily mean that 'moderate' impacts have to be reduced to 'minor' impacts, but that moderate impacts are being managed effectively and efficiently.  |
| <b>Major significance</b>    | An impact of major significance is one where an accepted limit or standard may be exceeded, or large magnitude impacts occur to highly valued/sensitive resource/receptors. A goal of the EIA process is to get to a position where the Project does not have any major residual impacts, certainly not ones that would endure into the long term or extend over a large area. However, for some aspects there may be major residual impacts after all practicable mitigation options have been exhausted (i.e. ALARP has been applied). An example might be the visual impact of a development. It is then the function of regulators and stakeholders to weigh such negative factors against the positive factors such as employment, in coming to a decision on the Project. |

Once the significance of the impact has been determined, it is important to qualify the **degree of confidence** in the assessment. Confidence in the prediction is associated with any uncertainties, for example, where information is insufficient to assess the impact. Degree of confidence can be expressed as low, medium or high.



**Appendix 2: Botanical Assessment Content Requirements of  
Specialist Reports, as prescribed by Appendix 6 of GN R326.**

| Regulation | Content as required by NEMA  | Specialist Report Section/Annexure Reference |
|------------|--|--|
| 1 (1) (a)  | (i) The specialist who prepared the report; and  | Cover & Page 2                               |
|            | (ii) The expertise of that specialist to compile a specialist report, including a CV.  | Page 2 & Appendix 3                          |
| 1 (1) (b)  | A declaration that the specialist is independent in a form as may be specified by the competent authority.   | Page 4                                       |
| 1 (1) (c)  | An indication of the scope of, and purpose for which, the report is prepared.  | Pages 6 & 7                                  |
| 1 (1)(cA)  | An indication of the quality and age of base data used for the specialist report.  | Page 12, 15--30                              |
| 1 (1)(cB)  | A description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change.   | Page 13                                      |
| 1 (1) (d)  | The duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment.  | Page 12                                      |
| 1 (1) (e)  | A description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used.  | Page 12                                      |
| 1 (1) (f)  | Details of an assessment of the specifically identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternatives. | Pages 32—35                                  |
| 1 (1) (g)  | An identification of any areas to be avoided, including buffers.   | Page 30                                      |
| 1 (1) (h)  | A map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers.   | Page 18                                      |
| 1 (1) (i)  | A description of any assumptions made and any uncertainties or gaps in knowledge.  | Page 7                                       |
| 1 (1) (j)  | A description of the findings and potential implications of such findings on the impact of the proposed activity or activities.  | Page 14--30                                  |
| 1 (1) (k)  | Any mitigation measures for inclusion in the EMPr.   | Page 34                                      |

| Regulation | Content as required by NEMA   | Specialist Report Section/Annexure Reference |
|------------|---|--|
| 1 (1) (l)  | Any conditions for inclusion in the environmental authorisation.  | Page 35                                      |
| 1 (1) (m)  | Any monitoring requirements for inclusion in the EMPr or environmental authorisation  | Not applicable                               |
| 1 (1) (n)  | A reasoned opinion-<br>(i) whether the proposed activity, activities or portions thereof should be authorised; and  | Page 35                                      |
|            | (iA) regarding the acceptability of the proposed activity or activities; and  |  |
|            | (ii) If the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan | Page 35                                      |
| 1 (1) (o)  | A description of any consultation process that was undertaken during the course of preparing the specialist report  | Not applicable                               |
| 1 (1) (p)  | A summary and copies of any comments received during any consultation process and where applicable, all responses thereto   | Not applicable                               |
| 1 (1) (q)  | Any other information requested by the competent authority  | Not applicable                               |

### **Appendix 3: Curriculum Vitae**

#### **Dr David Jury McDonald Pr. Sci. Nat.**

**Name of Company:** Bergwind Botanical Surveys & Tours CC. (Independent consultant)

**Work and Home Address:** 14 A Thomson Road, Claremont, 7708

**Tel:** (021) 671-4056 **Mobile:** 082-876-4051 **Fax:** 086-517-3806

**E-mail:** [dave@bergwind.co.za](mailto:dave@bergwind.co.za)

**Website:** [www.bergwind.co.za](http://www.bergwind.co.za)

**Profession:** Botanist / Vegetation Ecologist / Consultant / Tour Guide

**Date of Birth:** 7 August 1956

#### **Employment history:**

- 19 years with National Botanical Institute (now SA National Biodiversity Institute) as researcher in vegetation ecology.
- Five years as Deputy Director / Director Botanical & Communication Programmes of the Botanical Society of South Africa
- Thirteen years as private independent Botanical Specialist consultant (Bergwind Botanical Surveys & Tours CC)

**Nationality:** South African (ID No. 560807 5018 080)

**Languages:** English (home language) – speak, read and write  
Afrikaans – speak, read and write

#### **Membership in Professional Societies:**

- International Association for Impact Assessment (SA)
- South African Council for Natural Scientific Professions (**Ecological Science, Registration No. 400094/06**)
- Field Guides Association of Southern Africa

#### **Key Qualifications:**

- Qualified with a M. Sc. (1983) in Botany and a PhD in Botany (Vegetation Ecology) (1995) at the University of Cape Town.
- Research in Cape fynbos ecosystems and more specifically mountain ecosystems.
- From 1995 to 2000 managed the Vegetation Map of South Africa Project (National Botanical Institute).
- Conducted botanical survey work for AfriDev Consultants for the Mohale and Katse Dam projects in Lesotho from 1995 to 2002. A large component of this work was the analysis of data collected by teams of botanists.
- **Director: Botanical & Communication Programmes** of the Botanical Society of South Africa (2000—2005), responsible for communications and publications; involved with conservation advocacy particularly with respect to impacts of development on centres of plant endemism.

- Further tasks involved the day-to-day management of a large non-profit environmental organisation.
- **Independent botanical consultant** (2005 – to present) over 400 projects have been completed related to environmental impact assessments in the Western, Southern and Northern Cape, Karoo and Lesotho. A list of reports (or selected reports for scrutiny) is available on request.

### Higher Education

#### Degrees obtained

#### and major subjects passed:

B.Sc. (1977), University of Natal, Pietermaritzburg  
Botany III  
Entomology II (Third year course)

B.Sc. Hons. (1978) University of Natal, Pietermaritzburg  
Botany (Ecology /Physiology)

M.Sc. - (Botany), University of Cape Town, 1983.  
Thesis title: 'The vegetation of Swartboschkloof,  
Jonkershoek, Cape Province'.

PhD (Botany), University of Cape Town, 1995.  
Thesis title: 'Phytogeography endemism and diversity of the  
fynbos of the southern Langeberg'.

Certificate of Tourism: Guiding (Culture: Local)  
Level: 4 Code: TGC7 (Registered Tour Guide: WC  
2969).

#### Employment Record:

January 2006 – present: Independent specialist botanical consultant and tour guide in own  
company: **Bergwind Botanical Surveys & Tours CC**

August 2000 - 2005 : Deputy Director, later Director Botanical & Communication Programmes,  
Botanical Society of South Africa

January 1981 – July 2000 : Research Scientist (Vegetation Ecology) at National  
Botanical Institute

January 1979—Dec 1980 : National Military Service

*Further information is available on my company website: [www.bergwind.co.za](http://www.bergwind.co.za)*

## **ARCHAEOLOGICAL IMPACT ASSESSMENT**

### **Proposed cultivation of vineyards on the Farm Bethesda 238/38 & 335/38 Louisevale, Upington Northern Cape**

Assessment conducted under Section 38 (3) of the National Heritage  
Resource Act (No. 25 of 1999)

Prepared for:

**PIETER BADENHORST PROFESSIONAL SERVICES**

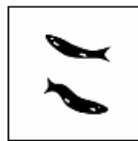
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**MAY  
2016<sup>1</sup>**

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<sup>1</sup> Revised September 2019

## **Executive summary**

### *Introduction*

ACRM was appointed by Pieter Badenhorst Professional Services (PBPS), on behalf of the Strauss Groep to conduct an Archaeological Impact Assessment (AIA) for the development of new vineyards (previously a pecan nut plantation) on the Farm Bethesda 38/225 and 38/335 in Louisevale, near Upington in the Northern Cape Province.

The proposed development will cover a footprint area of 13.4ha. Water for the new vineyards will be supplied via a new storage dam, pump station and pipeline situated on Farm 38/238. The dam and pump station will be located on previously disturbed land. The area set aside for the vineyards comprises undeveloped agricultural land. No planting will be done within 35m of any watercourse.

PBPS is the appointed independent Environmental Assessment Practitioner (EAP) responsible for facilitating the Basic Assessment process.

### *Legal requirements*

In terms of Section 38 (1) (c) (iii) of the National Heritage Resources Act 1999 (Act 25 of 1999), a Heritage Impact Assessment (HIA) of the proposed project is required if the footprint area of the proposed development is more than 5000m<sup>2</sup> in extent.

Section 38 (1) (a) of the Act also indicates that any person constructing a powerline, pipeline or road, or similar linear development or barrier exceeding 300m in length is required to notify the responsible heritage resources authority, who will in turn advise whether an impact assessment report is needed before development can take place.

### *Objectives*

The overall purpose of the AIA is to assess the sensitivity of archaeological resources in the proposed area, to determine the potential impacts on such resources, and to avoid and/or minimize such impacts by means of management and/or mitigation measures.

### *Findings*

A foot survey of the proposed development site, including associated infrastructure was undertaken by ACRM in April 2016, in which the following observations were made:

More than 80 stone artefacts were counted and mapped with a hand held GPS unit. The majority of the tools are assigned to the Later Stone Age (LSA), while less than five Middle Stone Age (MSA) tools were found. No Early Stone Age (ESA) implements were encountered. Most of the tools are spread thinly and unevenly over the surrounding landscape (i.e. comprising mostly single, isolated occurrences), but several dispersed (i.e. low density) scatters of tools were recorded alongside the Donkerhoekspruit, on a kopje in the south western portion of the site, and alongside an outcropping of dolerite near a small stream outside the proposed footprint area.

The majority of the lithics comprise modified (i.e. utilised & miscellaneous retouched pieces) and unmodified flakes and chunks, but a number of small round cores, were also

found. No formal tools such as scrapers or points were recorded, but two adzes and a backed 'knife' were found. One quartzite hammerstone/grindstone was also found, but no organic remains such as pottery or ostrich eggshell were recorded during the survey.

More than 96% of the implements are made on locally available banded ironstone, with the remainder in indurated shale, quartz and quartzite. Banded ironstone is well known to have been a favoured and desirable raw material for making stone artefacts and occurs at a number archaeological sites in the Upington area.

As archaeological sites are concerned, however, the occurrences are lacking in context as no pottery or ostrich eggshell was found. Several dispersed scatters of tools were recorded outside the footprint area, but no evidence of any factory or workshop site, or the result of any human settlement was identified. Indications are that the majority of the resources recorded during the study represent discarded flakes and flake debris.

#### *Grading*

Overall the relatively small numbers and isolated context in which they were found, means that the archaeological resources have been graded as having *low* (Grade 3C) significance.

#### *Built environment*

In terms of the built environment, no old buildings, structures or features, or any old equipment were found on the proposed development site.

Some ruined concrete buildings related to the previous farming enterprise occur on Farm 38/238, but these structures have no intrinsic heritage significance, or value.

#### *Graves*

No graves, or typical grave features or markers were encountered during the study.

#### *Impact statement*

Overall, the results of the study indicate that the proposed activity (i. e. a vineyard development), including associated infrastructure (storage reservoir, pump station & water pipeline), will not have an impact of great significance on the archaeological heritage, as these are expected to be limited.

Therefore, there are no objections to the authorization of the proposed development.

#### *Conclusion*

The study has captured a good record of the archaeological heritage present on the proposed development site, which have been graded as having *low* (Grade 3C) significance.

#### *Recommendations*

1. No archaeological mitigation is required.

2. Should any unmarked human burials/remains or ostrich eggshell water flask caches be uncovered, or exposed during preparation of the lands for cultivation, these must immediately be reported to the archaeologist (Jonathan Kaplan 082 321 0172), or the South African Heritage Resources Agency (Ms Natasha Higgitt 021 462 4502). Burials, etc. must not be removed or disturbed until inspected by the archaeologist.



Table of Contents

|  | Page |
|--|------|
| Executive summary                          | 1    |
| 1. INTRODUCTION                            | 5    |
| 2. HERITAGE LEGISLATION                    | 6    |
| 3. TERMS OF REFERENCE                      | 7    |
| 4. DESCRIPTION OF THE AFFECTED ENVIRONMENT | 7    |
| 5. STUDY APPROACH                          | 9    |
| 5.1 Method of survey                       | 9    |
| 5.2 Constraints and limitations            | 9    |
| 5.3 Identification of potential risks      | 10   |
| 5.4 Results of the desk top study          | 10   |
| 6. FINDINGS                                | 10   |
| 6.1 Archaeology                            | 10   |
| 6.2 Grading                                | 11   |
| 6.3 Built Environment                      | 16   |
| 6.4 Graves                                 | 16   |
| 7. ASSESSMENT OF IMPACTS                   | 16   |
| 8. CONCLUSIONS                             | 17   |
| 9. RECOMMENDATIONS                         | 17   |
| 10. REFERENCES                             | 18   |

## 1. INTRODUCTION

ACRM was appointed by Pieter Badenhorst Professional Services on behalf of the Strauss Groep, to conduct an Archaeological Impact Assessment (AIA) for the development of new vineyards<sup>2</sup> on the Farm Bethesda 38/225 and 38/335 in Louisevale (//Khara Hais Local Municipality) near Upington in the Northern Cape (Figures 1 & 2).

The proposed development will cover a footprint area of 13.4ha. Water for the new vineyards will be supplied via a new storage dam, pump station and pipeline situated on Farm No. 38/238 (Figure 3). The proposed storage dam and pump station will be located on previously disturbed land, while the area set aside for the new vineyards comprises undeveloped agricultural land. No planting will be done within 35m of any watercourse.

PBPS is the appointed independent Environmental Assessment Practitioner (EAP) responsible for facilitating the Basic Assessment process.



Figure 1. Locality Map. Red polygon illustrates the location of the study site

<sup>2</sup> The original application was for a pecan nut tree plantation



Figure 2. Google image illustrating the location of the proposed development site (green polygon).

## 2. HERITAGE LEGISLATION

The National Heritage Resources Act (Act No. 25 of 1999) makes provision for a compulsory Heritage Impact Assessment (HIA) when an area exceeding 5000 m<sup>2</sup> is being developed. This is to determine if the area contains heritage sites and to take the necessary steps to ensure that they are not damaged or destroyed during development.

The NHRA provides protection for the following categories of heritage resources:

- Landscapes, cultural or natural (Section 3 (3))
- Buildings or structures older than 60 years (Section 34);
- Archaeological sites, palaeontological material and meteorites (Section 35);
- Burial grounds and graves (Section 36);
- Public monuments and memorials (Section 37);
- Living heritage (defined in the Act as including cultural tradition, oral history, performance, ritual, popular memory, skills and techniques, indigenous knowledge systems and the holistic approach to nature, society and social relationships) (Section 2 (d) (xxi)).

Section 38 (1) (a) of the Act specifically indicates that any person constructing a powerline, pipeline or road, or similar linear development or barrier exceeding 300m in length is required to notify the responsible heritage resources authority, who will in turn advise whether an impact assessment report is needed before development can take place.

### 3. TERMS OF REFERENCE

The terms of reference for the archaeological study were to:

- Determine whether there are likely to be any important archaeological resources that may potentially be impacted by the proposed development;
- Indicate any constraints that would need to be taken into account in considering the development proposal;
- Identify potentially sensitive archaeological areas, and
- Recommend any further mitigation action.

### 4. DESCRIPTION OF THE AFFECTED ENVIRONMENT

The study site is located on the eastern side of the Orange/Gariep River about 12kms south west of Upington. (Figure 3) The proposed new vineyards are situated about 3kms east of the river. Access to the subject property is via the R359. The proposed site is bound by the Donkerhoekspruit on the northern and eastern boundary, an unnamed stream on the southern boundary and a fence line on the western boundary. The site slopes from north to south, and is covered in low scrub and bushes on a gravel and quartz substrate. A few outcroppings of dolerite occur in places. The stream/river courses are infested with thorny Swarthaak. Several, old twee-spoor gravel tracks crisscross the property. There is a kopje in the south western corner, but this has been excluded from the proposed development (Figure 4).



Figure 3. Google satellite map indicating the footprint area (green polygon) for the proposed new vineyards on Farm 35/338, and proposed new storage reservoir (yellow polygon) on Farm 35/338. The red and blue polygon/storage reservoirs have now been screened out of the development proposal.

Archaeological Impact Assessment proposed new vineyards on Farm 238/38 and Farm 338/38  
Louisevale, Upington



Figure 4. The proposed development site facing north. Photograph taken from the kopje



Figure 5. Footprint area for the previous proposed reservoir (red)



Figure 6. Route for the previous proposed pipeline (red)



Figure 7. Footprint area of the previous proposed reservoir (blue)



Figure 8. Route for the previous proposed pipeline (blue)

## 5. STUDY APPROACH

### 5.1 Method of survey

The overall purpose of the HIA is to assess the sensitivity of archaeological resources in the affected area, to determine the potential impacts on such resources and to avoid and/or minimize such impacts by means of management and/or mitigation measures.

The significance of archaeological resources was assessed in terms of their content and context. Attributes considered in determining significance include artefact and/or ecofact types, rarity of finds, exceptional items, organic preservation, potential for future research, density of finds and the context in which archaeological traces occur.

Survey track paths were captured and the position of identified archaeological occurrences and observations were fixed by a hand held GPS unit set on the map datum wgs 84.

The proposed new<sup>3</sup> reservoir (yellow polygon in Figure 3) was not searched for archaeological resources, but it is clear from the Google image that the receiving environment constitutes a transformed landscape. Fieldwork undertaken in 2016 confirms this

A literature survey was carried out to assess the archaeological context surrounding the proposed development site.

### 5.2 Constraints and limitations

Overall, archaeological visibility was good. The stream/river banks are, however, infested with thorny Swarthaak vegetation, resulting in low archaeological visibility.

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<sup>3</sup>This is now the preferred site

### 5.3 Identification of potential risks

Based on the results of the study, there are no archaeological risks associated with the proposed vineyard development. It is maintained that the study has captured a good record of the archaeological heritage present on the proposed development site.

### 5.4 Results of the desk top study

According to Beaumont and Vogel (2006), the archaeology of the Northern Cape is rich and varied covering long spans of human history. In Upington, no systematic archaeological work has been done, only a handful of commercial archaeology surveys as part of the EIA process. These studies have shown that stone artefact frequencies in the Upington area tend to be low, temporally mixed and occurring in an isolated and displaced context (Beaumont 2006a, b, c, d, 2008; Kaplan 2008; Dreyer 2013; Van Schalkwyk 2014a, 2014b; Nilssen 2012). In contrast Morris (2014) notes that there are, substantial herder encampments along the floodplain of the Orange/Gariep River but these tend to be short duration visits by small groups of hunter-gatherers. Most of these camps have been destroyed by intensive agricultural development alongside the river. Early and Middle Stone Age sites older than 20 000 years are rare in the Upington area, but small scatters of tools have been encountered in the area and ESA tools such as handaxes, cleavers cores and blades have been documented north of the town (Morris 2014, Morris 2010, 2012; Kaplan 2013a & b).

## 6. FINDINGS

### 6.1 Archaeology

More than 80 stone artefacts were counted and mapped with a hand held GPS unit (Table 1 & Figure 9). More than 95% of the tools are assigned to the Later Stone Age (LSA) while only three Middle Stone Age (MSA) pieces were found. No Early Stone Age (ESA) implements such as handaxes, or large angular flakes and chunks were encountered during the study. Most of the tools are spread very thinly over the surrounding landscape (i.e. they comprise single, isolated occurrences). There is, however, some patterning in the distribution of tools and it is interesting to note that the majority of the tools occur alongside the Donkerhoekspruit, and in the southern portion of the property (alongside an unnamed stream), while only a few tools were recorded in the northern portion of the proposed footprint area (Figure 9).

While most of the GPS readings record single archaeological occurrences, several dispersed (or low density) scatters of tools were recorded alongside the Donkerhoekspruit (Site 268), and on the kopje (Site 255) in the elevated south western portion of the proposed development site. A scatter of lithics comprising flakes, chunks, cores and several retouched tools, indicating more intensive flaking activity, occurs alongside a small unnamed stream that feeds into the Donkerhoekspruit (refer to Figure 16), but the scatter is located outside the proposed footprint area (Figure 9).

The majority of the tools on the site comprise modified and unmodified flakes and chunks, but a number (n = 12) of round cores were also found suggesting more regular flaking activity. Only a few formal tools were found, including two adzes (Site 250 & Site 296), and a possible 'knife' (Site 258). One quartzite hammerstone/grindstone (Site 298)

Archaeological Impact Assessment proposed new vineyards on Farm 238/38 and Farm 338/38 Louisevale, Upington

was also found. No organic remains such as pottery, bone or ostrich eggshell were encountered during the field study.

More than 96% of the implements are made on locally available banded ironstone, with the remainder in indurated shale, quartz and quartzite. Banded ironstone is well known to have been a favoured and desirable raw material for making stone artefacts and occurs at a number of sites in the Upington area. It is likely that the raw material was sourced from the Gariep River.

As archaeological sites are concerned, however, the occurrences are lacking in context as no pottery or ostrich eggshell was found. While several dispersed scatters of tools were located, mostly outside the proposed development site, no evidence of any factory or workshop site, or the result of any human settlement was identified.

Indications are that the majority of the remains recorded during the study represent discarded flakes and flake debris.

A collection of tools documented during the study are illustrated in Figures 11-15.

## 6.2 Grading

Overall the relatively small number of tools, and isolated context in which they were found, means that the archaeological remains have been graded as having *low* (Grade 3C) significance.

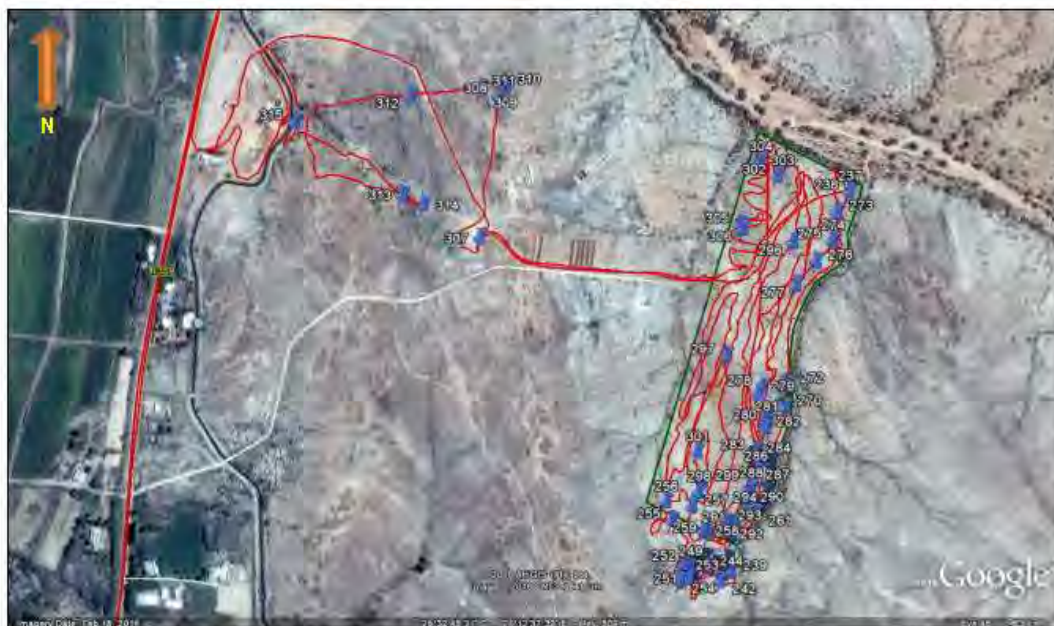


Figure 9. Survey track paths (red) and waypoints of archaeological finds



Archaeological Impact Assessment proposed new vineyards on Farm 238/38 and Farm 338/38  
Louisevale, Upington



Figure 10. Survey track paths and waypoints of archaeological finds: proposed pecan nut plantation

| Site | Farm name | Lat/long                  | Description of finds                        | Grading | Suggested mitigation                   |
|------|-----------|---------------------------|---|---------|--|
| 239  |           | S28° 33.048' E21° 12.832' | Banded ironstone (BI) misc. retouched flake | 3C      | None required (outside footprint area) |
| 240  |           | S28° 33.036' E21° 12.828' | BI utilised/retouched chunk                 | 3C      | None required (outside footprint area) |
| 241  |           | S28° 33.050' E21° 12.822' | BI utilised/retouched chunk                 | 3C      | None required (outside footprint area) |
| 242  |           | S28° 33.057' E21° 12.820' | BI utilised/retouched flake                 | 3C      | None required (outside footprint area) |
| 243  |           | S28° 33.040' E21° 12.814' | Weathered Indurated shale (IS) MSA flake    | 3C      | None required (outside footprint area) |
| 244  |           | S28° 33.043' E21° 12.806' | BI chunk                                    | 3C      | None required (outside footprint area) |
| 245  |           | S28° 33.034' E21° 12.805' | BI retouched flake and MRP                  | 3C      | None required (outside footprint area) |
| 246  |           | S28° 33.050' E21° 12.793' | Broken/split IS cobble & BI chunk           | 3C      | None required (outside footprint area) |
| 247  |           | S28° 33.040' E21° 12.795' | Quartz flake                                | 3C      | None required (outside footprint area) |
| 248  |           | S28° 33.038' E21° 12.790' | BI chunk                                    | 3C      | None required (outside footprint area) |
| 249  |           | S28° 33.043' E21° 12.788' | BI retouched chunk and weathered IS chunk   | 3C      | None required (outside footprint area) |
| 250  |           | S28° 33.049' E21° 12.787' | BI adze (step flaking)                      | 3C      | None required (outside footprint area) |
| 251  |           | S28° 33.053' E21° 12.786' | BI chunk                                    | 3C      | None required (outside footprint area) |

Archaeological Impact Assessment proposed new vineyards on Farm 238/38 and Farm 338/38  
Louisevale, Upington

|     |  |                           |  |    |  |
|-----|--|---------------------------|--|----|--|
|     |  |                           |  |    | footprint area)                        |
| 252 |  | S28° 33.038' E21° 12.784' | BI chunk   | 3C | None required (outside footprint area) |
| 253 |  | S28° 33.040' E21° 12.780' | BI misc. retouched chunk   | 3C | None required (outside footprint area) |
| 254 |  | S28° 33.055' E21° 12.776' | Dispersed scatter of tools associated with outcropping of dolerite – including BI <b>core</b> , retouched/utilised flakes, chunks & manuport | 3C | None required (outside footprint area) |
| 255 |  | S28° 32.998' E21° 12.768' | Dispersed scatter of tools on quartz covered kopje inc. BI <b>core</b> , chunks, utilized/retouched flakes, porphyry <b>core</b> .           | 3C | None required (outside footprint area) |
| 256 |  | S28° 32.980' E21° 12.762' | BI chunk, 2 flakes   | 3C | None required                          |
| 257 |  | S28° 32.985' E21° 12.791' | BI chunk   | 3C | None required                          |
| 258 |  | S28° 33.008' E21° 12.802' | BI 'knife' on cobble flake   | 3C | None required                          |
| 259 |  | S28° 33.012' E21° 12.807' | BI retouched/utilized flake  | 3C | None required                          |
| 260 |  | S28° 33.013' E21° 12.834' | Flat, utilized BI flake  | 3C | None required                          |
| 261 |  | S28° 32.992' E21° 12.860' | BI MRP and chunk   | 3C | None required                          |
| 262 |  | S28° 32.987' E21° 12.862' | BI utilised/retouched flake  | 3C | None required                          |
| 263 |  | S28° 32.987' E21° 12.862' | BI utilised/retouched flake  | 3C | None required                          |
| 264 |  | S28° 32.986' E21° 12.866' | BI round <b>core</b>   | 3C | None required                          |
| 265 |  | S28° 32.978' E21° 12.870' | BI utilised flake  | 3C | None required                          |
| 266 |  | S28° 32.963' E21° 12.874' | Large quartzite chunk  | 3C | None required                          |
| 267 |  | S28° 32.944' E21° 12.876' | BI chunk   | 3C | None required                          |
| 268 |  | S28° 32.944' E21° 12.876' | A low density scatter of tools, including BI utilized/retouched flakes, core and several flaked chunks alongside the Donkerhoekspruit        | 3C | None required                          |
| 269 |  | S28° 32.937' E21° 12.877' | Same as above  | 3C | None required                          |
| 270 |  | S28° 32.891' E21° 12.893' | BI chunk   | 3C | None required                          |
| 271 |  | S28° 32.883' E21° 12.895' | Split/broken BI cobble   | 3C | None required                          |
| 272 |  | S28° 32.870' E21° 12.896' | BI MRP and chunk   | 3C | None required                          |
| 273 |  | S28° 32.706' E21° 12.952' | BI chunk/ <b>core</b>  | 3C | None required                          |
| 274 |  | S28° 32.733' E21° 12.946' | Quartzite chunk/cobble <b>core</b>   | 3C | None required                          |
| 276 |  | S28° 32.753' E21° 12.929' | BI <b>core</b>   | 3C | None required                          |
| 277 |  | S28° 32.775' E21° 12.906' | BI chunk   | 3C | None required                          |
| 278 |  | S28° 32.872' E21° 12.869' | Weathered BI <b>core</b> /chunk  | 3C | None required                          |
| 279 |  | S28° 32.877' E21° 12.864' | Small BI chunk   | 3C | None required                          |
| 280 |  | S28° 32.898' E21° 12.874' | BI chunk   | 3C | None required                          |
| 281 |  | S28° 32.905' E21° 12.872' | Quartz <b>core</b> /chunk  | 3C | None required                          |
| 282 |  | S28° 32.911' E21° 12.870' | BI utilized flake  | 3C | None required                          |
| 283 |  | S28° 32.933' E21° 12.860' | IS cortex cobble chunk   | 3C | None required                          |
| 284 |  | S28° 32.936' E21° 12.860' | BI <b>MSA</b> retouched flake  | 3C | None required                          |
| 285 |  | S28° 32.949' E21° 12.860' | BI chunk   | 3C | None required                          |
| 286 |  | S28° 32.952' E21° 12.860' | BI chunk and <b>MSA</b> retouched flake  | 3C | None required                          |
| 287 |  | S28° 32.962' E21° 12.858' | Flat, worked out BI <b>core</b> (? <b>MSA</b> )  | 3C | None required                          |

Archaeological Impact Assessment proposed new vineyards on Farm 238/38 and Farm 338/38  
Louisevale, Upington

|     |                           |   |    |               |
|-----|---------------------------|---|----|---------------|
| 288 | S28° 32 968' E21° 12 855' | Weathered IS retouched cortex flake and BI chunk                  | 3C | None required |
| 289 | S28° 32 971' E21° 12 855' | BI cortex cobble <b>core</b> /chunk & BI flake                    | 3C | None required |
| 290 | S28° 32 983' E21° 12 851' | BI chunk  | 3C | None required |
| 291 | S28° 33 002' E21° 12 839' | Flat, utilized BI flake and broken BI flake                       | 3C | None required |
| 292 | S28° 33 004' E21° 12 829' | BI miscellaneous retouched chunk                                  | 3C | None required |
| 293 | S28° 33 000' E21° 12 827' | BI chunk  | 3C | None required |
| 294 | S28° 32 976' E21° 12 848' | Small BI flake  | 3C | None required |
| 295 | S28° 32 938' E21° 12 856' | Quartzite chunk/split cobble                                      | 3C | None required |
| 296 | S28° 32 734' E21° 12 904' | BI cortex flake/ <b>backed adze</b> with slight step flaking      | 3C | None required |
| 297 | S28° 32 841' E21° 12 830' | Round quartzite <b>core</b>                                       | 3C | None required |
| 298 | S28° 32 971' E21° 12 798' | Dolerite <b>hammerstone/grindstone</b>                            | 3C | None required |
| 299 | S28° 32 962' E21° 12 803' | BI chunk  | 3C | None required |
| 301 | S28° 32 933' E21° 12 797' | IS flat flake and BI chunk/ <b>core</b>                           | 3C | None required |
| 302 | S28° 32 671' E21° 12 887' | Flat BI utilized flake  | 3C | None required |
| 303 | S28° 32 655' E21° 12 868' | BI cobble flake   | 3C | None required |
| 304 | S28° 32 657' E21° 12 869' | Weathered BI flake  | 3C | None required |
| 305 | S28° 32 717' E21° 12 846' | BI <b>MRP</b>   | 3C | None required |
| 306 | S28° 32 721' E21° 12 849' | IS cortex cobble <b>core</b>                                      | 3C | None required |
| 307 | S28° 32 726' E21° 12 563' | Proposed alternative dam  | 3C | None required |
| 308 | S28° 32 590' E21° 12 585' | Several BI flakes and chunks lying about the existing storage dam | 3C | None required |
| 309 | S28° 32 582' E21° 12 593' | Existing storage dam  | 3C | None required |
| 311 | S28° 32 583' E21° 12 566' | A few BI flakes alongside existing water pipeline                 | 3C | None required |
| 312 | S28° 32 590' E21° 12 489' | BI chunk alongside existing water pipeline                        | 3C | None required |
| 313 | S28° 32 685' E21° 12 480' | BI chunk alongside alternative <b>(red)</b> water pipeline        | 3C | None required |
| 314 | S28° 32 694' E21° 12 503' | BI flake alongside proposed alternative <b>(red)</b> pipeline     | 3C | None required |
| 315 | S28° 32 614' E21° 12 362' | Several BI chunks and flakes alongside existing water canal       | 3C | None required |

Table 1. Spreadsheet of waypoints and description of archaeological finds

Archaeological Impact Assessment proposed new vineyards on Farm 238/38 and Farm 338/38  
Louisevale, Upington



Figure 11. Collection of tools from proposed pecan nut tree plantation. Scale is in cm



Figure 13. Collection of tools from proposed pecan nut tree plantation. Scale is in cm



Figure 12. Collection of tools from proposed pecan nut tree plantation. Scale is in cm



Figure 14. Collection of tools from proposed pecan nut tree plantation. Scale is in cm



Figure 15. Collection of tools from Farm 338/38. Scale is in cm



Figure 16. Site 254. View facing north west, behind the kopje

### 6.3 Built environment

In terms of the built environment, no old buildings, structures, features, or old equipment were found in the proposed footprint area.

Some ruined concrete buildings related to the previous farming enterprise occur on Farm 38/238, but these structures have no intrinsic heritage significance, or value.

### 6.4 Graves

No graves, or typical grave features or markers were encountered during the study.

## 7. ASSESSMENT OF IMPACTS

In the case of the proposed development of new vineyards including associated infrastructure on Farm 238/38 and Farm 338/38 in Louisevale, it is expected that archaeological impacts will occur during the implementation phase of the project, but that the overall impact on archaeological resources will be *low* (Table 2).

| Potential impacts on archaeological heritage |               |
|--|---------------|
| Extent of impact:                            | Site specific |
| Duration of impact;                          | Permanent     |
| Intensity                                    | Low           |
| Probability of occurrence:                   | Probable      |
| Significance without mitigation              | Low           |
| Significance with mitigation                 | Negative      |
| Confidence:                                  | High          |

Table 2. Assessment of archaeological impacts.

## **8. CONCLUSION**

The results of the study indicate that the proposed development of new vineyards on Farm 238/38, and a storage dam, pipeline and pump station on Farm 338/38, will not have an impact of great significance on the archaeological heritage.

The majority of the tools recorded comprise single isolated occurrences, while a few dispersed scatters of tools were mapped alongside the Donkerhoekspruit (Site 268), and outside the proposed footprint area (Site 254 & Site 255).

It is maintained that the baseline study has captured most of the information on the archaeological heritage present on the proposed development site.

The proposed site for the new storage dam, located between the, previous proposed and proposed alternative storage dam sites (blue & red polygon in Figure 3) was not searched for archaeological resources, but it is clear that the site constitutes a severely transformed landscape

## **9. RECOMMENDATIONS**

With regard to the proposed development of new vineyards (Farm 238/38) and associated infrastructure (Farm 238/38) in Louisevale near Upington, the following recommendations are made:

1. No archaeological mitigation is required.
2. Should any unmarked human burials/remains or ostrich eggshell water flask caches be uncovered, or exposed during construction activities, these must immediately be reported to the archaeologist (Jonathan Kaplan 082 321 0172), or the South African Heritage Resources Agency (SAHRA) (Att Ms Natasha Higgitt 021 462 4502). Burials must not be removed or disturbed until inspected by the archaeologist.

## 10. REFERENCES

- Beaumont, P.B. 2006a. Phase 1 Heritage Impact Assessment Report on a Planned Residential Development Flanking Dakota Drive in Upington, //Khara Hais Municipality, Northern Cape Province. McGregor Museum, Kimberley.
- Beaumont, P.B. 2006b. Phase 1 Heritage Impact Assessment Report on a Planned Extension of the Louisvaleweg Township, //Khara Hais Municipality, Northern Cape Province. McGregor Museum, Kimberley
- Beaumont, P.B. 2006c. Phase 1 Heritage Impact Assessment Report on a Planned Extension Flanking Rondonstraat, //Khara Hais Municipality, Northern Cape Province. An unpublished report by The McGregor Museum
- Beaumont, P.B. 2006d. Phase 1 Heritage Impact Assessment Report on a Planned Extension of the Raaswater Township, Siyanda District Municipality, Northern Cape Province. McGregor Museum, Kimberley
- Beaumont, P. B. 2008. Phase 1 Heritage Impact Assessment Report on a Portion of the Farm Keboes, 37, near Kanoneiland, Siyanda District Municipality, Northern Cape Province. McGregor Museum. Kimberley.
- Beaumont, P.B. & Vogel, J.C. 1984. Spatial patterning of the ceramic Later Stone Age in the Northern Cape Province, South Africa. In: Hall, M., Avery, G., Avery, D.M., Wilson, M.L. & Humphreys, A.J.B. (eds) *Frontiers: southern African archaeology today: 80-95*. Oxford: British Archaeological Reports International Series 207.
- Dreyer, C. 2013. First Phase Archaeological and Heritage Assessment of the housing developments at Melkstroom 563, Upington, Northern Cape. Report prepared for MDA Environmental Consultants. Cobus Dreyer Pr. Archaeologist and Heritage Resource Specialist. Bloemfontein.
- Kaplan, J. 2014. Heritage Impact Assessment, Zirco Roodeheuwel Kamiesberg Project, Namaqualand, South Africa. Report prepared for Coastal and Environmental Services. ACRM. Cape Town
- Kaplan, J. 2013. Archaeological Impact Assessment the proposed upgrading of the KVV Upington Effluent Management Facility, Northern Cape Province. Report prepared for EnviroAfrica cc. ACRM Cape Town.
- Kaplan, J. 2013a. Archaeological Impact Assessment proposed upgrading of the Louisevale Road Waste Water Treatment Facility in Upington, Northern Cape Province. Report prepared for EnviroAfrica. ACRM.
- Kaplan, J. 2013b. Archaeological Impact Assessment proposed low cost housing development Keimoes A & B, Northern Cape. Report prepared for EnviroAfrica. ACRM
- Kaplan, J. 2012. Agency for Cultural Resource Management, the proposed Keren Energy Keimoes Solar Energy Plant on Erf 666, Keimoes, Northern Cape. Report prepared for EnviroAfrica. ACRM.

Archaeological Impact Assessment proposed new vineyards on Farm 238/38 and Farm 338/38  
Louisevale, Upington

Kaplan, J. 2008. An archaeological assessment of two borrow pits alongside DR3321 Uap, Northern Cape Province. Report prepared for Van Zyl Environmental Consultants. ACRM.

Morris, D. 2014. Proposed development of the Upington Solar Thermal Plant Three within Portion 3 of the Farm McTaggarts Camp 435 west of Upington, Northern Cape. Archaeological Impact Assessment. Savannah Environmental. McGregor Museum, Kimberley.

Morris, D. 2013. Proposed development of the Upington Solar Thermal Plants Two and Three within Portion 3 of the Farm McTaggarts Camp 435, west of Upington, Northern Cape: Scoping phase heritage input. Report prepared for Savannah Environmental. McGregor Museum, Kimberley.

Morris, D. 2010. Upington Solar Thermal Plant: Archaeology: Specialist input for the Environmental Impact Assessment Phase and Environmental Management Plan for the proposed Upington Solar Thermal Plant, Northern Cape Province. Report prepared for Savannah Environmental. McGregor Museum, Kimberley.

Nilssen, P. 2012. Phase 1a Archaeological Impact Assessment, the proposed building and operation of a bulk water supply line near Upington on Remaining Extent of the Farm Vaalkoppies No. 40 //Khara Hais Municipality. Report prepared for Irme Van Zyl Environmental Consultants. Peter Nilssen. Klein Brak River.

Van Schalkwyk, J. 2014a. Cultural Heritage Impact Assessment for the proposed Township Development, Paballelo, Upington, //Khara Hais Municipality, Northern Cape. Report prepared for MEG Environmental Consultants. J Van Schalkwyk Heritage Consultant. Pretoria

Van Schalkwyk, J. 2014b. Cultural Heritage Impact Assessment for the proposed township development, Louisevaleweg, Upington, //Khara Hais Municipality, Northern Cape. Report prepared for MEG Environmental Consultants. J Van Schalkwyk Heritage Consultant. Pretoria

Van Schalkwyk, J. 2007. Heritage survey of Erf 3119 and 14700 of the Farm Kameelmond, Upington Area, Northern Cape Province. Report prepared for Bokamoso Landscape Architects. J. Van Schalkwyk Heritage Consultant. Pretoria



**RECOMMENDED EXEMPTION FROM FURTHER PALAEOLOGICAL STUDIES:**

**PROPOSED LOUISVALE AGRICULTURAL DEVELOPMENT ON FARM BETHESDA 38  
NEAR UPINGTON, NORTHERN CAPE**

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May 2016

**1. OUTLINE OF THE PROPOSED DEVELOPMENT**

The Strauss Groep, Upington, is proposing to plant about 13.4 ha of vineyards on farm Bethesda 38/225, situated near Louisvale c. 11.7 km southwest of Upington, Northern Cape (Fig. 1). Water will be supplied *via* a new storage dam (2000 m<sup>3</sup> capacity, 3 m deep), pump station and pipeline situated on farm Bethesda 38/238 immediately to the west (Fig. 2). The preferred layout for the dam and pipeline is shown in Fig. 2 while an alternative layout is shown in Fig. 3.

The dam and pump station will be sited on existing disturbed land. The pecan plantation land will be prepared for planting by deep breaking of the soil and then digging for the vineyards. Please note that the layout for planting might change depending on further specialist input. In any case no planting will be indicated within 32 m of any watercourse.

A Basic Assessment for this agricultural project is being conducted by Pieter Badenhorst Environmental Services, Wellington (Contact details: PO Box 1058, Wellington 7654. Cell: 0827763422. Fax: 0866721916). The present palaeontological comment has been commissioned on behalf of Pieter Badenhorst Environmental Services by The Agency for Cultural Resource Management (Contact details: Jonathan Kaplan. Address: 5 Stuart Road, Rondebosch. P/F: 021 685 7589. M: 082 321 0172. Email: acrm@wcacces.co.za).

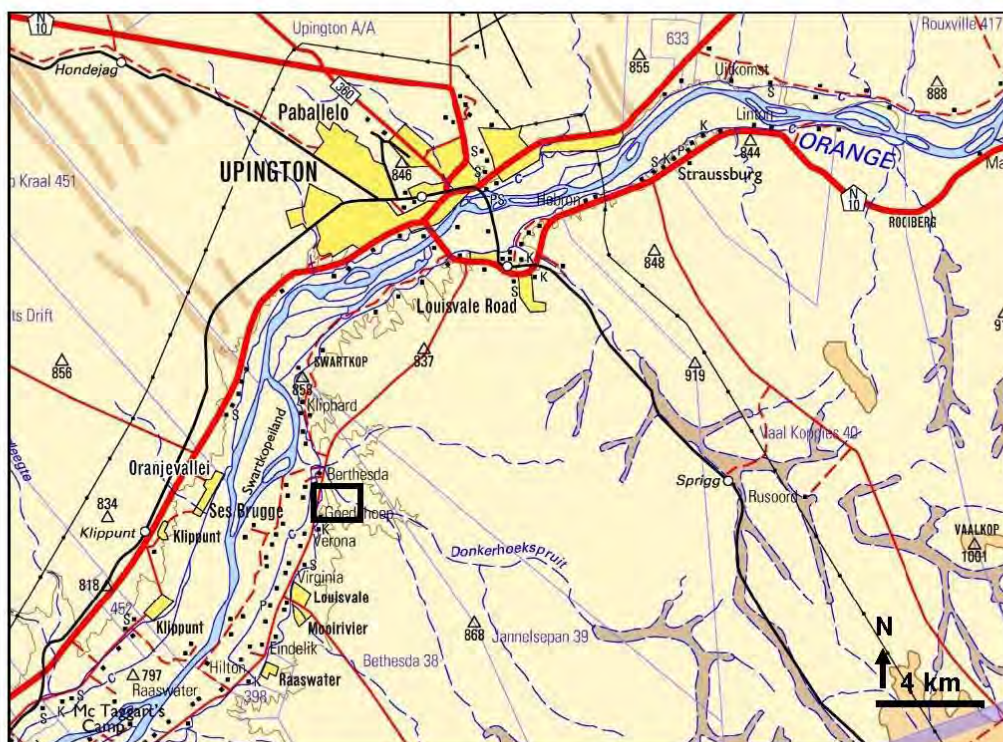


Figure 1: Extract from 1: 250 000 topographical map 2820 Upington (Courtesy of the Chief Directorate: National Geo-spatial Information) showing the location of the study area for the proposed Louisvale agricultural development on two portions of the Farm Bethesda 38/335 and 38/238, situated on the eastern side of the Orange River c. 11.7 km southwest of Upington, Northern Cape.

## 2. GEOLOGICAL BACKGROUND

The small Louisvale study area comprises fairly flat-lying, arid terrain at c. 790-800 m amsl on the eastern side of the Orange or Gariep River c. 11.7 km SW of Upington, Northern Cape. The proposed plantation is situated about 3 km east of the banks of the Orange River (Figs. 1 to 2).

The geology of the study area near Upington is shown on the 1: 250 000 geology map 2820 Upington (Council for Geoscience, Pretoria; Fig. 3). A comprehensive sheet explanation for this map has been published by Moen (2007). The study area on the eastern side of the Louisvale road is underlain at depth by ancient Precambrian basement rocks that belong to the **Namaqua-Natal Province** of Mid Proterozoic (Mokolian) age (Cornell *et al.* 2006, Moen 2007). They comprise highly metamorphosed migmatitic amphibolites and calc-silicate rocks of the **Jannelsepan Formation (Areachap Group)**. These basement rocks are approximately two to one billion years old and entirely unfossiliferous (Almond & Pether 2008). They are mantled at surface by downwasted rock rubble and surface gravels. Substantial alluvial deposits of the Orange River are not mapped this far east of the riverbanks.



**Figure 2: Google earth© satellite image of the Louisvale agricultural development study area on Farms Bethesda portions 38/335 and 38/238, on the eastern side of the Orange River c. 11.7 km southwest of Upington, Northern Cape. The preferred layout for the pecan nut plantation (green polygon on Bethesda 38/335), pipeline and storage dam (yellow line and blue polygon on Bethesda 38/238) are indicated here.**

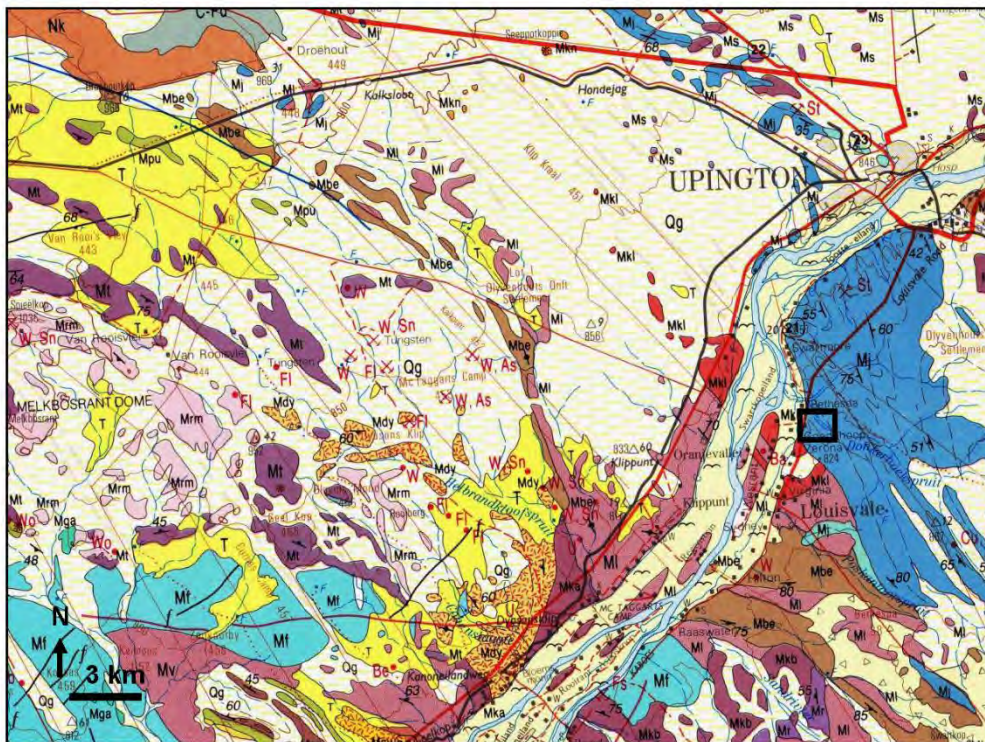


Figure 3. Extract from 1: 250 000 geological map 2820 Upington (Council for Geoscience, Pretoria) showing the location of the study area for the Louisvale agricultural development on the farm Bethesda 38 (black rectangle), c. 11.7 km southwest of Upington, Northern Cape Province. The study area is underlain at depth by unfossiliferous Precambrian (Middle Proterozoic / Mokolian) basement rocks of the Namaqua-Natal Metamorphic Province. These comprise high grade metamorphic rocks, namely migmatitic amphibolites and calc-silicate rocks of the Jannelsepan Formation of the Areachap Group (Mj, blue). Outside and to the west of the project area the basement rocks are extensively mantled by alluvial sediments of the Orange River (pale yellow with flying bird symbol on map). The overall palaeontological sensitivity of the entire study area is LOW.

### 3. PALAEOLOGICAL HERITAGE

The Precambrian metamorphic basement rocks are entirely unfossiliferous (Almond & Pether 2008). The overlying downwasted rock rubble and gravels are also unfossiliferous. Potentially fossil-bearing alluvial deposits of the Orange River are not mapped this far east of the river banks. The project footprint is small and largely disturbed.

### 4. CONCLUSIONS & RECOMMENDATIONS

Given the low palaeontological sensitivity, small area and disturbed character of the study area, it is concluded that the proposed Louisvale agricultural development is very unlikely to have significant impacts on local palaeontological heritage resources.

**It is therefore recommended that, pending the discovery of significant new fossils remains before or during development, exemption from further specialist palaeontological studies and mitigation be granted for the proposed agricultural development on Farm Bethesda 38 near Upington, Northern Cape.**

Should any substantial fossil remains (e.g. mammalian bones and teeth) be encountered during excavation, however, these should be safeguarded, preferably *in situ*, and reported by the ECO to the South African Heritage Resources Authority as soon as possible so that appropriate action can be taken by a professional palaeontologist, at the developer's expense (SAHRA contact details: Mrs Colette Scheermeyer, P.O. Box 4637, Cape Town 8000. Tel: 021 462 4502. Email: cscheermeyer@sahra.org.za). Mitigation would normally involve the scientific recording and judicious sampling or collection of fossil material as well as associated geological data (e.g. stratigraphy, sedimentology, taphonomy) by a professional palaeontologist.

## **5. KEY REFERENCES**

ALMOND, J.E. 2014a. Proposed RE Capital 3 Solar Development on the property Dyason's Klip near Upington, Northern Cape. Palaeontological heritage basic assessment: desktop study, 13 pp. Natura Viva cc, Cape Town.

ALMOND, J.E. 2014b. Proposed construction of RE Capital 11 photovoltaic solar facility on the remainder of the Farm Dyasonsklip 454, Upington, Northern Cape. Recommended exemption from further palaeontological studies, 6 pp. Natura Viva cc, Cape Town.

ALMOND, J.E. 2015. Proposed AEP Bloemsmond Solar 1 & Solar 2 PV Facilities on the Farm Bloemsmond 455 near Upington, Siyanda District Municipality, Northern Cape. Recommended exemption from further palaeontological studies, 6 pp. Natura Viva cc, Cape Town.

ALMOND, J.E. & PETHER, J. 2008. Palaeontological heritage of the Northern Cape. Interim SAHRA technical report, 124 pp. Natura Viva cc., Cape Town.

CORNELL, D.H., THOMAS, R.J., MOEN, H.F.G., REID, D.L., MOORE, J.M. & GIBSON, R.L. 2006. The Namaqua-Natal Province. In: Johnson, M.R., Anhaeusser, C.R. & Thomas, R.J. (Eds.) The geology of South Africa, pp. 461-499. Geological Society of South Africa, Marshalltown.

MOEN, H.F.G. 2007. The geology of the Upington area. Explanation to 1: 250 000 geology Sheet 2820 Upington, 160 pp. Council for Geoscience, Pretoria.

## **6. QUALIFICATIONS & EXPERIENCE OF THE AUTHOR**

Dr John Almond has an Honours Degree in Natural Sciences (Zoology) as well as a PhD in Palaeontology from the University of Cambridge, UK. He has been awarded post-doctoral research fellowships at Cambridge University and in Germany, and has carried out palaeontological research in Europe, North America, the Middle East as well as North and South Africa. For eight years he was a scientific officer (palaeontologist) for the Geological Survey / Council for Geoscience in the RSA. His current palaeontological research focuses on fossil record of the Precambrian - Cambrian boundary and the Cape Supergroup of South Africa. He has

recently written palaeontological reviews for several 1: 250 000 geological maps published by the Council for Geoscience and has contributed educational material on fossils and evolution for new school textbooks in the RSA.

Since 2002 Dr Almond has also carried out palaeontological impact assessments for developments and conservation areas in the Western, Eastern and Northern Cape under the aegis of his Cape Town-based company *Natura Viva cc*. He has been a long-standing member of the Archaeology, Palaeontology and Meteorites Committee for Heritage Western Cape (HWC) and an advisor on palaeontological conservation and management issues for the Palaeontological Society of South Africa (PSSA), HWC and SAHRA. He is currently compiling technical reports on the provincial palaeontological heritage of Western, Northern and Eastern Cape for SAHRA and HWC. Dr Almond is an accredited member of PSSA and APHP (Association of Professional Heritage Practitioners – Western Cape).

#### **Declaration of Independence**

I, John E. Almond, declare that I am an independent consultant and have no business, financial, personal or other interest in the proposed development project, application or appeal in respect of which I was appointed other than fair remuneration for work performed in connection with the activity, application or appeal. There are no circumstances that compromise the objectivity of my performing such work.



Dr John E. Almond,  
Palaeontologist, *Natura Viva cc*



## INTEGRATED WATER USE LICENSE APPLICATION



**LOUISVALE -Cultivation of vineyards across small streams,  
including associated infrastructure,  
on the Farm Bethesda 238/38 & 335/38 Louisvale, Northern  
Cape Province.**

October 2019

**Applicant details:**

**JC Strauss Eiendomme (Pty) Ltd &**

**Johan Strauss Familie Trust.**

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## QUALITY CONTROL

| Revision | Date              | Author      | Checked | Status              | Approved |
|----------|-------------------|-------------|---------|---------------------|----------|
| 00       | September<br>2019 | Elanie Kühn |         | Draft with<br>dBAR. |          |
| 01       |                   |             |         |                     |          |
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APPLICATION FOR A LICENSE FOR THE USE OF WATER (CONTROLLED ACTIVITY) IN TERMS OF  
THE NATIONAL WATER ACT, 1998 (ACT NO 36 OF 1998)

**TABLE OF CONTENTS**

|   |           |
|---|-----------|
| <b>1. THE APPLICATION AND TECHNICAL DETAIL</b>  | <b>11</b> |
| 1.1 The Applicant   | 11        |
| 1.2 The property on which the water use is intended   | 11        |
| 1.3 Magisterial District and Regional Service Authority   | 12        |
| 1.4 Ownership of the land:  | 12        |
| 1.5 Longitude and Latitude of the property/site:  | 12        |
| 1.6 Zoning of the land:   | 13        |
| 1.7 Ownership of the adjacent/potentially impacted land:  | 13        |
| 1.8 Water Use License Application details   | 13        |
| 1.9 Existing lawful water use and development on the property   | 13        |
| 1.10 Details of the water use intended  | 13        |
| 1.10.1 Section 21c & i –impeding and diverting flow in a watercourse; and altering the<br>bed, banks, course or characteristics of a watercourse. | 13        |
| 1.10.2 Section 21 b: Storing of water   | 15        |
| 1.11 Pump stations and Pipelines  | 17        |
| 1.12 Irrigation of any land   | 17        |
| 1.13 Groundwater:   | 17        |
| 1.14 Plough certificate   | 17        |
| 1.15 Storm Water Management   | 18        |
| 1.15.1 Introduction   | 18        |
| 1.15.2 Mitigation Measures:   | 18        |
| <b>2. DESCRIPTION OF THE ENVIRONMENT</b>  | <b>23</b> |
| 2.1 Climate   | 23        |
| 2.2 Topography & Geology  | 24        |
| 2.3 Natural vegetation and plant life   | 24        |
| 2.4 Land use  | 26        |
| 2.5 Surface water   | 26        |
| 2.6 Groundwater   | 26        |
| 2.7 Air quality   | 26        |
| 2.8 Noise   | 26        |
| 2.9 Sites of archaeological interest  | 27        |
| 2.9.1 Archaeological Assessment:  | 27        |

|           |  |           |
|-----------|--|-----------|
| 2.9.2     | Paleontological Assessment:  | 27        |
| 2.10      | Visual aspects   | 27        |
| 2.11      | Regional socio-economic structure  | 27        |
| 2.12      | Interested and Affected parties  | 27        |
| 2.13      | Industrial activity  | 28        |
| <b>3.</b> | <b>CONSIDERATIONS AND ASSESSMENT CRITERIA</b>  | <b>29</b> |
| 3.1       | The reserve  | 30        |
| 3.2       | The class and resource quality objectives of the water resource  | 30        |
| 3.3       | The strategic importance of the water to be authorized   | 30        |
| 3.4       | The existing lawful water use in the catchment under consideration   | 30        |
| 3.5       | The likely effect of the water uses to be authorized on the water resource and on other water users in the catchment | 30        |
| 3.6       | The impact on the environment  | 31        |
| 3.6.1     | Assessment of the impacts associated with the water use:   | 32        |
| 3.7       | The need to redress the results of the past racial and gender discrimination   | 32        |
| 3.8       | Efficient and beneficial use of the water in public interest   | 33        |
| 3.9       | Socio economic impact of water use to be authorized  | 34        |
| 3.10      | Investment already made and to be made by the water user in respect of the water use in question                     | 34        |
| 3.11      | The period for which the license is to be issued   | 34        |
| 3.12      | Failure to authorize the water use   | 35        |
| <b>4.</b> | <b>CONCLUSION</b>  | <b>35</b> |
| <b>5.</b> | <b>CONDITIONS</b>  | <b>35</b> |
| <b>6.</b> | <b>RECOMMENDATION</b>  | <b>36</b> |
| <b>7.</b> | <b>APPENDICES</b>  | <b>37</b> |
|           | <b>APPENDIX A: COMPLETED LICENSE APPLICATION FORMS</b>   | <b>37</b> |
|           | <b>APPENDIX B: EXISTING WATER USE CONFIRMATION</b>   | <b>38</b> |
|           | <b>APPENDIX C: DEED SEARCH AND TITLE DEEDS</b>   | <b>39</b> |
|           | <b>APPENDIX D: POWER OF ATTORNEY</b>   | <b>40</b> |
|           | <b>APPENDIX E1: PROPOSED LOCALITY AND DEVELOPMENT LAYOUT</b>   | <b>41</b> |
|           | <b>APPENDIX E2: DESIGN ILLUSTRATIONS</b>   | <b>43</b> |
|           | <b>APPENDIX F: TECHNICAL DOCUMENTS</b>   | <b>45</b> |
|           | <b>APPENDIX F.1: BASIC ASSESSMENT REPORT</b>   | <b>45</b> |
|           | <b>APPENDIX F.2: STORM WATER MANAGEMENT PLAN</b>   | <b>46</b> |
|           | <b>APPENDIX G: PROOF OF PUBLIC PARTICIPATION</b>   | <b>47</b> |

|  |           |
|--|-----------|
| <b>APPENDIX H: SECTION 27 REPORT</b>   | <b>48</b> |
| <b>APPENDIX I: CERTIFIED COPY OF ID</b>  | <b>49</b> |
| <b>APPENDIX J: COMPANY REGISTRATION CERTIFICATES AND TRUST INFORMATION</b>               | <b>50</b> |
| <b>APPENDIX K: COPY OF RECEIPT</b>   | <b>51</b> |
| <b>APPENDIX L: SECTION 21 C AND I LIST OF DRAINAGE LINES COORDINATES AND RISK MATRIX</b> | <b>52</b> |
| <b>APPENDIX M: LANDS CLAIM CONFIRMATION</b>  | <b>53</b> |
| <b>APPENDIX N: PLOUGH CERTIFICATE</b>  | <b>54</b> |

### **Table of Figures**

|  |           |
|--|-----------|
| <b>Figure 1: Project Locality</b> .....  | <b>12</b> |
| <b>Figure 2: Ephemeral streams/drainage areas</b> .....  | <b>14</b> |
| <b>Figure 3: Extract of map that shows the locality of the EWR sites in context of the MRUs (referenced from Figure 3.1 in Report No. RDM/WMA06/00/CON/COMP/2016).</b> ....                                    | <b>15</b> |
| <b>Figure 4: Dam Design</b> .....  | <b>16</b> |
| <b>Figure 5: Dam and Pipelines</b> .....   | <b>17</b> |
| <b>Figure 6: Stormwater infrastructure</b> .....   | <b>19</b> |
| <b>Figure 7: Mulching and planting between rows</b> .....  | <b>19</b> |
| <b>Figure 8: Scarifying of soil</b> .....  | <b>21</b> |
| <b>Figure 9: Buffer areas with natural vegetation between blocks and roads</b> .....   | <b>22</b> |
| <b>Figure 10: Average monthly rainfall and daily temperatures</b> .....  | <b>23</b> |
| <b>Figure 11: Geological map of the study area (purple boundary line) that is underlain partly by granite-gneiss and partly by amphibolite, gneisses and calc-silicate rocks (Jannelsepan Formation)</b> ..... | <b>24</b> |
| <b>Figure 12: Layout showing the CBA1 (green).</b> .....   | <b>25</b> |
| <b>Figure 13: Critical Biodiversity Area map indicating that the Bethesda Farm study area lies in an area classified as CBA2.</b> .....  | <b>25</b> |

**List of tables**

|  |           |
|--|-----------|
| <b>Table 1: Water Use License activities triggered .....</b> | <b>13</b> |
| <b>Table 2: Dam design details .....</b>                     | <b>16</b> |
| <b>Table 3: Impacts table.....</b>                           | <b>31</b> |

## List of Abbreviations

|                   |   |
|-------------------|---|
| <b>BAR</b>        | Basic Assessment Report   |
| <b>CBA</b>        | Critical biodiversity Area  |
| <b>DEA</b>        | Department of Environmental Affairs   |
| <b>DENC</b>       | Department of Environment and Nature Conservation   |
| <b>DWS</b>        | Department of Water and Sanitation  |
| <b>EA</b>         | Environmental Authorisation   |
| <b>EAP</b>        | Environmental Assessment Practitioner   |
| <b>ECO</b>        | Environmental Control Officer   |
| <b>EIA</b>        | Environmental Impact Assessment   |
| <b>EIS</b>        | Ecological Importance and Sensitivity   |
| <b>ELU</b>        | Existing Lawful Use   |
| <b>EMPr</b>       | Environmental Management Programme  |
| <b>ESA</b>        | Ecological Support Areas  |
| <b>ERW</b>        | Ecological Release Water  |
| <b>EWR</b>        | Existing Water Rights   |
| <b>FEPA</b>       | Fresh Water Ecosystem Priority Areas  |
| <b>HWS</b>        | Heritage Western Cape   |
| <b>I&amp;AP's</b> | Interested and Affected Parties   |
| <b>MAR</b>        | Mean Annual Runoff  |
| <b>MMP</b>        | Maintenance Management Plan   |
| <b>NFEPA</b>      | National Fresh Water Ecology Priority Areas   |
| <b>NEMA</b>       | National Environmental Management Act, 1998 (Act No. 107 of 1998)                               |
| <b>NEM: AQA</b>   | National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004)                   |
| <b>NEM: ICMA</b>  | National Environmental Management: Integrated Coastal Management Act, 2008 (Act No. 24 of 2008) |
| <b>NEM: WA</b>    | National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)                         |
| <b>NHRA</b>       | National Heritage Resources Act, 1999 (Act No. 25 of 1999)                                      |
| <b>PA</b>         | Protected Areas   |
| <b>PES</b>        | Present Ecological Status   |

|                |   |
|----------------|---|
| <b>PPP</b>     | Public Participation Process                        |
| <b>RE</b>      | Resident Engineer                                   |
| <b>SANBI</b>   | South African National Biodiversity Institute       |
| <b>SAHIRS</b>  | South African Heritage Information Resources System |
| <b>SWMP</b>    | Storm Water Management Plan                         |
| <b>S24G</b>    | Section 24G Process                                 |
| <b>V&amp;V</b> | Validation and Verification                         |
| <b>WMA</b>     | Water Management Area                               |
| <b>WQMR</b>    | Water Quality Management Report                     |
| <b>WULA</b>    | Water Use Licence Application                       |

## SYNOPSIS

The applicant is JC Strauss Eiendomme PTY Ltd, the properties are however, owned by Johan Strauss Familie Trust. This application is for the Applicant JC Strauss Eiendomme PTY Ltd to apply for a Water Use License in terms of Section 21(c) and (i) of the National Water Act for the streams that will be crossed as part establishment of vineyards. The establishment of the vineyards will take place on Portion 335 of Farm Bethesda no 38 across small sections of the unnamed drainage system that is located on site. The drainage system is classified as an ephemeral course as it will only flow sporadically after rain. These watercourses are not considered to be seasonal rivers which will regularly contain water in a seasonal pattern.

This application is also for the applicant, JC Strauss Eiendomme PTY Ltd to comply with the National Water Act (1998) under section 21 (b) for the construction of a small balancing dam on Portion 238 of Farm Bethesda 38. The various details pertaining to the dam is shown below in Table i.

**Table i: Dam specifications**

| Specifications for the balancing dam |                    |
|--------------------------------------|--------------------|
| Wall height                          | 4.9m               |
| Wall length                          | 30m                |
| Footprint area                       | 1000m <sup>2</sup> |
| Total volume at full capacity        | 4000m <sup>3</sup> |

Portion 355 Farm Bethesda no 38 therefore currently has 10ha (150 000 m<sup>3</sup>/annum) water use rights allocated to the property. Water will be abstracted from a new pump station adjacent to the existing Canal.

The WULA application is summarised, in the table below, for the following water usages:

**Table iii: Application details**

|   |  |
|---|--|
| (c) impeding or diverting flow of water in a watercourse                | For the construction of agricultural areas and evaporation ponds across ephemeral streams/natural drainage areas. Construction of a pipeline across a section of the stream. |
| (i) altering the bed, banks, course or characteristics of a watercourse | For the construction of agricultural areas and evaporation ponds across ephemeral streams/natural drainage areas. Construction of a pipeline across a section of the stream. |

|                                 |   |
|---------------------------------|---|
| (b) Storage of a water resource | [storage of a water resource]<br>For the temporary storage of water in a small balancing dam. |
|---------------------------------|---|

The drainage channel system on site has not been mapped (as a watercourse) on any of the maps that are available of the study area. However, upon request from DENC and DWS, the drainage system is seen as a watercourse. Please note: There will be NO planting of vineyards within 32m from the **Donkerhoekspruit** most of the channels running towards the Orange River has already been modified and developed across, therefore preventing flow towards the Orange River.

The unnamed drainage system is therefore classified as an ephemeral course as it will only flow sporadically after rain. These watercourses are not considered to be seasonal rivers which will regularly contain water in a seasonal pattern. The proposed site for development of the 13.4ha vineyards falls within an area outlined as **CBA1**.

The proposed agricultural development areas fall within the Lower Orange River catchment area. It however does not fall within any NEFPA catchment priority areas.



## 1. THE APPLICATION AND TECHNICAL DETAIL

### 1.1 The Applicant

The applicant is JC Strauss Eiendomme PTY Ltd, the properties are however, owned by Johan Strauss Familie Trust. The applicant, JS Strauss Eiendomme PTY Ltd, is applying for a Water Use License Application (WULA) in terms of Section 21(c) and (i) of the National Water Act for the construction of orchards/vineyards across small streams on Portion 335 of Farm Bethesda 38. Further for the construction of a pipeline across Portion 238 of Farm Bethesda 38, towards the new vineyards. They are further applying in terms of Section 21 (b) for the construction of a small balancing dam on Portion 238 of Farm Bethesda 38.

The Applicant details:

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Contact Persons (Director): Riaan Strauss

Property owner:

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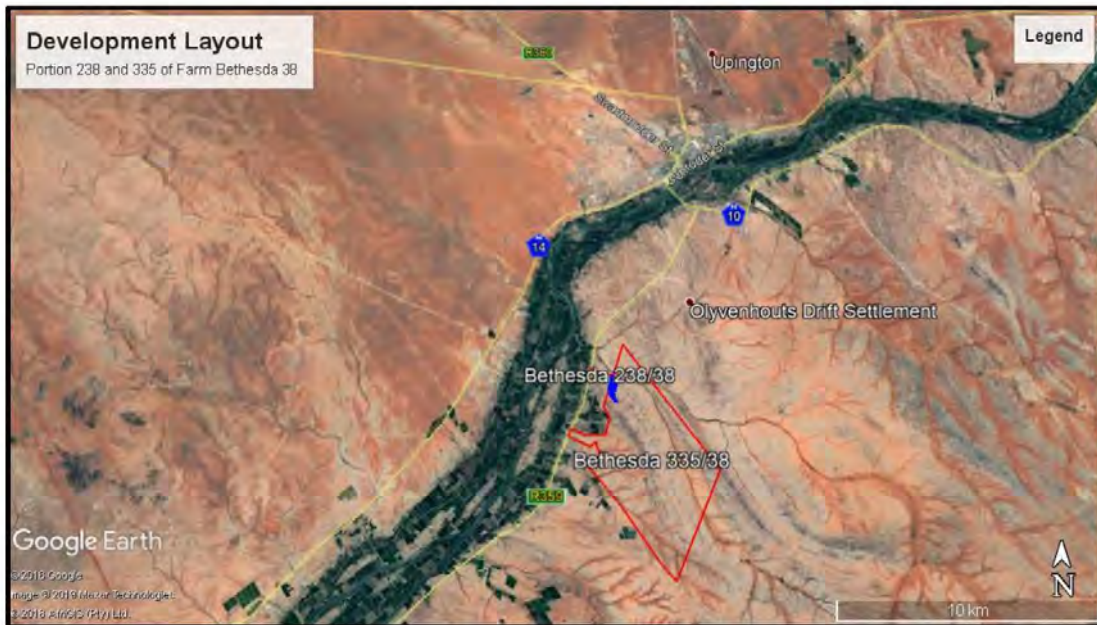
Contact Persons (Director): Riaan Strauss

### 1.2 The property on which the water use is intended

The proposed properties on which the agricultural activities will take place is situated on Portions 238 and 335 of Farm Bethesda 38 in the Louisvale area just outside of Upington within the Northern Cape. It is located in the ZF Mgcawu District Municipality. The farm lies west of the Orange River, and North of Louisvale (see Figure 1Error! Reference source not found.).

Access to the farm is via the R359 and it is approximately 3km South-West from Louisvale. Portion 335 of Farm 38 is owned by Johan Strauss Familie Trust and Portion 238 of Farm 38 is owned by J.C. Strauss Eiendomme (Pty) Ltd and both properties are zoned as Agriculture.

The applicant has appointed PBPS as the independent consultant to undertake the Environmental process.



**Figure 1: Project Locality**

**1.3 Magisterial District and Regional Service Authority**

The proposed development site lies within Dawid Kruiper Municipal area, in the Northern Cape.

**1.4 Ownership of the land:**

The applicant is JC Strauss Eiendomme PTY Ltd, the properties are however, owned by Johan Strauss Familie Trust. See Title Deeds included in Appendix C.

**1.5 Longitude and Latitude of the property/site:**

Dam site on Portion 238 of Farm Bethesda 38:

Latitude: 28°32'51.27"S

Longitude: 21°12'50.35"E

Agricultural area on Portion 335 of farm Bethesda 38:

Latitude: 28°33'01.79"S

Longitude: 21°12'54.70"E

**1.6 Zoning of the land:**

The proposed site is currently zoned for Agricultural Zone I, see APPENDIX C: Deed Search and Title Deeds.

**1.7 Ownership of the adjacent/potentially impacted land:**

Most of the surrounding land (north, west and east of the site) is zoned for agriculture.

**1.8 Water Use License Application details**

Application for a license in terms of the National Water Act, 1998 is made by the developer, JC Strauss Eiendomme PTY Ltd, for the following water usages:

**Table 1: Water Use License activities triggered**

|   |  |
|---|--|
| (c) impeding or diverting flow of water in a watercourse                | For the construction of agricultural areas and evaporation ponds across ephemeral streams/natural drainage areas. Construction of a pipeline across a section of the stream. |
| (i) altering the bed, banks, course or characteristics of a watercourse | For the construction of agricultural areas and evaporation ponds across ephemeral streams/natural drainage areas. Construction of a pipeline across a section of the stream. |
| (b) Storage of a water resource   | [storage of a water resource]<br>For the temporary storage of water in a small balancing dam.  |

**1.9 Existing lawful water use and development on the property**

As per the WARMS registration certificate included in Appendix B, the property has existing water use rights for 10ha (150000m<sup>3</sup>/a) on Portion 335 of Bethesda 38. The proposed development is for 13.4ha of vineyards, with drip irrigation and best practices, this water will be sufficient for the proposed development.

Water will be abstracted from a new pump station adjacent to the existing Canal.

**1.10 Details of the water use intended**

**1.10.1 Section 21c & i –impeding and diverting flow in a watercourse; and altering the bed, banks, course or characteristics of a watercourse.**

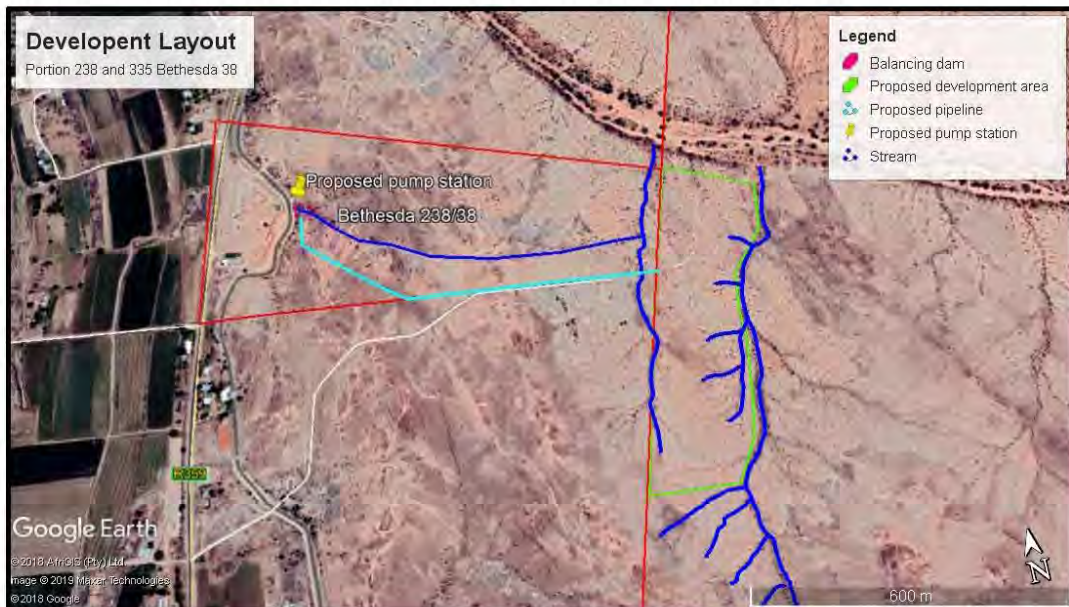
**1.10.1.1 Portion 335 of Farm Bethesda 38**

The drainage channel system on site has not been mapped (as a watercourse) on any of the maps that are available of the study area. However, upon request from DENC and DWS, the drainage system is seen as a watercourse. See Figure 2 for the development layout showing

the streams crossing the site. There will be NO planting of vineyards within the **larger drainage channels** as most of the channels running towards the Orange River has already been modified and developed across, therefore preventing flow towards the Orange River. The larger drainage channels run towards the **Donkerhoekspruit**. This stream flows towards the Orange River. A 32m buffer area was outlined to prevent any direct impact on the Donkerhoekspruit. Indirectly the stream will be impact as specialised flow will run into this stream. Mitigation measures will be put in place to prevent high flowrates into this stream.

The unnamed drainage system that will be impacted is therefore classified as an ephemeral course as it will only flow sporadically after rain. These watercourses are not considered to be seasonal rivers which will regularly contain water in a seasonal pattern. However, the site falls within an area outlined as **CBA1**.

The proposed agricultural development areas fall within the Lower Orange River catchment area. It however does not fall within any NEFPA catchment priority areas.



**Figure 2: Ephemeral streams/drainage areas**

#### **1.10.1.2 Present Ecological Status (PES) & Ecological Importance Sensitivity (EIS)**

Reference is made to the Draft Department of Water and Sanitation (DWS) Report (dated August 2016): "Determination of Ecological Water Requirements for Surface Water (rivers, estuaries and wetlands) and groundwater in the Lower Orange WMA; Report No. RDM/WMA06/00/CON/COMP/2016)1.

This Report provides the PES and EIS of the Orange River at EWR 02, located upstream of the confluence of the water courses that flow into the Orange River from the project site, and at

EWR 03, downstream of the Augrabies Falls and downstream of the confluence of the watercourses that flow into the Orange River from the project sites.

Refer to Figure 3 below for the location of the Project Site (Portion 75 of Farm Keboes no 37) in relation to EWR 02 and EWR 03.

EWR 02 and EWR 03 both have a:

- PES of C (Moderately Modified); and,
- EIS as High (the river in terms of biota and habitat may be sensitive to flow modifications but in some cases may have a substantial capacity for use.)



Figure 3: Extract of map that shows the locality of the EWR sites in context of the MRUs (referenced from Figure 3.1 in Report No. RDM/WMA06/00/CON/COMP/2016).

The drainage channel system is in a sub-catchment of an unnamed tributary, the tributary is not really a river, but more fits the description of a mostly dry drainage line/ephemeral stream. The overall analysis according to DWS: PES & EIS Desktop Assessment, is that the site was not assessed, and the ecological importance of the River is very low. Because it was not assessed, one has to fall back to the overall assessment for the EWR:02, which refers to a moderately modified system.

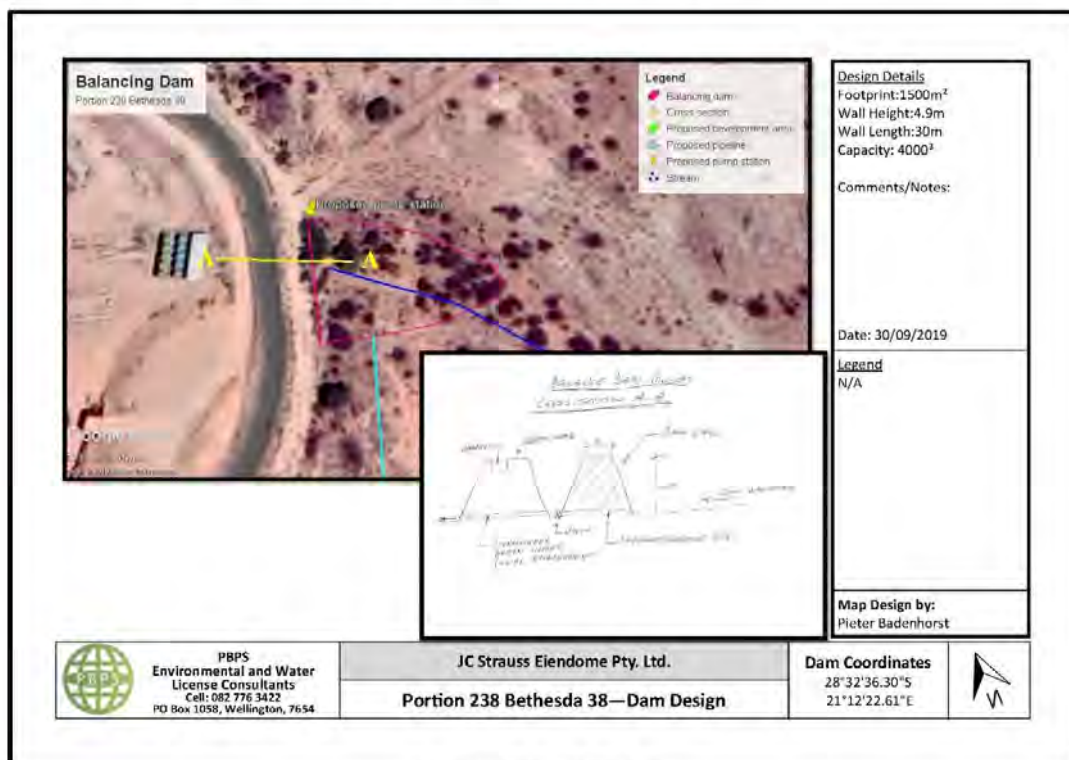
#### 1.10.2 Section 21 b: Storing of water

The application also consists of a dam development on Portion 238 of Farm Bethesda 38 as per the details in Table below.

**Table 2: Dam design details**

| Specifications for the balancing dam |                    |
|--------------------------------------|--------------------|
| Wall height                          | 4.9m               |
| Wall length                          | 30m                |
| Footprint area                       | 1000m <sup>2</sup> |
| Total volume at full capacity        | 4000m <sup>3</sup> |

The water being pumped from the canal will be temporarily stored in the dam as described in Table 2. The dam will be a small buffering dam of 4000m<sup>3</sup> in size. The dam will be located in a small depression area downstream of the agricultural area adjacent to the canal on Portion 238 of Farm Betehesda 38. This application is for the legalisation of the dam in which to secure their farming practices (orchards & vineyards) on the property. The water will be pumped from the dam via a new pipeline towards the newly proposed irrigation areas. Please see the Figure 4: Dam Design, below for the dam design map.



**Figure 4: Dam Design**

### 1.11 Pump stations and Pipelines

The water allocations of Portion 335 of Bethesda 38 – 150 000m<sup>3</sup>/a will be pumped directly from the existing new abstraction point from the canal on Portion 238 of Farm Bethesda 38, see Figure 5: Dam and Pipelines, below.

The new proposed dam on Portion 238 of Farm Bethesda 38 also receives the water from the new abstraction point and will pump the water via new pipelines across Portion 238 of Farm Bethesda 38 to the new agriculture areas on Portion 335 of Farm Bethesda 38, see Figure 5: Dam and Pipelines, below.

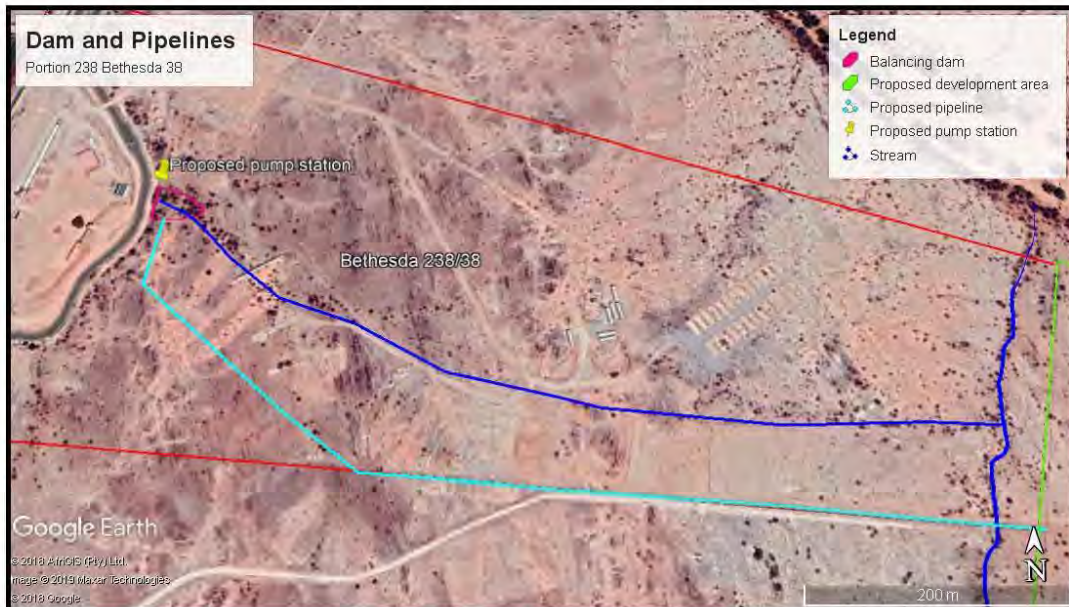


Figure 5: Dam and Pipelines

### 1.12 Irrigation of any land

The new corrected water allocation will be pumped directly from the canal into the balancing dam and irrigated onto the new vineyards/orchards or pumped to the existing storage dam on Portion 238 of Farm Bethesda 38. The new irrigation areas will be located on Portion 335 of Farm Bethesda 38. The new water allocation for Portion 75 of Keboes no 37 will be 3 885 000m<sup>3</sup>/a. The NEMA Application is for the new 13.4ha development area. There is however currently under existing approvals 107ha already planted.

### 1.13 Groundwater:

No ground water will be used for the development.

### 1.14 Plough certificate

Currently there is no Plough certificate for Portion 335 of Farm Bethesda 38. Find included in Appendix N the Plough certificate Application, the requirements will be discussed with Department of Agriculture, Forestry and Fisheries.

## **1.15 Storm Water Management**

### **1.15.1 Introduction**

This section in the report is intended to provide the Department of Water Affairs with all necessary information to assess the suitability of the measures to be taken by JC Strauss Eiendomme PTY Ltd regarding the successful storm water management of the proposed irrigation/agricultural development. This section describes the various infrastructure items that are/were to be constructed and the storm water management objectives that the landowner will undertake to ensure sustainable management of the constructed storm water infrastructure. Find attached in Appendix F.2 the Storm water Management Plan.

### **1.15.2 Mitigation Measures:**

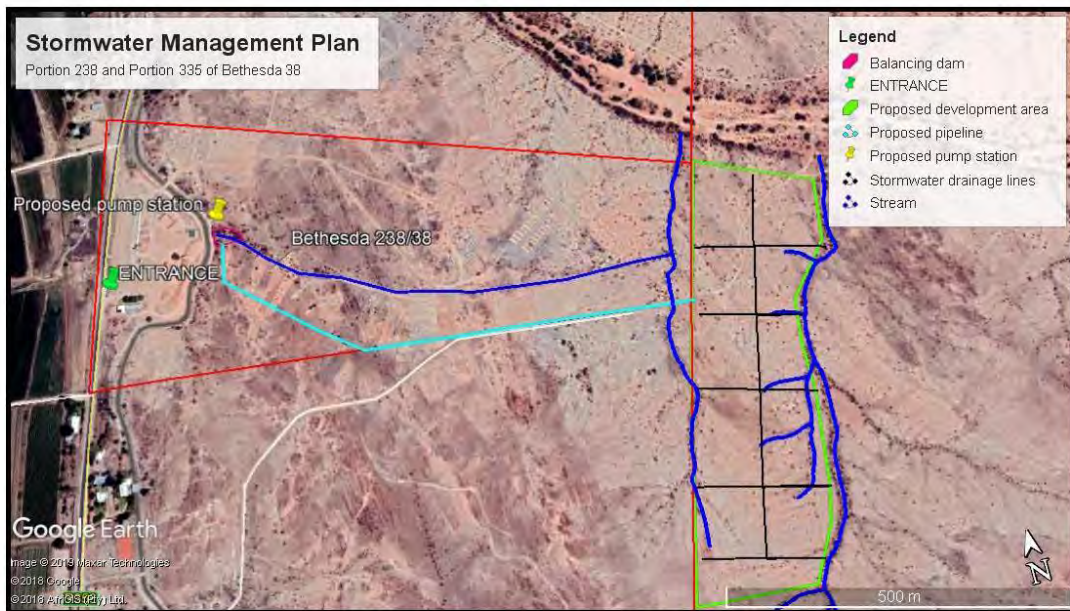
The main issues to be addressed with mitigation measures include:

1. Design
2. Irrigation
3. Nutrients (fertilisers)
4. Spraying (pesticides)
5. Storm water channels
6. Pipelines
7. Erosion control
8. River pump station

#### **1.15.2.1 Design**

The design of vineyard blocks took into account the natural flows to minimise impacts on the ephemeral streams. A storm water will be diverted around the planted blocks towards the diversion natural drainage, see Figure 6: Stormwater infrastructure. Flow entering the diversion channel will then flow downstream and naturally enter an existing Donkerkloofspruit downstream of the development.





**Figure 6: Stormwater infrastructure**

#### **1.15.2.2 Irrigation**

In order to prevent over irrigation, which might lead to water flows creating erosion and or transporting nutrients to the retained ephemeral streams, good farming practises such as irrigation on demand should be utilised.

In addition, the use of mulching should be used to reduce evaporation losses. The mulch also serves to retain moisture and prevent erosion near the plants at the source of irrigation; microjet or drip.

A typical example with mulching along the planted rows and planting between rows is shown below in Figure 7: Mulching and planting between rows.



**Figure 7: Mulching and planting between rows**

### **1.15.2.3 Nutrients**

Nutrients are usually applied in the irrigation water. Every effort must be made to only apply as required by the plant and soil.

Should fertiliser powder or pellets be used, and applied by hand or machine, it must only be placed along the vine plants and no mess or waste between rows should be allowed. Powder or pellet fertiliser may not be spilled between vine rows or on access roads between the vine blocks. Should this happen it must be picked up and removed immediately.

### **1.15.2.4 Spraying**

Spraying of pesticide is normally applied by machine as a vapour. The main potential source of pollution would be from spillages. Therefore, filling of the spray machine must be done in a safe area where pollution of the soil would not be possible. The best place would be on a concrete area where the pesticide is mixed with water.

### **1.15.2.5 Storm water channels**

As shown in the storm water infrastructure layout plan in Figure 6: Stormwater infrastructure, the black lines indicated are the storm water drainage constructed to accumulate the storm water and divert flow from the agricultural areas towards the natural drainage areas. The natural drainage areas flows towards the Donkerhoekspruit, from where it flows towards the Orange River.

It should be noted that no dissipation/retention structures other than the drainage pipelines are included to prevent erosion and storm water accumulation. The development will over time accumulate natural vegetation that will serve as natural dissipation structures. The natural storm water channels are deep enough to prevent overflow and erosion.

### **1.15.2.6 Pipelines**

The proposed new pipelines to the irrigation areas will cross a small section of natural vegetation and then run along the farm boundary towards the development area, the only sections of the pipeline that will affect the streams is shown in Figure 6: Stormwater infrastructure. Care will be taken to prevent any future impediment of flow related to this pipeline, as the pipes will be constructed below the ground. Find included in Appendix F the SWMP with the pipeline method statement for construction of pipelines (PVC Pipes) below ground. The following mitigation measures should be implemented for work on the pipelines:

- Care will be taken to only construct the pipelines during the dry seasons;
- As far as possible the section of the pipeline across/within the stream should be done manually, no machinery, resulting in the lowest possible impact;
- Infilling with original soils (as per method statement) and
- Flow meters must be equipped on the pipelines. -protective measurement on water losses. This must be monitored on a regular basis and records kept on site.

### 1.15.2.7 Erosion control

Erosion would normally occur with the following:

1. Over irrigation which create water flows from the planted rows to the area between the rows and then to roads between the blocks.
  - a. For mitigation see (3) below.
2. Pipe breakages where water will wash from the plants to the area between the rows to the roads between blocks and from where water can flow towards the retained ephemeral streams – thereby causing erosion gulley.
  - a. For mitigation see (3) below.
3. Rain events where the water will flow down slope to reach the ephemeral streams and along the way cause erosion where development took place; that is – between the planted rows and along the roads between blocks.
  - a. Mitigation include the following:
    - i. Mulching and planting/mulching between rows – see Figure 8: Scarifying of soil for typical example.
    - ii. Scarifying of soil between planted blocks and roads to create a soft/rough area to retain moisture and prevent erosion – see Figure 9: Buffer areas with natural vegetation between blocks and roads.



**Figure 8: Scarifying of soil**

- iii. Create a buffer with natural vegetation between the planted blocks and roads as shown in Figure 9: Buffer areas with natural vegetation between blocks and roads.



**Figure 9: Buffer areas with natural vegetation between blocks and roads**

Overall therefore, the natural approach is preferred whereby mulching, planting and natural buffer areas are used to serve as mitigation to prevent flows that could create erosion. This has the further advantage that it also acts against spreading of nutrients and pesticides.

## 2. Description of the Environment

### 2.1 Climate

The climatic conditions of this region of the Northern Cape are typical of conditions characteristics of semi-desert / arid savannah areas. The area is characterised by fluctuating temperatures, low and unpredictable rainfall and high evaporation rates. The low annual rainfall (average of 170 – 240 mm in Upington or even lower in some surrounding areas) is significantly lower than the evaporation rate. Rainfall usually occurs during the late spring and summer months.

The area experiences high temperatures, especially in the summer months, where daily maximums of >42°C are experienced. The annual evaporation in the area is approximately 2 281 mm. Winter temperatures can drop to below 4°C. Frost is rare, but occurs occasionally in most years, though usually not severely.

Weather data was received for the Upington area for the time period 2001 – 2005. Figure 10: Average monthly rainfall and daily temperatures, gives an indication of the average monthly temperatures and humidity over the 5-year period.

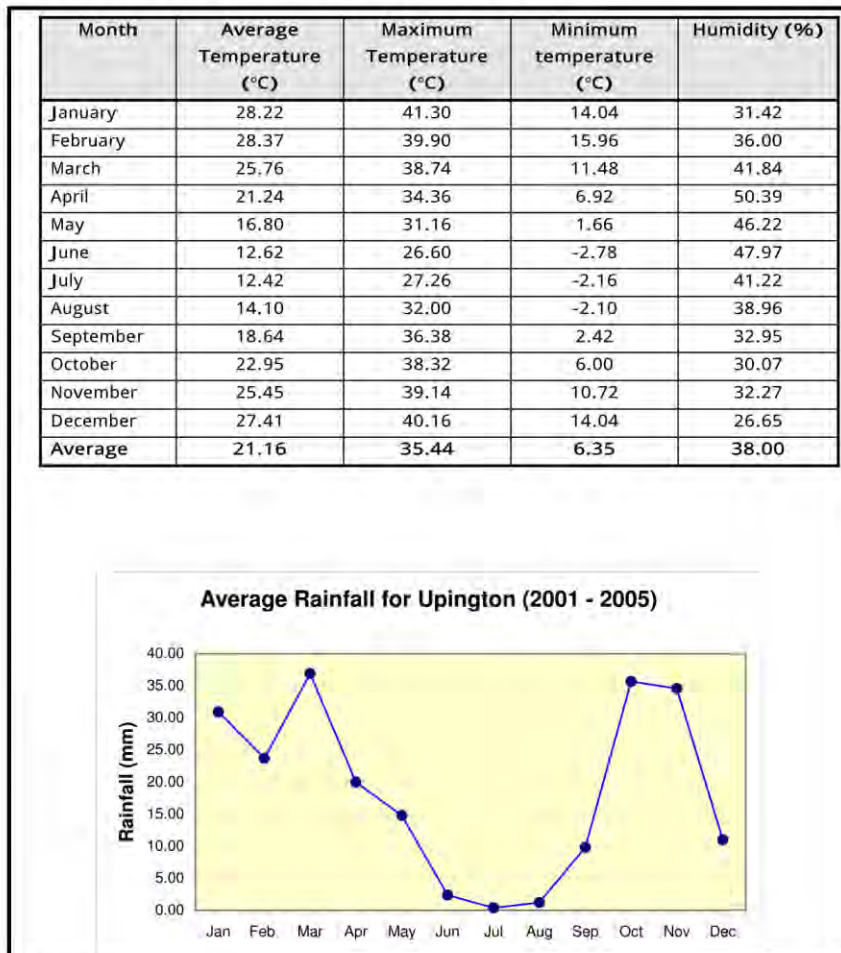
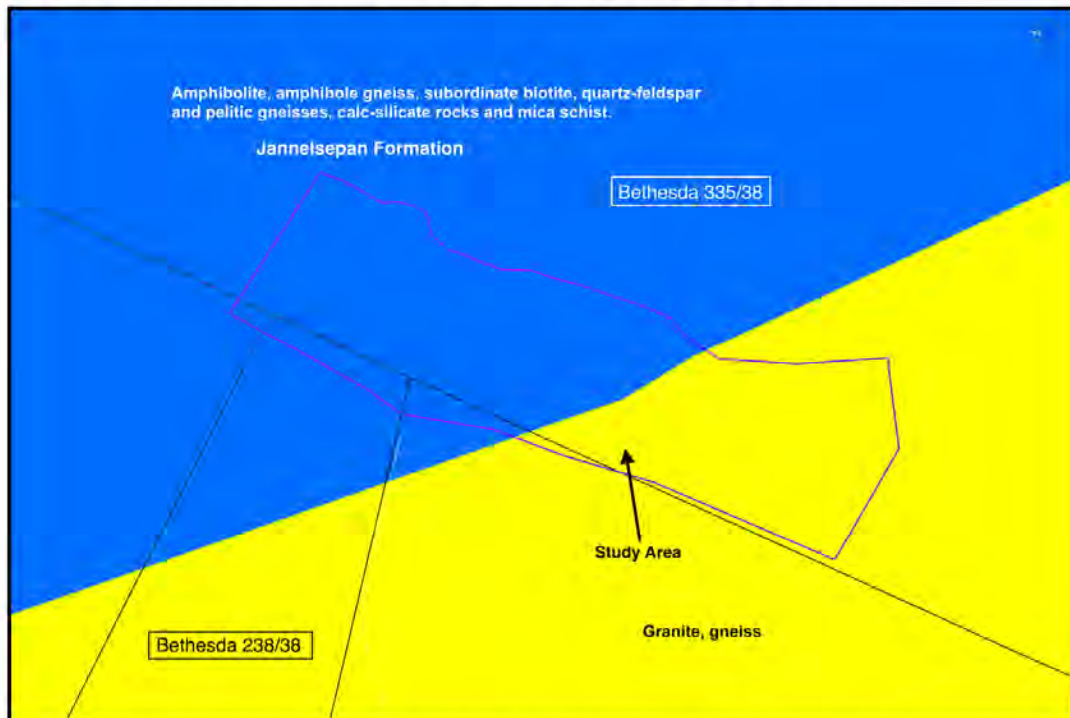


Figure 10: Average monthly rainfall and daily temperatures

## 2.2 Topography & Geology

The site slopes at a moderate gradient downwards from south to north and is located on a shallowly convex terrain.

The geology consists of migmatitic amphibolites and calc-silicate rocks of the Jannelsepan Formation (blue in Figure 11) and granite-gneisses (yellow in Figure 11) all within the Areachap Group of the Namaqua-Natal Geological Province (Cornell et al. 2006). The soils that are the weathered products of these rocks are gravelly and well-drained.



**Figure 11: Geological map of the study area (purple boundary line) that is underlain partly by granite-gneiss and partly by amphibolite, gneisses and calc-silicate rocks (Jannelsepan Formation).**

## 2.3 Natural vegetation and plant life

bioregions, the Upper Karoo Bioregion, Lower Karoo Bioregion and Bushmanland Bioregion. The Bethesda Farm study area near Louisvale is located in the Bushmanland Bioregion at a north-central location (Rutherford & Westfall, 1994; Rutherford et al. 2006; Mucina et al. 2006 in Mucina & Rutherford, 2006).

The entire Bethesda Farm study area falls within an extensive vegetation unit that was mapped by Mucina et al. (2005) and SANBI (2012) as Bushmanland Arid Grassland (Figure 1). It is widespread in the Bushmanland Bioregion and has a Least Threatened conservation status.

Despite the chosen area being within a CBA2, see Figure 13, from a botanical perspective it is suitable, acceptable and is supported as developable as long as the recommended mitigation measures are applied.

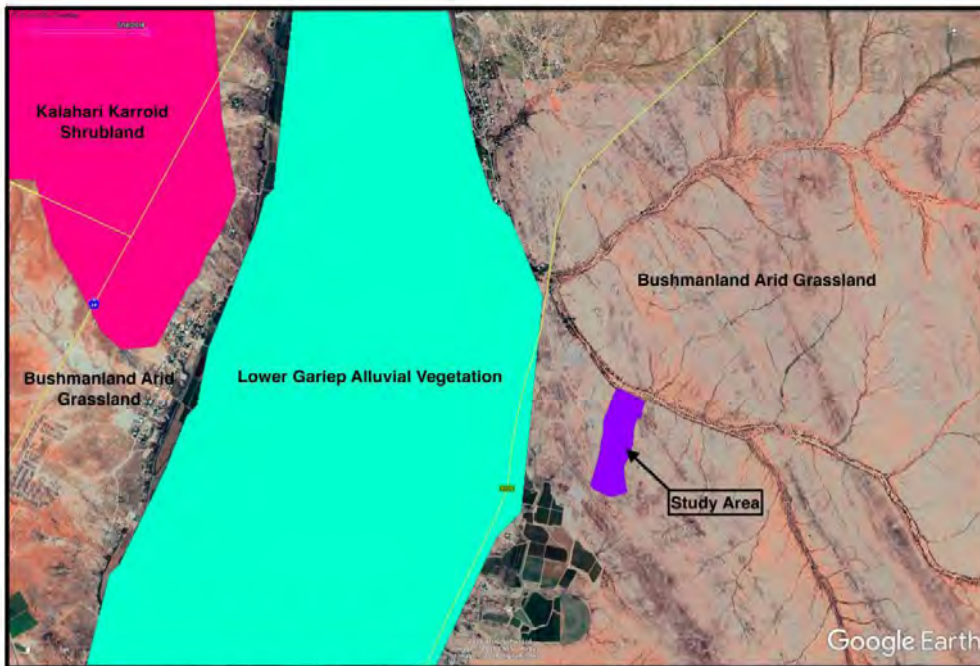


Figure 12: Layout showing the CBA1 (green).



Figure 13: Critical Biodiversity Area map indicating that the Bethesda Farm study area lies in an area classified as CBA2.

## **2.4 Land use**

Most areas in the wider study area do not have a high agricultural potential, except few portions in the alluvial zones close to the Orange River, where irrigation may be practiced. In addition, there are also severe climatic restrictions to agricultural potential. Rainfall is very low, while evaporation is extremely high, due to the high temperatures. For this reason, even the best soils are unsuited for dryland agriculture under these conditions.

Land use of the uncultivated areas is predominantly livestock farming, with overgrazing evident in many areas. The grazing capacity of the natural grasslands of the plains can vary between 25 and 35 hectares per large stock unit (equal to 3.5 to 5 hectares per small livestock unit).

## **2.5 Surface water**

### Names of watercourses:

The Orange River is located approximately 3km to the north of the site. No rivers flow through the property. The small drainage areas affected by the development currently flows towards the Donkerhoekspruit.

The Orange River is the primary water resource for the area. This river is used extensively for irrigation and is heavily cultivated along its banks. Crop production is reliant on water availability and irrigation potential, and therefore the reliance on the available water supply is great. Abstraction from the river and water storage in reservoirs is common at many sites where it is mainly used for irrigation purposes within the areas flanking the Orange River.

### Surface water use:

No surface water will be used during the operation of this project.

### Presence of wetlands:

No wetland areas have been identified.

## **2.6 Groundwater**

No ground water will be used.

## **2.7 Air quality**

No significant impact on the present conditions, which could be classed as fairly good air quality.

## **2.8 Noise**

There will be no significant contribution to noise from any planned activities.



## **2.9 Sites of archaeological interest**

### **2.9.1 Archaeological Assessment:**

The results of the Archaeology study indicate that the proposed activity (i. e. the cultivation of vineyards) and associated activities (i. e. a storage reservoir, pump station & water pipeline), will not have an impact of great significance on the archaeological heritage, as these are expected to be limited. Therefore, there are no objections to the authorization of the proposed development.

Conclusion:

The study has captured a good record of the archaeological heritage present on the proposed development site, which has been graded as having low (Grade 3C) significance.

Recommendations:

1. No archaeological mitigation is required.
2. Should any unmarked human burials/remains or ostrich eggshell water flask caches be uncovered, or exposed during the preparation of the lands for cultivation, these must immediately be reported to the archaeologist (Jonathan Kaplan 082 321 0172), or the South African Heritage Resources Agency (Ms Natasha Higgitt' 021 462 4502). Burials, etc. must not be removed or disturbed until inspected by the archaeologist. “

### **2.9.2 Paleontological Assessment**Error! Reference source not found.:

Given the low palaeontological sensitivity, small area and disturbed character of the study area, it is concluded that the proposed Louisvale agricultural development is very unlikely to have significant impacts on local palaeontological heritage resources.

It is therefore recommended that pending the discovery of significant new fossils remains before or during development, exemption from further specialist palaeontological studies and mitigation be granted for the proposed agricultural development on Farm Bethesda 38 near Upington, Northern Cape.

## **2.10 Visual aspects**

The site is already disturbed by the existing evaporation ponds. Agricultural development in an existing agricultural area.

## **2.11 Regional socio-economic structure**

### **2.12 Interested and Affected parties**

The WULA was distributed to I&AP's together with the S24G NEMA process. The WULA was be distributed to I&AP's from 15 February 2019 until 16 April 2019. An advertisement was placed in the Gemsbok on 15 February 2019.

### **2.13 Industrial activity**

The evaporation ponds do not receive wastewater from industrial activities, only domestic use wastewater as well as water from the crate washer.

### 3. CONSIDERATIONS AND ASSESSMENT CRITERIA

Management actions in the Development of an Integrated Water Quality Management Strategy for the Upper and Lower Orange Water Management Areas for the Lower Orange Water Management Area include the following:

#### ***Area 1: Boegoeberg to Kanon Islands***

*It is the vision of all interested and affected parties within Visioning Area 1:*

To contribute towards the integrated management of the surface and groundwater resources in all LOWMA catchments between Douglas and Boegoeberg Dam, to secure sufficient water that is fit for all beneficial uses, specifically including domestic and variable agricultural use, and to support a healthy aquatic ecosystem, particularly for ecological sensitive areas such as the Douglas Conservancy.

#### ***Area 2: Boegoeberg to Kanon Islands***

*It is the vision of all interested and affected parties within Visioning Area 2: (Kakamas/Augrabies/Keimoes falls within this area)*

To contribute towards securing suitable water supplies of qualities for all LOWMA catchments between Boegoeberg and Kanon Islands, that will sustain:

- a thriving table grape export market and wine production;
- local agricultural activities via an extensive irrigation canal system;
- a thriving stock farming industry;
- domestic and light industrial water use in all towns, specifically including Upington;
- supplying water to rural communities via both the Kalahari West and Karos-Geelkoppan water supply schemes.

***Area 3: Kanon Islands to Pella*** *It is the vision of all interested and affected parties within Visioning Area 3:* To promote the participatory and integrated management of all water resources pertaining to the LOWMA catchments situated between Kanon Islands and Pella in order to ensure that water supplies are of an acceptable quality to all water users, in particular to sustain a prominent conservation and ecotourism industry, as well as livestock and private game farming, while allowing room for beneficial water use.

**Other legislation and guidelines that have been considered includes the following:**

- The Constitution of South Africa Act No.108 Of 1996
- The National Environmental Management Act, 1998 (Act No. 107 Of 1998)
- Conservation of Agricultural Resources Act No 43 Of 1983
- Subdivision of Agricultural Land Act, 1970 (Act No. 70 Of 1970)

- National Environmental Management: Biodiversity Act (Act 10 Of 2004)
- Planning Legislation and Guideline

### **3.1 The reserve**

The Department of Water Affairs and Sanitation have recently completed the reserve determination for the Orange River: Directorate of Scientific Services in Pretoria.

From the reserve determination it could now be ascertained by your department as to the availability of water for the allocation of the water usages requested as per the issue of a license to the applicant.

### **3.2 The class and resource quality objectives of the water resource**

These aspects could only be addressed and commented on by the Department of Water Affairs.

### **3.3 The strategic importance of the water to be authorized**

This water use has no strategic importance.

### **3.4 The existing lawful water use in the catchment under consideration**

This authorization will have no impact on any existing lawful water use within the investigation area as these are existing rights that will be allocated to the various properties as outlined in 1.11. The property falls within the Louisvale Water Users Association.

### **3.5 The likely effect of the water uses to be authorized on the water resource and on other water users in the catchment**

This application, managed by DWS: Upington, will have little effect on the quantity of water available from within the catchment.

### 3.6 The impact on the environment

The impacts and mitigation measures are summarised in the table below:

**Table 3: Impacts table**

| Water Uses       | Potential Impact on  | Proposed Mitigation Measures  | Review of the adequacy of suggested mitigation measures             |
|------------------|--|---|---|
| Section 21 (c&i) | New irrigation areas associated with the additional water use rights | <p>Low positive</p> <ul style="list-style-type: none"> <li>• Measures should be implemented to reduce water use within the proposed development, such as the use of tension meters to avoid over irrigation of the soils.</li> <li>• Environmental education programs for workers will ensure that they will be sensitive to the environment and report incidents such as leaking taps, broken irrigation systems, etc.</li> <li>• The irrigation system to be used is DFM method along with irri-check calibrations and recommendations.</li> <li>• Test pits and data collections from these pits are taken on a regular basis to determine the moisture content for soil etc.</li> <li>• Soil coverage within the vineyards with chaff.</li> <li>• Regular monitoring and checks from specialists in the field to introduce best possible irrigation practices.</li> <li>• Keep a 32m buffer area between the development and the Donkerhoekspruit.</li> </ul> | Mitigation measures adequate to ensure positive impact takes place. |
| Section 21 (c&i) | Water Quality  | <ul style="list-style-type: none"> <li>• No impact on water quality, as construction will be conducted outside the rainfall season. (Replanting)</li> <li>• No flow from agricultural areas as into Donkerhoekspruit. Flow will be diverted to drainage areas, and dissipation through natural vegetation to prevent high flow ratios.</li> <li>• Measures should be implemented to reduce water use within the</li> </ul>  | Mitigation measures adequate to ensure impacts are fully mitigated. |

|                |   |   |   |
|----------------|---|---|---|
|                |   | proposed development, such as the use of tension meters to avoid over irrigation of the soils.  |   |
|                | Impeding and diverting flow within ephemeral streams. | <p>Low negative</p> <ul style="list-style-type: none"> <li>• The natural drainages areas and small ephemeral stream will be filled in and vineyards established on these areas, therefore a low negative impact on surface water flow.</li> <li>• This will however be mitigated by establishing a storm water management mitigation measures, outlined in the SWMP.</li> <li>• Keep a 32m buffer area between the development and the Donkerhoekspruit.</li> </ul> | Mitigation measures adequate to ensure impacts are fully mitigated. |
| Section 21 (b) | Construction of a small dam, adjacent to the canal.   | <ul style="list-style-type: none"> <li>• Small impact on the stream. However, existing flow towards canal stops and is not diverted towards canal</li> <li>• Re-use of dam walls for the new dam.</li> <li>• Rehabilitation of the small stream.</li> </ul>   | Mitigation measures adequate to ensure impacts are fully mitigated. |

### 3.6.1 Assessment of the impacts associated with the water use:

The impacts associated with the development of agricultural areas across stream is low negative, however mitigation measure considered can prevent any further negative impacts, see Table 6 above.

### 3.7 The need to redress the results of the past racial and gender discrimination

JC Strauss Eiendomme is a family business, registered in 1998 as a private company. The shareholders in the business are the founder, Mrs TG Strauss and her four sons, EA Strauss, A Strauss, JC Strauss and J Strauss.

The entity also plans to convert some of the current seasonal positions to permanent positions should this Water Use Licence Application be successful. However, the main positive impact is job security of current positions.

Three new employment opportunities were occupied, namely a tractor driver and two general workers. These three employees were issued by PPE, clothes, shoes and sun protection. (Hat/cap)

The ratio will be depended on demand and availability of people with the relevant skills – therefor this information is not yet available.

All employees will undergo a short relevant training session for the purpose needed.

Ratio for woman or men will be determined by request and application, during harvest and pruning time.

The new water use licence will lead to the security of the farming operation, and will create a demand for new staff and new skills, e.g.

- Skilled agricultural labourers from the local community;
- Specific knowledge of vineyards production will be needed;
- Specific knowledge of fruit packing will be needed;
- Support staff will be needed: Admin, forklift drivers, tractor operators and Code 14 drivers.
- Informal training takes place to ensure that workers are informed and equipped for the specific job needed.
- As mentioned in three workers will get permanent contracts.
- During the 8 week harvest season, approximately 24 people will be contracted temporarily.
- During further 3 months pruning season, an extra 3 to 4 people will be contracted temporarily.
- On the job training will take place wherever a lack of relevant skills has been detected.

#### Socio-Economic Development:

This property is situated between two long-established local communities, Raaswater and Lesideng, about 3km both ways.

There are no houses on the premises and due to the above-mentioned, there will be no need for housing.

Most of the houses have a small garden, they attend to themselves.

These communities have fixed facilities such as schools, sports fields and a church.

When and if a worker needs medical treatment of attention during working hours, the employer will make use of Government service providers.

A mobile clinic pays scheduled visits to the farm and neighbour farms. During these visits they cover issues such as Hiv/Aids, alcoholism, TB etc.

As specific needs occurred or been identified, it will be attended to by the company if possible, such as products to improve the playground of the schools or earthworks to repair sport fields.

### **3.8 Efficient and beneficial use of the water in public interest**

The new water use will have the following benefits:

- More sustainable development will immediately create the opportunity to proceed with the expensive exercise to plant new varieties that can spread the preparation, pruning, harvesting and packing seasons over longer periods. This will support the

entity in their efforts to convert as much as possible seasonal job opportunities into permanent job opportunities.

- The increase in production of export produce will bring more foreign capital to South Africa which is much needed to strengthen our economy and as such fully supported by Government.

### **3.9 Socio economic impact of water use to be authorized**

In a rural area such as this with a high unemployment rate, any new employment positions have a huge impact on the immediate and extended families of such new workers. This positive impact is reinforced and compounded by the realization of more families in this rural community with proper housing, undergoing skills training and going to church, sport, etc. and children going to school. Even seasonal work opportunities have the advantage of extra income plus the opportunity to gain skills that can be used to gain permanent employment on the farm or elsewhere in the future

Not only are the new employment opportunities important, but also the fact that:

- Existing jobs can be secured: The new development will directly secure existing and new job opportunities.
- Create the opportunity to proceed with the expensive exercise to plant new varieties that can spread the preparation, pruning, harvesting and packing seasons over longer periods. This will support the entity in their efforts to convert as much as possible seasonal job opportunities into permanent job opportunities. Especially black females from the farm and neighbouring towns will benefit here. The positive impact on their lives will even be more, as more of them will now also be promoted to supervisor level to help manage the increased production as well as the increase in value-adding volume.
- The security in production of export produce will bring more foreign capital to South Africa which is much needed to strengthen our economy and as such fully supported by Government.

### **3.10 Investment already made and to be made by the water user in respect of the water use in question**

No existing investments made,

#### **The future investments to be made:**

1. No additional investments, other than mentioned above.

### **3.11 The period for which the license is to be issued**

The license should be issued for the maximum possible period, as the water use will be of a permanent nature.



### **3.12 Failure to authorize the water use**

Failure to authorize the water use will result in the following:

- Financial loss due to existing investments already made, buying of properties and water use rights,
- The design and processes implemented to obtain authorisation also has a high financial implication that will be lost.
- Loss in current and future employment opportunities and skills development and training opportunities.

## **4. CONCLUSION**

The development of the agricultural areas across small streams and the development of a pipeline and a small balancing dam will not negatively impact on any other water users in the area. The site is already largely modified to the Orange River side of the development. The impact on the Donkerhoekspruit will be low as a 32m buffer area is provided as mitigation. The drainage from the development area will flow into natural drainage lines and will also be mitigated through natural dissipation.

The authorisation of the farm and procurement of the environmental rights on each property, thereby complying with the necessary legislation will have numerous positive socio-economic impacts not only on the farm but also the region and result in job creations, skills development, social upliftment and earning of foreign currency.

## **5. CONDITIONS**

When instructed to do so by the Responsible Authority the user must fit a self-registering meter at the user's expense to measure water use and the user at his expense must maintain the meter in satisfactory working condition.

Officers from the Department of Water Affairs will at all times have free access to the property and the water works for supervision and control purposes.

The Department's or Responsible Authority's local representative will issue the necessary instructions to the user with regard to the keeping of proper registers of water use and quality, and the owner must at all times comply with such instructions.

The Department accepts no liability for any damage, loss or inconvenience, of whatever nature, suffered as a result of: shortage of water; inundation or flood; siltation of the river or dam basin; and/or the shifting of water work in the event of a rise or drop in the water level of river or dam.

The quality or suitability of the water for any purpose is not guaranteed.

The water abstracted/used in terms of this license may only be used for the authorized purposes.

This license is not a permanent, lawful right and is not transferable from one user to another or from one property to another.

The user must take every possible precaution to the satisfaction of the Department, to prevent pollution of water resources.

The Department of Water and Sanitation reserves the right to withdraw this license in the event of failure to comply with any of the said conditions or provisions.

The applicant has a period of 2 (two) years within which to commence/implement this water use, failing which, the license will lapse.

## **6. RECOMMENDATION**

The following recommendations should be adhered to:

- Any further recommendations outlined in the Environmental Authorisation and the Water Use License issued.
- When instructed to do so by the Responsible Authority the user must fit a self-registering meter at the user's expense to measure water use and the user at his expense must maintain the meter in satisfactory working condition.
- Officers from the Department of Water Affairs will at all times have free access to the property and the water works for supervision and control purposes.
- The Department's or Responsible Authority's local representative will issue the necessary instructions to the user with regard to the keeping of proper registers of water use and quality, and the owner must at all times comply with such instructions.
- The Department accepts no liability for any damage, loss or inconvenience, of whatever nature, suffered as a result of: shortage of water; inundation or flood; siltation of the river or dam basin; and/or the shifting of water work in the event of a rise or drop in the water level of river or dam.
- The quality or suitability of the water for any purpose is not guaranteed.
- The water abstracted/used in terms of this license may only be used for the authorized purposes.
- This license is not a permanent, lawful right and is not transferable from one user to another or from one property to another.
- The user must take every possible precaution to the satisfaction of the Department, to prevent pollution of water resources.

The Department of Water Affairs reserves the right to withdraw this license in the event of failure to comply with any of the said conditions or provisions.

The applicant has a period of 2 (two) years within which to commence/implement this water use, failing which, the license will lapse.

It is recommended that the Section 21 (c) and (i) for development across streams on Portion 335 of Farm Bethesda 38 and for the construction of a pipeline across streams on Portion 238 of Farm Bethesda 38. It is also recommended that the Section (b) for the construction of a small balancing dam on Portion 238 of Farm Bethesda 38.

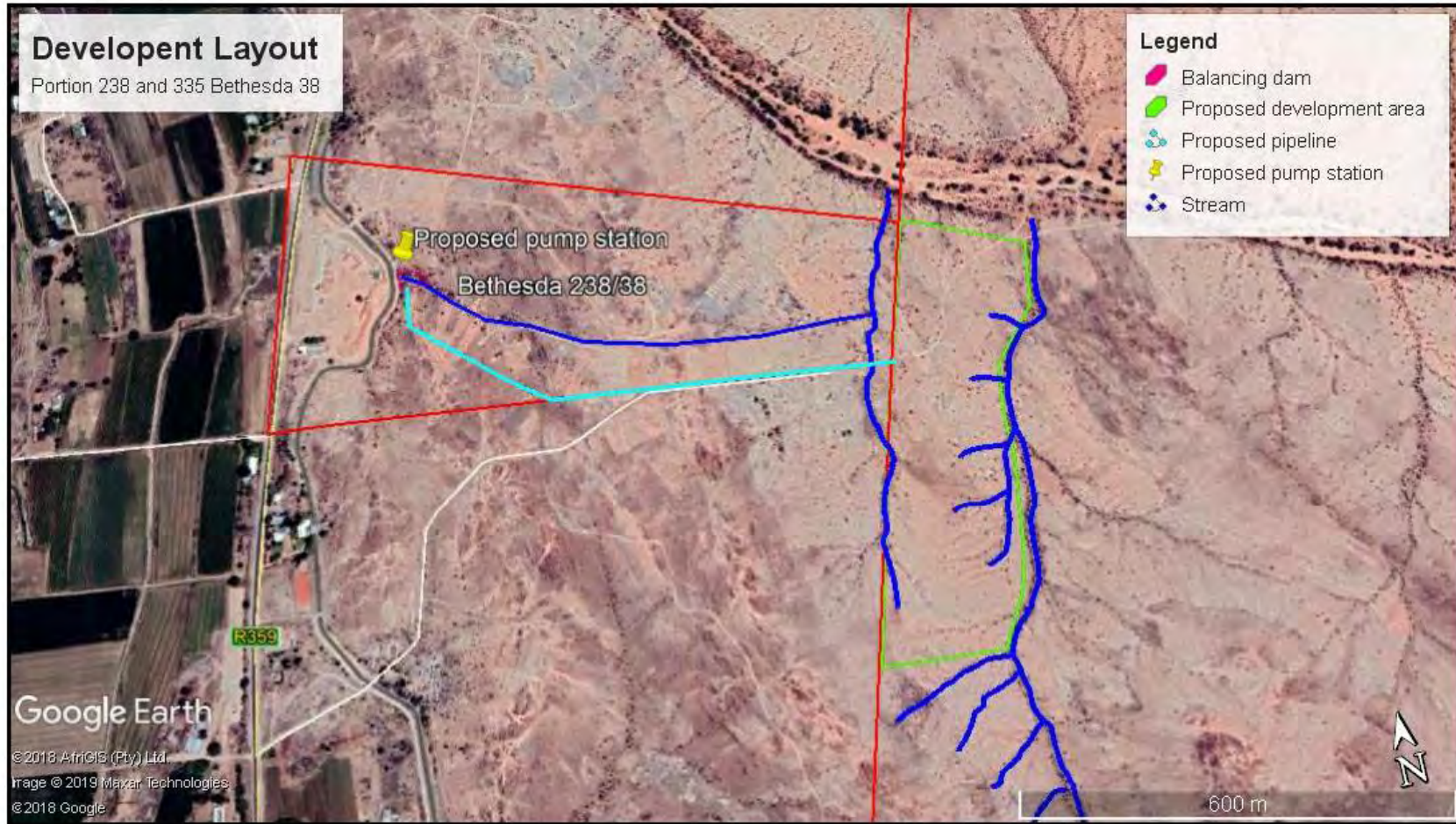
**7. APPENDICES**

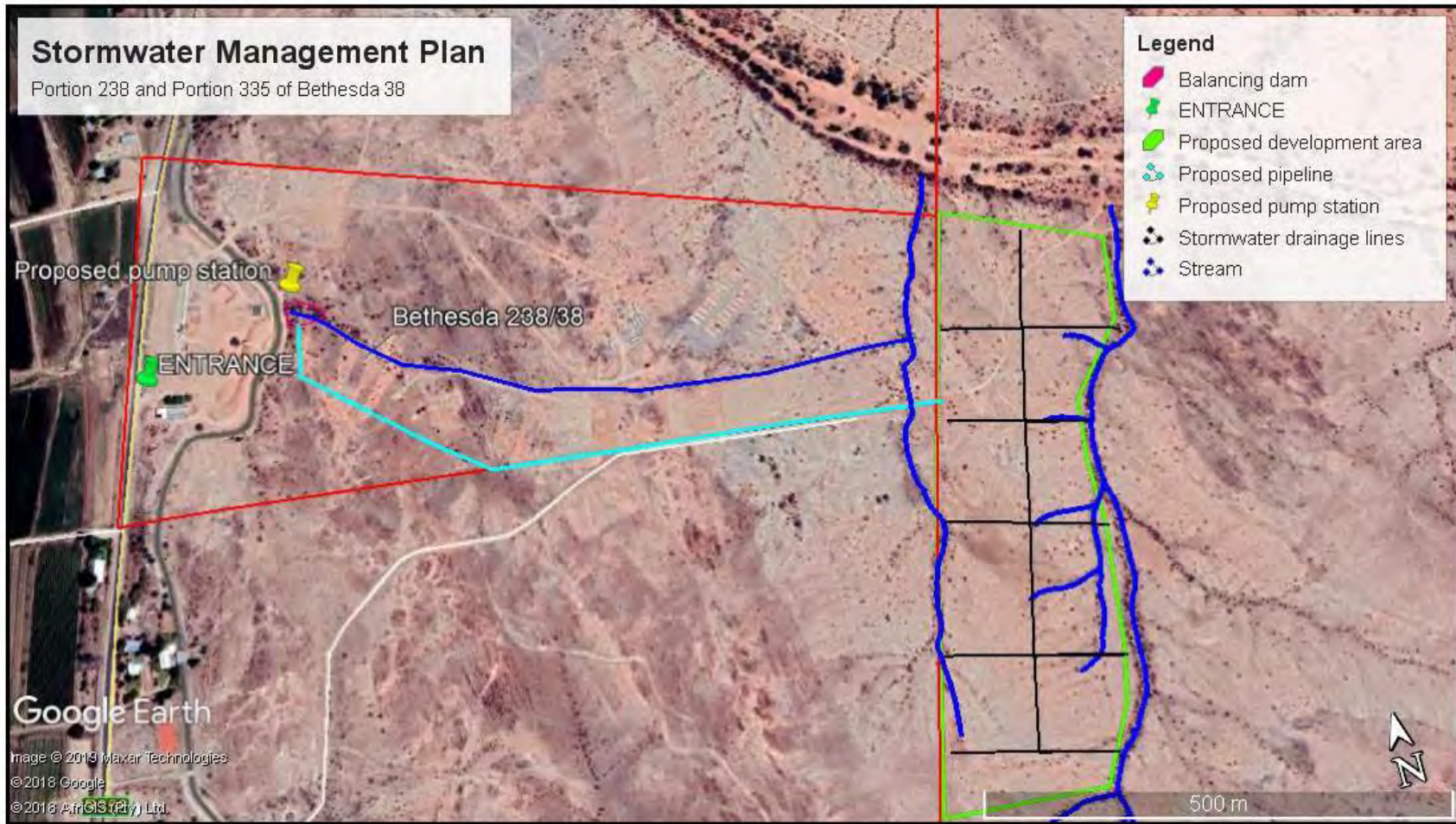
**APPENDIX A: Completed License Application Forms**

**APPENDIX B: Existing Water Use Confirmation**

**APPENDIX C: Deed Search and Title Deeds**

**APPENDIX D: Power of Attorney**

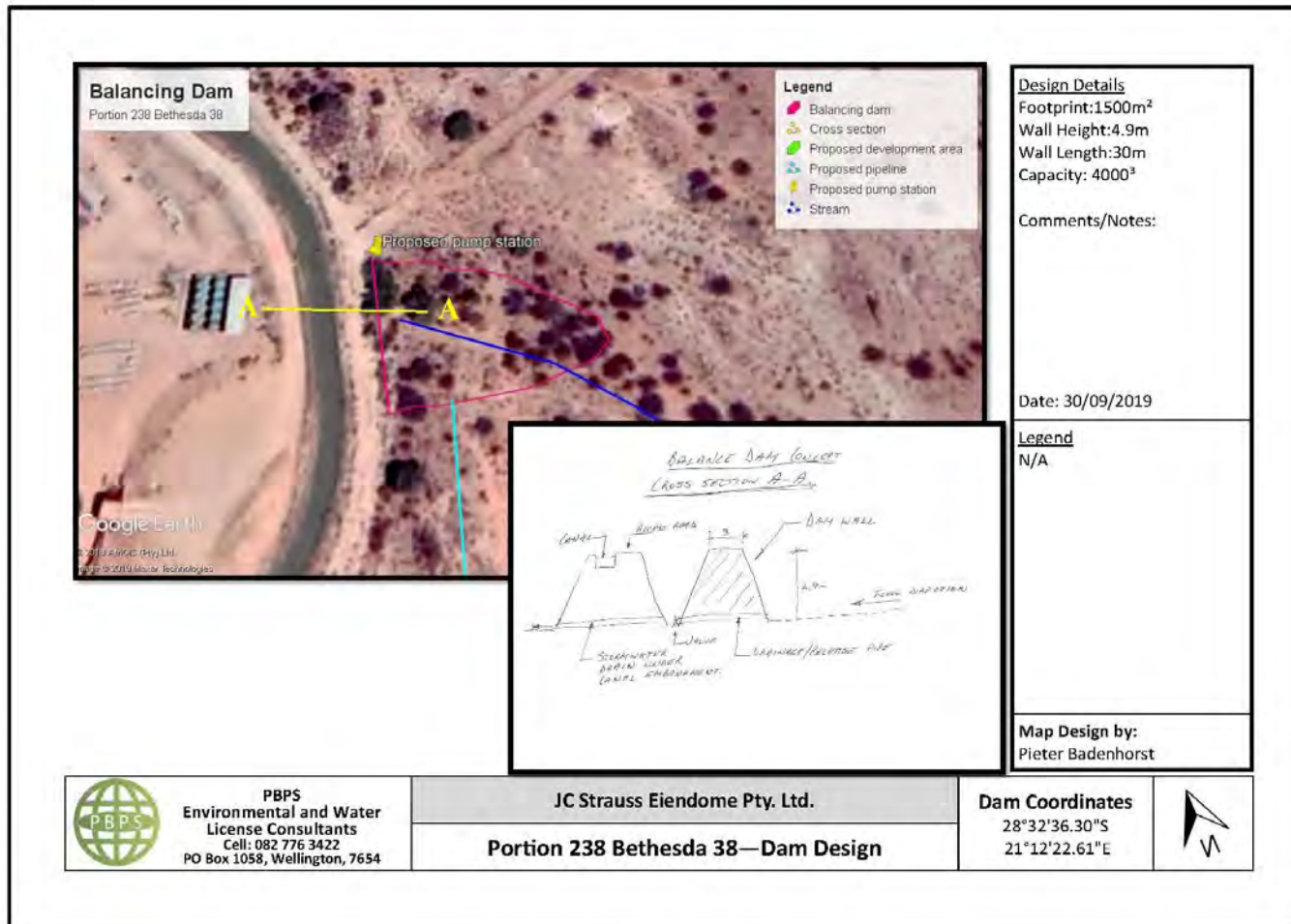




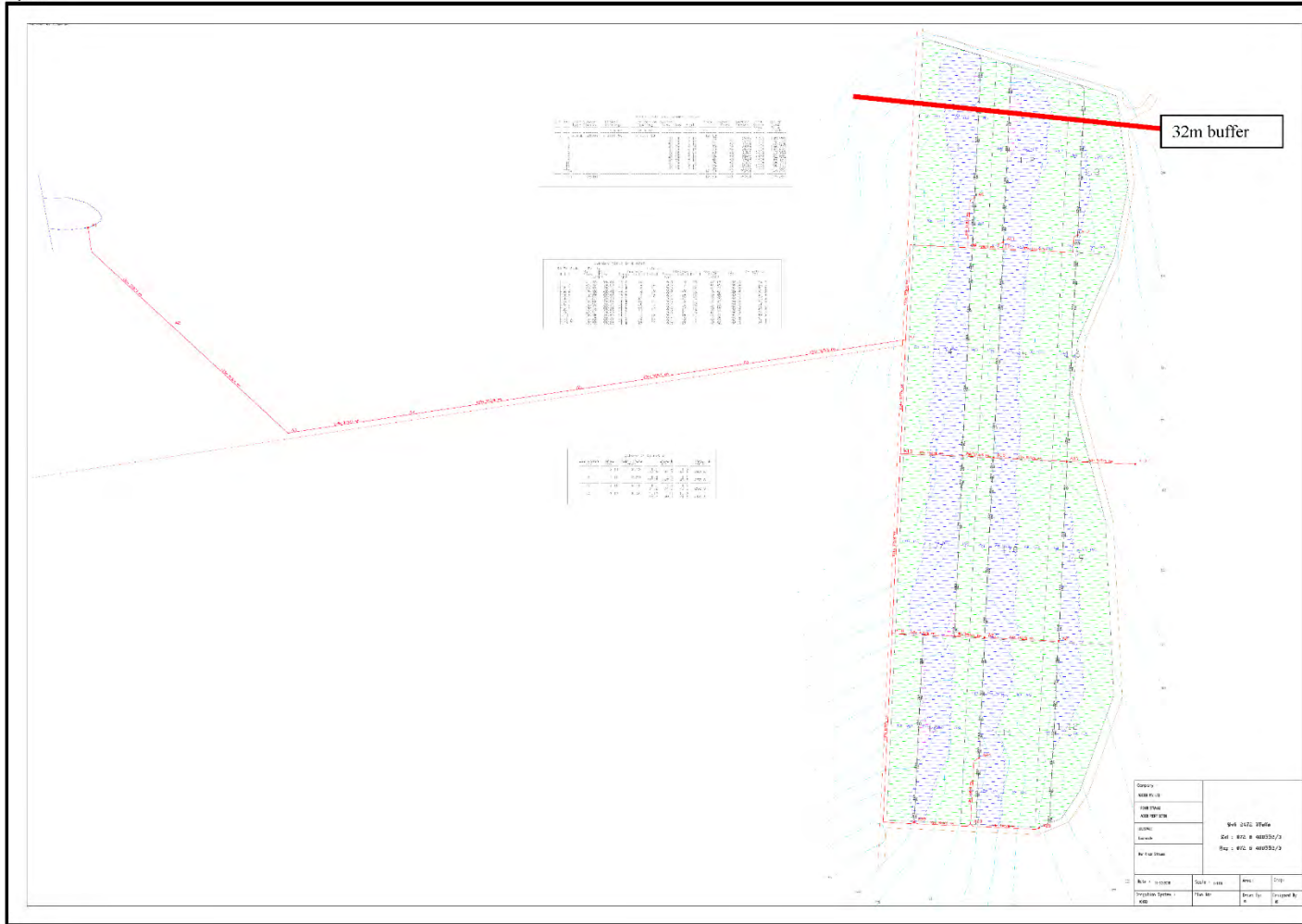


APPENDIX E2: Design Illustrations

Balancing Dam



Development Layout



**APPENDIX F: Technical Documents**

**Appendix F.1: Basic Assessment Report**

Basic Assessment Report will be submitted to DENC, approval is awaited. Find included on the cd.

**Appendix F.2: Storm water Management Plan**

**APPENDIX G: Proof of Public Participation**

**APPENDIX H: Section 27 Report**

## **Appendix E: Public Participation**

### **Appendix E1: Public Participation Report for DBAR**

#### **THE OFFICIAL PUBLIC PARTICIPATION PROCESS FOR THE DBAR INCLUDED THE FOLLOWING:**

##### **REGISTRATION AND ADVERTISEMENT (APPENDIX E3: ADVERTISEMENT)**

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An advertisement was placed in the local paper, Die Gemsbok, on Friday 04 October 2019. An advertisement served as a notice for registration as an Interested and Affected Parties and provides comments on the dBAR as part of the official public participation process. The registration/comment period was from Wednesday 09 October 2019 until Friday, November 2019.

##### **NOTICE BOARD (APPENDIX E4: SITE NOTICE AND LOCALITY)**

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Notice Boards was placed at the site entrance and on the Farm on Friday 04 October 2019.

##### **INFORMATION AND REPORTING FOR THE FORMAL PROCESS**

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A notice that included the Executive Summary was made available and distributed by registered post to all registered I&AP's and neighbours for the 30-day commenting period, from Wednesday 09 October 2019 until Friday, November 2019. The notice also informed all I&AP's of the availability of the draft Basic Assessment Report which could be obtained from the EAP. Comments received are placed in the Final Basic Assessment Report. The actual comments received on the Executive Summary and Draft Basic Assessment Report, as part of the public participation will be shown in the Final BAR. Digital copies will be made available to those who request it.

Hard copies or digital copies of the report were sent to DENC, Department of Water and Sanitation, SAHRA, Nature Conservation, Local Municipality, DAFF, District Municipality and Louisvale Water Users Association.

##### **I&AP'S DATABASE**

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The I&AP'S database in Appendix E2: I&AP'S List was compiled from identified & registered I&AP's. The database was continuously updated to include new I&AP's that have submitted comments on the Draft Basic Assessment Report.

##### **COMMENTS AND RESPONSES**

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The actual comments received on the draft report will be included in the fBAR. The comments and response sheet are included in Appendix E7: Comments and Response Table.

## Appendix E2: I&AP'S List



|   | Erf no/Farm | Surname        | Initials | Representing                                    | Tel                                 | Fax        | email                       | Post Box  | Town                  | Code         | Reg |
|---|-------------|----------------|----------|---|-------------------------------------|------------|-----------------------------|---|-----------------------|--------------|-----|
| 1 |             | Ntoba          | Mr E     | Dawid Kruiper<br>Local Municipality<br>Manager  | 0543387000                          | 0543387350 |                             | Private Bag X6003   | Upington              | 8800         | L   |
| 2 |             |                |          | Dawid Kruiper LM<br>Ward Councillor             |                                     |            |                             |   |                       |              | L   |
| 3 |             | Lategan        | Mr G     | ZF Mgcawu<br>District<br>Municipality           | 0543372800                          | 0543372888 |                             | Private Bag X6039   | Upington              | 8800         | L   |
| 4 |             | October        | L        | Department of<br>Agriculture and<br>Land Reform |                                     |            |                             | P. O. Box 18  | Springbok             | 8240         | L   |
| 5 |             | Riba           | Ordain   | DENC: NC  | 0609914817                          | 0277188814 |                             | Corner of River and<br>Nelson Mandela Road,<br>Provincial Building,<br>1stfloor<br>Private Bag x 6102 | Upington<br>Kimberley | 8800<br>8300 | L   |
| 6 |             | White          | C        | Department of<br>Water Affairs                  | 082 887<br>8866/<br>054 338<br>5819 |            | TowellJ@dws.gov.<br>za      | Private Bag X5912   | Upington              | 8800         | L   |
| 7 |             | De<br>Fontaine | la<br>S  | Nature<br>Conservation                          | 0543384800                          |            | sdelafontaine@g<br>mail.com | Evelina De Bruin<br>(former Provincial)<br>Building, Corner of<br>Rivier & Nelson<br>Mandela Road     | Upington              | 8800         | L   |

|    |                             |             |              |  |                                   |  |                            |                |           |      |   |
|----|-----------------------------|-------------|--------------|--|-----------------------------------|--|----------------------------|----------------|-----------|------|---|
| 8  |                             | Mans        | J            | Department of<br>Agriculture<br>Forestry and<br>Fisheries                | 0543385909                        |  | jacolinema@daff.<br>gov.za | P. O. Box 2782 | Upington  | 8800 | L |
| 9  | Janelsepan no<br>39         | Holtzhausen | David        | Louisvale Water<br>Users Association                                     | 0728438855                        |  |                            |                |           |      | L |
| 10 |                             | De Villiers | Anton        | Blaauwskop<br>Water Users<br>Association                                 | 0824529332                        |  | adevtomail.co.za           |                |           |      | L |
| 11 | Ptn 255<br>Bethesda 38      |             |              | J Steenkamp<br>Boerdery CC /<br>Victory Parade<br>Trading 121 PTY<br>LTD | 0825782439                        |  |                            | P.O.Box 121    | Louisvale | 8809 | L |
| 12 | Remainder of<br>Bethesda 38 | Engelbrecht | Theunis<br>G |  | 0827841530<br>/<br>082784<br>1531 |  | theunis.e@mweb.<br>co.za   | Posbus 205     | Louisvale | 8809 | L |
| 13 | Ptn 307<br>Bethesda 38      | Engelbrecht | Theunis<br>G |  | 0827841530<br>/<br>0827841531     |  | theunis.e@mweb.<br>co.za   | Posbus 205     | Louisvale | 8809 | L |

|    |                    |           |  |  |   |                                  |  |  |                          |                                  |                        |      |   |
|----|--------------------|-----------|--|--|---|----------------------------------|--|--|--------------------------|----------------------------------|------------------------|------|---|
| 14 | Ptn<br>Bethesda 38 | 263<br>38 | <b>NOG NIE<br/>GEREGISTRE<br/>ER NIE</b> |  |   |                                  |  |  |                          |                                  |                        |      | L |
| 15 | Ptn<br>Bethesda 38 | 262<br>38 | Du Preez /<br>Visser                     | Rudolf J/<br>Alicia /<br>Jean-<br>Paul |   |                                  |  |  |                          | Plaas 97, Bethesda               | Louisvale,<br>Upington | 8801 | L |
| 16 | Ptn<br>Bethesda 38 | 134<br>38 | Schlechter                               | Pierre R/<br>Petrone<br>Ila LM         |   | 072841<br>6329 / 054<br>335 1024 |  |  |                          | Posbus 795                       | Upington               | 8800 | L |
| 17 | Ptn<br>Bethesda 38 | 348<br>38 |  |  | Local Authority<br>(Khara Hais<br>Municipality) |                                  |  |  |                          | Privaatsak X6003                 | Upington               | 8800 | L |
| 18 | Ptn<br>Bethesda 38 | 416<br>38 | <b>NOG NIE<br/>GEREGISTRE<br/>ER NIE</b> |  | Local Authority<br>(Khara Hais<br>Municipality) |                                  |  |  |                          | Privaatsak X6003                 | Upington               | 8800 | L |
| 19 | Ptn<br>Bethesda 38 | 336<br>38 | van der<br>Merwe                         | Schalk                                 | Orahari Three CC                                | 0823305509                       |  |  | schalk@oranjenet<br>.net | Posbus 119, P/A SWP<br>V/D Merwe | Louisvale              | 8809 | L |
| 20 | Ptn<br>Bethesda 38 | 327<br>38 | <b>NOG NIE<br/>GEREGISTRE<br/>ER NIE</b> |  |   |                                  |  |  |                          |                                  |                        |      | L |
| 21 | Ptn<br>Bethesda 38 | 337<br>38 |  |  | Gog van der Colff<br>Trust                      | 0543322901                       |  |  |                          | Posbus 1928                      | Upington               | 8800 | L |
| 22 | Ptn<br>Bethesda 38 | 400<br>38 |  |  | Gog van der Colff<br>Trust                      | 0543322901                       |  |  |                          | Posbus 1928                      | Upington               | 8800 | L |
| 23 | Ptn<br>Bethesda 38 | 240<br>38 | Kuys                                     | Christia<br>n S                        |   | 0824203800                       |  |  | iankuys@lantic.ne<br>t   | Posbus 3                         | Louisvale              | 8809 | L |

|    |                    |                |             |            |   |  |  |                               |          |      |   |
|----|--------------------|----------------|-------------|------------|---|--|--|-------------------------------|----------|------|---|
| 24 | Ptn<br>Bethesda 38 | 97<br>Bruwer   | Adamse<br>P |            | 0543323195<br>/<br>083 318<br>3177                    |  | admin@vispameu<br>bels.co.za   | Posbus 394                    | Upington | 8800 | L |
| 25 | Ptn<br>Bethesda 38 | 127<br>Kruger  | Willem<br>H | Carpe Diem | 054 332 2901<br>083383<br>8290                        |  |  | P. O. Box 1928<br>Posbus 1969 | Upington | 8800 | L |
| 26 | Ptn<br>Bethesda 38 | 46<br>Kruger   | Willem<br>H |            | 0833838290  |  |  | Posbus 1969                   | Upington | 8800 | L |
| 27 | Ptn<br>Bethesda 38 | 237<br>Strauss | Elias A     |            | 0827709536  |  | <a href="mailto:braam.strauss@scbpc.co.za">braam.strauss@scbpc.co.za</a> /<br><a href="mailto:bestrauss@mweb.co.za">bestrauss@mweb.co.za</a> | Posbus 1356                   | Kathu    | 8446 | L |
| 28 | Ptn<br>Bethesda 38 | 279<br>Malan   | Daniel J    |            | 082 354 1930<br>/<br>054331<br>1326 / 083<br>235 3520 |  |  | Posbus 2633                   | Upington | 8800 | L |

Appendix E3: Advertisement

Appendix E3.1: Advertisement Text

Appendix E3.2: Proof of Advertisement

Appendix E4: Site Notice and Locality

Appendix E4.1: Site Notice Locality

Appendix E4.2: Text and proof of site notice



Appendix E5: Proof of Notifications

Appendix E5.1.1 Proof of letters sent for dBAR

Appendix E5.1.2. Proof of letters sent for fBAR

Appendix E5.2: Notification letters sent

Appendix E 5.2.1: Notification letter sent to I&AP for official dBAR

Appendix E5.2.2: Notification letter sent to Authorities for official dBAR

Appendix E 5.2.3: Notification letter sent to I&AP for official fBAR

Appendix E 5.2.4: Notification letter sent to Authorities for official fBAR

Appendix E6: Comments Received

Appendix E6.1: Comments received on dBAR

Appendix E6.2: Comments received on fBAR



Appendix E7: Comments and Response Table

| COMMENTS ON DBAR |               |                   |             |                   |
|------------------|---------------|-------------------|-------------|-------------------|
| Date             | Comments from | Comments received | Response by | Response received |
|                  |               |                   |             |                   |
|                  |               |                   |             |                   |
|                  |               |                   |             |                   |
|                  |               |                   |             |                   |
|                  |               |                   |             |                   |
|                  |               |                   |             |                   |

## Appendix E8: Meeting minutes and attendance registers

## Appendix G: Environmental Management Programme (EMPr)



# **DRAFT CONSTRUCTION, OPERATIONAL & MAINTENANCE MANAGEMENT PROGRAMME**



## **PROPOSED AGRICULTURAL DEVELOPMENT AND ASSOCIATED INFRASTRUCTURE ON PORTIONS 238 AND 335 OF FARM BETHESDA 38, LOUISVALE.**

DENC Reference nr  
October 2019

JC Strauss Eiendomme (Pty) Ltd &  
Johan Strauss Familie Trust.

Riaan Strauss

P.O. Box 968, Uppington, 8800

Email: [riaan@it5.co.za](mailto:riaan@it5.co.za)

Cell: 082 770 1037

## CONTENTS

|     |  |    |
|-----|--|----|
| 1   | Introduction .....   | 1  |
| 2   | Environmental issues.....  | 6  |
| 2.1 | Vegetation.....  | 6  |
| 2.2 | Aquatic habitat.....   | 9  |
| 3   | Aim and Objectives of the EMPr.....  | 11 |
| 4   | Compliance with Applicable Laws.....                                       | 11 |
| 5   | Roles and Responsibilities.....  | 12 |
| 6   | Monitoring & Auditing.....   | 16 |
| 6.1 | ECO Monitoring.....  | 16 |
| 6.2 | Auditing.....  | 17 |
| 7   | Environmental auditing and monitoring schedule.....                        | 19 |
| 8   | Management Programme – Pre-construction & Construction & Operational ..... | 20 |
| 8.1 | Specific conditions as stated in EA .....                                  | 20 |
| 8.2 | Contractual obligations.....   | 20 |
| 8.3 | Penalties.....   | 20 |
| 8.4 | Methodology statement .....  | 21 |
| 8.5 | Proposed Impact Management Actions.....                                    | 24 |
|     | Appendix A: Additional Reports.....  | 52 |
|     | Appendix B: Tracking Table .....   | 53 |
|     | Appendix C: Schedule of Fines.....   | 54 |
|     | Appendix D: Method Statement Proforma.....                                 | 56 |
|     | Appendix E: Method Statement Control Sheet.....                            | 59 |
|     | Appendix F: Project map .....  | 60 |
|     | Appendix G: EAP Curriculum Vitae.....                                      | 61 |

### List of Figures

|  |           |
|--|-----------|
| <b>Figure 1: Locality .....</b>  | <b>1</b>  |
| <b>Figure 2: Proposed development area on Portions 238 and 335 of Farm Bethesda 38. ....</b> | <b>2</b>  |
| <b>Figure 3: Dam .....</b>   | <b>3</b>  |
| <b>Figure 4: Dam and Pipelines .....</b>   | <b>4</b>  |
| <b>Figure 5: Sensitivity map of the study area .....</b>                                     | <b>7</b>  |
| <b>Figure 6: Critical Biodiversity Area .....</b>  | <b>8</b>  |
| <b>Figure 7: Location of the canal and streams.....</b>                                      | <b>10</b> |
| <b>Figure 8: Reporting structure.....</b>  | <b>13</b> |

**List of abbreviations**

|           |   |
|-----------|---|
| BAR       | Basic Assessment Report   |
| CBA       | Critical Biodiversity Area  |
| DEA       | National Department of Environmental Affairs  |
| DENC      | Northern Cape: Department of Environment and Nature Conservation                                |
| DWS       | National Department of Water and Sanitation   |
| EA        | Environmental Authorisation   |
| EAP       | Environmental Assessment Practitioner   |
| ECO       | Environmental Control Officer   |
| EIA       | Environmental Impact Assessment   |
| EIS       | Ecological Importance and Sensitivity   |
| ELU       | Existing Lawful Use   |
| EMPr      | Environmental Management Programme  |
| ESA       | Ecological Support Area   |
| ERW       | Ecological Release Water  |
| EWR       | Existing Water Rights   |
| FEPA      | Fresh Water Ecosystem Priority Areas  |
| HWC       | Heritage Western Cape   |
| &AP's     | Interested and Affected Parties   |
| MAR       | Mean Annual Run-off   |
| MMP       | Maintenance Management Plan   |
| NFEPA     | National Freshwater Ecology Priority Areas  |
| NEMA      | National Environmental Management Act, 1998 (Act No. 107 of 1998)                               |
| NEM: AQA  | National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004)                   |
| NEM: ICMA | National Environmental Management: Integrated Coastal Management Act, 2008 (Act No. 24 of 2008) |
| NEM: WA   | National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)                         |
| NHRA      | National Heritage Resources Act, 1999 (Act No. 25 of 1999)                                      |
| PA        | Protected Area  |

|        |   |
|--------|---|
| PES    | Present Ecological Status                     |
| PPP    | Public Participation Process                  |
| RE     | Resident Engineer                             |
| RP     | Responsible Person                            |
| SANBI  | South African National Biodiversity Institute |
| V&V    | Validation and Verification                   |
| WCBSBP | Western Cape Biodiversity Spatial Plan        |
| WMA    | Water Management Area                         |
| WULA   | Water Use Licence Application                 |
| WUL    | Water Use License                             |

### Definitions

*Alien species* - Plants and animals which do not arrive naturally in an area - they are brought in by humans. Alien plants often force indigenous species out of the area. Rooikrans is a good example of alien species in the Cape.

*Alternative* - A possible course of action, in place of another, that would meet the same purpose and need defined by the development proposal. Alternatives considered in the EIA process can include location and/or routing alternatives, layout alternatives, process and/or design alternatives, scheduling alternatives or input alternatives.

*Aspect* – Element of an organisation’s activities, products or services that can interact with the environment.

*Auditing* - A systematic, documented, periodic and objective evaluation of how well the environmental management programme is performing with the aim of helping to safeguard the environment by facilitating management control which would include meeting regulatory requirements. Results of the audit help the organisation to improve its environmental policies and management systems.

*Biodiversity* - The rich variety of plants and animals that live in their own environment. Fynbos is a good example of rich biodiversity in the Cape.

*Built environment* - Physical surroundings created by human activity, e.g. buildings, houses, roads, bridges and harbours.

*Conservation* - Protecting, using and saving resources wisely, especially the biodiversity found in an area.

*Construction site, working area or Site* - means any area within the boundaries of the property(ies) where construction is taking place.

*Contamination* - Polluting or making something impure.

*Corrective (or remedial) action* - Response required to address an environmental problem that is in conflict with the requirements of the EMPr. The need for corrective action shall be determined through monitoring, audits or management review.

*Degradation* - The lowering of the quality of the environment through human activities, e.g. river degradation, soil degradation.

*Ecology* - The scientific study of the relationship between living things (animals, plants and humans) and their environment.

*Ecosystem* - The relationship and interaction between plants, animals and the non-living environment.

*Environment* - Our surroundings, including living and non-living elements, e.g. land, soil, plants, animals, air, water and humans. The environment also refers to our social and economic surroundings, and our effect on our surroundings.

*Environmental Impact Assessment (EIA)* - An Environmental Impact Assessment (EIA) refers to the process of identifying, predicting and assessing the potential positive and negative social, economic and biophysical impacts of a proposed development. The EIA includes an evaluation of alternatives; recommendations for appropriate management actions for minimising or avoiding negative impacts and for enhancing positive impacts; as well as proposed monitoring measures.

*Environmental Management System (EMS)* - Environmental Management Systems (EMS) provide guidance on how to manage the environmental impacts of activities, products and services. They detail the organisational structure, responsibilities, practices, procedures, processes and resources for environmental management. The ISO14001 EMS standard has been developed by the International Standards Organisation.

*Environmental policy* - Statement of intent and principles in relation to overall environmental performance, providing a framework for the setting of objectives and targets.

For the purposes of this Specification the following definitions shall apply (please note some definitions may not apply to this EMP):

*Fynbos* - Low-growing and evergreen vegetation found only in the south Western Cape. Fynbos is known for its rich biodiversity.

*Habitat* - The physical environment that is home to plants and animals in an area, and where they live, feed and reproduce.

*Hazardous waste* - Waste, even in small amounts, that can cause damage to plants, animals, their habitat and the well-being of human beings, e.g. waste from factories, detergents, pesticides, hydrocarbons, etc.

*Impact* - A description of the potential effect or consequence of an aspect of the development on a specified component of the biophysical, social or economic environment within a defined time and space.

*Indigenous species* - Plants and animals that are naturally found in an area.

*Infrastructure* - The network of facilities and services that are needed for economic activities, e.g. roads, electricity, water, sewerage.

*Integrated* - Mixing or combining all useful information and factors into a joint or unified whole.



*Integrated Environmental Management (IEM)* - A way of managing the environment by including environmental factors in all stages of development. This includes thinking about physical, social, cultural and economic factors and consulting with all the people affected by the proposed developments. Also called "IEM".

*Land use* - The use of land for human activities, e.g. residential, commercial, industrial use.

*Mitigation* - Measures designed to avoid, reduce or remedy adverse impacts

*Natural environment* - Our physical surroundings, including plants and animals, when they are unspoiled by human activities.

*No-Go area*- means any area where no access is allowed.

*Over-utilisation* - Over-using resources - this affects their future use and the environment.

*Policy* - A set of aims, guidelines and procedures to help you make decisions and manage an organisation or structure. Policies are based on people's values and goals. See Integrated Metropolitan Environmental Policy.

*Process* - Development usually happens through a process - a number of planned steps or stages.

*Proponent* – Developer. Entity which applies for environmental approval and is ultimately accountable for compliance to conditions stipulated in the Environmental authorisation (EA) and requirements of the EMPr.

*Recycling* - Collecting, cleaning and re-using materials.

*Refuse*- refers to all solid waste, including construction debris (cement bags, wrapping materials), waste and surplus food, food packaging, organic waste etc.

*Resources* - Parts of our natural environment that we use and protect, e.g. land, forests, water, wildlife, and minerals.

*Scoping Report* - A report presenting the findings of the scoping phase of the EIA. This report is primarily aimed at reaching closure on the issues and alternatives to be addressed in the EIA (in the case of a full EIA process).

See Integrated Environmental Management.

*Stakeholders* - A subgroup of the public whose interests may be positively or negatively affected by a proposal or activity and/or who are concerned with a proposal or activity and its consequences. The term includes the proponent, authorities and all interested and affected parties.

*Storm water management* – Strategies implemented to control the surface flow of storm water such that erosion, sedimentation and pollution of surface and ground water resources in the immediate and surrounding environments are mitigated. This is specifically important during the construction and decommissioning phases of a project.

*Sustainability* - Being able to meet the needs of present and future resources.

*Sustainable development* - Development that is planned to meet the needs of present and future generations, e.g. the need for basic environmental, social and economic services. Sustainable development includes using and maintaining resources responsibly.

*Waste Management* – Classifying, recycling, treatment and disposal of waste generated during construction and decommissioning activities.

*Wetlands* - An area of land with water mostly at or near the surface, resulting in a waterlogged habitat containing characteristic vegetation species and soil types e.g. vlei's, swamps.

*Zoning* - The control of land use by only allowing specific type development in fixed areas or zones.

**Requirements as stated in GN 982 Environmental Impact Assessment Regulations, 2014, Appendix 4 and corresponding section**

| Requirement  | Section   |
|--|---|
| 1. (1) An EMPr must comply with section 24N of the Act and include-  |   |
| (a) details of<br>(i) the EAP who prepared the EMPr; and<br>(ii) the expertise of that EAP to prepare an EMPr, including a curriculum vitae;   | Details of EAP, page 10<br>Appendix G: EAP Curriculum Vitae, page 61  |
| (b) a detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;   | Environmental auditing and monitoring schedule included on page 19  |
| (c) a map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that any areas that should be avoided, including buffers;   | Appendix F: Project map, page 60  |
| d) a description of the impact management objectives, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including-<br>(i) planning and design;<br>(ii) pre-construction activities;<br>(iii) construction activities;<br>(iv) rehabilitation of the environment after construction and where applicable post closure; and<br>(v) where relevant, operation activities; | Aim and Objectives of the EMPr, page 11<br>Mitigation measures and management actions included in page 20.  |
| e) a description and identification of impact management outcomes required for the aspects contemplated in paragraph (d);  | Proposed Impact Management Actions refers to the outcomes in the table on page 24.  |
| (f) a description of proposed impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraphs (d) and<br>(e) will be achieved, and must, where applicable, include actions to –<br>(i) avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;<br>(ii) comply with any prescribed environmental  | Mitigation measures and management actions included in page 24.<br><br>Further detail with regards to the Compliance with Applicable Laws on page 11. |

|  |  |
|--|--|
| management standards or practices;<br>(iii) comply with any applicable provisions of the Act regarding closure, where applicable; and<br>(iv) comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable;   |  |
| (g) the method of monitoring the implementation of the impact management actions contemplated in paragraph (f);  | Mitigation measures and management actions included in page 24. Monitoring & Auditing on page 16.  |
| (h) the frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);   | Monitoring & Auditing on page 16. Frequency etc included in table in Proposed Impact Management Actions on page 24.  |
| (i) an indication of the persons who will be responsible for the implementation of the impact management actions;  | Aim and Objectives of the EMPr, page 11<br>Compliance with Applicable Laws, page 11.<br>Roles and Responsibilities on page 12.   |
| (j) the time periods within which the impact management actions contemplated in paragraph (f) must be implemented;   | Proposed Impact Management Actions includes the expected time management on page 24.   |
| (k) the mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);  | Proposed Impact Management Actions includes the mechanism for monitoring and compliance on page 24. The Monitoring & Auditing on page 16.  |
| (l) a program for reporting on compliance, taking into account the requirements as prescribed by the Regulations;  | Monitoring & Auditing refers to reporting on compliance on page 16 This is also outlined in section Management Programme – Pre-construction & Construction & Operational on page 20. |
| m) an environmental awareness plan describing the manner in which-<br>(i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and<br>(ii) risks must be dealt with in order to avoid pollution or the degradation of the environment; and | This is included under page 19.  |
| (n) any specific information that may be required by the competent authority   | Appendix G.  |

**Details of EAP**

|   |   |                    |
|---|---|--------------------|
| Company of Environmental Assessment Practitioner (EAP): | Pieter Badenhorst Professional Service cc   |                    |
| EAP name:   | Elanie Kühn   |                    |
| Postal address:   | P. O. Box 1058  |                    |
|   | Wellington  | Postal code: 7655  |
| Telephone:  | 021 873 7228  | Cell: 076 584 0822 |
| E-mail:   | elaniem@iafrica.com   | Fax: 086 672 1946  |
| EAP Qualifications:                                     | <p>Pieter Badenhorst - 43 years' experience (16 @ CSIR) in environmental management; report writing; project management; facilitation also including preparing of EMPr's</p> <p>Elanie Kühn – BSc Hons. in Environmental Management, 13 years' experience in environmental management and water use license applications etc.</p> |                    |
| EAP Registrations/Associations:                         | <p>Pieter -IAIAsa, Pr Eng, SAICE</p> <p>Elanie - IAIAsa</p>   |                    |

## 1 Introduction

### BACKGROUND, LOCALITY AND PROJECT DESCRIPTION

The proposed properties on which the agricultural activities will take place is situated on Portions 238 and 335 of Farm Bethesda 38 in the Louisvale area just outside of Upington within the Northern Cape. It is located in the ZF Mgcawu District Municipality. The farm lies west of the Orange River, and North of Louisvale (see Figure 1).

Access to the farm is via the R359 and it is approximately 3km South-West from Louisvale. Portion 335 of Farm 38 is owned by Johan Strauss Familie Trust and Portion 238 of Farm 38 is owned by J.C. Strauss Eiendomme (Pty) Ltd and both properties are zoned as Agriculture.

The applicant has appointed PBPS as the independent consultant to undertake the Environmental process.

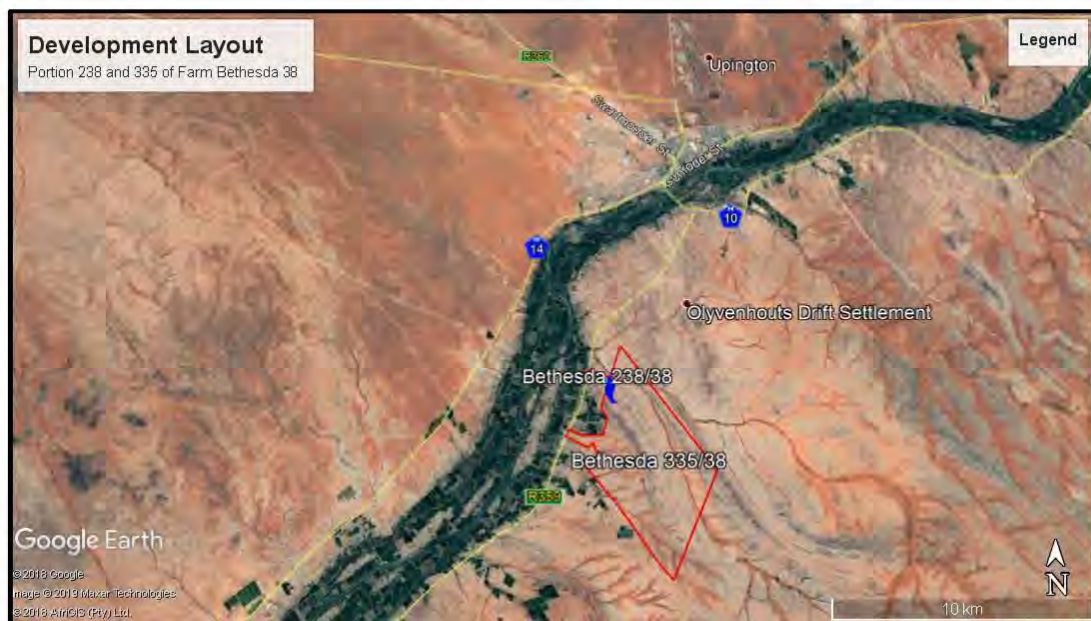


Figure 1: Locality

#### **Proposed Development:**

The proposed development is to establish an agricultural area for the cultivation of vineyards on Portion 335 of Farm 38. The development further includes a small storage dam and pipeline for irrigation on Portion 238 on Farm 38 (see Figure 2 **Error! Reference source not found.**), to provide water for the agricultural area. The development will consist of the following:

1. The proposed 13.4 ha vineyard development area that will cross the small streams (green polygon);
2. A small storage dam, with a capacity of approximately 4000 m<sup>3</sup>, covers an area of 1500 m<sup>2</sup> and has a wall height of 4.9m (pink polygon); and
3. Pipelines – Construction of 838 m pipeline with a diameter of 315 mm to be installed (light

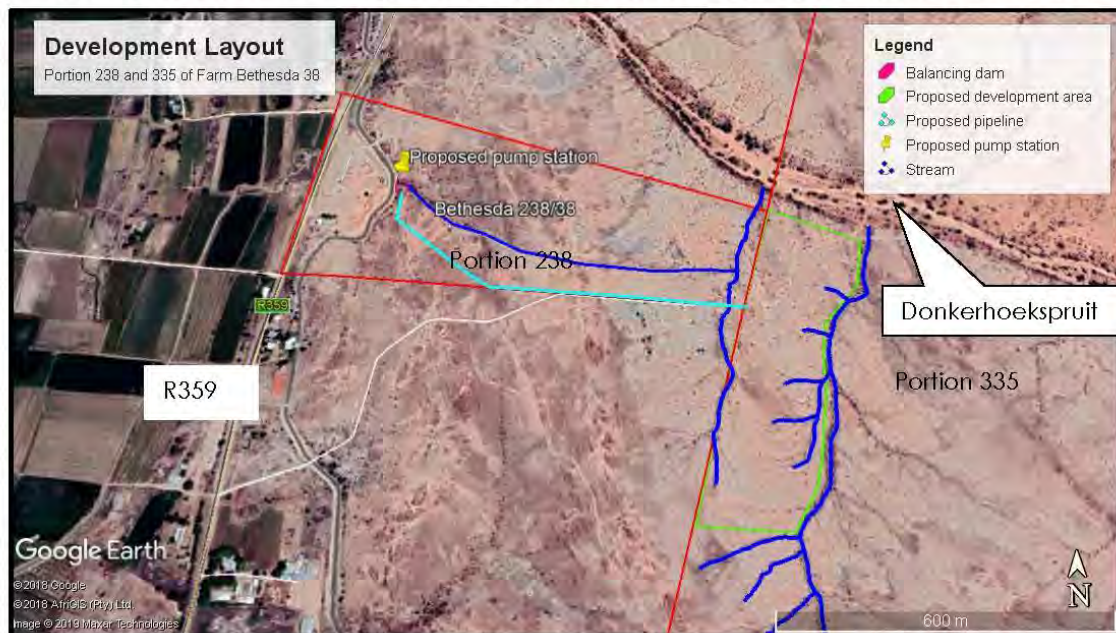
blue line).

**Table 1: Property details**

| Property details                | Property size | SG 21-digit codes     | Ha of proposed new development area       |
|---------------------------------|---------------|-----------------------|---|
| Portion 238 on Farm Bethesda 38 | 34.7 ha       | C03600000000003800238 | Dam: 940 m <sup>2</sup><br>Pipeline: 838m |
| Portion 335 of Farm Bethesda 38 | 2544 ha       | C03600000000003800335 | 13.4 ha vineyards                         |

**1. Proposed agricultural development**

The proposal is therefore to clear an area of 13.4ha covered with indigenous vegetation, with small streams to develop vineyards for agricultural use. All proposed cultivation areas have existing access (see Figure 2 and Figure 3 **Error! Reference source not found.** for more detail).



**Figure 2: Proposed development area on Portions 238 and 335 of Farm Bethesda 38.**

**2. Dam:**

The proposed dam is a small balancing dam. Water will be abstracted directly from the canal and pumped into the small dam (Figure 3 and Figure 4), from where it will be distributed to the vineyards via the proposed pipeline as described below. The dam will have the following dimensions:

- Wall length 30m
- Wall breadth 3m
- Wall height 4.9m
- Cover an area of 1000m<sup>2</sup>

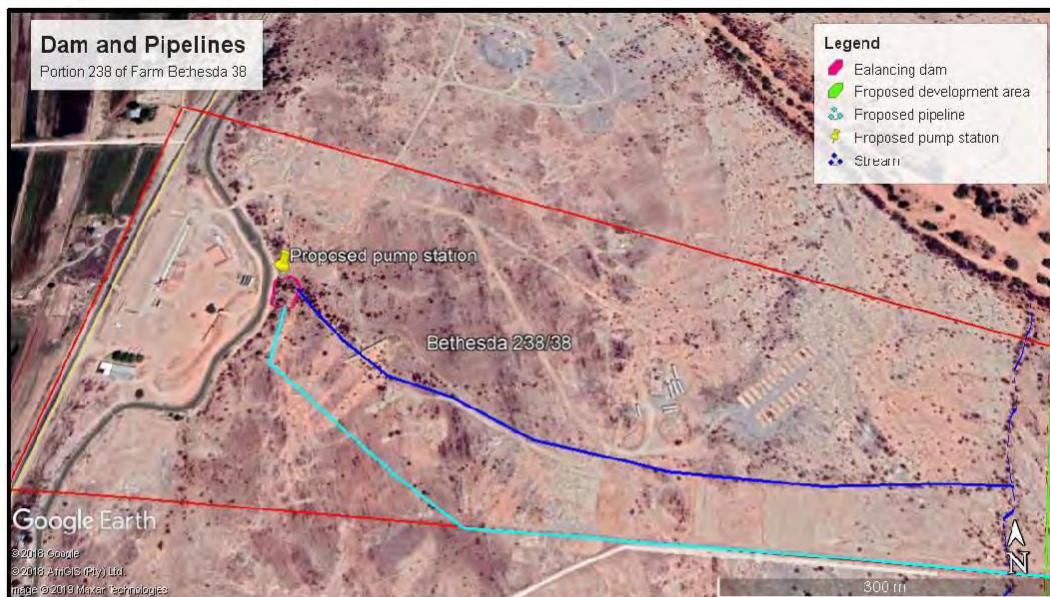
- Capacity of 4000m<sup>3</sup>



Figure 3: Dam

3. Pipelines:

Pipelines (315mm diameter and 838 m total length) will be built on Portion 238 of Farm Bethesda no 38. The water will be extracted from an existing canal (adjacent to the small dam), located at the blue dropped pin marked "Pump station" in **Error! Reference source not found.** The water will then be fed to the neighbouring farm (Portion 335 of farm 38), where it will be utilised for irrigation purposes.





**Figure 4: Dam and Pipelines**

**ADDITIONAL INFORMATION:**

**Electricity:**

An existing Eskom overhead line runs through the property and the proposed agricultural development areas. Existing electrical connections will be used. No additional electricity necessary.

Water use rights:

**Access:**

Access to Portion 238 of Farm Bethesda 38 is via the R359. Access to Portion 335 of Farm Bethesda 38 is via a gravel road across Portion 238 Farm Bethesda 38.

**WATER USE LICENSE APPLICATION INCLUDING - EXISTING LAWFUL  
WATER USE & AGRICULTURAL ACTIVITIES ON THE PROPERTY**

The property has existing water use rights allocated for approximately 10ha (150 000m<sup>3</sup>/a) from the Louisvale Water Users Association. A water Use License Application will be lodged with the Department of Water and Sanitation in Upington for the following activities:

1. 21 c and i for agricultural development across streams, development of a dam in the stream and pipeline crossing the streams
2. 21 b for the storage of water taken from a resource

Find the Water Use License Application will be submitted.

This document is a requirement for environmental authorization (EA) to be attached at Appendix A. All mitigation measures included in the EA will be inserted into Appendix C. On approval by DEA&DP the developer must ensure that its conditions are implemented by making the document available to the contractor and also ensure that an ECO or the Resident Engineer are appointed, and systems are in place to evaluate compliance. The contractor(s) is expected to familiarise himself with the contents of this document and to implement its conditions.

Overall the EMPr will aim to:

- Control the construction and operational activities in such a way that negative impacts on the physical environment, sensitive areas and surrounding residential areas are prevented or minimised.
- Ensure that mitigation and rehabilitation measures are implemented where required.

Please note that this document does not replace any other regulations, laws and bylaws that the contractor must adhere to. It specifically does not replace the regulations of the Occupational Health and Safety act of 1993 (Act No. 85 of 1993).

Funding for the implementation of the Construction EMPr is the financial responsibility of the developer.

The project environmental issues are shown in section 2 with the construction EMPr in section 3 and the operational EMPr in section 4.

## 2 Environmental issues

No significant biophysical impacts are anticipated as the environment has been degraded due to agricultural activities in the surrounding area.

### 2.1 Vegetation

#### **VEGETATION AND FAUNA (AS PER FRESHWATER OPINION AND BOTANICAL OPINION, INCLUDED IN DBAR)**

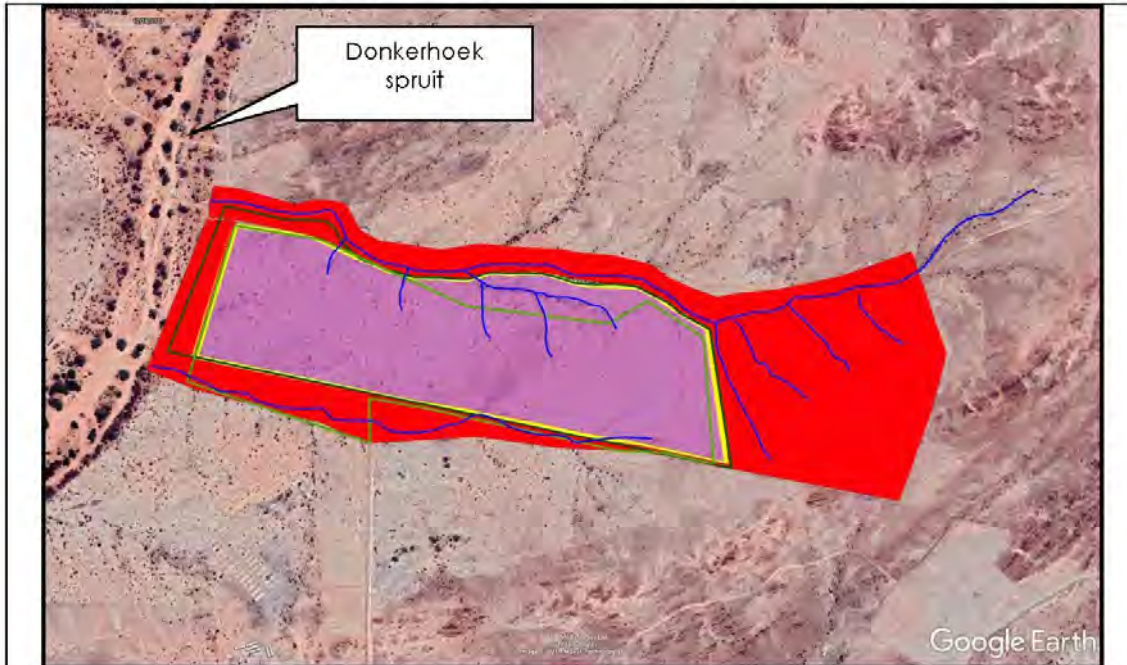
The entire Bethesda Farm study area falls within an extensive vegetation unit that was mapped by Mucina et al. (2005) and SANBI (2012) as Bushmanland Arid Grassland. It is widespread in the Bushmanland Bioregion and has a Least Threatened conservation status (Government Gazette, 2011; Driver et al. 2012). This vegetation type is characteristically dominated by ‘white grasses’ in the genus *Stipagrostis* but also has a complement of low shrubs.

The vegetation in essence is a low, open grassy shrubland with emergent small trees. The drainage lines that have a higher concentration of black thorn trees (*Vachellia mellifera subsp. detinens*) would be buffered and would not be directly impacted by agricultural development.

Only one specimen of *Aloe gariensis* (Orange River aloe) was found but numerous clusters of *Aloe claviflora* (cannon aloe) occur, mainly in the southern part of the study area. These species are protected.

A number of small trees of *Boscia foetida* were found and recorded. However, significantly no protected *Boscia albitrunca* (shepherd’s tree) trees were found. In addition, no protected *Vachellia erioloba* (camel thorn) trees were recorded since the substrate is not suitable for them.

The vegetation does not display a high level of sensitivity over most of the site, but the southern part is rocky, with exposed bedrock, and this area is ecologically sensitive, with many niches resulting in high plant species richness. The southern part of the area investigated should therefore be avoided and not disturbed. A sensitivity map is given in Figure 5, showing that the ‘central’ part of the area investigated (shaded pink) would be acceptable for cultivation whereas the boundary zone should be avoided, and the Donkerhoekspruit buffered by 32 m.



**Figure 5: Sensitivity map of the study area**

Sensitivity map of the study area with the pink area being an area of low sensitivity. The zone between the pink area and the outer (red) boundary is considered to have moderate to high sensitivity. The dark green boundary indicates the Alternative 1 (Alternative 2 according to BAR) development area; the light-green boundary indicates the Alternative 2 (Alternative 3 according to BAR) development area and the yellow boundary indicates the Alternative 3 (Alternative 1, preferred, according to BAR) development area. (Note the orientation of the image with North to the left). Refer to the Botanical Assessment Report included in the BAR.

Critical biodiversity areas and ecological support areas have been mapped for the whole of the Northern Cape Province including the ZF Mgcawu District Municipality where Louisvale is located.

The available CBA shapefiles (Enrico Oosthuysen pers. comm.) for the Northern Cape Province were overlaid on Google Earth™ which allowed determination of the CBA classification of the area around Louisvale. The study area on farm Bethesda 238 & 335 is located in an area classified as CBA2 (**Error! Reference source not found.**).



**Figure 6: Critical Biodiversity Area**

Mitigation:

Proposed mitigation:

- (1) Avoidance of seasonal drainage lines (accepting that those within the development area would be lost); the drainage lines outside the development area must be buffered by at least 32 m.
- (2) Search and rescue of all *Aloe gariepensis* and *Aloe claviflora* plants.
- (3) Search and rescue of *Ledebouria sp.* – a perennial geophyte.

Indirect impacts:

By definition indirect impacts occur away from the 'action source' i.e. away from the development site. The impact assessed here is specifically how the proposed agricultural development would have an indirect impact on vegetation and flora away from the development site. No indirect impacts were identified.

Cumulative impacts

The receiving environment into which the proposed agricultural development would be imposed is not altered but in terms of the great extent of Bushmanland Arid Grassland the cumulative impact would be very small. It would not lead to irreversible loss of resources and even though it would be located in an area designated as a CBA2, it would not result in the national conservation target not being met. Consequently, the cumulative impacts would be Low Negative.

General Assessment and Recommendations:

A single vegetation type, Bushmanland Arid Grassland, occurs in the study area. It is generally not sensitive, but the site harbours protected species (aloes and geophytes) that would need to be relocated to safe sites prior to development.

No protected trees such as *Boscia albitrunca* (Shepherd's tree) and *Vachellia erioloba* (camel thorn) were found in the study area.

It is strongly recommended that the seasonal drainage lines should be buffered and that no agricultural development takes place that would affect them.

The assessment of impacts together with the desired area proposed for cultivation taken together indicate that it would be optimal to apply Alternative 3 since this would be the best compromise to ensure protection of the watercourses while offering adequate area for cultivation.

The impact of Alternative 3 can be mitigated from Medium negative to Low negative by relocating the protected plant species.

Cumulative impacts would be Low negative at the most and even as low as Very low negative since Bushmanland Arid Grassland is not threatened in any way and is unlikely to be threatened in the future since it is very widespread.

Buffering of the drainage lines and Search & Rescue of protected plants and geophytes must be a condition of environmental authorisation.

Conclusions:

Vineyards have been successfully established in the Louisvale area under irrigation and the proposed agricultural development would not likely encounter any problems. The short, cold winters (when the vines need to go into complete dormancy) and long, hot summers are ideal for this type of agriculture. In general, therefore, the site proposed for the vineyard is suitable for this purpose.

Despite the chosen area being within a CBA2, from a botanical perspective it is suitable, acceptable and is supported as developable as long as the recommended mitigation measures are applied.

**2.2 Aquatic habitat**AQUATIC FEATURES

The proposed development falls within the Lower Orange River Water Management area, within the D73F quaternary catchment area. The Portion 238 and 355 of Farm Bethesda 38 is located in a sub-catchment of a stream locally known as the Donkerhoekspruit, see Figure 7. The Donkerhoekspruit is not really a river, but more fits the description of a mostly dry drainage line. Most of the drainage lines in the area have been straightened and engineered into ditches for

least flow resistance and optimal drainage. However, the Donkerhoekspruit has escaped this and it still in a morphologically natural state. The impact is local, on the spot where the drainage lines are diverted. It is not foreseen that that the current impact or the planting of the envisaged additional vineyard would make a noticeable hydrological difference to the existing situation in the Donkerhoekspruit or the Orange River.

A canal is present on a section of the development site (where the dam is to be built on Portion 238 and from which water will be supplied for irrigation purposes). A pipeline (indicated in the light blue line in Figure 7) will run from the dam towards the vineyard development area from where it will intersect a dried up stream on Portion 238. A few dry streams on the vineyard development area (on Portion 335) will also be impeded.

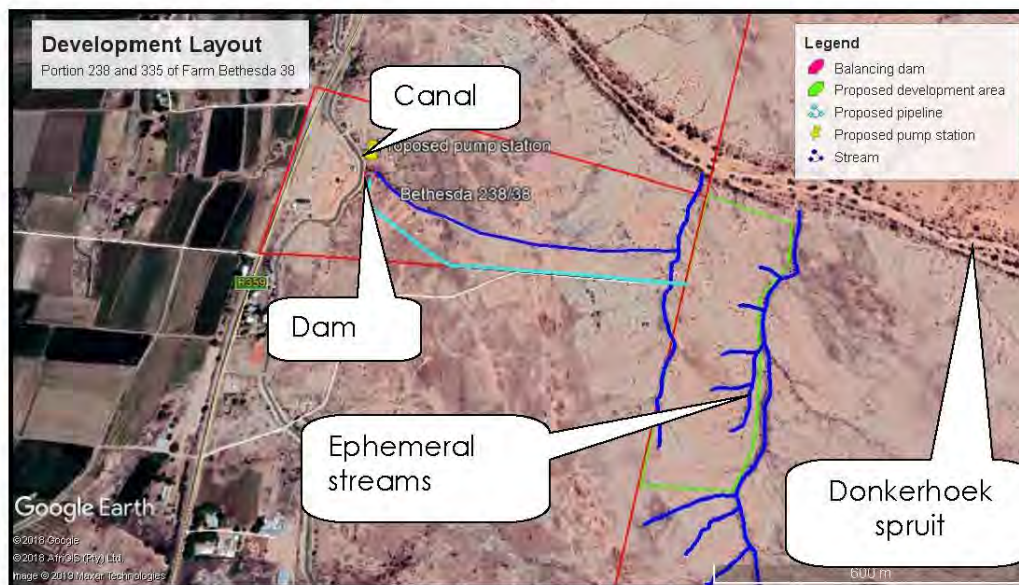


Figure 7: Location of the canal and streams.

#### ARCHAEOLOGY AND PALAEOLOGY

The following is taken from the Archaeological Assessment:

##### *Impact statement*

Overall, the results of the study indicate that the proposed activity (i. e. the cultivation of vineyards) and associated activities (i. e. a storage reservoir, pump station & water pipeline), will not have an impact of great significance on the archaeological heritage, as these are expected to be limited. Therefore, there are no objections to the authorization of the proposed development.

##### *Conclusion*

The study has captured a good record of the archaeological heritage present on the proposed development site, which have been graded as having *low* (Grade 3C) significance.

**Recommendations**

1. No archaeological mitigation is required.
2. Should any unmarked human burials/remains or ostrich eggshell water flask caches be uncovered, or exposed during preparation of the lands for cultivation, , these must immediately be reported to the archaeologist (Jonathan Kaplan 082 321 0172), or the South African Heritage Resources Agency (Ms Natasha Higgitt' 021 462 4502). Burials, etc. must not be removed or disturbed until inspected by the archaeologist. “

The following is taken from the Paleontological Assessment, included in the BAR:

“Given the low palaeontological sensitivity, small area and disturbed character of the study area, it is concluded that the proposed Louisvale agricultural development is very unlikely to have significant impacts on local palaeontological heritage resources.

It is therefore recommended that, pending the discovery of significant new fossils remains before or during development, exemption from further specialist palaeontological studies and mitigation be granted for the proposed agricultural development on Farm Bethesda 38 near Upington, Northern Cape.”

### 3 Aim and Objectives of the EMPr

The aim of the EMPr is to:

- Identify those construction activities identified for the proposed project that may have a negative impact on the environment;
- Outline the mitigation measures that will need to be taken and the steps necessary for their implementation; and,
- Describe the reporting system to be undertaken during construction.

The objectives of the EMPr are to:

- Identify a range of mitigation measures which shall reduce and mitigate the potential adverse impacts to minimal or insignificant levels;
- Provide a pro-active and practical working mechanism to enable the measurement and monitoring of environmental performance on site; and,
- Ensure that the environmental specifications are identified, effective and contractually binding to enable compliance on site.

### 4 Compliance with Applicable Laws

The supreme law of the land is “The Constitution of the Republic of South Africa”, which states: *“Every person shall have the right to an environment which is not detrimental to his or her health or well-being”*.

Laws applicable to protection of the environment in terms of Environmental Management (and relating to construction activities) include but are not restricted to:

- National Environmental Management Act, No. 107 of 1998



- National Environmental Management: Air Quality Act (AQA), No. 39 of 2004
- National Environmental Management: Biodiversity Act, No. 10 of 2004
- National Environmental Management: Waste Act, No. 59 of 2008
- National Heritage Resources Act, No. 25 of 1999
- National Water Act, No 36 of 1998 and amendments
- National Veld and Forest Fire Act, No 101 of 1998
- Occupational Health and Safety Act, No 85 of 1993
- Soil Conservation Act, Act No 76 of 1969
- Sub-division of Agricultural Land Act Repeal Act 64 of 1998 (re: soil conservation) and all regulations framed there under and amendments there to.

Of particular importance is Section 28 (1) of the National Environmental Management Act (NEMA – Act 107 of 1998) which places an obligation on all individuals to take due care of the environment and to ensure remedial action is instituted to minimise and mitigate environmental impact.

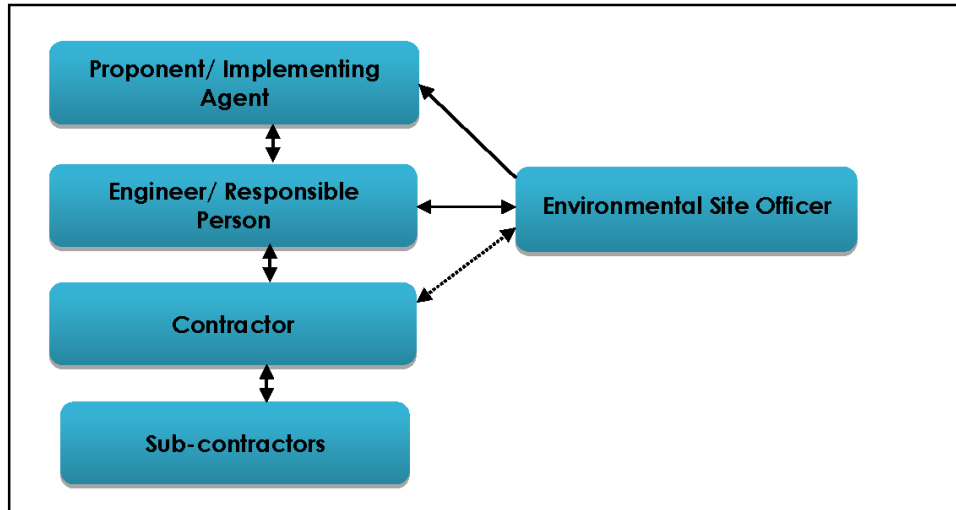
The EMPr forms part of the Contract Documentation and is thus a legally binding document. In terms of this Act an individual responsible for environmental damage must pay costs both to environment and human health and the preventative measures to reduce or prevent additional pollution and/or environmental damage from occurring. This is referred to as the Polluter Pays Principle.

## 5 Roles and Responsibilities

The key role players during maintenance work are anticipated to be as follows:

- Applicant (Holder of the EA) – JC Strauss Eiendomme (PTY) Ltd
- Engineer / Responsible Person (RP), who will oversee the activities of the contractors on site;
- Environmental Control Officer (ECO);
- Contractors responsible for the maintenance and repair activities; and
- Any sub-contractors hired by the contractor.

The anticipated management structure (organogram) is presented in Figure 8 below and shows the proposed lines of communication for maintenance activities. The applicant retains overall responsibility for maintenance and the implementation of the EMPr.



**Figure 8: Reporting structure**

Key roles and responsibilities with respect to the implementation of the EMPr is outlined below.

**Applicant – JC Strauss Eiendomme (PTY) Ltd:**

The applicant (through their Implementing Agent if applicable) has overall responsibility for management of maintenance activities. In terms of environmental management, the proponent will:

- Appoint suitably experienced Engineers, if required, who will be responsible for the overall management of activities on site;
- Identify any activities not covered by the scope of this EMPr, and determine the need for, and where required, obtain relevant authorisations;
- Ensure that the Engineers are aware of the requirements of the EMPr, implement the EMPr and monitor the Contractor's activities on site;
- Ensure that the Contractor is aware of and contractually bound to the provisions of this EMPr by including the relevant environmental management requirements in tender and contract documents, as appropriate;
- Appoint a suitably qualified and experienced ECO to oversee environmental management of the required works;
- Ensure that the Contractor remedies environmental problems timeously and to the satisfaction of the Engineer and authorities (when necessary); and

**Responsible Person:**

The applicant will appoint suitably qualified Engineers (if necessary), who in turn will designate a responsible person (RP) to oversee activities of the Contractor. This role will be fulfilled either by the Resident Engineer or a suitably qualified representative of the applicant, if applicable. The RP shall:

- Ensure that the Contractor is duly informed of the EMPr and associated responsibilities and implications of this EMPr prior to commencement of construction and maintenance activities;
- Identify the need for, and request/provide Method Statements for future maintenance and repair works;
- Monitor the Contractor's activities regarding the requirements outlined in the EMPr;
- Report any environmental emergencies/concerns to the applicant immediately; and

**Environmental Control Officer:**

The ECO shall be a suitably qualified/experienced environmental professional or professional firm, appointed by the proponent, for the duration of repair or maintenance works. The ECO shall:

- Request Method Statements from the Contractor prior to the start of relevant activities, where required, and approve these (as appropriate) without causing undue delay;
- Monitor, review and verify compliance with the EMPr by the main Contractor, as well as any sub-contractors and specialist contractors;
- Undertake site inspections at least twice a month to determine compliance with the EMPr;
- Identify areas of non-compliance and recommend corrective actions (measures) to rectify them in consultation with the applicant, the RP and the Contractor, as required;
- Compile a checklist highlighting areas of non-compliance following each ECO inspection;
- Ensure follow-up and resolution of all non-compliances;
- Provide feedback for continual improvement in environmental performance;
- Respond to changes in project implementation or unanticipated activities which are not addressed in the EMP, and which could potentially have environmental impacts, and advise the applicant, the RP and Contractor as required; and
- Act as a point of contact for local residents and community members.

**Contractor:**

The Contractor will be required to appoint or designate a Contractor's Environmental Representative (CER) who will assume responsibility for the Contractor's environmental management requirements on site and be the point of contact between the Contractor, the ECO and the RP. The CER shall:

- Ensure that all activities on site are undertaken in accordance with the EMPr and /or an approved Method Statement which applicable;
- Monitor the Contractor's activities with regard to the requirements outlined in the EMPr;
- Ensure that all employees and Sub-contractors comply with the EMPr;
- Immediately notify the RP and ECO of any non-compliance with the EMPr, or any other issues of environmental concern; and
- Ensure that non-compliance is remedied timeously and to the satisfaction of the RP and ECO.

The Contractor has a duty to demonstrate respect and care for the environment. The Contractor will be responsible for the cost of rehabilitation of any environmental damage that may result from non-compliance with the EMPr, environmental regulations and relevant legislation.

**Sub-contractors:**

All Sub-contractors will be required to:

- Ensure that all employees are duly informed of the EMPr and associated responsibilities and implications of this EMPr prior to maintenance activities;
- Ensure that all activities on site are undertaken in accordance with the EMPr;
- Monitor employees' activities with regard to the requirements outlined in the EMPr;
- Immediately notify the RP and ECO of any non-compliance with the EMPr, or any other issues of environmental concern; and
- Ensure that non-compliance is remedied timeously and to the satisfaction of the RP and ECO.

The Sub-contractor has a duty to demonstrate respect and care for the environment. The Sub-contractor will be responsible for the cost of rehabilitation of any environmental damage that may result from non-compliance with the EMPr, environmental regulations and relevant legislation, resulting from their presence on site.

## 6 Monitoring & Auditing

### 6.1 ECO Monitoring

The holder of the E.A. must appoint a suitably experienced environmental control officer ("ECO"), for the duration of the construction and rehabilitation phases of implementation.

The ECO must-

- be appointed prior to commencement of any vegetation clearing or construction activities commencing;
- ensure compliance with the EMPr and the conditions contained herein;
- keep record of all activities on site; problems identified; transgressions noted and task schedule of tasks undertaken by the ECO;
- Remain employed until all rehabilitation measures, as required for implementation due to construction damage, are completed and the site is ready for operation.

An Environmental Control Officer (ECO) will implement and monitor environmental control of the development. The ECO duties will be as follows:

- Ensure implementation and monitoring of the EMPr.
- Make changes to the EMPr as required.
- Visit the site prior to the commencement of activities, to ensure that the correct method statements are prepared. The site must be visited within 10 days after the commencement of activities, and once a month thereafter.
- Prepare ECO site visit reports as required by mitigation measures or by the EA.
- Maintain a photographic record of the work and environmental issues.
- The ECO visits must take place: 1) prior to construction and site clearing, 2) monthly after construction has commenced and 3) 6 months after completion of construction.
- Site visit reports must be compiled which includes photographic evidence and recommendations. The report must be made available to the contractor, applicant and applicable authorities.
- An Audit report must be compiled within 6 months after completion of construction.

A copy of the Environmental Authorisation, EMPr, any independent assessments of financial provision for rehabilitation and environmental liability, closure plans, audit reports and compliance monitoring reports must be kept at the site of the authorised activities.

Access to the site referred to in Section C must be granted, and the environmental reports mentioned above must be produced, to any authorised official representing the Competent Authority who requests to see it for the purposes of assessing and/or monitoring compliance with the conditions contained herein.

The ECO will maintain a file containing the following:

- 1) Copy of the EMPr
- 2) Methodology statement(s) by the contractor(s)
- 3) Site establishment plan
- 4) Letter from contractor(s) indicating that he has familiarised himself with the contents of the EMPr.
- 5) Letter from contractor(s) on environmental awareness training
- 6) The applicant must ensure that complaints received by the farm are documented.
- 7) The contractor shall maintain a copy of the following documents on-site:
  - Operational Plan;
  - Emergency response and remedial action plan;
  - Environmental Management Programme (EMPr) and other documents related to the operation on file.
- 8) Tracking table (see Appendix B).
- 9) Method Statements (See Appendix E and F).

## 6.2 Auditing

The holder must, for the period during which the environmental authorisation and EMPr remain valid-

- ensure the compliance with the conditions of the environmental authorisation and the EMPr, is audited;
- An Audit report must be compiled within 6 months after completion of construction.
- During the operational phase, the holder must ensure that environmental audit(s) are performed and submitted as outlined in the Environmental Authorisation. During the operational phase the frequency of the auditing of compliance with the conditions of the environmental authorisation and of compliance with the EMPr shall not exceed intervals of 5 years;
- the environmental audit report must be prepared and submitted to the Competent Authority, by an independent person with the relevant environmental auditing expertise;
- The Environmental Audit Report, must-
  - a. provide verifiable findings, in a structured and systematic manner, on-
    - i. the level of compliance with the conditions of the environmental authorisation and the EMPr and whether this is sufficient or not; and
    - ii. The ability of the measures contained in the EMPr to sufficiently provide for the avoidance, management and mitigation of environmental impacts associated with the undertaking of the activity.

- b. identify and assess any new impacts and risks as a result of undertaking the activity;
  - c. evaluate the effectiveness of the EMPr;
  - d. identify shortcomings in the EMPr;
  - e. identify the need for any changes to the avoidance, management and mitigation measures provided for in the EMPr;
  - f. indicate the date on which the construction work was commenced with and completed or in the case where the development is incomplete, the progress of the development and rehabilitation;
  - g. indicate the date on which the operational phase was commenced with and the progress of the rehabilitation;
  - h. include a photographic record of the site applicable to the audit; and
  - i. Be informed by the ECO reports (where applicable to the construction phase).
- The holder must, within 7 days of the submission of the environmental audit report to the Competent Authority, notify all registered I&AP's of the submission and make the report available to anyone on request and where the holder has such a facility, be placed on a publicly accessible website.

## 7 Environmental auditing and monitoring schedule

| Environmental auditing and monitoring schedule      |   |  |  |
|---|---|--|--|
| Non-operational phases                              |   |  |  |
|   | Frequency   | Record & duties to be fulfilled  | Report   |
| ECO site visits                                     | Once Monthly  | <ul style="list-style-type: none"> <li>• Ensure compliance with the EMPR and the conditions contained herein</li> <li>• Keep record of all activities on site; problems identified; transgressions noted, and a task schedule of tasks undertaken by the ECO;</li> <li>• Remain employed until all rehabilitation measures, as required for implementation due to construction damage, are completed and the site is ready for operation.</li> </ul> | Site visit report to holder of EA.   |
| Auditing  | Completion of project   | Ensure the compliance with the conditions of the environmental authorisation and The EMPR  | Submit the Environmental Audit Report(s) to the Competent Authority.   |
| Final construction phase Environmental Audit Report | Within six (6) months of completion of construction.  | Ensure the compliance with the conditions of the environmental authorisation and The EMPR  | Submit these Environmental Audit Report(s) to the Competent Authority.   |
| Operational phases                                  |   |  |  |
| Environmental audit(s)                              | The frequency of the auditing of compliance with the Conditions of the environmental authorisation and of compliance with the EMPR shall not exceed intervals of 5 years. | <ul style="list-style-type: none"> <li>• The holder must ensure that environmental audit(s) Are performed regularly.</li> <li>• The Report must comply with the conditions of the Environmental Authorisation.</li> </ul>  | <ul style="list-style-type: none"> <li>• Submit these Environmental Audit Report(s) to the Competent Authority,</li> <li>• The environmental audit report must be prepared and submitted to the Competent Authority, by an independent person with the relevant environmental auditing expertise.</li> </ul> |





## 8 Management Programme – Pre-construction & Construction & Operational

Please note that the EMPr must be included in any tender documentation and all sub-contractors on the site must be made aware of this EMPr and they must at all times adhere to the procedures specified.

Only those sections applicable to the specific construction activity are relevant and to be implemented.

### 8.1 Specific conditions as stated in EA

- 1) To be included after issue of EA

### 8.2 Contractual obligations

1. The Contractor shall acknowledge receipt of copies of the EMPr and confirm in writing that he has familiarised himself with the contents thereof;
2. The Contractor shall comply with all environmental obligations imposed by the RE/ECO/EO.
3. The Contractor shall co-operate fully with the RE/ECO/EO and use his best endeavours to ensure that the objectives of the EMPr are fulfilled in the course of the Contractor's execution of the works or the relevant part thereof.
4. The Contractor shall erect an information board containing background information for the construction activity and listing the relevant contact details for complaint.
5. The Contractor must ensure that all workers are given environmental awareness training on the requirements of the EMPr. This must form part of the Contractor's contract agreement. The RE/ECO/EO must be informed in writing of implementation.
6. Working hours will be from 7:00pm to 18:00pm Monday to Saturday. No work will be allowed on Sundays or public holidays.
7. Deliveries will only be allowed between 8:00am and 5pm.
8. Preference must be given to local labour.
9. Workers (except security guards) shall not be housed on site.

### 8.3 Penalties

Penalties must be instituted for non-compliance. The penalty is over and above the cost of rectifying the problem and/or damage. Penalties vary on a sliding scale from R 1 000 to R 5 000 for non-serious to serious issues as determined by the RE/ECO/EO/EO.

These penalties must be paid into a separate account to be administered by the developer. The RE/ECO/EO/EO will decide how the penalties, if any, are to be spent.

Refer to Appendix D for the Schedule of Fines.

## 8.4 Methodology statement

Method Statements must be compiled by the contractor(s) before any construction or activity shall commence. The statement must include a site establishment plan indicating all relevant areas. The RE/ECO/EO must approve the Method Statement. Refer to Appendix E.

The ECO must identify Method Statements that will be required as part of the project implementation. The list provided below is generic, and only that which is applicable to the proposed development of the dams and associated infrastructure will be required (underlined).

### Access routes

- Upgrading and construction of access routes.
- Rehabilitation of temporary access routes.
- Location of proposed access routes.

### Alien plant clearing

- Method of control to be used for the eradication or control of alien vegetation.

### Blasting

- Details of all methods and logistics associated with blasting.

### Bunding

- Method of bunding for static plant.

### Camp establishment

- Layout and preparation of the construction camp.
- Method of installing fences required for “no go” areas, working areas and construction camp areas.
- Preparation of the working area.

### Cement /concrete batching

- Location, layout and preparation of cement/ concrete batching facilities including the methods employed for the mixing of concrete including the management of runoff water from such areas.

### Contaminated water

- Contaminated water management plan, including the containment of runoff and polluted water.

### Demolition

- Proposed method(s) of demolition.

### Dredging

- Proposed methods and compounds to treat spills.
- Methods of refuelling dredger.

### Drilling and jack hammering

- Method of drill coring with water or coolant lubricants.
- Methods to prevent pollution during drilling operations.

### Dust

- Dust control.

### Earthworks

- Method for the control of erosion during bulk earthwork operations.
- Method of undertaking earthworks, including hand excavation and spoil management.

### Emergency

- Emergency construction method statements.

**Environmental awareness course**

- Logistics for the environmental awareness course for all the Contractors employees.
- Logistics for the environmental awareness course for the Contractors management staff.

**Erosion control**

- Method of erosion control, including erosion of spoil material.

**Exposed aggregate finishes**

- The method of control, treatment and disposal with respect to exposed aggregate finishes.

**Fire, hazardous and poisonous substances**

- Handling and storage of hazardous wastes.
- Emergency spillage procedures and compounds to be used.
- Emergency procedures for fire.
- Use of herbicides, pesticides and other poisonous substances.
- Methods for the disposal of hazardous building materials including asbestos, fibre claddings, refrigerants and coolants.

**Fuels and fuel spills**

- Methods of refuelling vehicles.
- Details of methods for fuel spills and clean-up operations.
- Refuelling of construction vehicles in high flow areas [or in the 1 in 50-year floodplain].
- Method of refuelling dredger during dredging operations.

**Piling, jacking and thrust boring**

- The method of piling operation (e.g. driven or bored) or in situ casting or pre-cast pile structures.

**Rehabilitation**

- Rehabilitation of disturbed areas and revegetation after construction is complete.
- Rehabilitation of street or hardened surfaces after construction is complete.
- Retaining walls and gabions.
- Method for construction and installation of retaining walls/ gabion baskets.

**Riverine corridors**

- Method for all construction activities within the 1 in 50-year floodplain.

**Rock breaking**

- Details of chemical applications to be used for rock breaking.

**Settlement ponds and sumps**

- Layout and preparation of settlement ponds and sumps.

**Solid waste management**

- Solid waste control and removal of waste from Site.
- Methods for the disposal of vegetation cuttings, building materials or rubble generated by construction.

**Sources of materials**

- Details of materials imported to the site (where applicable).

**Sensitive environments**

- Proposed construction methods within any sensitive environments. These can include but are not limited to wetlands, dams and rivers.

**Traffic**

- Traffic safety measure for entry/ exit onto/ off public roads.
- Traffic control when crossing roads or pedestrian routes with construction activities.

**Vegetation clearing**

- Method of vegetation clearing during site establishment.

**Wash areas**

- Location, layout, preparation and operation of all wash areas, including vehicle wash, workshop washing and paint washing and clearing.

**Wastewater treatment works**

- Emergency procedures for accidental leaks, spillage or overflow of raw wastewater, semi treated wastewater, sludge or final effluent. The Method Statement shall include the following:
  - a. a comprehensive list of available equipment (*e.g.* pipes and pumps) in the event of a spill
  - b. the location of all emergency equipment
  - c. the individual(s) responsible for the upkeep and maintenance of the emergency equipment
  - d. an indication of how regularly the emergency equipment will be checked to ensure that it is working properly
  - e. the location of any and all temporary emergency sumps, including old sludge ponds, clarifiers, low lying areas *etc.*
  - f. the size of spillage which the emergency procedures shall contain
  - g. where and how any spilled material will be returned to the wastewater works system
  - h. who shall be notified in the event of an emergency, including contact numbers for the relevant local authority
- Methods to isolate any section of the wastewater infrastructure for construction or maintenance purposes.
- Methods to connect new structures or reconnect old structures to the wastewater treatment infrastructure.

### 8.5 Proposed Impact Management Actions

The environmental management and mitigation measures that must be implemented during all construction and operational activities, as well as responsibilities and timelines for the implementation of these measures are presented in Table 4-2. Monitoring thereof, is discussed in section 6.1 above.

| Action                              | Proposed impact management action and Procedures / Mitigation measures to achieve it  | Responsible person for implementation | Implementation timeframe and frequency  | Outcome   |
|-------------------------------------|---|---------------------------------------|---|---|
| 1. Environmental awareness training | <ol style="list-style-type: none"> <li>All the Contractors employees and Sub-Contractors employees and any suppliers' employees that spend more than 1 day a week or four days in a month on site, must attend an Environmental Awareness Training course presented by the Contractor the first of which shall be held within one week of the Commencement Date. Subsequent courses shall be held as and when required.</li> <li>The Engineer/ECO will provide the Contractor with the course content for the environmental awareness training course, and the Contractor shall communicate this information to his employees on the site, to any new employees coming onto site, to his subcontractors and to his suppliers.</li> <li>The Contractor shall supply the Engineer/ECO with a monthly report indicating the number of employees that will be present on site during the following month and any changes in this number that may occur during the month.</li> <li>The Contractor shall submit a Method Statement detailing the logistics of the environmental awareness training course.</li> </ol> | Contractor                            | Within one week of the Commencement Date/or of new appointments. Subsequent courses shall be held as and when required. | <ul style="list-style-type: none"> <li>Understanding of the EMPr.</li> <li>Compliance of Contractor with the EMPr.</li> </ul>                     |
| 2. Buffer area                      | <ol style="list-style-type: none"> <li>A buffer area of 32m of the Donkerhoekspruit should be kept during construction activities, and the stream area beyond that strictly treated as a No-Go area.</li> </ol>   | Holder of EA or representative        | Before construction commences and maintained throughout development.  | <ul style="list-style-type: none"> <li>Ensure no illegal entries.</li> <li>Ensuring no further degradation of the natural environment.</li> </ul> |

| Action                        | Proposed impact management action and Procedures / Mitigation measures to achieve it  | Responsible person for implementation      | Implementation timeframe and frequency                   | Outcome   |
|-------------------------------|---|--|--|---|
|                               | 2. A buffer zone of 32m from all streams, except those affected by the development.   |  |  | <ul style="list-style-type: none"> <li>• Ensure no vegetation cleared or disturbed.</li> <li>• Ensuring no degradation to freshwater ecology/environment downstream of the activity.</li> </ul>   |
| 3. Demarcation and protection | <ol style="list-style-type: none"> <li>1. The property must be fenced prior to start of construction to determine the construction/work area. Proper access control must be implemented to ensure that only authorised people obtain access to the site.</li> <li>2. The 30m building boundary must be marked and all construction must take place within this area.</li> <li>3. No-Go which include sensitive areas, such as the stream, wetland and dams, must be clearly demarcated prior to commencing of demolition and/or earthworks/building operations.</li> <li>4. The contractor must ensure that fencing and/or demarcations are maintained for the duration of the project.</li> <li>5. Although not limited to, No-Go areas include the residential areas, dams, stream/river and wetland.</li> <li>6. No work outside of the property boundary will be allowed.</li> <li>7. Special features shall be marked on a site layout plan prior to any works commencing on site. These areas shall be designated "No go" areas.</li> <li>8. Outcrops, rock faces, trees and natural vegetation or any other natural or special features inside and outside the Site, shall not be defaced, painted for benchmarks for survey or any other purposes or otherwise damaged in any way without the prior approval of the Engineer/ECO. These features shall</li> </ol> | Holder of EA or representative/contractor. | Before construction commences and maintained throughout. | <ul style="list-style-type: none"> <li>• Ensure no illegal entries.</li> <li>• Ensuring no further degradation of the natural environment.</li> <li>• Ensure no vegetation cleared or disturbed.</li> <li>• Ensuring no degradation to fresh water ecology/environment downstream of the activity.</li> </ul> |

| Action                                      | Proposed impact management action and Procedures / Mitigation measures to achieve it  | Responsible person for implementation                                  | Implementation timeframe and frequency                  | Outcome   |
|---|---|--|---|---|
|   | be demarcated as “no go” areas and shall be fenced or similarly protected, as determined by the Engineer/ECO.   |  |   |   |
| 4. Stream &Wetland Sensitive - Environments | <ol style="list-style-type: none"> <li>1. A buffer area of 32m of the Donkerhoekspruit should be kept during construction activities, and the stream area beyond that strictly treated as a No-Go area.</li> <li>2. A buffer zone of 32m from all streams, except those affected by the development.</li> <li>3. In order to prohibit the dam of taking more than the enlisted amount of water, a metering system is proposed in order to monitor the total amount of water taken.</li> </ol>   | Holder of EA or representative/<br>contractor/<br>freshwater ecologist | Before construction commences and maintained throughout | <ul style="list-style-type: none"> <li>• Ensure no illegal entries.</li> <li>• Ensuring no further degradation of the natural environment.</li> <li>• Ensure no vegetation cleared or disturbed.</li> <li>• Ensuring no degradation to fresh water ecology/environment downstream of the activity.</li> <li>• Enhancing the downstream wetlands and water quality.</li> <li>• Only enlisted water will be used.</li> <li>• Monitoring as outlined is adhered to.</li> </ul> |
| 4. Aesthetics                               | <p>The aesthetics measures indicated below must be implemented as required by the specific site and situated and as agreed with the RE/ECO/EO/EO.</p> <ol style="list-style-type: none"> <li>1. The Contractor shall be required to visually screen the site.</li> <li>2. Visual screening shall be aesthetically pleasing and shall be erected by the Contractor prior to commencing any activities.</li> <li>3. Visual screening shall be maintained by the Contractor for the duration of the Contract.</li> <li>4. Visual screening must be of the following types:                             <ul style="list-style-type: none"> <li>• Shade cloth</li> <li>• Hessian</li> <li>• Berms</li> </ul> </li> </ol> | Holder of EA or representative   | Before construction commences and maintained throughout | <ul style="list-style-type: none"> <li>•The construction site is aesthetically pleasing and to reduce the possible visual impact.</li> </ul>  |



| Action  | Proposed impact management action and Procedures / Mitigation measures to achieve it  | Responsible person for implementation      | Implementation timeframe and frequency                  | Outcome   |
|---------|---|--|---|---|
| 5. Camp | <ol style="list-style-type: none"> <li>1. The Contractor’s camp, offices, and storage facilities shall not be located within an environmentally sensitive area or the No-Go areas. The camp’s position must be approved by RE/ECO.</li> <li>2. The camp must be fenced as agreed with the RE/ECO.</li> <li>3. Water from the kitchens, showers, sinks etc., shall be discharged in a manner approved by the RE/ECO.</li> <li>4. The contractor must ensure that all temporary structures, equipment, materials, and facilities used or created on-site during the construction phase are removed and appropriately disposed of.</li> <li>5. No littering by the contractor’s employees shall be tolerated under any circumstances, anywhere in the demarcated area for construction.</li> </ol> <p><b>Site of construction camp</b></p> <ol style="list-style-type: none"> <li>1. Choice of site for the contractor’s camp requires the ECO’s permission and must take into account location of local residents and / or ecologically sensitive areas, including flood zones and slip / unstable zones. A site plan must be submitted to the ECO and project manager for approval.</li> <li>2. The construction camp must not be situated within the 1:100-year flood line or on slopes greater than 1:3.</li> <li>3. The size of the construction camp must be minimized (especially where natural vegetation or grassland has had to be cleared for its construction).</li> <li>4. The contractor must attend to drainage of the camp site to avoid standing water and / or sheet erosion.</li> <li>5. Suitable control measures over the contractor’s</li> </ol> | Holder of EA or representative/ Contractor | Before construction commences and maintained throughout | <ul style="list-style-type: none"> <li>• All construction infrastructure etc. is located within a demarcated camp, within which possible impacts on the environment can be mitigated.</li> <li>• The site is not located close to any environmentally sensitive areas.</li> </ul> |

| Action | Proposed impact management action and Procedures / Mitigation measures to achieve it  | Responsible person for implementation | Implementation timeframe and frequency | Outcome |
|--------|---|---------------------------------------|--|---------|
|        | <p>yard, plant and material storage to mitigate any visual impact of the construction activity must be implemented.</p> <ol style="list-style-type: none"> <li>6. No development, or activity of any sort associated with camp, is allowed below the 1:50 year flood line of any water system.</li> <li>7. Storage of materials (including hazardous materials) at site camp</li> <li>8. Choice of location for storage areas must take into account prevailing winds, distances to water bodies, general on-site topography and water erosion potential of the soil.</li> <li>9. Storage areas must be designated, demarcated and fenced.</li> <li>10. Storage areas must be secure to minimize the risk of crime. They must also be safe from access by unauthorised persons.</li> <li>11. Fire prevention facilities must be present at all storage facilities.</li> <li>12. Proper storage facilities for the storage of oils, paints, grease, fuels, chemicals and any hazardous materials to be used must be provided to prevent the migration of spillage into the ground and groundwater regime around the temporary storage area(s). These pollution prevention measures for storage must include a bund wall high enough to contain at least 110% of any stored volume, and this must be sited away from drainage lines in a site with the approval of the ECO.</li> <li>13. These storage facilities (including any tanks) must be on an impermeable surface that is protected from the ingress of storm water from surrounding areas in order to ensure that accidental spillage does not pollute local soil or water resources.</li> </ol> |                                       |  |         |

| Action | Proposed impact management action and Procedures / Mitigation measures to achieve it  | Responsible person for implementation | Implementation timeframe and frequency | Outcome |
|--------|---|---------------------------------------|--|---------|
|        | <p>14. Clear signage must be placed at all storage areas containing hazardous substances / materials. Staff dealing with these materials / substances must be aware of their potential impacts and follow the appropriate safety measures.</p> <p>15. A Waste Disposal Contractor must be employed to remove waste oil. These wastes must only be disposed of at a licensed landfill sites designed to handle hazardous wastes. A disposal certificate must be obtained from the Waste Disposal Contractor.</p> <p>16. The contractor must ensure that its staff is made aware of the health risks associated with any hazardous substances used and has been provided with the appropriate protective clothing/equipment in case of spillages or accidents and have received the necessary training.</p> <p>17. All excess cement and concrete mixes are to be contained on the construction site prior to disposal off site.</p> <p>18. Any spillage, which may occur, shall be investigated and immediate action must be taken. This must also be reported to the ECO and DEA&amp;DP, as well as local authorities if so required.</p> <p>19. Drainage of construction camp</p> <p>20. Run-off from the camp site must not discharge into neighbours' properties.</p> <p><b>End of construction</b></p> <p>1. Once construction has been completed on site and all excess material has been removed, the storage area shall be rehabilitated. If the area was badly damaged, reseeding shall be done.</p> <p>2. Such areas shall be rehabilitated to their natural state. Any spilled concrete shall be removed, and</p> |                                       |  |         |

| Action                    | Proposed impact management action and Procedures / Mitigation measures to achieve it  | Responsible person for implementation      | Implementation timeframe and frequency  | Outcome   |
|---------------------------|---|--|---|---|
|                           | soil compacted during construction shall be ripped, levelled and re-vegetated.  |  |   |   |
| 6. Tree protection        | <ol style="list-style-type: none"> <li>All trees, which are to be retained, are to be clearly indicated on a site plan and demarcated.</li> <li>Trees to be demarcated shall be clearly marked under the supervision of the Engineer/ECO. Marking techniques include danger tape, paint (be aware of long-term aesthetics), strapping and pegs. Tagging by exclusion shall be considered, i.e. where the number of trees to be cleared is fewer than those to be retained then marked trees for felling and all other trees shall automatically be retained.</li> <li>Demarcation shall remain in place for the duration of works on site. If damaged, demarcation shall be repaired or replaced immediately.</li> </ol>  | Holder of EA or representative             | If and when required. Before construction commences and maintained throughout. Note possible application to DAFF. | <ul style="list-style-type: none"> <li>Protect the various protected trees, note possible application to DAFF.</li> </ul>     |
| 7. Sensitive environments | <p><b>Additional</b></p> <ol style="list-style-type: none"> <li>Ablution facilities must be located as far away as possible from the river and wetland. Safe and effective sewage treatment will require one of the following sewage handling methods:</li> <li>The use of chemical toilets which are supplied and maintained by the subcontractor</li> <li>The establishment of ablution facilities for all staff and construction workers. A minimum of one toilet must be provided per 15 persons at each working area.</li> <li>Effluent and waste water – All effluent water from the camp/office must be disposed of in a properly designed and constructed system (ablution facilities), situated so as not to adversely affect the river and wetland. No construction fluids must be allowed to enter the river and wetland. These must be disposed of via the solid waste stream. No wastewater must be disposed of onto soil. This</li> </ol> | Holder of EA or representative/ Contractor | Before construction commences and maintained throughout. If and when required.                                    | <ul style="list-style-type: none"> <li>No further impacts on the fauna and flora other than outlined and approved.</li> </ul> |

| Action | Proposed impact management action and Procedures / Mitigation measures to achieve it  | Responsible person for implementation | Implementation timeframe and frequency | Outcome |
|--------|---|---------------------------------------|--|---------|
|        | <p>does not include clean groundwater from excavations or rainwater.</p> <p>5. Hazardous waste and spillage – Petrochemicals, oils and identified hazardous substances must only be stored under controlled conditions. All hazardous materials must be stored in a secured, appointed area that is fenced and has restricted entry. The site must be protected from direct or indirect spillage of pollutants such as cement, concrete, sewage, chemicals, fuels, oils, aggregate, tailings, wash water, organic materials and bituminous or tar products. Responsibility for spill treatments lies with the contractor. Should water downstream of the spill be polluted, and fauna and flora show signs of deterioration or death, specialist hydrological or ecological advice will be sought for appropriate treatment and remedial procedures to be followed.</p> <p>6. Construction vehicles and equipment must be kept in a good working condition. Storage and re-fuelling areas must be clearly demarcated, bunded and lined.</p> <p>7. Spillage of any fuels directly onto bare soil or into a watercourse must be prevented at all times.</p> <p>8. Litter and solid waste – No littering by construction workers must be allowed. Measures must be taken by the contractor to reduce the potential for litter and negligent behaviour with regard to the disposal of all refuse. The contractor must provide litter bins at all places of work. Solid waste must be stored in an appointed area in covered, tip proof metal drums for collection and disposal.</p> <p><b>Animals</b></p> <p>1. The site is within a rural area that has been extensively cultivated and it is therefore unlikely</p> |                                       |  |         |

| Action                                 | Proposed impact management action and Procedures / Mitigation measures to achieve it   | Responsible person for implementation             | Implementation timeframe and frequency                                       | Outcome   |
|--|--|---|--|---|
|  | <p>that any animal life would be present. However, should any animal life be encountered it must be carefully removed and none must be harmed or killed. Most animals will move away naturally except possibly snakes. Any problems must be reported to the ECO.</p>   |   |  |   |
| <p>8. Cement mixing/batching plant</p> | <ol style="list-style-type: none"> <li>1. The cement mixing or batching plant area(s) must be indicated on the Site Establishment Plan.</li> <li>2. All wastewater resulting from batching of concrete shall be disposed of via the wastewater management system where available.</li> <li>3. The cement/ concrete batching works shall be kept neat and clean at all times. No batching activities shall occur on unprotected substratum of any kind.</li> <li>4. All runoff from batching areas shall be strictly controlled, and cement-contaminated water shall be collected, stored and disposed of at a site approved by the Engineer/ECO/EO. Dagma boards, mixing trays and impermeable sumps shall be used at all mixing and supply points. Contaminated water shall be disposed at a waste disposal site approved by the Engineer/ECO/EO.</li> <li>5. Contaminated water storage facilities shall not be allowed to overflow and appropriate protection from rain and flooding shall be implemented.</li> <li>6. Contaminated water treatment on Site shall require a method statement approved by Engineer/ECO/EO.</li> <li>7. Unused cement bags are to be stored so as not to be affected by rain or runoff events.</li> <li>8. Used bags shall be stored in weatherproof containers to prevent wind-blown cement dust and water contamination. Used bags shall be disposed of on a regular basis via the solid waste</li> </ol> | <p>Holder of EA or representative/ Contractor</p> | <p>Continuously Throughout the construction phase. If and when required.</p> | <ul style="list-style-type: none"> <li>•Mixing of cement will be done in an environmentally sensitive manner.</li> <li>• No cement spillage takes place.</li> </ul> |

| Action         | Proposed impact management action and Procedures / Mitigation measures to achieve it   | Responsible person for implementation | Implementation timeframe and frequency | Outcome                    |
|----------------|--|---------------------------------------|--|----------------------------|
|                | <p>management system and shall not be used for any other purpose.</p> <p>9. Concrete transportation shall not result in spillage.</p> <p>10. Cleaning of equipment and flushing of mixers shall not result in pollution of the surrounding environment: Care shall be taken to collect contaminated wash water from cleaning activities and dispose of it in a manner approved by the Engineer/ECO/EO. To prevent spillage onto roads, ready mix trucks shall rinse off the delivery shoot into a suitable sump prior to leaving Site.</p> <p>11. Suitable screening and containment shall be in place to prevent wind-blown contamination associated with bulk cement silos, loading and batching.</p> <p>12. With respect to exposed aggregate finishes, the Contractor shall collect all contaminated water &amp; fines and store it in sumps for disposal at an approved waste site.</p> <p>13. All visible remains of excess concrete shall be physically removed on completion of the plaster or concrete pour section and disposed. Washing the remains into the ground is not acceptable. All excess aggregate shall also be removed. Any mixed cement (for building or plastering) at the work area must be placed on boards or container to prevent spillage or contamination of the soil.</p> <p>14. During cement delivery boards or other protection material must be used to prevent spilling on the ground.</p> <p>15. No mixed concrete/dagga must be placed or stored on bare surfaces. Dagga boards must be use at all times to prevent contamination of surfaces.</p> |                                       |  |                            |
| 9. Surface and | 1. The Contractor shall take all reasonable steps to   | Holder of EA or                       | Continuously Throughout                | •No further degradation or |

| Action                | Proposed impact management action and Procedures / Mitigation measures to achieve it   | Responsible person for implementation | Implementation timeframe and frequency        | Outcome   |
|-----------------------|--|---------------------------------------|---|---|
| groundwater pollution | <p>prevent pollution of surface and groundwater as a result of his activities. Such pollution could result from release (accidental or otherwise) of chemicals, oils, fuels, paint, and sewage, water from excavations, construction water, water carrying soil particles or waste products.</p> <ol style="list-style-type: none"> <li>2. Cement or concrete mixing must take place in such a way as to prevent any cement water runoff. All pieces of cement or related material are to be stored and dumped at the approved Municipal site.</li> <li>3. Bulk cement silos and storage areas must be properly lined/screened/contained to prevent windblown cement dust or pollution of water during rain events.</li> <li>4. On completion, storm water catch pits must be closed with geotextile (biddim) or similar material to prevent sand or other contaminants from entering the system.</li> <li>5. Ready-mix trucks are not permitted to clean chutes at the work site.</li> <li>6. Adequate plastic or concrete lined cleaning pits are to be installed to facilitate washing of all cement and painting equipment. A functional, non-leaking, water point must be installed at each pit. The top 75% of the water in the pit must be disposed down the sewerage system, with approval from the Engineer. The remaining water and sludge must be disposed of at a Municipal approved site or removed by a chemical contractor.</li> <li>7. The Contractor shall provide water and/or washing facilities at the construction camp for personnel.</li> <li>8. In the event of any pollution entering any water body, the Contractor shall inform the RE/ECO/EO immediately.</li> </ol> | representative/ Contractor            | the construction phase. If and when required. | deterioration of ground and surface water due to construction activities. |



| Action            | Proposed impact management action and Procedures / Mitigation measures to achieve it  | Responsible person for implementation      | Implementation timeframe and frequency                                | Outcome   |
|-------------------|---|--|---|---|
|                   | 9. The contractor will be responsible for any clean-up costs involved should pollution, erosion or sedimentation have taken place.  |  |   |   |
| 10. Air pollution | <p><b>Air Pollution</b></p> <ol style="list-style-type: none"> <li>1. During the construction phase, and due to the nature of the project, a small amount of smoke (from machines) and dust could be generated. Dust pollution may have an impact on the operational workers.</li> <li>2. In order to minimize the effect of dust pollution, the construction area must be kept wet as far as possible and the workers must wear the necessary safety clothing. The applicant is referred to section 19 of the National Water Act No. 36 of 1998 with regard to the prevention of, and remedies for, the effects of pollution. In terms of this section of the Act, the person who owns controls, occupies or uses the land in question is responsible for taking measures to prevent pollution of water resources and property.</li> </ol> | Holder of EA or representative/ Contractor | Continuously Throughout the construction phase. If and when required. | Ensuring dust etc associated with construction activities are mitigated and managed to prevent any degradation to the natural environment.              |
| 11. Noise control | <ol style="list-style-type: none"> <li>1. Working hours will be restricted to daily normal working hours.</li> <li>2. Limit the use of heavy vehicle machinery and construction activities associated with high level noise to 07h00 to 18h00 from Mondays to Saturdays, particularly to where residential areas or sensitive institutions are situated close to the site.</li> <li>3. All noise and sounds generated by plant or machinery must adhere to SABS 0103 specifications for the maximum permissible noise levels for residential areas.</li> <li>4. All plant and machinery are to be fitted with adequate silencers.</li> <li>5. No sound amplification equipment such as sirens,</li> </ol>   | Holder of EA or representative             | Continuously Throughout the construction phase. If and when required. | <ul style="list-style-type: none"> <li>• Ensuring no noise levels above Standard and mitigating possible noise in the receiving environment.</li> </ul> |

| Action                        | Proposed impact management action and Procedures / Mitigation measures to achieve it   | Responsible person for implementation      | Implementation timeframe and frequency                                | Outcome  |
|-------------------------------|--|--|---|--|
|                               | <p>loud hailers or hooters shall be used on site, after normal working hours, except in emergencies.</p> <p>6. If work is to be undertaken outside of normal work hours, permission must be obtained from the Local Authority. Prior to commencing any such activity, the Contractor is also to advise the potentially affected neighbouring residents. Dates, times and the nature of the work to be undertaken are to be provided. Notification may include letter-drops.</p> <p>7. The acceptable noise level according to SABS 10103 Code of Practice is 45dBA in rural district during the day and 35dBA at night. The applicant must comply/adhere to this requirement.</p> <p>8. The Contractor shall make adequate provision to prevent or minimize the possible effects of air and noise pollution. Should the noise from the construction work be found to cause problems, (which is not anticipated to be the case) work hours in these areas must be restricted between 06:00 and 18:00, or as otherwise agreed between the parties involved. Strict measures shall therefore be enforced, especially in terms of the contract specifications, to prevent any negative impacts in this regard.</p> |  |   |  |
| 12. Pipe testing and cleaning | <ol style="list-style-type: none"> <li>Cleaning/flushing of pipelines shall not impair (down grade) downstream baseline water quality.</li> <li>Materials used in the sterilisation of pipelines, viz. chlorine solutions shall be treated as hazardous substances and disposed of at an approved landfill site.</li> <li>Litter traps shall be installed and maintained at the outflow of all pipelines.</li> </ol>   | Holder of EA or representative/ Contractor | Continuously Throughout the construction phase. If and when required. | <ul style="list-style-type: none"> <li>No blockages and damage to pipes.</li> </ul>              |
| 13. Erosion control           | The Contractor must take all reasonable precautions to prevent soil erosion resulting from a diversion, restriction  | Holder of EA or representative/ Contractor | Continuously Throughout the construction phase. If                    | <ul style="list-style-type: none"> <li>Ensuring no further degradation of the natural</li> </ul> |

| Action | Proposed impact management action and Procedures / Mitigation measures to achieve it   | Responsible person for implementation | Implementation timeframe and frequency | Outcome  |
|--------|--|---------------------------------------|--|--|
|        | <p>or increase in the flow of storm water or water resulting from its operations and activities, to the satisfaction of the RE/ECO/EO. Possible measures that can be considered include the following:</p> <ol style="list-style-type: none"> <li>1. Brush cut packing</li> <li>2. Mulch or chip cover</li> <li>3. Straw stabilising (at the rate of one bale/m<sup>2</sup> and rotated into the top 100mm of the Completed earthworks)</li> <li>4. Watering</li> <li>5. Planting / sodding</li> <li>6. Hand seeding sowing</li> <li>7. Hydroseeding</li> <li>8. Soil binders and anti-erosion compounds</li> <li>9. Mechanical cover or packing structures</li> <li>10. Gabions &amp; mattresses</li> <li>11. Geofabric</li> <li>12. Hessian cover</li> <li>13. Armourflex</li> <li>14. Log / pole fencing</li> <li>15. Retaining walls</li> <li>16. The Contractor shall take reasonable measures to control the erosive effects of storm water runoff.</li> <li>17. The Contractor shall use silt screens to prevent overland flowing water from causing erosion.</li> <li>18. The use of straw bales as filters, which are placed across the flow of overland storm water flows, shall be used as an erosion protection measure.</li> <li>19. The ploughing-in of straw offers limited protection against storm water runoff induced erosion and shall be used as an erosion protection measure.</li> <li>20. The Contractor shall be liable for any damage to downstream property caused by the diversion of</li> </ol> |                                       | and when required.                     | <p>environment.</p> <ul style="list-style-type: none"> <li>• Ensure no more vegetation cleared or Disturbed due to erosion.</li> <li>• No erosion downstream of the newly constructed dams.</li> </ul> |

| Action           | Proposed impact management action and Procedures / Mitigation measures to achieve it   | Responsible person for implementation | Implementation timeframe and frequency                                | Outcome   |
|------------------|--|---------------------------------------|---|---|
|                  | overland storm water flows.  |                                       |   |   |
| 14. Dust control | <p><b>DUST - generated by works</b></p> <ol style="list-style-type: none"> <li>1. Sand stockpiles are to be covered with hessian, shade cloth or DPC plastic.</li> <li>2. Stockpiles are to be located in sheltered areas and the usable/cut face orientated away from the direction of the prevailing wind for that season.</li> <li>3. Excavating, handling or transporting erodible materials in high wind or when dust plumes visible shall be avoided.</li> <li>4. If high winds prevail the Engineer shall decide whether water dampening measures or cessation of activities is required, and if necessary, they shall have the authority to temporarily stop certain of the works until wind conditions become more favourable.</li> </ol> <p><b>Dust – generated by roads and vehicle movement</b></p> <ol style="list-style-type: none"> <li>1) Vehicle speeds shall not exceed 40km/h along gravel roads or 20km/h on unconsolidated or non-vegetated areas. Dust plumes created by vehicle movement are to be monitored.</li> <li>2) If access roads are generating dust beyond acceptable levels dust suppression measures must be initiated. These include, but are not limited to the following:                         <ol style="list-style-type: none"> <li>2.1 Reduction of travelling speeds along the road.</li> <li>2.2 Restriction of vehicle or plant usage.</li> <li>2.3 Application of chemical soil binders.</li> <li>2.4 Application of a suitable sacrificial road surfacing.</li> <li>2.5 If water is to be used for dust suppression, then only the critical areas shall be watered. The use of water carts or hand watering is preferable. Overhead sprayers shall not be permitted in windy conditions, as the evaporation loss is too high. Watering is to be supervised to prevent unnecessary water wastage, and runoff into potentially</li> </ol> </li> </ol> | Contractor                            | Continuously Throughout the construction phase. If and when required. | <ul style="list-style-type: none"> <li>• Ensuring proper dust suppression.</li> <li>• Minimizing the potential dust impacts during construction.</li> </ul> |

| Action              | Proposed impact management action and Procedures / Mitigation measures to achieve it  | Responsible person for implementation | Implementation timeframe and frequency                                | Outcome  |
|---------------------|---|---------------------------------------|---|--|
|                     | sensitive areas. Preferable watering times are early morning and late afternoon/ evening. Water restrictions are to be observed if in place.  |                                       |   |  |
| 15. Fire management | <ol style="list-style-type: none"> <li>1) No open fires or naked flames for heating or cooking shall be allowed on Site. Stoves and other electrical equipment shall only be permitted in the Contractor’s camp and never be left unattended.</li> <li>1.1. The Contractor shall take all reasonable and active steps to avoid increasing the risk of fire through their activities on Site. No fires shall be lit except at places approved by the Engineer/ECO/EO.</li> <li>1.2. The Contractor shall ensure that the basic fire-fighting equipment is to the satisfaction of the Municipal Fire Chief (where applicable).</li> <li>1.3. The Contractor shall supply all living quarters, site offices, kitchen areas, workshop areas, materials, stores and any other areas identified by the Engineer/ECO/EO with tested and approved firefighting equipment.</li> <li>1.4. Fire and “hot work” shall be restricted to a site approved by the Engineer/ECO/EO</li> <li>1.5. A braai facility shall be considered at the discretion of the Engineer/ECO/EO. The area shall be away from flammable stores. All events shall be under management supervision and a fire extinguisher shall be immediately available. “Low smoke” fuels shall be used. Smoke free zoning regulations shall be considered.</li> <li>1.6. Fires within National Parks, Nature Reserves and natural areas are prohibited.</li> <li>1.7. Cooking shall be restricted to bottled gas facilities under strict control and supervision. The sensitivity of the surrounding land uses and occurrence of natural indigenous vegetation must be considered</li> </ol> | Contractor                            | Continuously Throughout the construction phase. If and when required. | <ul style="list-style-type: none"> <li>• Prevent any open fires from taking place.</li> <li>• Prevention measures in place if any accidental fires do take place.</li> </ul> |

| Action               | Proposed impact management action and Procedures / Mitigation measures to achieve it   | Responsible person for implementation | Implementation timeframe and frequency                                | Outcome  |
|----------------------|--|---------------------------------------|---|--|
|                      | <p>when assessing the risk of fires.</p> <p>1.8. The Contractor shall take precautions when working with welding or grinding equipment near potential sources of combustion. Such precautions include having a suitable, tested and approved fire extinguisher immediately at hand and the use of welding curtains.</p> <p>1.9. The Contractor shall identify the authorities responsible for fighting fires in the area and shall liaise with them regarding procedures should a fire start. The Contractor shall ensure that his staff are aware of the fire danger at all times and are aware of the procedure to be followed in the event of a fire. The Contractor shall also ensure that all the necessary telephone numbers etc. are posted at conspicuous and relevant locations in the event of an emergency. The Contractor shall advise the relevant authority of a fire as soon as one starts and shall not wait until he can no longer control it.</p> <p>1.10. Should a contractor be found responsible for the outbreak of a fire, he shall be liable for any associated costs.</p> |                                       |   |  |
| 16. Water management | <ol style="list-style-type: none"> <li>1. The Contractor shall provide water for drinking and construction purposes until such time as it is available from the local system. Water from the local system must be used carefully and sparingly with the view of not wasting water.</li> <li>2. Taps are to be attached to secure supports and leaking taps and hosepipes are to be repaired immediately.</li> <li>3. Watering as dust suppression must be undertaken as a last resort. It is preferable that sand stockpiles be covered rather than watered.</li> <li>4. Any abstraction from natural water sources such as</li> </ol>   | Holder of EA or representative        | Continuously Throughout the construction phase. If and when required. | <ul style="list-style-type: none"> <li>•Management of water for drinking, construction activities and dust suppression.</li> </ul> |

| Action               | Proposed impact management action and Procedures / Mitigation measures to achieve it  | Responsible person for implementation       | Implementation timeframe and frequency                                | Outcome  |
|----------------------|---|---|---|--|
|                      | <p>a stream or groundwater will require a Method Statement for approval by the RE/ECO/EO.</p> <p>5. An adequate supply of potable water that complies with bacteriological and chemical quality must be available at all times.</p> <p>6. Water samples of the potable water must be taken at regular intervals and the results kept on record.</p> <p>7. The aforementioned records must be made available to a competent authority upon request.</p>  |   |   |  |
| 17. Waste management | <p>1. A waste minimisation approach must be followed. This requires recycling wherever possible. All waste therefore to be suitably contained and removed regularly from site in accordance with the municipal waste management procedures. Other examples shall include the use of rubble as fill, minimisation of waste concrete and the use of brush cuttings for mulching on rehabilitated areas.</p> <p>2. The Contractor shall be responsible for the establishment of a refuse control and removal system that prevents the spread of refuse within and beyond the construction sites.</p> <p>3. The Contractor shall ensure that all refuse is deposited in refuse bins, which he shall supply and arrange to be emptied on a weekly basis. Refuse bins shall be of such a design that the refuse cannot be blown out and that animals or birds are not attracted to the waste and spread it around. Refuse bins shall be water tight, wind-proof and scavenger-proof and shall be appropriately placed throughout the site. Refuse must also be protected from rain, which may cause pollutants to leach out. Refuse bins shall be appropriately placed throughout the Site and shall be conspicuous (e.g. painted bright yellow).</p> | Holder of EA or representative/ Contractor. | Continuously Throughout the construction phase. If and when required. | <ul style="list-style-type: none"> <li>•Ensure the site is kept free of litter.</li> <li>•Ensuring proper waste management and removal takes place.</li> <li>•Ensuring legal waste removal takes place.</li> </ul> |

| Action      | Proposed impact management action and Procedures / Mitigation measures to achieve it  | Responsible person for implementation | Implementation timeframe and frequency                                | Outcome  |
|-------------|---|---------------------------------------|---|--|
|             | <ol style="list-style-type: none"> <li>4. Refuse shall be disposed of at an approved waste site (site and method to be agreed with Local Authority). Refuse shall not be burnt or buried on or near the Site.</li> <li>5. The Contractor shall provide labourers to clean up the Contractor's camp and Site on a weekly basis.</li> <li>6. The Contractor shall also clean the Contractor's camp and Site of all structures, equipment, residual litter and building materials at the end of the contract.</li> <li>7. No waste, specifically rubble and "building rubble" shall be utilised for fill material, except where such actions are approved or licenced</li> </ol>   |                                       |   |  |
| 18. Toilets | <ol style="list-style-type: none"> <li>1. The Contractor shall be responsible for providing all sanitary arrangements for construction and supervisory staff on the site. A minimum of one chemical toilet shall be provided per 15 persons. Toilets provided by the Contractor must be easily accessible and within a practical distance from the workers. Toilets shall be located within areas of low environmental importance. The toilets shall be of a neat construction and shall be provided with doors and locks and shall be secured to prevent them blowing over. Toilets shall be placed outside areas susceptible to flooding.</li> <li>2. The Contractor shall keep the toilets in a clean, neat and hygienic condition. The Contractor shall supply toilet paper at all toilets.</li> <li>3. The Contractor shall be responsible for the cleaning, maintenance, servicing and emptying of the toilets on a regular basis (by chemical contractor). No waste to be dumped in the bush or wetland.</li> <li>4. The Contractor shall ensure that the toilets are</li> </ol> | Holder of EA or representative        | Continuously Throughout the construction phase. If and when required. | <ul style="list-style-type: none"> <li>•Appropriate sewerage management will take place.</li> <li>•Sufficient ablution facilities provided.</li> </ul> |



| Action                           | Proposed impact management action and Procedures / Mitigation measures to achieve it  | Responsible person for implementation | Implementation timeframe and frequency                                | Outcome   |
|----------------------------------|---|---------------------------------------|---|---|
|                                  | <p>emptied before the builders’ or other holidays and the waste be stored and disposed of at an appropriate place off site.</p> <ol style="list-style-type: none"> <li>5. The Contractor shall ensure that no spillage occurs when chemical toilets are cleaned and emptied.</li> <li>6. The Contractor shall supply a contingency plan for spills from toilets.</li> <li>7. Performing ablutions in any other area is strictly prohibited.</li> <li>8. The location for construction camps and toilets must be approved by the ECO.</li> </ol>   |                                       |   |   |
| 19. Fuel and chemical management | <ol style="list-style-type: none"> <li>1. Fuel may be stored on site providing the following is strictly adhered to:</li> <li>2. All necessary approvals with respect to fuel storage and dispensing shall be obtained from the appropriate authorities.</li> <li>3. The Municipal Fire Chief (or as applicable) must be informed and consulted to Fire Regulations.</li> <li>4. The Contractor shall ensure that all liquid fuels and oils are stored in tanks with lids, which are kept firmly shut and under lock and key at all times.</li> <li>5. The Contractor shall stand any equipment that may leak, and does not have to be transported regularly, on watertight drip trays to catch any pollutants. The drip trays shall be of a size that the equipment can be placed inside it. Drip trays shall be cleaned regularly and shall not be allowed to overflow.</li> <li>6. All hazardous material (e.g., oils, Petrol or diesel) used on site must be disposed of at an approved hazardous waste facility or with the services of a licensed waste transportation company. All certificates of disposal and weigh bridge slips need to be signed by all relevant officials and kept as records on the premises.</li> </ol> | Holder of EA or representative        | Continuously Throughout the construction phase. If and when required. | <ul style="list-style-type: none"> <li>•Ensuring proper use/ storage/ handling and management of fuel on site.</li> <li>•Ensuring minimal to no impact on the natural environment.</li> </ul> |

| Action | Proposed impact management action and Procedures / Mitigation measures to achieve it  | Responsible person for implementation | Implementation timeframe and frequency | Outcome |
|--------|---|---------------------------------------|--|---------|
|        | <p>7. The contractor will be responsible for the cleaning up of any spill and associated costs.</p> <p>8. Areas for storage of fuels and other flammable materials shall comply with standard fire safety regulations and shall require the approval of the Municipal Fire Chief (in urban areas) or RE/ECO/EO.</p> <p>9. Temporary above ground storage tanks may be permitted at the discretion of the Municipal Fire Chief based on the merit of the situation, provided that the following requirements are complied with:</p> <p>10. Written application together with a plan and authority from the Municipality shall be forwarded to the Municipal Fire Chief (in urban areas) or RE/ECO/EO at least fourteen (14) days prior to the installation being erected on site. Written permission shall be obtained from the chief fire officer for the erection of the installation.</p> <p>11. The drawn plan shall be acceptable to the Municipal Fire Chief (in urban areas) or RE/ECO/EO and to contain the following information:</p> <p>1.11. the scale</p> <p>1.12. the name and address of the premises,</p> <p>1.13. the number and the quantity of the tanks,</p> <p>1.14. the position of the tanks in relation to the boundary, other flammable or combustible materials, etc,</p> <p>1.15. the size and construction materials used for the bund</p> <p>1.16. the product to be kept in the tank, and</p> <p>1.17. any other information relevant to the situation.</p> <p><b>Location</b></p> <p>12. The fuel storage area shall be located at one of the following locations: {provide a list of acceptable locations for the fuel storage area}.</p> |                                       |  |         |

| Action | Proposed impact management action and Procedures / Mitigation measures to achieve it   | Responsible person for implementation | Implementation timeframe and frequency | Outcome |
|--------|--|---------------------------------------|--|---------|
|        | <p>13. The Engineer/ECO shall be advised of the area that the Contractor intends using for the storage of fuel.</p> <p>14. The location of the fuel storage area will be determined by the Municipal Fire Chief (in urban areas) and be approved by the Engineer/ECO/EO.</p> <p>15. The tank shall be erected at least 3.5 meters from buildings, boundaries and any other combustible or flammable materials.</p> <p><b>Signs/good practice/safety precautions</b></p> <p>16. Symbolic safety signs depicting “No Smoking”, “No Naked Lights” and “Danger” conforming to the requirement of SABS 1186 are to be prominently displayed in and around the fuel storage area. The volume capacity of the tank shall be displayed.</p> <p>17. No smoking shall be allowed in the vicinity of the stores.</p> <p>18. The capacity of the tank shall be clearly displayed, and the product contained within the tank clearly identified using the emergency information system detailed in SABS 0232 part 1.</p> <p>19. There shall be adequate fire-fighting equipment at the fuel storage and dispensing area or areas.</p> <p>20. Fuel shall be kept under lock and key at all times.</p> <p><b>Tanks</b></p> <p>21. The storage tank shall be removed on completion of the works.</p> <p>22. The storage tank shall be on the premises only for as long as the contract last.</p> <p>23. All such tanks to be designed and constructed in accordance with a recognised code.</p> <p>24. The rated capacity of tanks shall provide sufficient capacity to permit expansion of the product contained therein by the rise in temperature during storage.</p> |                                       |  |         |

| Action | Proposed impact management action and Procedures / Mitigation measures to achieve it  | Responsible person for implementation | Implementation timeframe and frequency | Outcome |
|--------|---|---------------------------------------|--|---------|
|        | <p><b>Bunds/storage areas</b></p> <p>25. Tanks shall be situated in a bunded area the volume of which shall be at least 150% of the volume of the largest tank. The floor of bund shall be smooth and impermeable constructed of concrete or plastic sheeting with impermeable joints with a layer of sand over to prevent perishing. The bund walls shall be of concrete or formed of well-packed earth with the impermeable lining extending to the crest. The floor of the bund shall be sloped towards an oil trap or sump to enable any spilled fuel and/or fuel-soaked water to be removed.</p> <p>26. A bacterial hydrocarbon digestion agent that is effective in water approved by the Engineer/ECO/EO shall be installed in the sump.</p> <p>27. The tanks and bunded areas shall be covered by a roofed structure to prevent the bunded area from filling with rain water. This structure shall be constructed in such a way, and to the approval of the Engineer/ECO/EO, to ensure that it is wind resistant.</p> <p>28. Any water that collects in the bund shall not be allowed to stand and shall be removed within one day and taken off Site to a disposal site approved by the Engineer/ECO/EO, and the bacterial hydrocarbon digestion agent shall be replenished.</p> <p><b>Empty containers</b></p> <p>29. Only empty and externally clean tanks shall be stored on the bare ground. All empty and externally dirty tanks shall be sealed and stored on an area where the ground has been protected.</p> <p><b>Filling/dispensing methods</b></p> <p>30. Any electrical or petrol-driven pump shall be</p> |                                       |  |         |

| Action                   | Proposed impact management action and Procedures / Mitigation measures to achieve it   | Responsible person for implementation | Implementation timeframe and frequency                                | Outcome   |
|--------------------------|--|---------------------------------------|---|---|
|                          | <p>equipped and positioned so as not to cause any danger of ignition of the product.</p> <p>31. If fuel is dispensed from 200 litre drums, the proper dispensing equipment shall be used. The drum shall not be tipped in order to dispense fuel. The dispensing mechanism of the fuel storage tank shall be stored in a waterproof container when not in use.</p> <p>32. Adequate precautions shall be provided to prevent spillage during the filling of any tank and during the dispensing of the contents.</p> <p><b>Method statements</b></p> <p>33. A method statement is required for the filling of and dispensing from storage tanks.</p> |                                       |   |   |
| 34. Litter and oil traps | <p>2) Refuse screens and oil traps shall be installed at runoff concentration points from large parking facilities, wash bays, storm water outlets, inlets to detention ponds, workshop forecourt drainage points, ablution and eating areas. These facilities shall be serviced and monitored at the discretion of the Engineer/ECO</p>   | Holder of EA or representative        | Continuously Throughout the construction phase. If and when required. |   |
| 20. Contaminated water   | <p><b>General</b></p> <p>3) The Engineer/ECO/EO's approval will be required prior to the discharge of contaminated water to the Municipal sewer system.</p> <p>4) The Contractor shall prevent discharge of any pollutants, such as cements, concrete, lime, chemicals and fuels into any water sources.</p> <p>5) Water from kitchens, showers, laboratories, sinks etc. shall be discharged into a conservancy tank for removal from the site.</p> <p>6) Runoff from fuel depots/workshops/truck washing areas and concrete swills shall be directed into a conservancy tank and disposed</p>  | Holder of EA or representative        | Continuously Throughout the construction phase. If and when required. | <ul style="list-style-type: none"> <li>•Contaminated water will be dealt with as part of the existing infrastructure on the property.</li> <li>•The workshops on the property will be utilised to manage runoff.</li> </ul> |

| Action                        | Proposed impact management action and Procedures / Mitigation measures to achieve it   | Responsible person for implementation | Implementation timeframe and frequency                                | Outcome   |
|-------------------------------|--|---------------------------------------|---|---|
|                               | <p>of at a site approved by the Engineer/ECO and Local Authority.</p> <p>7) The contaminated water, contaminated run-off, or effluent released into a water body requires analysis in terms of the National Water Act. Contaminated water must not be released into the environment without authorisation from the relevant authority.</p> <p><b>Washing areas</b></p> <p>8) Wash areas shall be placed and constructed in such a manner so as to ensure that the surrounding areas, which include groundwater, are not polluted.</p> <p>9) A Method Statement shall be required for all wash areas where hydrocarbon and hazardous materials, and pollutants are expected to be used. This includes, but is not limited to, vehicle washing, workshop wash bays, paint wash and cleaning.</p> <p>10) Wash areas for domestic use shall ensure that the disposal of contaminated "grey" water is sanctioned by the Engineer/ECO.</p> |                                       |   |   |
| 21. Vehicles and access roads | <ol style="list-style-type: none"> <li>1. The movement of any vehicles and/ or personnel outside of the designated working areas shall not be permitted without the written authorisation of the Engineer/ECO.</li> <li>2. Should the Contractor not exercise sufficient control to restrict all work to the area within the marker boundaries, then these on instruction of the Engineer/ECO/EO shall be replaced by fencing the additional cost of which shall be borne by the Contractor.</li> <li>3. Dust control measures such as dampening with water shall be implemented where necessary, as</li> </ol>  | Holder of EA or representative        | Continuously Throughout the construction phase. If and when required. | <ul style="list-style-type: none"> <li>•Proper vehicle movement on site and surrounding areas.</li> <li>•Management of potential damage to existing roads during construction.</li> <li>•Traffic management to ensure safety on roads.</li> </ul> |

| Action | Proposed impact management action and Procedures / Mitigation measures to achieve it   | Responsible person for implementation | Implementation timeframe and frequency | Outcome |
|--------|--|---------------------------------------|--|---------|
|        | <p>indicated by the Engineer/ECO.</p> <ol style="list-style-type: none"> <li>4. Access and haul roads shall be maintained by the Contractor.</li> <li>5. Maintenance includes adequate drainage and side drains, dust control and restriction of edge use.</li> <li>6. All temporary access routes shall be rehabilitated at the end of the contract to the satisfaction of the Engineer/ECO.</li> <li>7. All public roads shall be kept clear of mud and sand. Mud and sand that has been deposited through construction activities shall be cleared regularly.</li> <li>8. Any materials used for layer works shall be approved by the Engineer/ECO prior to the activity commencing.</li> <li>9. Damage to the existing access roads as a result of construction activities shall be repaired to the satisfaction of the Engineer/ECO/EO, using material similar to that originally used. The cost of the repairs shall be borne by the Contractor</li> <li>10. Traffic safety measures, to the satisfaction of the Engineer/ECO, shall be considered in determining entry / exit onto public roads.</li> <li>11. All users of haul roads shall not exceed 45 km/h (cars)/ 15 km/h (trucks) {note that the standard spec places a site speed limit of 45 km/h for all vehicles}</li> <li>12. Appropriate traffic warning signs shall be erected and maintained.</li> <li>13. Trained and equipped flagmen shall be used where the access road intersects with any public roads.</li> <li>14. Attention shall be paid to minimising disruption of the flow of traffic and reducing the danger to other road users and pedestrians.</li> <li>15. Method statements are required for the following:</li> </ol> |                                       |  |         |

| Action                       | Proposed impact management action and Procedures / Mitigation measures to achieve it  | Responsible person for implementation  | Implementation timeframe and frequency                                | Outcome  |
|------------------------------|---|--|---|--|
|                              | <ul style="list-style-type: none"> <li>-</li> <li>• Traffic safety measures with regard to entry and exit on public roads and the control of construction traffic.</li> <li>• Proposed route for new access roads, tracks, or haul roads; the proposed construction of new roads, and the method of upgrading existing roads; and the proposed methods of rehabilitation on completion.</li> </ul>  |  |   |  |
| 22. Stockpiling of materials | <ol style="list-style-type: none"> <li>1. The Contractor shall temporarily stockpile topsoil materials in such a way that the spread of materials is minimised, and thus the impact on the natural vegetation. The stockpiles must be placed within areas demarcated for this purpose. The RE/ECO/EO shall approve stockpile areas.</li> </ol>  | Holder of EA or representative/Contractor  | Continuously Throughout the construction phase. If and when required. | <ul style="list-style-type: none"> <li>•Appropriate stockpiling, to ensure topsoil can be utilised properly.</li> <li>•Re-establish vegetation</li> </ul>                              |
| 23. Heritage remains         | <ol style="list-style-type: none"> <li>1. Should any unmarked human burials/remains or ostrich eggshell water flask caches be uncovered, or exposed during preparation of the lands for cultivation, , these must immediately be reported to the archaeologist (Jonathan Kaplan 082 321 0172), or the South African Heritage Resources Agency (Ms Natasha Higgitt' 021 462 4502). Burials, etc. must not be removed or disturbed until inspected by the archaeologist.</li> <li>2. It is therefore recommended that, pending the discovery of significant new fossils remains before or during development, exemption from further specialist palaeontological studies and mitigation be granted for the proposed agricultural development on Farm Bethesda 38 near Upington, Northern Cape.</li> <li>3. A qualified archaeologist and/or palaeontologist must be contracted where necessary (at the expense of the holder) to remove any heritage</li> </ol> | Holder of EA or representative/Contractor<br>If discovered qualified archaeologist and/or palaeontologist. | Continuously Throughout the construction phase. If and when required. | <ul style="list-style-type: none"> <li>•To ensure the proper management of heritage remains are undertaken in the event of a discovery during construction and excavations.</li> </ul> |



| Action  | Proposed impact management action and Procedures / Mitigation measures to achieve it   | Responsible person for implementation | Implementation timeframe and frequency   | Outcome  |
|---|--|---------------------------------------|--|--|
|   | remains.   |                                       |  |  |
| 24. Contingency planning                            | <ol style="list-style-type: none"> <li>1. In the event of a spill or leak of product into the ground and/or water courses (e.g. that of hazardous substances used for the construction phase), such incidents must be reported (within 14 days) to all the relevant authorities including the Directorate: Pollution Management in accordance with Section 30(10) of the National Environmental Management Act No. 107 of 1998 (NEMA) and Section 20 (3) of the National Water Act No.36 of 1998 (NWA), that pertains to the control of emergency incidents and the remediation of the affected area. All necessary documentation must be completed and submitted within the prescribed timeframes.</li> <li>2. Containment, clean-up, and remediation must commence immediately.</li> </ol> | Holder of EA or representative        | Continuously Throughout the construction phase. If and when required.                | •Management tools and emergency contacts available in the event of a spillage or incident. |
| 25. Energy Efficiency & Waste Minimization Measures | <p>The following design measures will be considered for energy and water saving measures:</p> <ul style="list-style-type: none"> <li>• Household waste to be separated and re-cycled (glass, paper, green/garden waste).</li> <li>• The use of energy saving bulbs in all structures, alternatively use low voltage or compact fluorescent lights are to be used in this project.</li> </ul>   | Holder of EA or representative        | Continuously Throughout the construction phase. If and when applicable and required. | •Energy and water saving mechanisms implemented.   |

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## **Appendix A: Additional Reports**

No additional reports



**Appendix B: Tracking Table**

| Requirement                  | Received |    | Date | Comment |
|------------------------------|----------|----|------|---------|
|                              | Yes      | No |      |         |
| Methodology statement        |          |    |      |         |
| Site establishment plan      |          |    |      |         |
| Letter re contents of EMPr   |          |    |      |         |
| Letter re awareness training |          |    |      |         |
|                              |          |    |      |         |
|                              |          |    |      |         |
|                              |          |    |      |         |
|                              |          |    |      |         |
|                              |          |    |      |         |
|                              |          |    |      |         |
|                              |          |    |      |         |
|                              |          |    |      |         |
|                              |          |    |      |         |

## Appendix C: Schedule of Fines

### SCHEDULE OF FINES FOR ENVIRONMENTAL DAMAGE OR EMPr TRANSGRESSIONS

(Based on City of Cape Town: Standard Environmental Specifications – Ver. 5 (03/2002))

Note: The maximum fine for any environmental damage will never be less than the cost of applicable environmental rehabilitation.

| EMPr TRANSGRESSION OR RESULTANT ENVIRONMENTAL DAMAGE  | MIN. FINE | MAX. FINE |
|---|-----------|-----------|
| Failure to comply with prescriptions regarding appointment of an ESO and monitoring of EMPr compliance.                                   | R500      | R2000     |
| Failure to comply with prescriptions regarding environmental awareness training.  | R500      | R5000     |
| Failure to comply with prescriptions regarding method statements.   | R500      | R5000     |
| Failure to report environmental damage or EMPr transgressions to the ESO.   | R500      | R1000     |
| Failure to carry out instructions of the ESO regarding the environment or the EMPr.   | R500      | R1000     |
| Failure to comply with prescriptions posting of emergency numbers.  | R500      | R5000     |
| Failure to comply with prescriptions regarding a complaint register.  | R500      | R1000     |
| Failure to comply with prescriptions regarding information boards.  | R500      | R1000     |
| Failure to comply with prescriptions regarding site demarcation and enforcement of 'no go' areas.   | R500      | R5000     |
| Failure to comply with prescriptions regarding site clearing.   | R500      | R5000     |
| Failure to comply with prescriptions for supervision for loading and off-loading of delivery vehicles.                                    | R500      | R1000     |
| Failure to comply with prescriptions for securing of loads to ensure safe passage of delivery vehicles.                                   | R500      | R1000     |
| Failure to comply with prescriptions for the storage of imported materials within a designated contractor's yard.                         | R500      | R1000     |
| Failure to comply with prescribed administration, storage or handling of hazardous substances.  | R500      | R1000     |
| Failure to comply with prescriptions regarding equipment maintenance and storage.   | R500      | R1000     |
| Failure to comply with fuel storage, refuelling, or clean-up prescriptions.   | R500      | R1000     |
| Failure to comply with prescriptions regarding procedures for emergencies (spillages and fires).  | R1000     | R5000     |
| Failure to comply with prescriptions regarding construction camp.   | R500      | R5000     |
| Failure to comply with prescriptions for the use of ablution facilities.  | R500      | R1000     |
| Failure to comply with prescriptions regarding water provision.   | R500      | R1000     |
| Failure to comply with prescriptions for the use of designated eating areas, heating source for cooking or presence of fire extinguishers | R500      | R1000     |
| Failure to comply with prescriptions regarding fire control.  | R500      | R5000     |
| Failure to comply with prescriptions for solid waste management.  | R500      | R5000     |
| Failure to comply with prescriptions regarding road surfacing.  | R500      | R5000     |
| Failure to comply with prescriptions to prevent water pollution and sedimentation   | R500      | R5000     |
| Failure to comply with prescriptions to the protection of natural features, flora, fauna and archaeology.                                 | R500      | R5000     |
| Failure to comply with prescriptions regarding speed limits.  | R500      | R1000     |
| Failure to comply with prescriptions regarding noise levels of construction activities.   | R500      | R5000     |
| Failure to comply with prescriptions regarding working hours.   | R500      | R5000     |

|  |      |       |
|--|------|-------|
| Failure to comply with prescriptions regarding aesthetics.                               | R500 | R1000 |
| Failure to comply with prescriptions regarding dust control.                             | R500 | R1000 |
| Failure to comply with prescriptions regarding security and access onto private property | R500 | R1000 |
| Failure to comply with prescriptions regarding cement and concrete batching              | R500 | R5000 |

For each subsequent similar offence committed by the same individual, the fine shall be doubled in value to a maximum value of R50,000.

## Appendix D: Method Statement Proforma

### METHOD STATEMENT PROFORMA

#### METHOD STATEMENT FOR THE:

This method statement is to be completed by the Contractor (in consultation with the Resident Engineer and EO) at least 5 working days prior to the proposed commencement date of the said work and represents a binding agreement to the method statement by all site contractors and sub-contractors involved in the work for which the method statement is submitted.

DATE OF SUBMISSION: \_\_\_\_\_

LEAD CONTRACTOR: \_\_\_\_\_

OTHER CONTRACTORS AND/OR SUB-CONTRACTORS: \_\_\_\_\_

Describe in detail what work is to be undertaken?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Describe in detail where on the site the works are to be undertaken and the extent? Provide a sketch plan and grid block reference.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Lead supervisor/foreman name and contact details: \_\_\_\_\_

Number of personnel: \_\_\_\_\_

Construction activities: \_\_\_\_\_

Plant and machinery to be used: \_\_\_\_\_

Other: \_\_\_\_\_

\_\_\_\_\_

What environmental impacts are anticipated and what precautions are proposed to prevent these impacts? (Refer to the relevant sections of the EMP for guidance and provide general site camp layout).

\_\_\_\_\_

Toilet facilities: \_\_\_\_\_

Litter: \_\_\_\_\_

Security: \_\_\_\_\_

Plant/machinery (operation, servicing, management, storage, refuelling, etc.).

\_\_\_\_\_

Emergencies and fire: \_\_\_\_\_

\_\_\_\_\_

Hazardous materials (handling, management, storage):

\_\_\_\_\_

Have all personnel involved been through an environmental induction course:

\_\_\_\_\_

Petrochemical spill remediation and containment measures:

\_\_\_\_\_

Other:

\_\_\_\_\_



**DECLARATION BY PARTIES**

**Contractor:**

I understand the contents of the method statement and the scope of the works required of me. I further understand that the method statement may be amended on application to the above signatories and that the Environmental Officer will audit my compliance with the contents of this method statement.

\_\_\_\_\_  
*Print Name*

\_\_\_\_\_  
*Date*

\_\_\_\_\_  
*Signed*

**Environmental Officer (EO):**

The work described in this method statement, if carried out according to the methodology described, is satisfactory mitigation to prevent avoidable environmental harm.

\_\_\_\_\_  
*Print Name*

\_\_\_\_\_  
*Date*

\_\_\_\_\_  
*Signed*

**Resident Engineer:**

The work described in this method statement, if carried out according to the methodology described, is satisfactory mitigation to prevent avoidable environmental harm.

\_\_\_\_\_  
*Print Name*

\_\_\_\_\_  
*Date*

\_\_\_\_\_  
*Signed*

## Appendix E: Method Statement Control Sheet

### METHOD STATEMENT CONTROL SHEET

CONTRACT NO: \_\_\_\_\_

### METHOD STATEMENT CONTROL SHEET

(This control sheet is to be attached to all methods statements)

MS Number:

**THIS SECTION TO BE COMPLETED BY THE CONTRACTOR/METHOD STATEMENT AUTHOR ONLY**

|                      |
|----------------------|
| <b>TITLE:</b>        |
| <b>DESCRIPTION:</b>  |
| <b>SUBMITTED BY:</b> |

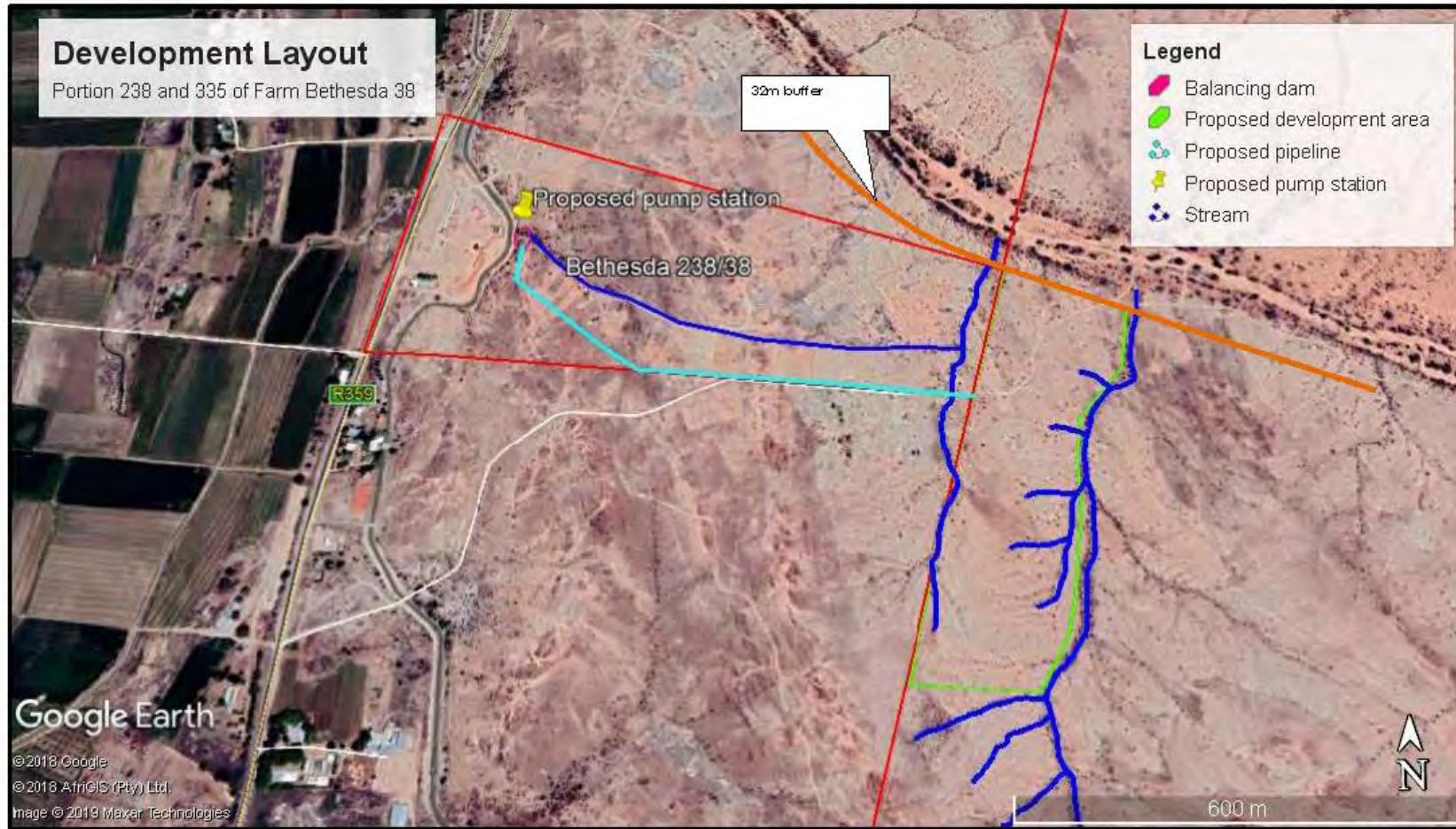
Date requested by: \_\_\_\_\_ Date submitted: \_\_\_\_\_

Date response required by: \_\_\_\_\_ Date work start: \_\_\_\_\_

| REVIEW SCHEDULE |           |          |
|-----------------|-----------|----------|
| Date            | Authority | Comments |
|                 |           |          |
|                 |           |          |
|                 |           |          |
|                 |           |          |
|                 |           |          |
|                 |           |          |
|                 |           |          |
|                 |           |          |
|                 |           |          |
|                 |           |          |

| DISTRIBUTION AND AUTHORISATION |           |    |            |
|--------------------------------|-----------|----|------------|
|                                | APPLICANT | EO | CONTRACTOR |
| Name                           |           |    |            |
| Signature                      |           |    |            |
| Date                           |           |    |            |

Appendix F: Project map



## Appendix G: EAP Curriculum Vitae

PB Professional Services CC  
PO Box 1058  
Wellington 7654

Phone: 021 873 7228  
Cell: 0827763422  
Fax: 0868721916  
E-mail: pbps@africa.com

### Pieter Badenhorst

|  |   |  |                              |
|--|---|--|------------------------------|
| <b>Nationality</b>   | South African   |  |                              |
| <b>Date of birth</b>   | 25 March 1951   |  |                              |
| <b>Qualifications</b>  | B.Sc. B.Eng. (Civil)<br>M.Eng. (Irrigation)<br>B.Hons. (B&A)<br>MBA   | University of Stellenbosch<br>University of Stellenbosch<br>University of Stellenbosch<br>University of Stellenbosch   | 1973<br>1977<br>1992<br>1993 |
| <b>Special courses</b>   | <ul style="list-style-type: none"> <li>● Project Management (5/1990), GROMAN, Stellenbosch;</li> <li>● Project Management Diploma (2-7/91), Damelin Management School, Cape Town;</li> <li>● Time Management (7/91), FSA-Contact group, Cape Town;</li> <li>● Advanced Project Management, GROMAN (9/91), Stellenbosch;</li> <li>● Environmental Auditing (11/93), Inst. of Environmental Assessment, Lincoln, England;</li> <li>● SPIN Complex Selling (2/94), Sales Productivity Associates, Johannesburg;</li> <li>● Presentation (3/94), Whitehead Morris, Johannesburg;</li> <li>● Public participation - Participan (10/94), CSIR/Univ. Cape Town</li> </ul>  |  |                              |
| <b>Professional membership</b>   | Professional engineer, member of the Engineering Council of South Africa<br>Member of the South African Institute of Civil Engineers<br>Member of International Association for Impact Assessment (South Africa)  |  |                              |
| <b>Career</b>  | <p>Since 1997<br/>1997<br/>1995 - 1996<br/><br/>1993 - 1994<br/>1992<br/>1982 - 1991<br/>1981<br/>1979 - 1980<br/>1978<br/>1974 - 1977</p>  | <p>Own consultancy<br/>CSIR, Environmentek; Provincial Business Development Manager<br/>Gulf Petrochemical Services LLC, Business Development Engineer (Sultanate of Oman &amp; UAE)<br/>and CSIR Marketing Manager Middle East (Sultanate of Oman, UAE &amp; Qatar).<br/>CSIR, Ematek, Coastal Development Programme; Marketing Manager<br/>Study for MBA<br/>CSIR, Ematek, Coastal Development Programme; Project Manager<br/>Municipality of Somerset West; Deputy Town Engineer<br/>Municipality of Kulls River; Town Engineer<br/>Municipality of Klerksdorp; Senior Engineer (water)<br/>Department of Water Affairs; Assistant Engineer</p> |                              |
| <b>Current position</b>  | Owner of Pieter Badenhorst Professional Services CC. As a private consultant now provide consultancy services in Environmental/coastal Management, Environmental Engineering, Public Participation and Project Management.  |  |                              |
| <b>Professional experience</b>   | <p>39 years experience in civil, municipal and environmental engineering as well as business development. Civil experience in heavy construction with Department of Water Affairs. Municipal experience includes Senior Engineer, Klerksdorp, Town Engineer of Kulls River and Deputy Town Engineer of Somerset West. Nearly 16 years at CSIR in environmental management (estuarine and coastal), business management, coastal engineering and project management. Work and lived two years in Middle East working in business development, project management for CSIR contracts, tender preparation and environmental management advice. Have extensively traveled the coastlines of Australia and USA to study coastal management. Other overseas visits were undertaken to UK, Netherlands and Australia to investigate commercialisation of CSIR products and general business opportunities.</p> <p>Now mainly involved with environmental studies and management. Have produced various technology research reports for CSIR. The following projects were undertaken for DEAT: a Coastal Management Technical Guide; project managed the Adopt A Beach and Interpretive Signage projects as well as public participation components; initiated and implemented the Blue Flag campaign in South Africa. A number of impact studies were/are undertaken for various clients including major developments with/without golf courses and eco estates. Produced various Scoping and Environmental Impact Reports, Environmental Management Plans and an Environmental Management Framework. Act as Environmental Control Officer for many developments including Thesen Islands Canal development (Knysna), Pezula Private Estate development (Knysna), George Mall development, Leisure Isle Boat Club upgrade (Knysna), Breakwater Bay (George), St Helena Bay development and various building sites. Have undertaken a number of asset assessments for Municipalities.</p> <p>Presented a third year course in Coastal Management at Cape Technikon.</p> |  |                              |
| <b>Publications/Contracts</b><br>(A full list is available on request) | <ul style="list-style-type: none"> <li>● Scoping and Environmental Impact reports.</li> <li>● Environmental Management Plans –construction and operation.</li> <li>● Basic Assessment Reports</li> <li>● S24G Applications</li> <li>● Waste License Applications</li> <li>● Water Use License Applications</li> <li>● Quarry applications/EMPRs</li> <li>● Contract reports on coastal and estuarine environmental management, coastal engineering and monitoring (including a beach monitoring project along the KZN coastline) and various reports on implementation of the Blue Flag campaign.</li> <li>● Contract reports in business management include market research and technology requirements (environment, food and textile/clothing industries).</li> <li>● Publications include CZM Technical Guide, CZM Guidelines and Coastal Processes. Research publications on sedimentation in estuaries and low-level environmental monitoring techniques.</li> <li>● Formed part of the Estuarine and Coastal Unit (ECRU) team that compiled the "Estuaries of the Cape" series.</li> <li>● Formed part of the team that compiled the Policy and Principles &amp; Objectives for Coastal Zone Management in the RSA – for Council of the Environment.</li> <li>● Formed part of the team that developed Norms and Standards for inclusion into NEMA.</li> <li>● Feasibility studies for Department of Environment Affairs &amp; Tourism and Department of Water Affairs.</li> <li>● EIA Review for DEAT on proposed Cape Town Harbour expansion</li> <li>● Member of team – SA Wetland audit for SANBI</li> </ul>   |  |                              |

PB Professional Services CC  
PO Box 1058  
Wellington 7654

Phone: 021 8737228  
Cell: 076 584 0822  
Fax: 0866721916  
E-mail: elaniem@afica.com

## Elanie Kühn

|   |  |  |              |
|---|--|--|--------------|
| <b>Nationality</b>  | South African  |  |              |
| <b>Date of birth</b>  | 20 February 1983   |  |              |
| <b>Qualifications</b>   | B.Sc. Degree (Zoology & Physiology)<br>B Sc. Hons. (Environmental Management)  | North West University – Potchefstroom<br>North West University – Potchefstroom   | 2004<br>2005 |
| <b>Special courses</b>  | None additional to the above.  |  |              |
| <b>Professional membership</b>  | IAIA South Africa  |  |              |
| <b>Career</b>   | 2010 - current<br>2006 - 2009<br>2005  | Pieter Badenhorst Professional Services - Wellington<br>Doug Jeffrey Environmental Consultants - Paarl<br>DERA Environmental Consultancy – Klerksdorp (Part time while completing Hons.) |              |
| <b>Current position</b>   | Environmental Assessment Practitioner at Pieter Badenhorst Professional Services cc. As a private consultant now provide consultancy services in Environmental Management, Public Participation and Project Management.  |  |              |
| <b>Professional experience</b>  | The consultant has 13 years' experience in project management and report writing. She has worked for two other environmental assessment companies prior to the present. She completed her BSc degree and gained an Honours Degree in Environmental Management from the North West University in Potchefstroom. She has been working with Pieter Badenhorst for the last nine years working on Environmental Impact Assessments and Water Use License Applications.   |  |              |
| <b>Publications/ Contracts</b><br>(A full list is available on request) | Projects and work experience range from: <ul style="list-style-type: none"> <li>● Project Management</li> <li>● Basic Assessment Reports</li> <li>● Scoping and Environmental Impact Assessment reports.</li> <li>● Environmental Management Programmes –construction/operational/decommissioning.</li> <li>● S24G Applications</li> <li>● Waste License Applications</li> <li>● Water Use License Applications</li> <li>● Mining EMP's</li> <li>● Mining Rights and Prospecting Rights applications</li> <li>● Environmental Control Officer (ECO)</li> <li>● Auditing Reports</li> </ul> |  |              |

## Appendix H: Details of EAP and expertise

PB Professional Services CC  
PO Box 1058  
Wellington 7654

Phone: 021 8737228  
Cell: 076 584 0822  
Fax: 0866721916  
E-mail: elaniem@jafrica.com

### Elanie Kühn

|   |   |  |              |
|---|---|--|--------------|
| <b>Nationality</b>  | South African   |  |              |
| <b>Date of birth</b>  | 20 February 1983  |  |              |
| <b>Qualifications</b>   | B.Sc. Degree (Zoology & Physiology)<br>B Sc. Hons. (Environmental Management)   | North West University – Potchefstroom<br>North West University – Potchefstroom   | 2004<br>2005 |
| <b>Special courses</b>  | None additional to the above.   |  |              |
| <b>Professional membership</b>  | IAIA South Africa   |  |              |
| <b>Career</b>   | <b>2010 - current</b><br><b>2006 - 2009</b><br><b>2005</b>  | Pieter Badenhorst Professional Services - Wellington<br>Doug Jeffrey Environmental Consultants - Paarl<br>DERA Environmental Consultancy – Klerksdorp (Part time while completing Hons.) |              |
| <b>Current position</b>   | Environmental Assessment Practitioner at Pieter Badenhorst Professional Services cc. As a private consultant now provide consultancy services in Environmental Management, Public Participation and Project Management.   |  |              |
| <b>Professional experience</b>  | The consultant has 13 years' experience in project management and report writing. She has worked for two other environmental assessment companies prior to the present. She completed her BSc degree and gained an Honours Degree in Environmental Management from the North West University in Potchefstroom. She has been working with Pieter Badenhorst for the last nine years working on Environmental Impact Assessments and Water Use License Applications.  |  |              |
| <b>Publications/ Contracts</b><br>(A full list is available on request) | <p>Projects and work experience range from:</p> <ul style="list-style-type: none"> <li>● Project Management</li> <li>● Basic Assessment Reports</li> <li>● Scoping and Environmental Impact Assessment reports.</li> <li>● Environmental Management Programmes –construction/operational/decommissioning.</li> <li>● S24G Applications</li> <li>● Waste License Applications</li> <li>● Water Use License Applications</li> <li>● Mining EMP's</li> <li>● Mining Rights and Prospecting Rights applications</li> <li>● Environmental Control Officer (ECO)</li> <li>● Auditing Reports</li> </ul> |  |              |

## Appendix I: Specialist's declaration of interest

### Botanist specialist declaration

*Botanical Assessment: Agricultural development at Farm Bethesda 238/38 & 335/38, Louisaale,  
Northern Cape Province*

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#### Declaration of independence:

I David Jury McDonald, as the appointed Specialist hereby declare/affirm the correctness of the information provided or to be provided as part of the application, and that I:

- in terms of the general requirement to be independent:
  - other than fair remuneration for work performed in terms of this application, have no business, financial, personal or other interest in the development proposal or application and that there are no circumstances that may compromise my objectivity; or
  - am not independent, but another specialist (the "Review Specialist") that meets the general requirements set out in Regulation 13 has been appointed to review my work (Note: a declaration by the review specialist must be submitted);
- in terms of the remainder of the general requirements for a specialist, have throughout this EIA process met all of the requirements;
- have disclosed to the applicant, the EAP, the Review EAP (if applicable), the Department and I&APs all material information that has or may have the potential to influence the decision of the Department or the objectivity of any report, plan or document prepared or to be prepared as part of the application; and
- am aware that a false declaration is an offence in terms of Regulation 48 of the EIA Regulations, 2014 (as amended).



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Signature of the specialist:

Bergwind Botanical Surveys & Tours CC

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Name of company:

18 July 2019

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Date:

## Archaeology

### THE SPECIALIST DECLARATION FORM

Note: Duplicate this section where there is more than one specialist.

I **Jonathan Kaplan**, as the appointed specialist, hereby declare/affirm the correctness of the information provided or to be provided as part of the application, and that I:

- in terms of the general requirement to be independent:
  - other than fair remuneration for work performed/to be performed in terms of this application, have no business, financial, personal or other interest in the activity or application and that there are no circumstances that may compromise my objectivity; or
  - am not independent, but another specialist that meets the general requirements set out in Regulation 13 have been appointed to review my work (Note: a declaration by the review specialist must be submitted);
- in terms of the remainder of the general requirements for a specialist, am fully aware of and meet all of the requirements and that failure to comply with any the requirements may result in disqualification;
- have disclosed/will disclose, to the applicant, the Department and interested and affected parties, all material information that have or may have the potential to influence the decision of the Department or the objectivity of any report, plan or document prepared or to be prepared as part of the application;
- have ensured/will ensure that information containing all relevant facts in respect of the application was/will be distributed or was/will be made available to interested and affected parties and the public and that participation by interested and affected parties was/will be facilitated in such a manner that all interested and affected parties were/will be provided with a reasonable opportunity to participate and to provide comments;
- have ensured/will ensure that the comments of all interested and affected parties were/will be considered, recorded and submitted to the Department in respect of the application;
- have ensured/will ensure the inclusion of inputs and recommendations from the specialist reports in respect of the application, where relevant;
- have kept/will keep a register of all interested and affected parties that participate/d in the public participation process; and
- am aware that a false declaration is an offence in terms of regulation 48 of the 2014 NEMA EIA Regulations.

Note: The terms of reference of the specialist must be attached.



---

Signature of the specialist:

**Agency for Cultural Resource Management**

---

Name of company:

**24 September, 2019**

---

Date:

## Palaeontology



recently written palaeontological reviews for several 1: 250 000 geological maps published by the Council for Geoscience and has contributed educational material on fossils and evolution for new school textbooks in the RSA.

Since 2002 Dr Almond has also carried out palaeontological impact assessments for developments and conservation areas in the Western, Eastern and Northern Cape under the aegis of his Cape Town-based company *Natura Viva* cc. He has been a long-standing member of the Archaeology, Palaeontology and Meteorites Committee for Heritage Western Cape (HWC) and an advisor on palaeontological conservation and management issues for the Palaeontological Society of South Africa (PSSA), HWC and SAHRA. He is currently compiling technical reports on the provincial palaeontological heritage of Western, Northern and Eastern Cape for SAHRA and HWC. Dr Almond is an accredited member of PSSA and APHP (Association of Professional Heritage Practitioners – Western Cape).

#### **Declaration of Independence**

I, John E. Almond, declare that I am an independent consultant and have no business, financial, personal or other interest in the proposed development project, application or appeal in respect of which I was appointed other than fair remuneration for work performed in connection with the activity, application or appeal. There are no circumstances that compromise the objectivity of my performing such work.



Dr John E. Almond,  
Palaeontologist, *Natura Viva* cc

## Appendix J: Additional Information



