DRAFT SCOPING REPORT

LONGLAKE EXTENSION 34 TOWNSHIP

REMAINING EXTENT OF THE FARM LONGMEADOW 296 IR

REFERENCE: GAUT 002/18-19/E0118

DECEMBER 2019
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1.0 INTRODUCTION

A scoping process aims to determine the content and extent of the matters which should be covered in the environmental impact assessment and the information to be submitted to the competent authority for decision making. This report therefore identifies the key issues to be considered, sets out the appropriate time and space boundaries of the EIA study, provides information necessary for decision-making by identifying the significant effects and factors to be studied in detail during the Environmental Impact Assessment Report (EIR) phase of the process.

The section below provides some background information including details of the applicant, the Environmental Assessment Practitioner (EAP), the proposed activity, and maps out the application process to be followed to fully comply with the provisions of the EIA Regulations, 2014.

1.1 Context and background to the site

The applicant, Taroko Development (Pty) Ltd, proposes to establish a mixed-use township that includes, among others, low- medium density residential uses, educational facilities, special (hotel & conference centre), private open space and associated infrastructure. In addition, the main access to the township will be obtained from Maxwell Drive, which marks the northern boundary of the township. This road will be extended from the K113 up to the access to the township located east of the M60. The proposed development forms part of an area constituting the Highlands Precinct on part of the Remaining Extent of the Longmeadow 296 IR and is to be known as Longlake Extension 34.

The Highlands Precinct area is located within the environs of the Kynoch Chloorkop, a site that was historically used for fertiliser manufacture. The Kynoch factory started in the 1960’s and closed in 1999. Historical operations, such as the spraying of fertiliser and various plant activities including the historical sulfuric acid plant and effluent storage as well as the disposal of gypsum residue have occurred within and around the area. Both the Kynoch Chloorkop activities and the effluent spraying have a significant imprint on the soils and water resources in the area.

1.2 Site location

At a regional scale, the subject property is within the metropolitan boundary of the City of Johannesburg, towards its north eastern extremities. It is thus in a position of strategic connectivity between the 3 major metropolitan areas of the region. In addition, the site lies in proximity to major regional assets such as O.R. Tambo International Airport which is located approximately 10km south east of the site and the Sandton CBD, a major commercial hub located approximately 9km south west of the site. The site is served by both regional road connections with ease of access to the M1, N3 and N1 which connect it with neighboring cities and major nodes such as Centurion, Alexandra, Johannesburg central and Boksburg/Benoni nodes. It also benefits or is poised to benefit from current and future expansions in public transport provision, both through the City of Johannesburg Integrated Transport Network plans, as well as through the Provincially led Gautrain Rail Service.

At a local scale, is bordered by the Modderfontein Reserve to the south and the west thereof, the extension of Maxwell Drive to the north and the extension of Marlboro Drive to the east.

The locality of the site is shown as Fig 1, while Table 1 provides the SG 21 Digit Code of the property.
1.3 Surrounding land uses and zoning

The surrounding areas are characterised by diverse developments and land use patterns. These include residential and light industrial or commercial uses within the Longlake area. Linbro Park area to the west of the property is rapidly evolving with many of the small holding plots being redeveloped into light industrial uses, or multi-unit housing developments. Toward the eastern edges of the site as the surrounding development intensity decreases there are large swathes of vacant greenfield areas, which are potentially unique future development opportunities. This is also an evolving context due to other planned precincts within the Modderfontein Master Plan boundary such as the proposed Town Center Precinct which will have a significant impact on the future of this Township.

The site will be connected to surrounding neighborhoods through significant local connectors like Marlboro Drive and the potential extension of Maxwell Drive. Surrounding developments include diverse with residential areas. The Linbro Park Agricultural Holdings host middle to higher income rural residential community, Buccleuch host middle to higher income residential communities, Marlboro...
Gardens and Kelvin host middle to lower income communities, Kliptfontein View and Chloorkop to the north-east host lower-income communities and Far Bank East and Alexandra to the southwest host lower-income communities.

The portion of the property further to the north-east of the Township has been developed as the Kynoch industrial development where fertilizers have been manufactured, hence the reason for the current “Industrial 1” zoning at a coverage of 25% and FSR of 0.25 which may be increase to 1.2 with the special consent of the local authority. The majority of the property is currently vacant.

1.4 Details of the applicant

Table 2: Details of the applicant

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applicant</td>
<td>Taroko Development (Pty) Ltd (Taroko)</td>
</tr>
<tr>
<td>Representative</td>
<td>Leticia Potts</td>
</tr>
<tr>
<td>Designation</td>
<td>HOD: Modderfontein Project</td>
</tr>
<tr>
<td>Physical address</td>
<td>11 Bylsbridge Boulevard Building 14, Block C, 2nd Floor, Highveld, Centurion</td>
</tr>
<tr>
<td>Postal address</td>
<td>PO Box 39727, Faerie Glen, 0043</td>
</tr>
<tr>
<td>Telephone</td>
<td>012 676 8510</td>
</tr>
<tr>
<td>Email address</td>
<td><a href="mailto:leticia.potts@m-t.co.za">leticia.potts@m-t.co.za</a></td>
</tr>
</tbody>
</table>

1.5 Details of the EAP

To ensure full compliance with the EIA Regulations (2014) promulgated under section 24 (5) of the National Environmental Management Act, 1998 NEMA (Act No. 107 of 1998) (NEMA), Taroko appointed Nali Sustainability Solutions (Pty) Ltd as the independent Environmental Assessment Practitioner (EAP) to manage the application process to obtain the Environmental Authorisation for the proposed project.

Table 3: Details of the EAP

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Nali Sustainability Solutions (Pty) Ltd</td>
</tr>
<tr>
<td>Lead EAP</td>
<td>Mr Pirate Ncube</td>
</tr>
<tr>
<td>Physical Address</td>
<td>65 Country Club Drive, Irene Farm Villages, Centurion</td>
</tr>
<tr>
<td>Postal Address</td>
<td>P Bag X1, Stand 1829, Irene Farm Villages, Centurion, 0045</td>
</tr>
<tr>
<td>Contact details</td>
<td>Tel: 0824517120; Fax: 086 694 1178, Email: <a href="mailto:ncube.nali@gmail.com">ncube.nali@gmail.com</a></td>
</tr>
<tr>
<td>Expertise/experience</td>
<td>More than 26 years’ experience in spatial planning, environmental planning &amp; management (encompassing Strategic Environmental Assessments, Environmental Impact Assessments and reviews, development of Environmental Management Plans, conducting Environmental Compliance Monitoring and Reporting). Served/s in various decision-making bodies including the DFA Tribunal, Environmental Advisory Committee, MEC Appeals Advisory Panel. Qualified Town Planner with master’s in real estate and MBA.</td>
</tr>
</tbody>
</table>
1.6 Overview of the application process

The environmental assessment process will be undertaken in two phases namely:

- **Environmental Scoping Process** which includes the notification of the process and commissioning of specialists’ studies. This particular report details the outcome of this process; and

- **The Environmental Impact Assessment phase** resulting in the EIAR as well as an Environmental Management Programme (EMPr). The EMPr will be compiled based on the findings of the Environmental Impact Assessment and will provide mitigation and management measures for the planning and construction phase of the proposed project.

1.7 Objectives of the Scoping Process

The scoping process will, through a consultative process:

- a) Identify the relevant policies and legislation relevant to the activity;
- b) Motivate the need and desirability of the proposed activity;
- c) Identify and confirm the preferred activity and technology alternative through an impact and risk assessment and ranking process;
- d) Identify and confirm the preferred site through a site selection process, which includes an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified alternatives focusing on the geographical, physical, biological, social, economic, and cultural aspects of the environment;
- e) Identify the key issues to be addressed in the assessment phase;
- f) Agree on the level of assessment to be undertaken, including the methodology to be applied, the expertise required as well as the extent of further consultation to be undertaken to determine the impacts and risks the activity will impose on the site, including the nature, significance, consequences, extent, duration, and probability of the impacts; and
- g) Identify suitable measures to avoid, manage or mitigate impacts and to determine the extent of the residual risks that need to be managed and monitored.

1.8 Environmental Impact Assessment Report Phase

The EIAR will present findings of the EIA, describe the proposed activity and affected environment, forecast the significant impacts likely to result from the implementation of the activity; evaluate alternatives; and identify and evaluate the effectiveness of mitigation measures. An Environmental Management Programme will also be developed.

The draft EIAR will be made available to registered I&APs, including the competent authority to review and comment for a period of 30 days. Once the comments have been collated, responded to and integrated into the final EIAR the report will be submitted to GDARD for consideration and decision making.
2.0 ACTIVITY DETAILS AND MOTIVATION

This section provides details of the proposed activity and associated infrastructure as well as motivation for the proposed development.

2.1 Details of the proposed activity

The purpose of this application is to obtain environmental authorisation for the proposed establishment of a residential township, consisting of the uses listed in the below:

<table>
<thead>
<tr>
<th>ERVEN</th>
<th>NO OF ERVEN</th>
<th>USE ZONE</th>
<th>DENSITY / BULK</th>
<th>STAND SIZES</th>
</tr>
</thead>
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<tr>
<td>1-386</td>
<td>386</td>
<td>&quot;Residential 1&quot;</td>
<td>1 dwelling per erf / total of 386 units</td>
<td>Average of ±1 066m²</td>
</tr>
<tr>
<td>388-390</td>
<td>3</td>
<td>&quot;Residential 2&quot;</td>
<td>25 units per hectare / total of 638 units</td>
<td>Average of ±400m²/unit (internal street included)</td>
</tr>
<tr>
<td>391</td>
<td>1</td>
<td>&quot;Educational&quot;</td>
<td>1 850 children/ FSR = 3,2473ha (0,35)</td>
<td>9,2781ha</td>
</tr>
<tr>
<td>387</td>
<td>1</td>
<td>&quot;Special&quot; for hotel conference centre, clubhouse, gymnasium, restaurant, dwelling houses, residential buildings</td>
<td>FSR = 1,9447ha (0,3)</td>
<td>6,4825ha</td>
</tr>
<tr>
<td>392</td>
<td>1</td>
<td>&quot;Special&quot; for access and access control</td>
<td>n/a</td>
<td>12,7234ha</td>
</tr>
<tr>
<td>393</td>
<td>1</td>
<td>&quot;Private Open Space&quot; including clubhouse, gymnasium, restaurant</td>
<td>n/a</td>
<td>4,6714ha</td>
</tr>
<tr>
<td>394-396</td>
<td>4</td>
<td>&quot;Private Open Space&quot;</td>
<td>n/a</td>
<td>7,8215ha</td>
</tr>
</tbody>
</table>

The proposed layout has been guided by the development constraints and opportunities presented by the site. Included among these were the shape of the land, nature of adjacent land uses, the need for efficiency in land allocation in relation to infrastructure services, specialist and engineering recommendations, the wetland areas, areas of ecological sensitivity and geological constraints, as well as future roads. However, the Environmental Impact Assessment (EIA) and associated specialists’ studies will inform the final layout.

2.2 Proposed Layout Plan

The development of the layout plan has gone through various iterations to arrive at the options that have been evaluated. While several layout alternatives were considered, below are the options that were considered most feasible.
Figure 2: Preferred layout
2.3 Infrastructure services

2.3.1 Access Roads

No road infrastructure and direct access currently exist for the proposed township. Therefore, provisions have to be made for the development to proceed. According to the engineers, the site is planned to have three access points, as briefly described below and shown in Figure 3;

- **Access 1 (Primary Access):** This will be the main access to the residential development. A full access will be taken off the extension of Maxwell Drive and it will be located approximately 720m from Marlboro Drive Intersection. The intersection will be a signalised, T-intersection and is in conjunction with JRA Class 3 access spacing standards relative to adjacent intersections.
- **Access 2 (Secondary Access):** This access is planned to serve the proposed hotel and conference facilities on the western portion of the township. A full access will be taken off the extension of Maxwell Drive and will remain a T-junction in the future.
- **Access 3 (School Access):** Access to the school component is proposed off a newly proposed public road which will form the eastern boundary of the site. A formal access with a drop-off / pick-up area is proposed to comply with the JRA Standards. The school access point will be located no closer than 500m away from the Class 2 Roads, in accordance with the TRH26 Manual and JRA Requirements.

![Figure 3: Proposed roads and access points](image)

2.3.2 Roads improvements identified in the Traffic Impact Study

Road improvements and upgrades will be undertaken per phase of the development. The upgrades required for phase 1 include:

- Maxwell Drive / Proposed Main Site Access Intersection (One traffic lane per direction)
- Maxwell Drive / Proposed Road Intersection (east of main site access) (One traffic lane per direction)
- Maxwell Drive / Marlboro Drive Intersection (One traffic lane per direction)
• Marlboro Drive / Proposed Road Intersection (One traffic lane per direction)
• M60 (Marlboro Drive) / K113 Intersection (Additional southbound lane required).

The following road link will be required as part of Phase 1:
• The road link required for Phase 1 of the proposed development results from the proposed partial intersection of K113 and the road link to Laneshaw Street discussed within the study.
• The Marlboro Drive (M60) bridge construction and Marlboro Drive extension to Maxwell Drive is also a requirement of Phase 1 to ensure access to the development. The construction cost of the bridge and the road will therefore be included as part of service agreements which will form part of the certificate of completion to be provided prior to approval of the Section 82 Certificate with other external upgrades as proposed above.

Road intersections to be upgraded as part of the full / ultimate development extent of uses (over and above those for Phase 1) will be the following:
• Maxwell Drive / Proposed Main Site Access Intersection (Two approach traffic lanes per direction and signalisation when warranted)
• Maxwell Drive / Proposed Hotel & Conference Access Intersection (One traffic lane per direction), no upgrades required.

![Map showing intersections](image)

Figure 4: Map showing intersections

### 2.3.3 Stormwater management

The Highlands precinct lies on two subcatchments as shown in Figure 5. The northern part draining generally to the Noordhoek Stream, and the southern part draining generally to the Northern Stream (also referred to as the W30 Stream). Parts of both subcatchments contain areas draining directly to the Modderfontein Spruit.
Currently, no stormwater infrastructure exists on the proposed Longlake Extension 34. Various options are being considered for the management of post development stormwater for this site, refer to Figures 6&7. The design will be based on the following main principles in order to comply with the Joburg Stormwater bylaws:

- The 1:25 post development run-off volume needs to be approximately the same as the pre-development run-off volume;
- No increase in the peak discharge volume;
- Treatment of the 1:2 stormwater run-off volume.

The above will be achieved by promoting stormwater infiltration practices, stormwater retention and rainwater harvesting for irrigation by means of the following proposed stormwater best management practices, including:

- Grassed and planted swales with check dams;
- Channels with check dams;
- Bioretention areas;
- Wet Ponds;
- Sportsfields as infiltration basins.

The above infrastructure will be designed with the landscape architect to ensure the creation of a functional system which is also aesthetically pleasing.
Figure 6: Stormwater management infrastructure

Figure 7: Typical stormwater management infrastructure
2.3.4 Water services

2.3.4.1 Existing infrastructure
The south-eastern side of the site is criss-crossed with existing low-grade water pipes previously belonging to AEL to supply dynamite testing sites with water. None of these water pipes can be re-used and will therefore be disregarded.

2.3.4.2 Water design criteria
The following standards will be used in the design of a new water reticulation:

- Average annual daily demand (AADD)
  - Residential 1: 0.8 kℓ/unit
  - Residential 2: 0.8 kℓ/unit
  - Special (Hotel): 0.77 kℓ/100m²
  - Education: 0.02 kℓ/pupil
  - Special (Gate House): 0.6 kℓ/unit

- Peak hour demand
  - Peak hour factor (PHF): 4.0
  - Peak hour demand: PHF x AADD

- System heads
  - Maximum static head (no demand): 90 m
  - Minimum residual head under conditions of peak hour demand at erf boundary: 25 m

- Fire-fighting
  - Fire risk category: Moderate
  - Total fire flow: 50 ℓ/s
  - Flow at any one hydrant: 25 ℓ/s
  - Minimum pressure at fire: 15 m
  - Duration of fire: 4 hrs
  - Spacing of fire hydrants: 180 m maximum.

- Linear pipeline velocity
  - Maximum under conditions of peak hour: 1.5 m/s
  - Maximum under conditions of fire-fighting: 2.2 m/s

- Pipe material: PVC-U to SANS 966 Part 1
  - Minimum pipe class: Class 12
  - Supply lengths: 6 m
  - Joints: Spigot and socket joints with rubber sealing rings.

- Boundary roughness (k-value): 0.1 mm
- Flow formula: D’Arcy Weissbach

- Depth of cover below final ground level
  - On sidewalks: 1.0 m(min) – 1.5 m(max)
  - Across streets: 1.0 m(min) – 1.5 m(max)

- Placement of pipes inside a 30 m and greater road reserve for dual carriageway (JRA): 2 m from erf boundary on the low side of street.
• Placement of isolating valves:
  - Opposite splay corner pegs in networks.
  - So that not more than 4 valves must be shut off to isolate any part of the network.
  - So that not more than 30 dwellings in a normal residential area are without water if work is to be carried out on any network pipe.

• Placement of hydrants:
  - Opposite the communal erf pegs and between 0.3 m and 0.6m away from them.
  - Not closer than one erf length to any intersection.

2.3.4.3 Proposed new infrastructure
The proposed development falls inside the future Highlands Reservoir supply area. A new Rand Water connection and a new 710 mm bulk water supply pipeline are currently being installed along Allandale road. A new 600 mm diameter water pipeline is required to tie into this pipeline and run in a north-south direction along Marlboro Drive (M60). The pipeline will run southwards towards Maxwell Drive and then reduce to a 300 mm diameter pipe whilst turning westwards towards the entrance of the development. Various road crossings are foreseen.

Peak hourly consumption together with fire flow requirements determine water network pipe sizes aiming at maintaining a maximum flow velocity of approximately 2.2 m/s under fire flow conditions. For this development it implies a minimum internal pipe diameter size of 208 mm. Network pipe sizes will be determined by a detailed analysis of water demands across Highlands. A water meter assembly will be installed at the entrance to each individual erf.
2.3.5 Sewer services

2.3.5.1 Existing infrastructure

The existing Modderfontein Bulk Outfall Sewer Pipeline drains in a north-western direction south of the Modderfontein Spruit past the proposed development along it’s south-western boundary. It connects to the Bruma Bulk Outfall Sewer Pipeline further north and then drains westwards towards the Northern Waste Water Treatment Works.

2.3.5.2 Sewer design criteria

The following standards will be used in the design of the sewer reticulation:

- Sewage outflow per day
  - Residential 1: 0.7 kℓ/unit
  - Residential 2: 0.7 kℓ/unit
  - Special (Hotel): 0.55 kℓ/100m2
  - Education: 0.015 kℓ/pupil
  - Special (Gate House): 0.4 kℓ/unit

- Peak factor
  - Peak hour factor (PHF) Residential 1: 2.3
  - Peak hour factor (PHF) Residential 2: 2.3
  - Peak hour factor (PHF) Special (Hotel): 3.0
  - Peak hour factor (PHF) Educational: 3.0

- Sewer capacity: Pipes shall be designed to run at 67% full, measured in terms of flow depth.
• Provision for stormwater infiltration: The remaining 33%
• Flow formula: Manning with n = 0.013
• Velocities in sewers: 0.7 m/s minimum
  2.0 m/s maximum
• Fall through manholes: 80 mm (for sewers ≤ 315 mm Ø)
• Minimum pipe size for reticulation pipes: 145 mm internal diameter
• Sewer erf connections: 110 mm diameter at the lowest point of each erf.

New bulk sewer pipelines will be required to link a number of internal sewer connections to the existing bulk outfall sewer pipeline across the Modderfontein Spruit inside the Modderfontein Reserve. A pipeline will be required along the north-western boundary of the site, as well as along the southern boundary. Two options for the sewer pipeline crossings of the Modderfontein Spruit are being considered - one along the existing Dam 4 bridge and the other along the existing wall to the east of the Dam. These will be evaluated to determine the best option. The internal sewer reticulation of the proposed development will connect directly to this existing bulk outfall sewer pipeline inside the Modderfontein Reserve.

![Proposed sewer network](image)

Figure 9: Proposed sewer network

### 2.3.6 Electricity supply

Pienaar & Erwee Engineers (Pty) Ltd have been appointed to assess electrical capacity for the township.

According to the engineers, the estimated maximum demand for Longlake Extension 34 amounts to approximately 9021.87 kVA. Due to the fact that City Power requires reserve capacity on all its’ distribution transformers, it is recognised that once Highlands Estate Extension 7 and 8 have been allocated to be supplied by the Longlake substation, no future bulk supply capacity can be allocated to this substation unless the following upgrades are done:

- Construction of Phase 3 of the Longlake Substation to 90kVA firm.
• Upgrading of the Sebenza to Greenstone Overhead line to a 150MVA dual circuit.

It is the intention to install 11 kV cables for Highlands Estate Extension 7 and 8 Townships from the Longlake Substation over the Modderfontein Reserve via the M60 (Marlboro Drive) bridge and later from Klipfontein View Substation. The main MV distributed supply will be done by underground cables across the Marlboro Drive bridge that will be constructed close to the position of the Longlake Substation and over the Modderfontein Reserve. All these services will be installed within the street reserve.

From the assessment of available bulk infrastructure, the engineers concluded that:
• Bulk electrical capacity for Longlake Extension 34 is not currently available.
• To provide for this township, the developer will have to upgrade the Longlake Primary Substation to 90 MVA firm capacity and construct a high voltage (HV) dual-circuit 150MVA overhead line from Sebenza to Greenstone.

2.4 Listed Activities triggered

In terms of the NEMA EIA Regulations of 2014, the activities triggered by the proposed development are presented in the table below.

<table>
<thead>
<tr>
<th>Government Notice:</th>
<th>Activity No (s)</th>
<th>Describe each listed activity as per the wording in the listing notices:</th>
</tr>
</thead>
</table>
| GN. R 983, 8 December 2014 | Activity 12 | The development of –  
(i) …; or  
(ii) 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  
(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of the watercourse; -- excluding—  
... |
| GN. R 983, 8 December 2014 | Activity 19 | The infilling of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from –  
(i) A watercourse;  
But excluding where such infilling, depositing, dredging, excavation, removal or moving-  
a) Will occur behind a development setback;  
b) Is for maintenance purposes undertaken in accordance with a maintenance management plan; or  
c) Fall within the ambit of activity 21 in this Notice, in which case that activity applies.  
d) ...  
e) ... |
| GN. R 983, 8 December 2014 | Activity 27 | The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for—  
(i) the undertaking of a linear activity; or  
... |
<table>
<thead>
<tr>
<th>Activity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activity 47</td>
<td>The expansion of facilities or infrastructure for the transmission and distribution of electricity where the expanded capacity will exceed 275 kilovolts and the development footprint will increase.</td>
</tr>
<tr>
<td>Activity 15</td>
<td>The clearance of an area of 20 hectares or more of indigenous vegetation except where such clearance is required for—(i). The undertaking of a linear activity; or(ii). maintenance purposes undertaken in accordance with a maintenance plan.</td>
</tr>
<tr>
<td>Activity 4</td>
<td>The development of a road wider than 4 metres with reserve less than 13.5 metres.</td>
</tr>
<tr>
<td>Activity 6</td>
<td>The development of resorts, lodges, hotels, tourism or hospitality facilities that sleep 15 people or more.</td>
</tr>
<tr>
<td>Activity 12</td>
<td>The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance is required for maintenance purposes undertaken in accordance with a maintenance plan.</td>
</tr>
</tbody>
</table>

**c. Gauteng**

- i.  
- ii.  
- iii.  
- iv. Sites identified as Critical Biodiversity Areas (CBAs) or Ecological Support Areas (ESAs) in the Gauteng Conservation Plan or in bioregional plans;  
- v. Sites identified within threatened ecosystems listed in terms of the National Environmental Management Act: Biodiversity Act (Act No. 10 of 2004);  
- vi. Sensitive areas identified in an environmental management framework adopted by the relevant environmental authority;  
- vii.  
- viii. Important Bird and Biodiversity Area (IBA);  
- ix.  
- x.  
- xi.  
- xii. or
### Activity 14

**The development of** –
(i) ...; or
(ii) infrastructure or structures with a physical footprint of 10 square metres or more...

where such development occurs –
(a) within a water course;
(b) ...
(c) If no development setback has been established, within 32 metres of a water course, measured from the edge of a water course;

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

### c. Gauteng

...  
iv. Sites identified as Critical Biodiversity Areas and Ecological Support Areas (CBA) and Ecological Support Areas (ESA) in the Gauteng Conservation Plan or bioregional plans;

v. Within any critically endangered or endangered ecosystems listed in terms of section 52 of the NEMBA...;

vi. Sensitive areas identified in an environmental management framework adopted by the relevant environmental authority;

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### 2.5 Motivation for the proposed activity

The application is for a residential neighborhood providing for approximately 1024 residential units (catering for both “Residential 1” and “Residential 2” units), a school and hotel with a connected open space network. The proposed activity is on vacant property located directly adjacent to the existing Modderfontein Reserve within an area historically used for the Modderfontein operations. The development is likely to contribute to the transformation of the inefficient urban structure by providing for a mixed use development within vacant urban land. This will support compatibility of uses, contribute to limiting urban sprawl while bringing in economic investment, creating employment opportunities and providing different housing opportunities and typologies in the area.

### 2.5.1 Need and desirability

The Greater Highlands Precinct Plan of which the property forms part of is situated within the metropolitan boundary of the City of Johannesburg. It is thus in a location of strategic connectivity between the 3 major metropolitan areas of the region. In addition, the site lies in proximity to major regional assets such as O.R. Tambo International Airport which is located approximately 10 km south east of the site and the Sandton CBD, a major commercial hub located approximately 9 km south west of the site.
The greater Highlands area is served by both regional road connections with ease of access to the M1, N3 and N1 which connect it with neighboring cities and major nodes such as Centurion, Alexandra, Johannesburg central and Boksburg/Benoni nodes. It also benefits or is poised to benefit from current and future expansions in public transport provision, both through the City of Johannesburg Integrated Transport Network plans, as well as through the Provincially led Gautrain rail service.

The surroundings of the greater Highlands area on a local level are characterised by diverse development and land use patterns. Surrounding uses are primarily light industrial and/or commercial uses in the existing Longlake and Linbro Business Park areas with the inclusion of a medium to high residential development in Longlake. Surrounding developments adjacent to the greater Highlands area are also economically diverse with residential neighborhoods such as Linbro Park Agricultural Holdings hosting a middle to higher income rural residential community, Buccleuch hosting middle to higher income established residential communities, Marlboro Gardens and Kelvin hosting middle to lower income communities, Klipfontein View and Chloorkop to the north east hosting lower income communities and Far Bank East and Alexandra to the south west hosting lower income communities. The process of establishing the township shall ultimately facilitate the development of mostly a lower density development scheme not provided within the direct vicinity and ensure a wide variety of housing topologies within the larger area.

Large tracts of land are currently still undeveloped between the Modderfontein Reserve and Allandale Road and offers a rare green field opportunity to implement the systematic intensification of an area inside of the urban development boundary to enable the spatial transformation of the region. It is held that the subject property is located within an area that is very closely associated with the spatial manifestation of the larger Modderfontein development and offers the potential to support intensified growth efforts.

The fact that the property is located opposite to exiting urban development and is seen as a natural expansion of urban growth, places the onus on urban planners to consider the appropriate utilisation of the property within the existing spatial context. Considering the prominence of the property adjacent the Modderfontein Reserve calls for the consideration of a more exclusive development at lower densities to have a positive impact on future more affordable higher densities within the Greater Highlands Precinct.

The appropriateness and spatial rational underpinning the incorporation of residential full title houses and lower density residential units on the property should be seen within the context of the current and future development trends taking place and that will take place within the surrounding spatial context. The decision to incorporate residential full title dwelling houses and lower density residential units within the larger overall Modderfontein Framework area is primarily justified and required to enable the development of sustainable, integrated mixed-use environment in association with the larger Modderfontein development to be known as Taroko City in future. Taroko City will be an integrated cosmopolitan area to be developed connecting residential estates, business and retail parks, city center, private schools, nature reserve and vast green public spaces and gardens as one connected garden city. The above is required to ensure full potential of Taroko City which is centrally located within the fastest growing city on the African continent. Residents and visitors will be able to live, work, shop, play and breathe in this unique green lung of Johannesburg, just minutes away from the financial hub of Africa, the Sandton CBD.

The Johannesburg and Pretoria CBDs are within fast and easy reach through use of either the adjacent main arterial highways or the Gautrain, with a dedicated station to be located in the heart of Taroko City in future. The residential estates will be pivotal in establishing a connected lifestyle for residents who will have access to comprehensive, integrated and affordable lifestyle assets and products such as natural piped gas, information and communication technologies and products, all-inclusive insurance and emergency services and solar and other energy efficient service offerings. Security of person, assets and resources in this unique garden city will be provided through state-of-the-art technologies and practices. The residential estates will comprise an integrated combination of free-standing, sectional title as well as mature lifestyle residential units.
Taroko City will furthermore include neighborhood and value retail centers, schools and tertiary institutions, light industrial areas, hotel, entertainment and conference facilities, hospital and health care facilities, sports fields and facilities, including the exceptional Modderfontein golf course. The Modderfontein Reserve will be retained as a unique communal asset to connect all residents and visitors to this unique garden city and its lifestyle incorporating wholeness, health and care. All future owners or lease holders of erven or units within this township will become members of the Greater Modderfontein Property Umbrella Association Non-Profit Company which will be liable to manage and maintain the necessary infrastructure, facilities, public open green spaces and sport and health facilities to secure and maintain this unique lifestyle for all its residents, workers and visitors within the larger Taroko City.

2.6 Description of Alternatives

The IEM procedure stipulates that the environmental investigation needs to consider feasible alternatives for any proposed development. Therefore, a number of possible proposals or alternatives for accomplishing the same objectives should be identified and investigated. The various alternatives are assessed in terms of both environmental acceptability as well as economic feasibility. The preferred option is to be highlighted and presented to the authorities. The following alternatives are examples of the different kinds of alternatives that may be considered and investigated for a particular development:

- Input alternatives;
- Activity alternatives;
- Location alternatives;
- Status quo / no-go alternatives;
- Demand alternatives / Supply alternatives;
- Scheduling alternatives; and
- Process alternatives.

2.6.1 Input alternatives

Various types of material can be used for the construction of the Longlake Extension 34 Township and its associated structures. These include different brick types (face brick, cement brick, etc.), roof types (pitched or flat), finishes (paint colour, external lighting, landscape features, etc.) and road surfacing (asphalt, brick paving). The proposed development should enhance the status of the area, be aesthetically pleasing and present a high order node in the area.

Energy effective construction and orientation methods need to be considered. The following recommendations regarding building structures and designs are recommended:

- Use of building material that requires excessive amounts of energy to manufacture should be minimised;
- Building material should be legally obtained by the supplier, e.g. wood must have been legally harvested, and sand should be obtained only from legal borrow pits and from commercial sources;
- Building material that can be recycled / reused should be used rather than building material that cannot;
- Use highly durable building material for parts of the building that is unlikely to be changed during the life of the building is highly recommended;
- Make use of recycled concrete (green concrete); and
- Make use of clay blocks for construction of buildings.

2.6.2 Activity alternatives

These are sometimes referred to as project alternatives, although the term activity can be used in a broad sense to embrace policies, plans and programmes as well as projects. Consideration of such alternatives requires a change in the nature of the proposed activity.
For the Highlands Precinct, the location of the site lends itself well for the development of residential uses as a component of the precinct. Further, it is anticipated that the type of development proposed will meet the demand in the area.

2.6.3 Layout alternatives

Layout alternatives permit consideration of different spatial configurations of an activity or components of activity on a particular site. For example, siting of a particular structure either prominently to attract attention or screened from view to minimize aesthetic impacts.

2.6.3.1 Site layout

The site abuts a wetland system along its western boundary while the southern side abuts the Modderfontein Reserve. Taking into account these elements, the infrastructure provisions and the need to ensure compatibility and to maximise the beneficial use of environmental resources but reducing possible negative impacts of the proposed development, different layout versions have been developed. **Layout 1** consists mostly different residential typologies with educational uses towards the south of the site and a hotel on the north-western end of the site.

![Figure 10: Layout plan - Alternative 1](image-url)
Figure 11: Layout Alternative 2

Layout 2- consists of Res 1 and Res 3, a school and some commercial uses along the M60.

2.6.3.2 Stormwater Layout Alternatives

The design for stormwater management has been influenced by a number of factors. Key among these include the impact of historic activities that have taken place within and adjacent to the site, the sulphate dams within the site, the amount of stormwater likely to be generated by the development, the location of the site relative to sensitive environments as well as the requirements of the City of Johannesburg.
Stormwater layout alternative 1 (Figure 12) - the layout focusses on attenuation structures located mostly at the edges of the development. This takes into account the gradient of the site as well as the position of the natural systems for the final stormwater discharge.

The layout also proposes one stormwater dam within the boundaries of the Modderfontein Reserve but outside of the 1:100 year floodlines and the wetland buffer zone. The structure is proposed within an area degraded vegetation and limited ecological value. The approach would that the structure would be designed to serve an ecological function by increasing the wet area which is likely to attract bird life, to function properly as a water quality structure and for aesthetic appeal serving as a neighbourhood amenity.

Stormwater layout alternatives 2 (Figure 13) - this has a number of attenuation facilities within the development site and just outside the southern-western boundary of the site (within the reserve).

Stormwater layout alternatives 3 (Figure 14) - this has a reduce number of attenuation structures, all located within the boundaries of the township. To contend with, this design would have to be informed by what happens to the Sulphate Dams and possible contamination resulting thereof.
Figure 13: Alternative 2 – Small but numerous attenuation structures within the township

Figure 14: Alternative 3 – Reduced number attenuation ponds on the side
2.6.3.3 Sewer Layout Alternatives

Two possible sewer crossings of the Modderfontein spruit have been considered as shown below.

Figure 15: Alternative 1- Proposed sewer network as per GLS proposal

Figure 16: Alternative 2 sewer crossing utilising existing but broken bridge
The alternative external sewer alignments have been informed by the location of the existing bulk sewer line, the sewer network proposed by GLS as well as the need to limit the impact of the sewer crossing on the wetland area.

2.6.4 Location alternatives

No alternative sites have been considered as this site is owned by the proponent and is contiguous to areas/sites that have been developed by the applicant. Preliminary investigations concluded that the proposed site is the most suitable due to its ideal location in terms of the requirements for residential development. Moreover, this township forms part of the precinct that has already been authorised for development.

2.6.5 Demand alternatives

The residential sector in Gauteng has performed very well over the last few years. This good performance results from the abnormally long and severe slump in “construction fixed investments” during the 1980’s and 1990’s. A typical “construction fixed investment” cycle should be in the region of 15-20 years. In the 80’s/90’s period of stagnation in South Africa, this cycle was almost two decades. Subsequently, the country’s economic growth has been on a broad, accelerating path, since the early 1990’s. Hence, the demand for economic and residential infrastructure has been established.

2.6.6 Assessment of alternatives considered

Land uses choices as reflected in the layout plans, route alignment for the sewer line, stormwater infrastructure and the no-go alternatives were evaluated for the site. Please refer to section 5 below where the different alternatives are assessed.

2.6.7 Status quo / No-go alternatives

The no-go option was also considered. This entails leaving the site in its present state. The site is currently vacant. Leaving it in its present state would mostly likely result in the site being unattended to, uncontrolled and unmanaged which could subject the site to abuse and degradation (which is already taking place), as no control mechanisms are likely to be implemented.

Vacant land within the Gauteng urban core in general is a valuable commodity and resource and even more so when such land falls within or is adjacent to a development corridor. It is imperative that such a resource is not left vulnerable to the effects of urban decay and its negative economic and social implications.

If development of the site is not approved the site will remain as is. Given that preliminary assessment does not point to any environmental fatal flaws but that the site is strategically located, and its development is likely to contribute substantially to economic development, employment creation and that the wetland areas will not be adversely affected it is therefore considered proper that development of the site might be a better option from economic, social and environmental perspectives. This shall be confirmed through the detailed assessment to be conducted through the EIR process.
3.0 LEGISLATIVE AND POLICY CONTEXT

This section serves to highlight key legislation and policy framework that has implications on the proposed activity. It must be noted that this list is not exhaustive but notes, at high level, the critical laws and policies that have been considered.


All environmental aspects should be interpreted within the context of the Constitution. The Constitution has enhanced the status of the environment by virtue of the fact that environmental rights have been established (Section 24) and because other rights created in the Bill of Rights may impact on environmental management. An objective of local government is to provide a safe and healthy environment (Section 152) and public administration must be accountable, transparent and encourage participation (Section 195(1)(e) to (g)).

Implications for the proposed development:
- Obligation to ensure that proposed activity will not result in pollution and/or ecological degradation;
- Obligation to ensure that where possible conservation is promoted; and
- Obligation to ensure that the proposed activity is ecologically sustainable, while demonstrating economic and social benefits.


The National Environmental Management Act (Act No. 107 of 1998) (NEMA) is South Africa’s overarching framework for environmental legislation. The object of NEMA is to provide for operative environmental governance by establishing principles for decision-making on matters affecting the environment, institutions that will promote co-operative governance, and procedures for co-ordinating environmental functions exercised by organs of state.

It sets out a number of principles that aim to give effect to the environmental policy of South Africa. These principles are designed to, amongst others, serve as a general framework for environmental planning, as guidelines by reference to which organs of state must exercise their functions and guide other laws concerned with the protection or management of the environment.

Chapter 5 of NEMA serves to promote integrated environmental management which must place people and their needs at the forefront of its concerns, and serve their physical, psychological, developmental, cultural and social interests equitably. Development must be socially, environmentally and economically sustainable. Sustainable development therefore requires the consideration of all relevant factors.

In terms of the NEMA and the EIA Regulations, 2014, an application for environmental authorisation for certain listed activities must be submitted to either the provincial environmental authority, or the national authority, depending on the types of activities being applied for. The current EIA regulations, GN R.982, GN R.983, GN R.984 and GN R.985, promulgated in terms of Sections 24(5), 24M and 44 of the NEMA commenced on 08 December 2014. GN R.983 lists those activities for which a Basic Assessment is required, GN R.984 lists the activities requiring a full EIA (Scoping and Impact Assessment phases) and GN R.985 lists certain activities and competent authorities in specific identified geographical areas. GN R.982 defines the EIA processes that must be undertaken to apply for Environmental Authorisation. The listed activities that are applicable to this project are identified in Section 2 above.

Implications for the proposed development
- The principles espoused in NEMA serve as guidelines for relevant decision makers in ensuring the protection of the environment. Therefore, the proposed development must be consistent with these
principles.

- Where this is not possible, deviation from these principles would have to be very strongly motivated;
- The activity may not take place without the required authorisation; and
- Both the Scoping and EIAR processes will have to be informed by these principles and include public participation process.


One of the main objectives of the NEMWA is to provide for the regulation of waste management in order to protect health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development. The Act provides:

- National norms and standards for regulating the management of waste by all spheres of government;
- Specific waste management measures including:
  - The licensing and control of waste management activities;
  - The remediation of contaminated land;
  - to provide for the national waste information system; and
  - Compliance and enforcement mechanisms.

In terms of the NEMWA, certain waste management activities must be licensed and in terms of Section 44 of the Act, the licensing procedure must be integrated with an environmental impact assessment process in accordance with the EIA Regulations promulgated in terms of the NEMA. Government Notice 921, which was published in Government Gazette No.37083, on 29 November 2013 and implemented with immediate effect, lists the waste management activities that require licensing. A distinction is made between Category A waste management activities, which require a Basic Assessment, and Category B activities, which require a full EIA (Scoping followed by Impact Assessment)

Implications for the development:

- Any activities listed in GN 718 of the Waste Act require an EIA.
- Waste generated by the activity must be managed in accordance with the provisions of the Act.

3.4 The National Environmental Management: Biodiversity Act (Act 10 of 2004)

The Act provides for the management and conservation of South Africa’s biodiversity within the framework of the NEMA. This Act allows for the protection of species and ecosystems that warrant national protection, the sustainable use of indigenous biological resources, the fair and equitable sharing of benefits arising from bioprospecting involving indigenous biological resources and the establishment and functions of the South African National Biodiversity Institute. Key elements of the Act are:

- The identification, protection and management of species of high conservation value;
- The identification, protection and management of ecosystems and areas of high biodiversity value;
- Biodiversity Initiatives such as the STEP (Subtropical Thicket Ecosystem Plan) and CAPE (Cape Action Plan for People and Environment) may become accepted as bioregional plans and are thus implemented as legislation;
- Alien invasive species control of which the management responsibility is directed to the landowner; and
- Section 53 of the Act identifies that any process or activity that is regarded as a threatening process in terms of a threatened ecosystem, requires environmental authorization via a full Environmental Impact Assessment process.

Implications for the current development:

There were no ecologically endangered species encountered on the site; the majority of the site was identified as degraded grassland.

The National Water Act (The Act) provides for the management of South Africa’s water resources. The purpose of the Act is to ensure that the Republic’s water resources are protected, used, developed, conserved and controlled. It is concerned with the allocation of equitable access and the conservation of water resources within South Africa. The National Water Act of 1998 repealed many of the powers and functions of the Water Act of 1956. Key provisions include the following:

- **Catchment Areas** - Any disturbance to a watercourse such as the construction of a dam or weir type facility requires authorization from the Department of Water and Sanitation.
- **Water Supply** - Under the National Water Act, a developer is required to obtain the necessary permits for water usage and the disposal of wastewater from the authority responsible for the administration of the Act.
- **Any private well or borehole sunk for the abstraction of groundwater has to be reported and registered with the regulatory authority.**
- **Wastewater** - The National Water Act is the principal piece of South African legislation governing wastewater management.

**Implications for the proposed development:**

- Any proposed water uses must be specified and registered and/or licensed;
- Any modifications to drainage lines on site must be investigated in terms of water use requirements;
- The developers are responsible for taking reasonable measures to prevent pollution of water resources that it owns, controls, occupy or uses on the land in question;
- The developers are required to remedy a situation where pollution of a water resource occurs following an emergency incident and where it is responsible for the incident or owns or is in control of the substance involved;
- The developers must take all reasonable measures to minimise the impacts of the incident, undertake clean-up procedures, remedy the effects of the incident and take measures as directed by the catchment agency; and
- Waste created during construction needs to be controlled adequately to negate the impacts on ground and surface water.

**3.6 The National Heritage Resources Act, 1999 (Act 25 of 1999)**

The Act aims to promote the good management of the national estate of South Africa. The national estate can include:

- Places, buildings, structures and equipment of cultural significance;
- Places to which oral traditions are attached or that are associated with living heritage;
- Historical settlements and townscapes;
- Geological sites of scientific or cultural importance;
- Archaeological and palaeontological sites;
- Graves and burial grounds, including:
  - Ancestral graves
  - Royal graves and graves of traditional leaders
  - Graves of victims of conflict
  - Graves of individuals designated by the Minister by notice in the Gazette
  - Historical graves and cemeteries
- Sites of significance relating to the history of slavery in South Africa.

In terms of Section 38 of the Act, the South African Heritage Resources Agency (SAHRA) must be notified during the early planning phases of a project for any development that includes the following activities:
• the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length any development or other activity which will change the character of a site exceeding 5 000 m² in extent:
• the re-zoning of a site exceeding 10 000 m² in extent, or
• any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority.

Implications for the proposed development:
• Any artefacts uncovered during the construction phase must be reported to SAHRA;
• No person may alter or demolish any structure or part of a structure, which is older than 60 years or disturb any archaeological or palaeontological site or grave older than 60 years without a permit issued by the relevant provincial heritage resources authority. The age of the stable building on site needs to be determined; and
• SAHRA must be informed of the proposed development and provided an opportunity to comment. This may result in the need for a basic heritage assessment.

3.7 The Gauteng Provincial Environmental Management Framework, 2015

The objective of the GPEMF is to guide sustainable land use management within the Gauteng Province. The GPEMF, inter alia, serve the following purposes:
• To provide a strategic and overall framework for environmental management in Gauteng;
• Align sustainable development initiatives with the environmental resources, developmental pressures, as well as the growth imperatives of Gauteng;
• Determine geographical areas where certain activities can be excluded from an EIA process; and
• Identify appropriate, inappropriate and conditionally compatible activities in various Environmental Management Zones in a manner that promotes proactive decision-making.

Implications for the proposed development:
The site is located within the Urban Development Zone (Zone 1) of the EMF while the proposed sewer crossings, some stormwater outlets and the road crossing affecting wetland area fall within Zone 2. The intention Zone 1, the Urban Development Zone is to streamline urban development activities and promote development infill, densification and concentration of urban development to establish a more effective and efficient city region that will minimise urban sprawl. The proposed mixed-use development providing commercial/industrial uses in close proximity of residential uses is aligned with government policy in general and the provisions of the spatial tools including the EMF in particular.

3.8 City of Johannesburg Spatial Development Framework 2040

The SDF 2040 sets the guiding vision and then builds a concrete strategy for its realisation. The site falls within the Randburg-OR Tambo Corridor earmarked for the...” development of strategic land parcels using current development dynamics to drive growth and reduce expansion pressure on the periphery”. The proposed development is aligned with the principles and objectives of the of the SDF.

3.9 Other legal provisions and policies

Other policies, municipal plans and guideline documents that are relevant to the project are listed below:
• Electricity Act (Act 41 of 1987);
• Integrated Resource Plan for South Africa (2010);
• National Road Traffic Act (Act No. 93 of 1996);
• Gauteng Employment Growth and Development Strategy;
• Gauteng 2055 (2014);
• Johannesburg Metropolitan Open Space Policy (2004).
4.0 DESCRIPTION OF THE RECEIVING ENVIRONMENT

This section establishes the baseline conditions by describing the biophysical and socio-economic environment that may influence or be affected by the development. This includes information obtained from literature sources and is described at a level deemed appropriate for the study. While a summary of the environmental aspects is provided, more detailed studies will be provided during the impact assessment phase. The three components to the environment are recognised as:

- Physical Environment;
- Biological Environment;
- Socio-Economic Environment.

Only those elements of the environment considered to have a bearing on the project are discussed.

4.1 Physical Environment

4.1.1 Climate

The climate is characterised by typical Highveld conditions, with relatively warm to hot summers, fairly high rainfall and moderate to cool winters (with little or no rain). Cycles of prolonged drought, lasting for several years, are a natural phenomenon. The area experiences thunderstorms, which usually occur in the late afternoons during the summer months. The area lies at an altitude of approximately 1 500 meters above sea level. The average annual rainfall is 638mm. The average maximum summer temperature is 26.9°C and the average maximum winter temperature is 16°C.
Figure 17: Max, Min and Average Temperature

4.1.2 Air quality

As the site is located within easy reach of the Chlorokop and Modderfontein Industrial areas. As a result, an air quality study has been commissioned to determine the ambient air quality of the area.

4.1.3 Noise

While the workings on the Gypsum dumps might result in high noise levels, these working are expected to be completed by the end of 2019. No other adjacent activities have potential to compromise ambient noise levels in the area. In addition, the proposed development is not expected to result in any significant increase in the ambient noise levels in the area.

4.1.4 Topography

The site generally falls moderately form the North East to the South West with an estimated slope of 7%. According to the Geotechnical Engineer, it will be advisable that building platforms, access roads and parking areas slightly be elevated in relation to the immediate surroundings in order to assist channelling of surface water run-off and to contribute towards the internal stability of structures and road pavements.

4.1.5 Geology and Soils

According to the 1:250 000 East Rand 2628 geological map, the site is underlain by Granodiorite of the Halfway House Granite Suite. Reworked residual granodiorite and/or residual granodiorite were encountered in all the test holes, whilst granodiorite bedrock was encountered in most of the test holes dug. From a macro point of view, the site is generally underlain by potentially collapsible hillwash transported, followed by pebblemarker transported, pedogenic (partly developed ferricrete and fully developed hardpan ferricrete) horizons in places, reworked residual granodiorite, residual granodiorite and very soft rock and harder, granodiorite bedrock and interspersed with numerous granodiorite rock outcrops.
From a geotechnical site class designation point of view, can be divided into four zones, namely Zone A, B, C and D. Zone A class as “R”, whilst both Zones B and C class as “S2/R” and Zone D class as “Marshy/S2/R”, all in accordance with the NHBRC classification system (Figure 18).

In terms of the soils/rock horizons, the following were encountered during fieldwork and is expected to underlie the proposed township development:

- A superficial organic layer comprising of dead leaves, roots, etc, absent of soils and generally ranging between 0,1m and 0,2m in thickness, where encountered. The superficial organic layer was only encountered in test holes TH36, TH41, TH43, TH44, TH45, TH53 & TH54 and generally where dense vegetation occurs.

- Dry to slightly moist yet moist to very moist in places, generally dark olive-brown becoming light orange-brown with depth, predominantly very loose and apparently medium dense to dense in areas but potentially compressible and pinhole voided, fine to medium grained silty and clayey SAND, generally with numerous grass, plant and tree roots in places, hillwash transported. The layer occurs across the site and from GGL ranging between 0,2m and 1,1m below GGL with its thickness varying between 0,2m and 1,0m across the site.

- Slightly moist and moist to very moist, dark olive-brown, speckled and mottled yellow-orange and bright white, ranging between very loose and dense in places but medium dense in the most cases, massive, fine to coarse grained GRAVEL (and COBBLES in some areas) in a fine to medium grained silty and clayey sand matrix with or without numerous scattered grass roots in profile, pebblemarker transported. The horizon was randomly encountered across the site and between 0,5m and 1,1m below GGL with its thickness varying between 0,15m and 0,7m, where encountered.

- Slightly moist and moist to very moist, dark olive-brown and yellow-orange, speckled and mottled yellow-orange and black, ranging between loose to medium dense and medium dense to dense, highly ferruginous, fine to coarse grained silty SAND with abundant scattered, slightly to highly weathered,
medium hard rock, ferricrete nodules in profile, partly developed ferricrete, pedogenic. This layer was only sporadically encountered across the site and only within 7% of the test holes dug, namely TH04, TH11, TH12 and TH48 and between 0,6m and 1,3m below GGL. The expected layer thickness range between 0,3m and 0,7m where encountered.

- Moist to very moist, dark olive-brown and yellow-orange, speckled and mottled yelloworange and black, highly ferruginous and cemented, ranging between MEDIUM HARD ROCK and MEDIUM HARD ROCK TO HARD ROCK hardness, fully developed hardpan ferricrete, pedogenic was sporadically encountered and only in 8% of the test holes (TH12, TH23, TH47, TH51 & TH53), between 0,2m and 0,9m below GGL and resulted in digging refusal of the TLB in 3No of these occurrences. In the remaining cases, the layer thickness was measured to range between 0,2m and 0,3m only. Hence the recommended quality assurance test pitting to confirm the minimum required layer thickness with a competent excavator (25t or heavier), noted under clause 5.3.2, 5.5 and 5.9.1 of this report.

- Dry to slightly moist and moist to very moist, predominantly dark yellow-orange, mottled, streaked and blotched dark olive-brown and grey, ranging between loose and very dense bordering very soft rock hardness across the site, massive, fine to coarse grained silty, slightly clayey SAND with frequent scattered highly weathered, soft rock to medium hard rock gravel in profile in the majority of cases, reworked granodiorite was encountered in 77% of the test holes dug. The horizon was encountered between 0,35m and 2,3m below GGL with the layer thickness generally ranging between 0,2m and 1,5m.

- Slightly moist to moist and very moist, dark yellow-orange, micro-speckled black, generally ranging between medium dense to dense and very dense bordering very soft rock hardness (medium dense – TH02 only) across the site, slightly ferruginous, fine to coarse grained silty SAND, residual granodiorite was encountered in 48% of the test holes dug. The horizon was encountered between 0,6m and in excess of 2,4m below GGL with the layer thickness generally ranging between 0,2m and 1,3m. However, a very dense bordering very soft rock hardness consistency was noted in a number of the test holes where the residual granodiorite was encountered which resulted in digging refusal of the TLB. Thus, deeper occurrence is therefore possible to occur on site.

- Predominantly dark yellow-orange, micro-speckled black, coarse grained, massive, highly weathered, very closely spaced and black stained jointed in the majority of cases and widely spaced closed spaced where outcrops occur, VERY SOFT ROCK TO EXTREMELY HARD ROCK, granodiorite occurs from GGL in the case of outcrops to between 0,2m and 2,3m below GGL.

4.1.6 Surface water

The Modderfontein area is situated in the A21 C quaternary catchment in the Crocodile West — Marico Water Management Area. The main river flowing through the larger Modderfontein property is the Modderfontein Spruit which has its origins near Croydon in Kempton Park and flows in a northerly direction to the Jukskei River. Four drainage channels/areas are identifiable in the vicinity of the proposed development area. These include:

- Allandale stream: A drainage channel, usually dry, originating north of Allandale road to the north-east of the development area. The sub-catchment includes the northern most wetland area.
- Noordehoek stream: A drainage channel (intermittent flow) to the west of the gypsum dams which drains to the Modderfontein Spruit
- W25 stream (Kynoch I): A drainage channel (intermittent flow) originating south of the historical Kynoch Chloorkop factory area and draining to the W20 stream (a minor tributary of the Modderfontein Spruit).
- Kynoch 3 stream: A drainage channel (intermittent flow), located to the south and west of the southern-most wetland area which also drains to the W20 stream.

Only the Noordehoek stream and the Modderfontein Spruit are located close to/adjacent to the proposed development. These are likely to be impacted upon by the post development stormwater flows. Therefore, appropriate measures and designs will need to be put in place to ensure that the pre-development stormwater flows into these systems are maintained.
4.2 Biological Environment

4.2.1 Terrestrial ecology

While a full ecological assessment was undertaken by Enviro Insight in March 2018. (Overall, most of the habitats on site are considered disturbed and impacted by the current and historical land use as well as surrounding edge effects of urban infrastructure. The following section provides a description of each of the habitat types occurring within the study area.

Biome

The development site lies within the Grassland Biome which is found chiefly on the high central plateau of South Africa. Grasslands are dominated by a single layer of grasses. The amount of cover usually depends on rainfall and the degree of grazing. Trees are absent except in a few localised habitats. Geophytes are often abundant. Frost, fire and grazing maintain the grass dominance and prevent the establishment of trees.

Vegetation Type

The study area is located within the Egoli Granite Grassland vegetation type. This vegetation type has been classified as Endangered due to the high levels of fragmentation, urban expansion as well as low protection levels (Mucina & Rutherford 2006). It is not resilient to high levels of disturbance and continues to come under severe pressure from the expansion of high density development. Less than 3 % of the targeted 24 % is conserved in several nature reserves. The landscape and vegetation features are described as low hills and moderately undulating plains, which support tall grass species such as *Hyparrhenia hirta*, dominating the area. Scattered rocky outcrops and rock sheets form suitable habitats for woody species (Mucina and Rutherford, 2006). The Egoli Granite Grassland has also been listed as a threatened ecosystem (SANBI, 2011).

![Figure 19: Precinct area in relation to the vegetation type (Mucina and Rutherford, 2006)](image)
Habitat delineation

Overall, most of the habitats on site are considered disturbed and impacted by the current and historical land use as well as surrounding edge effects of urban infrastructure. The following section provides a description of each of the habitat types occurring within the study area.

Habitat Unit 1 – Degraded Grassland

The majority of the habitat within the study area can be classified as Degraded grassland. The area has high infestations of alien and exotic weed species including Bidens pilosa, Campuloclinium macrocephalum, Cortaderia selloana, Cosmos bipinnatus, Melinis repens, Pennisetum setaceum, Solanum mauritianum, Tagetes minuta, and Verbena bonariensis occurring in high densities. Grass species include Aristida congesta, Eragrostis curvula, Digitaria eriantha, Chloris virgata, Heteropogon contortus, Hyparrhenia hirta, Schizachyrium sanguineum and Urochloa mosambicensis within the natural fragments and Cynodon dactylon as well as Pennisetum clandestinum occurring in the more disturbed areas. Forb species recorded in this habitat include Felicia muricata, Gomphocarpus fruticosus, Helichrysum nudifolium, Hermannia cf. lancifolia, Hilliardiella oligocephala, Hypoxis iridifolia, Hypoxis rigidula, Pelargonium luidum, Polygala hottentotta, Senecio inornatus and Wahlenbergia undulata. This habitat is considered to be of low sensitivity.

No SCC were recorded during the survey conducted in early March 2018 or mid April 2017 and due to the high density of alien weeds the likelihood of occurrence is regarded as medium.

Habitat Unit 2 – Transformed

The Transformed habitat unit represented areas manipulated in their entirety and which no longer show any meaningful ecological functionality. These areas represent mining areas, bunkers for the safe storage of explosives, workshops and offices and roads. Some flora species (grasses, forbs, trees, all mostly weeds) do exist mostly immediately surrounding these areas. This habitat type is classified as non-sensitive and no SCC are expected to occur within this habitat type.

Habitat Unit 3 – Watercourse

This habitat unit represents the visible surface water and wet grassland areas throughout the study area (please take note that these areas are identified based on vegetation and historical images from Google Earth
and should not be seen as a formal wetland delineation). These areas along with their edges are mostly surrounded by various alien and invasive plants, mainly due to transport of seeds via the watercourse as well as historical and current land use disturbances within the site. Natural vegetation such as *Eragrostis curvula, Digitaria eriantha, Imperata cylindrica, Phragmites australis, Typha capensis* and the orchid *Habenaria falcicornis* does occur in fragments. Other alien/invasive plants associated with this habitat recorded include *Arundo donax, Paspalum dilatatum, Pennisetum clandestinum, Persicaria lapathifolia, Tagetes minuta* and *Verbena bonariensis*. From a habitat perspective, the habitat has a moderate to high sensitivity due to functional role it plays in the distribution and filtering of water as well as habitat for various fauna (including avifauna). Watercourses in general are sensitive and provide important ecological services, act as buffer areas against climate change and provide important habitat to flora and fauna species.

No floral SCC were recorded during the survey and the likelihood of occurrence is regarded as medium.

**Habitat unit 4 - Rocky outcrop**

This habitat unit represents areas where large rock features are protruding from the ground surface. Most of the habitat is disturbed by human activity in the form of trails demarcated through the habitat and previous disturbance. Some rocky areas were observed dispersed between alien vegetation stands. This is important to note as the habitat provides suitable habitat and refugia for faunal species, especially for reptiles and small mammals.

The plant species diversity and density were lower than expected for this habitat type and included *Aloe spp.*, *Aristida junciformis, Bryum argenteum, Cyperus rupestris, Cheilanthes viridis, Dichapetalum cymosum, Melinis repens, Opuntia ficus-indica, Pellaea calomelanos, Tritonia cf. nelsonii, Xerophyta retinervis*. No red data species were recorded during the survey and the likelihood of occurrence is regarded as low along the proposed road extension, and moderate for rocky outcrops within the surrounding study area.

**Habitat unit 5 – Alien vegetation**

This habitat unit consist of *Eucalyptus* sp. trees planted historically as hedgerows as well as areas invaded mostly by *Acacia mearnsii, Campuloclinium macrocephalum* and *Cortaderia selloana*. The area is disturbed and is indicated as having a very low sensitivity. As mentioned above, the rocky habitat occurs dispersed within the alien vegetation habitat which is not necessarily indicated on the habitat map (Figure 6).

**Plant species of conservation concern**

No SCC were recorded during both surveys. The disturbed nature of the habitat is considered unsuitable for plant SCC within the study area. Overall and based on the vegetation analysis and the observations made during the survey it is evident that the area currently shows some functional ecological value (especially wetland systems), but not to the degree of providing habitat for plant SCC. It should be noted that both *Hypoxis hemerocallidea* and *Boophone disticha* has been recorded within 250 m west of the study area. Both these species are Orange Listed species according to GDARD C-Plan v3.3 (GDARD, 2014), and if located on the study area where development will impact them, it is required to be removed and relocated as determined by GDARD.

**Faunal species of conservation concern**

Through the assessment of faunal characteristics of the site (habitat potential, connectivity to surrounding intact habitats, evidence of the presence of faunal species etc.) as well as applying the basic assessment study performed in conjunction with the aforementioned faunal references, no faunal “trigger” species were identified. A list of fauna SCC that could potentially occur within in the study area is indicated in Table 5 followed by a discussion below.
Table 5: Fauna SCC previously recorded within the 2628AA QDS

<table>
<thead>
<tr>
<th>Family</th>
<th>Genus</th>
<th>Species</th>
<th>Common name</th>
<th>Red list category</th>
<th>ADU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pyxicephalidae</td>
<td>Pyxicephalus</td>
<td>adspersus</td>
<td>Giant Bull Frog</td>
<td>Near Threatened</td>
<td>Frog MAP</td>
</tr>
<tr>
<td>Felidae</td>
<td>Acinonyx</td>
<td>jubatus</td>
<td>Cheetah</td>
<td>Vulnerable</td>
<td>Mammal MAP</td>
</tr>
<tr>
<td>Felidae</td>
<td>Panthera</td>
<td>leo</td>
<td>Lion</td>
<td>Vulnerable</td>
<td>Mammal MAP</td>
</tr>
<tr>
<td>Hyaenidae</td>
<td>Crocuta</td>
<td>crocuta</td>
<td>Spotted Hyena</td>
<td>Near Threatened</td>
<td>Mammal MAP</td>
</tr>
<tr>
<td>Hyaenidae</td>
<td>Parahyaena</td>
<td>brunnea</td>
<td>Brown Hyena</td>
<td>Near Threatened</td>
<td>Mammal MAP</td>
</tr>
<tr>
<td>Vespertilionidae</td>
<td>Pipistrellus</td>
<td>rusticus</td>
<td>Rusty Pipistrellus</td>
<td>Near Threatened</td>
<td>Mammal MAP</td>
</tr>
</tbody>
</table>

**South African Hedgehog (Atelerix frontalis) Near Threatened**

Hedgehogs are listed as Near Threatened and although the species is common in urban environments and is affected by development, it is also found on grasslands of varying degrees of quality, especially in the absence of dogs and other feral predators. With a loss of grassland habitat, it is likely that local hedgehog populations will be displaced or eradicated. The best course of action will be to allow for worker induction, which will report hedgehog presence and allow individuals to be safely relocated to more undisturbed areas.

**Serval (Leptailurus serval) Near Threatened**

It is anticipated that a non-significant resident population persists within the study area, given the predicated high density of rodents and the suitable habitat. The species is a relatively common wetland associate in grassland areas and although the Near Threatened status warrants due consideration, the species is not considered to be a fatal flaw given adequate mitigation (especially of wetland environments).

**Brown Hyaena (Parahyaena brunnea) Near Threatened**

Brown Hyaena is an essential component of the ecosystem and act as important scavengers in the region, clearing carcasses that can potentially spread diseases to wild mammal populations. Brown Hyaena is listed as Near Threatened and although they are present in high densities within some areas of Gauteng, pure grassland (even with some rocky outcrops) does not represent the cornerstone of their distribution. Furthermore, the high density of infrastructure and consequently human presence in the surrounding area will decrease their Likelihood of Occurrence.

**African Clawless Otter (Aonyx capensis) Near Threatened and Spotted-Necked Otter (Hydrictis maculicollis) Vulnerable**

The spotted-necked otter has been upgraded to Vulnerable in 2016. It was apparent that some potentially suitable migratory/dispersal habitat persists within the study area; especially within the watercourse habitat. However, most of the study area is sub-optimal for spotted-necked otters which prefer deep, clear pools which support large populations of fish. The conclusion for the spotted-neck otter (which the likelihood of occurrence is considered to be almost definite but transitory in all the relevant study areas exhibiting flowing water) requires mitigation measures buffering of all flowing watercourses from the development infrastructure and buffering of heavy cattle grazing in watercourses. For now, the proposed 32 m buffer area should be implemented at the southern and western watercourses of the study area.

Regarding the African clawless otter, the species is much more terrestrial and the watercourse habitat is considered to be optimal. The species was confirmed through scats downstream of the study area. The Near Threatened status of this species does not warrant single species ecological support buffering or fatal flaw allocation.

**Giant Bullfrog Pyxicephalus adspersus Regionally Near Threatened**

The Giant Bullfrog is listed by Minter *et al.* (2004) as Near Threatened. This species has been recorded in the quarter degree (FrogMap 2018) on which the study area resides and due to their ecological attributes (large amphibians which breed in seasonally inundated wetlands) are pertinent to the study. Although GDARD has
removed Giant Bullfrog from the list of trigger species, the Red List status as well as the association with wetland habitats warrants analysis. The analysis of the water bodies’ habitat suggests that historically, this species would have had a very high likelihood of occurring within the study area. The proposed development is unlikely to affect the breeding habitat of this species should the watercourses be protected.

African Grass Owl *Tyto capensis* Vulnerable
This species is dependent on the presence of the grass species *Imperata cylindrica* located in wet areas. Even though the entire study area was not surveyed on foot, some stands of *I. cylindrica* were recorded on site. The density and presence of this grass species in wetland areas surrounding the study area were considered medium and not sufficient to support breeding individuals of *T. capensis*. Based on the limited information, the presence of this species cannot be ruled out. It is therefore suggested that prior to construction suitable areas are surveyed and the extent of *I. cylindrica* be mapped.

Habitat sensitivity
Based on the fauna and flora observations during the fieldwork as well as the current impacts described above, each habitat type was evaluated in terms of its ecological sensitivity. This sensitivity is rated as either low, medium or high, where low sensitivity is considered ideal for development and high sensitivity areas are to be avoided by potential development. The habitat sensitivity is illustrated as Figure 21. It should be noted that after the wetland report and its addendum report (Terrasoil 2018) was made available, the sensitivity map was adjusted in order to take into account the findings of the wetland delineation and land contamination mapping. By no means have the overall ecological services or integrity been compromised; rather a collective approach was taken in order to highlight suitable areas for development where impacts are considered either low and/or easy to mitigate, and to highlight areas that are considered “no-go” areas from a development perspective.

The overall sensitivity can be summarised as follows:
- The overall sensitivity is defined as being mostly low, due to a highly disturbed and transformed system which is not characteristic of the vegetation type.
- The presence of watercourses on the study area present suitable habitat for both aquatic and terrestrial species, and act as a corridor in an already transformed and fragmented landscape. The sensitivity is indicated as either moderate but mostly high. Areas considered to be contaminated by previous activities were excluded as high as they no longer serve a functional role and act as pollution zones which should rather be developed on in order to contain it.
Aquatic ecology

Watercourses adjacent to the site are, in general, sensitive and provide important ecological services, act as climate change corridors and provide important habitat to flora and fauna species. These areas, along with their edges are mostly surrounded by various alien and invasive plants, mainly due to transport of seeds via the watercourse as well as historical and current land use disturbances within the site. Natural vegetation such as *Eragrostis curvula*, *Digitaria eriantha*, *Imperata cylindrica*, *Phragmites australis*, *Typha capensis* and the orchid *Habenaria falcicornis* do occur in fragments. Other alien/invasive plants associated with this habitat recorded include *Arundo donax*, *Paspalum dilatatum*, *Pennisetum clandestinum*, *Persicaria lapathifolia*, *Tagetes minuta* and *Verbena bonariensis*. From a habitat perspective, these areas are considered to be of moderate to high sensitivity due to their functional roles in the distribution and filtering of water as well as serving as habitats for various fauna (including avifauna).

However, no red listed species were recorded during the survey and the likelihood of occurrence is regarded as medium.
Historically, the site and its environs fell within the area that supported the functioning of the AECI Modderfontein operations. The land was recently released for development.

The proposed township falls within the Highlands Precinct area located within the Randburg-OR Tambo corridor according to the City of Johannesburg Spatial Development Framework. The intention of the corridor is to create a strong east-west development corridor in the north of the city with a broader city region focus, while capitalizing on the opportunities for infill development in the vacant tracts of land along this corridor. This corridor would also intersect with the north-south Corridor of Freedom along the Louis Botha Corridor, which links from Soweto past the Inner City into Sandton; thus, strengthening connectivity to the metropolitan core and other principal metropolitan sub-centers.

Further, the SDF shows that the site forms part of the Transformation Zone (The “Blue” Zone). This zone represents the spatial extent of the urban transformation focus of urban growth and investment promotion, as well as being the focus of future incentive packages, and the bulk of public capital investment (primarily facilitated through the Johannesburg Strategic Infrastructure Platform – JSIP). In the Blue Zone, the city will promote densification, diversification and intensification through capital infrastructure investment, increased density allowances and other incentives.

Figure 22: Image showing wetlands

### 4.3 Human Environment

#### 4.3.1 Socio-economic context

Historically, the site and its environs fell within the area that supported the functioning of the AECI Modderfontein operations. The land was recently released for development.

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Spatial opportunities include well placed parcels of open land linking the areas, including Modderfontein, Linbro Park and Frankenwald in Johannesburg, and Dries Niemandt in Ekurhuleni, all of which are potential centers of developmental energy and investment. The development of these areas creates opportunities for new road based and public transport connections to be made to 110 bridge areas that currently contribute to spatial discontinuity. Economic development potential of these infill areas is significant, and their mixed-use characters would contribute to greater job intensity and land productivity.

Figure 23: Provisions of the COJ SDF 2010

At a local context, the site falls within the Modderfontein Masterplan of September 2017. According to the master plan, the property falls within an area earmarked to develop as mixed use area but providing for predominately residential uses. The proposed rights are therefore directly in line with this approved policy for the area.
Figure 24: Modderfontein Master Plan

4.3.2 Archaeology and cultural heritage/sites of importance

Site investigations were carried out by the National Cultural History Museum in December 2006 for the entire Modderfontein site.

In order to understand the complex, it was divided into different categories, based on a heritage approach:

- **Industrial area**: This is the ‘factory’ area, where production of all products takes place. Some very interesting remains are found here, most of which is still in use.
- **Private areas**: These are the various houses. All of these are used for habitation, or as offices. As a result, they are mostly well maintained.
- **Infrastructure/open space**: The streets, parks, etc. are all well maintained.
- **Hidden features**: These are essentially those sites identified by Hall (1997), which is currently either inaccessible due to them being in restricted areas or because they are covered by grass. As their locations are known, either from Hall’s report or from this one, they can be managed.

Based on the survey, the following can be said:

- The whole Modderfontein precinct is unique in the sense that it retains much of its original character, within the framework of its original purposes, i.e. the production of dynamite and other chemicals.
- As such it reflects not only technological development over more than a century, but also the people as related social fabric of the country as a whole.
- The integrity of most identified features and structures are intact and speaks volumes for the management of the area and its conservation.
4.3.3 Visual aspects

The majority of the site is currently undeveloped and is characterized by overgrown veld grass but contains traces of prior disturbance. A small portion has been developed by bunkers of previous activity on the property. The proposal by the applicant extends to a low density residential development. It is not likely that the neighbouring developments may suffer any inconvenience associated with overlooking or impact on privacy and amenity. In particular, appropriate setbacks have been proposed and the orientation of buildings on the subject property will be such that the risk of impacting on the amenity and privacy of adjacent landowners will be kept to a minimum. Therefore, the proposed development is not expected to be visually intrusive as the receptors are not considered to be visually sensitive.

4.3.4 Land contamination

Owing to the historic uses within and operations adjacent to the development site, potential contamination and effective handling of pollution within the site and seepage from sources outside of the site must be investigated. For Long Lake Extension 4, two sources are relevant, the aluminum sulphate dams and seepage from the gypsum dams.

4.3.4.1 Aluminium ponds

Aluminium sludge derived from operations at Modderfontein was deposited in nine small earth walled ponds located upgrade of Dam 4. The total footprint area of the ponds is approximately 30 000 m².

The ponds were decommissioned in 1988. Until 2001, an unlined canal of strong effluent from the Central Factory and Fuse areas was located immediately upgrade of the dams. The effluent overflowed into the ponds during high flow periods and the strong effluent leached into the ponds. The ponds themselves have also overflowed resulting in the denudation of vegetation downgrade of the site.

The sludge was characterized and classified in terms of the DWAF Minimum Requirements (SRK Report 277660) in early 2000, with the objective being to assess the risk to the environment of those chemicals which were likely to leach from the sludge. Based on the chemical analyses then, it was concluded that in terms of the potential environmental impacts, leachate from the sludge contained aluminum, copper, lead and zinc at concentration levels that exceed the Acceptable Environmental Risk (AER) concentration levels.

However, as the main receptors were the surface ecological environment downgrade of the dams, and the contaminated water contained in Dam 4, (with no development earmarked for the area), the risk profile to receptors was considered to be low.

The main areas of concern with respect to potential adverse impacts from the Aluminium Sulphate ponds are:

- the downgrade surface zone, approximately 2000 m² to 3000 m² (0.2 – 0.3ha) in extent, located between the ponds and the effluent holding dam (Dam 4);
- effluent dam (Dam 4).

The potential environmental concerns associated with the ponds are:

- ground and surface water contamination caused by seepage and spillages from the ponds;
- vegetation denudation in the area between the ponds and Dam 4 caused by contaminated surface run-off and groundwater seepage;
- soil degradation in the area between the ponds and Dam 4 caused by contaminated surface run-off and groundwater seepage.
Gypsum

Longlake Extension 34 is situated near an area that used to house gypsum dumps, the gypsum sites have been since cleared and rehabilitated. The area that used to house gypsum dumps is bordered by Waterval to the north, Klipfonteinview Residential Areas and Allandale road to the north-east, the old Chloorkop factory site to the south-east and Modderfontein to the south. It comprised both the old and new gypsum dams. Effluent from Modderfontein has been sprayed north and north-east of the area as well as the south of the dump zone. Other waste deposits in the vicinity of the dumps include the Chloorkop ash dump and the calcine waste residue deposit.

Waste from the manufacture of fertilisers, comprising a mixture of waste gypsum, sulphuric acid and phosphate rock was dumped on the old gypsum dump from 1964 to 1972. Similar waste was dumped on the new gypsum dump from 1972 to 1979. The waste gypsum comprises calcium sulphate (CaSO₄), phosphate and fluoride, (SRK Report 216667/4).

5.0 IMPACT ASSESSMENT METHODOLOGY AND ASSESSMENT OF IMPACTS

This section provides the methodology for assessing the significance of impacts associated with the activity. The criterion for determining impact significance has been defined in accordance with the criteria drawn from Appendix 3 of the Environmental Impact Assessment Regulations, 2014. The levels of detail described in the EIA regulations were fine-tuned by assigning specific values to each impact identified.

In order to establish a coherent framework within which all impacts could be objectively assessed, it is necessary to establish a rating system, to be applied consistently to all the criteria. For such purposes each aspect is assigned a value ranging from one (1) to four (4) depending on its definition. The tables below provide a summary of the criteria and the rating scales, which will be used in the assessment the impacts.

5.1 Description of nature and scale of impacts

The table below provides a brief description of the terms used to assess the impact of the proposed activity on the environment.

<table>
<thead>
<tr>
<th>Nature: classification of whether the impact is positive or negative, direct or indirect.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extent: spatial scale of impact and classified as:</td>
</tr>
<tr>
<td>• Site: the impacted area is the whole or significant portion of the site.</td>
</tr>
<tr>
<td>• Local: Within a radius of 2 km of the construction site.</td>
</tr>
<tr>
<td>• Regional: the impacted area extends to the immediate, surrounding and neighbouring properties.</td>
</tr>
<tr>
<td>• National: the impact can be considered to be of national significance.</td>
</tr>
<tr>
<td>Duration: Indicates what the lifetime of the impact will be and is classified as:</td>
</tr>
<tr>
<td>• Short term: The impact will either disappear with mitigation or will be mitigated through natural process in a span shorter than the construction phase.</td>
</tr>
<tr>
<td>• Medium term: The impact will last for the period of the construction phase, where after it will be entirely negated.</td>
</tr>
<tr>
<td>• Long term: The impact will continue or last for the entire operational life of the development but will be mitigated by direct human action or by natural processes thereafter. The only class of impact which will be non-transitory.</td>
</tr>
<tr>
<td>• Permanent: Mitigation either by man or natural process will not occur in such a way or in such a time span that the impact can be considered transient.</td>
</tr>
</tbody>
</table>
### Intensity
Describes whether an impact is destructive or benign;
- **Low**: Impact affects the environment in such a way that natural, cultural and social functions and processes are not affected.
- **Moderate**: Affected environment is altered, but natural, cultural and social functions and processes continue albeit in a modified way.
- **High**: Natural, cultural and social functions and processes are altered to extent that they temporarily cease.
- **Very High**: Natural, cultural and social functions and processes are altered to extent that they permanently cease.

### Probability
Describes the likelihood of an impact actually occurring:
- **Improbable**: Likelihood of the impact materialising is very low
- **Possible**: The impact may occur
- **Highly Probable**: Most likely that the impact will occur
- **Definite**: Impact will certainly occur.

### Significance
Based on the above criteria the significance of issues was determined. The total number of points scored for each impact indicates the level of significance of the impact, and is rated as:
- **Low**: the impacts are less important.
- **Medium**: the impacts are important and require attention; mitigation is required to reduce the negative impacts.
- **High**: the impacts are of great importance. Mitigation is therefore crucial.

### Cumulative
In relation to an activity, means the impact of an activity that in itself may not be significant but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area.

### Mitigation
Where negative impacts are identified, mitigation measures (ways of reducing impacts) have been identified. An indication of the degree of success of the potential mitigation measures is given per impact.

---

### 5.2 Criteria for rating of impacts

This describes the criteria to be used and the significance rating of the impacts.

#### Table 7: Criteria for rating of impacts

<table>
<thead>
<tr>
<th>Criteria for the rating of impacts</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Criteria</strong></td>
<td><strong>Extent</strong></td>
</tr>
<tr>
<td>National</td>
<td>Regional</td>
</tr>
<tr>
<td>Permanent</td>
<td>Long-term</td>
</tr>
<tr>
<td>Very high</td>
<td>High</td>
</tr>
<tr>
<td>Definite</td>
<td>Highly probable</td>
</tr>
<tr>
<td><strong>Points allocation</strong></td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Significance Rating of identified impacts</th>
<th>Impact</th>
<th>Points</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Low</strong></td>
<td>4-6</td>
<td>A low impact has no permanent impact of significance. Mitigation measures are feasible and are readily instituted as part of a standing design, construction or operating procedure.</td>
<td></td>
</tr>
<tr>
<td><strong>Medium</strong></td>
<td>7-9</td>
<td>Mitigation is possible with additional design and construction inputs.</td>
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</tr>
<tr>
<td><strong>High</strong></td>
<td>10-12</td>
<td>The design of the site may be affected. Mitigation and possible remediation are needed during the construction and/or operational phases. The effects of the impact may affect the broader environment.</td>
<td></td>
</tr>
<tr>
<td><strong>Very high</strong></td>
<td>13-16</td>
<td>The design of the site may be affected. Mitigation and possible remediation are needed during the construction and/or operational phases. The effects of the impact may affect the broader environment.</td>
<td></td>
</tr>
</tbody>
</table>
### Status

<table>
<thead>
<tr>
<th>Status</th>
<th>Perceived effect of the impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive (+)</td>
<td>Beneficial impact</td>
</tr>
<tr>
<td>Negative (-)</td>
<td>Adverse impact</td>
</tr>
</tbody>
</table>

Negative impacts are shown with a (-) while positive ones are indicated as (+)

#### 5.3 Preliminary issues and environmental sensitivities

The preliminary environmental issues and sensitivities relating to the physical, biological, economic social and institutional/legal framework have been identified in the body of the report. The following potential impacts were identified and will be investigated further during the EIR phase:

- Ground and surface water pollution;
- Destruction of the wetland;
- Impact on geology and soils;
- Impact on fauna and flora including primary vegetation and grasslands;
- Topography and visual impacts;
- Socio-economic issues, such as employment creation, economic viability and other social impacts including security;
- Waste generation and management;
- Dust and noise impacts;
- Loss of heritage resources;
- Disruption of services in the area;
- Increase in traffic volumes;
- Safety and security;
- Access to open space;
### 5.4 Comparative assessment of alternatives - before and after mitigation

<table>
<thead>
<tr>
<th>Environmental Aspects</th>
<th>Physical</th>
<th>Biological</th>
<th>Socio-Economical</th>
<th>Institutional</th>
<th>Total of Impacts</th>
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<tbody>
<tr>
<td>L – Lower positive</td>
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<td>M – Medium positive</td>
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<td>H – Higher positive</td>
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<tr>
<td>L – Lower negative</td>
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<td>M – Medium negative</td>
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<td>H – Higher negative</td>
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<tr>
<td>N – Neutral</td>
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</tbody>
</table>

#### Construction Phase

**Alternative 1:** Before Mitigation
- Geology and Soils: L
- Hydrology: M
- Topography: H
- Climate: N
- Fauna: M
- Flora: M
- Qualitative Environment: L
- Visual, Noise: M
- Pollution: H
- Security: H
- Compatibility of Land-Use: L
- Local Authority: N
- Economic Impact – Local Authority: L
- Impact & AP: H
- Impact Private Sector: N
- Cultural and Historical: L
- High agricultural potential land: M
- Total: 2

**After Mitigation**
- Geology and Soils: L
- Hydrology: L
- Topography: N
- Climate: L
- Fauna: L
- Flora: L
- Qualitative Environment: H
- Visual, Noise: H
- Pollution: H
- Security: H
- Compatibility of Land-Use: L
- Local Authority: L
- Economic Impact – Local Authority: L
- Impact & AP: N
- Impact Private Sector: M
- Cultural and Historical: M
- High agricultural potential land: M
- Total: 29

**Alternative 2:** Before Mitigation
- Geology and Soils: L
- Hydrology: M
- Topography: H
- Climate: N
- Fauna: M
- Flora: L
- Qualitative Environment: M
- Visual, Noise: M
- Pollution: H
- Security: M
- Compatibility of Land-Use: L
- Local Authority: N
- Economic Impact – Local Authority: L
- Impact & AP: H
- Impact Private Sector: N
- Cultural and Historical: M
- High agricultural potential land: M
- Total: 9

**After Mitigation**
- Geology and Soils: L
- Hydrology: L
- Topography: N
- Climate: L
- Fauna: L
- Flora: L
- Qualitative Environment: H
- Visual, Noise: H
- Pollution: H
- Security: H
- Compatibility of Land-Use: L
- Local Authority: L
- Economic Impact – Local Authority: L
- Impact & AP: N
- Impact Private Sector: M
- Cultural and Historical: M
- High agricultural potential land: M
- Total: 26

#### Operational Phase

**Alternative 1:** Before Mitigation
- Geology and Soils: L
- Hydrology: M
- Topography: M
- Climate: M
- Fauna: L
- Flora: H
- Qualitative Environment: L
- Visual, Noise: M
- Pollution: H
- Security: H
- Compatibility of Land-Use: N
- Local Authority: N
- Economic Impact – Local Authority: M
- Impact & AP: M
- Impact Private Sector: M
- Cultural and Historical: M
- High agricultural potential land: L
- Total: 14

**After Mitigation**
- Geology and Soils: M
- Hydrology: L
- Topography: M
- Climate: L
- Fauna: M
- Flora: M
- Qualitative Environment: M
- Visual, Noise: H
- Pollution: H
- Security: H
- Compatibility of Land-Use: N
- Local Authority: N
- Economic Impact – Local Authority: M
- Impact & AP: M
- Impact Private Sector: M
- Cultural and Historical: M
- High agricultural potential land: L
- Total: 45

**Alternative 2:** Before Mitigation
- Geology and Soils: L
- Hydrology: M
- Topography: H
- Climate: M
- Fauna: L
- Flora: H
- Qualitative Environment: L
- Visual, Noise: M
- Pollution: H
- Security: M
- Compatibility of Land-Use: N
- Local Authority: N
- Economic Impact – Local Authority: M
- Impact & AP: M
- Impact Private Sector: M
- Cultural and Historical: M
- High agricultural potential land: M
- Total: 3

**After Mitigation**
- Geology and Soils: M
- Hydrology: L
- Topography: M
- Climate: L
- Fauna: M
- Flora: M
- Qualitative Environment: M
- Visual, Noise: M
- Pollution: M
- Security: N
- Compatibility of Land-Use: N
- Local Authority: N
- Economic Impact – Local Authority: M
- Impact & AP: M
- Impact Private Sector: M
- Cultural and Historical: M
- High agricultural potential land: M
- Total: 37

**Preferred Alternative**
Based on the comparative impact assessment, **Alternative 1 (preferred layout)** is more beneficial.

**ROUTE POSITION OF SEWER LINE**
### Environmental Aspects

- **L** – Lower positive
- **M** – Medium positive
- **H** – Higher positive
- **L** – Lower negative
- **M** – Medium negative
- **H** – Higher negative
- **N** – Neutral

<table>
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<td>In line with SDF or other frameworks, and open space plans</td>
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</tbody>
</table>

### Construction Phase

**Alternative 1: Before Mitigation**

- **L** = 10
- **M** = 8
- **N** = 5

**After Mitigation**

- **L** = 10
- **M** = 8
- **N** = 5

**Preferred Alternative**

- Based on the comparative impact assessment, **Alternative 1 Route alignment** is more beneficial.

### Stormwater Outlets

#### Construction

**Alternative 1: Before Mitigation**

- **M** = 12
- **N** = 8

**After Mitigation**

- **M** = 12
- **N** = 8

**Alternative 2: Before Mitigation**

- **M** = 20

**After Mitigation**

- **M** = 20

Nali Sustainability Solutions (Pty) Ltd 53
5.5 Preliminary assessment of anticipated Impacts

The impacts/aspects (beneficial and adverse) of the proposed activity are identified in the body of the report. The specific preliminary impacts associated with the development on the study area (are identified under each environment of this report), and general construction and operational phase related impacts associated with development are listed in the Table below.

<table>
<thead>
<tr>
<th>Environmental Aspects</th>
<th>Physical</th>
<th>Biological</th>
<th>Socio-Economical</th>
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After mitigation

<table>
<thead>
<tr>
<th>Physical</th>
<th>Biological</th>
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OPERATIONAL PHASE

Alternative 1: Before Mitigation

<table>
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<th>Physical</th>
<th>Biological</th>
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After Mitigation

<table>
<thead>
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<tr>
<td>Preferred Alternative</td>
<td>Based on the comparative impact assessment Alternative 1 stormwater outlets are more beneficial</td>
<td></td>
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</tbody>
</table>

Alternative 2: Before Mitigation

<table>
<thead>
<tr>
<th>Physical</th>
<th>Biological</th>
<th>Socio-Economical</th>
<th>Institutional</th>
<th>Total of Impacts</th>
</tr>
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<tbody>
<tr>
<td>L</td>
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</table>

Alternative 2: Before Mitigation

<table>
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<tr>
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<th>Socio-Economical</th>
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Preferred Alternative

Based on the comparative impact assessment Alternative 1 stormwater outlets are more beneficial
### Table 8: Preliminary quantification of impacts during the construction phase

<table>
<thead>
<tr>
<th>Environmental Component</th>
<th>Potential Impact</th>
<th>Environmental Significance Score</th>
<th>Mitigation Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Impacts</td>
<td></td>
<td>E</td>
<td>D</td>
</tr>
</tbody>
</table>
| Ground and surface water pollution | - Contamination of surface and groundwater due to spillages, leakage, incorrect storage and handling of chemicals, oils, lubricants, cement, fuels and other hazardous material.  
|                          | - Deposition of contaminated water into the wetland,  
|                          | - Erosion of the banks and siltation. | 3      | 3 | 3 | 4 | 13                          | - Adequate stormwater drainage should be constructed. Stormwater culverts and drains are to be located and covered with metal grids to prevent blockages;  
|                          |                                                                                   |                                  | - All hazardous substances must be stored on an impervious surface in a designated bunded area able to contain 110% of the total volume of materials stored.  
|                          |                                                                                   |                                  | - All earth moving vehicles and equipment must be regularly maintained to ensure their integrity and reliability. No repairs may be undertaken beyond the contractor lay-down areas or without precautionary measures implemented.  
|                          |                                                                                   |                                  | - An Emergency Preparedness and Response Plan will be developed and implemented should an incident occur.  
|                          |                                                                                   |                                  | - Establishment of stormwater diversion berms around the contractor laydown area and other potential contaminated areas (e.g. diesel storage tanks or refueling station).  
|                          |                                                                                   |                                  | - Care must to be taken to ensure that no contaminated water enters the natural watercourse. Preventative measures including sumps from where contaminated water can be either treated in situ or removed to an appropriate waste site.  
|                          |                                                                                   |                                  | - Excess or spilled concrete should be confined within the works area and then removed to a waste site.  
|                          |                                                                                   |                                  | - Stream banks stabilization and prevention of further erosion to be implemented.  
<p>|                          |                                                                                   |                                  | - Protect sloping areas and wetland banks that are susceptible to erosion and ensure that there is no undue soil erosion resultant from activities within and adjacent to the construction camp and Work Areas. |</p>
<table>
<thead>
<tr>
<th>Environmental Component</th>
<th>Potential Impact</th>
<th>Environmental Significance Score</th>
<th>Mitigation Measures</th>
</tr>
</thead>
</table>
| Geology and soils       | ● Destabilisation of surface geology as a result of excavations  
● Potential erosion, degradation and loss of topsoil due to construction activities as well as stormwater runoff                                                                                               | 1 1 3 4 9                        | ● Building platforms, access roads and parking areas slightly be elevated in relation to the immediate surroundings in order to assist channeling of surface water run-off and to contribute towards the internal stability of structures and road pavements.  
● Proper surface run-off and subsurface drainage including damp proofing form part of the permanent works.  
● Insofar excavation within “Hard” material is concerned, excavation by means of power tools, such as seismic pneumatic rock breaker attached to a 25t traxcavator for instance, should be considered as a minimum.  
● The founding of surface beds, access roads and parking areas are summarized as follows:  
  - Rip and re-compact the upper say 300mm (minimum) of in-situ soils to a minimum of 93% Mod AASHTO in-situ density.  
  - Import minimum one layer of G7 quality natural soils/gravels and compact to 95% of Mod AASHTO at optimum moisture content for all surface bed preparation and selected road layer works construction purposes.  
  - A minimum of 1No x stabilized C4 base/subbase layer should be considered for road pavement construction purposes, as a minimum.  
  - Interlocking block paving should preferably be considered as the final road and parking. |
| Topography              | ● Alteration of topography due to excavations stockpiling of soil, building material, debris and waste material on site.  
● Stability of slopes                                                                                                                                  | 1 1 1 2 5                        | ● Limit excavations to areas required for construction purposes.  
● Avoid placing of stockpiles and other services on areas likely to pose obtrusive visual impact  
● Precautionary measures and design from the engineer must be implemented.  
● Re-vegetation of re-profiled slopes;  
● Temporary stabilisation of slopes using geotextiles; and Installation of gabions and reno mattresses. |
| Air quality             | Dust pollution on site which would affect adjacent developments as a result of construction activities and vehicles on site.                                                                                          | 2 1 2 4                          | ● Enforcement and adherence to speed limits on onsite roads to prevent the liberation of dust.  
● Dust suppression measures including regular application of water must be implemented. Water used for this purpose must be used in quantities that will not result in the generation of run-off.  
● All site workers to wear PPE to avoid any exposure to contaminated dust particles. |
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<tr>
<th>Environmental Component</th>
<th>Potential Impact</th>
<th>Environmental Significance Score</th>
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<td>E  D  I  P  Total  Rating</td>
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<tr>
<td>Biophysical Impacts</td>
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</table>
| Flora                   | Site clearing for construction activities leading to loss of species diversity and habitat characteristics | 1  4  1  2  8                  | - The removal of plant species should only occur on the footprint area of the development and not over the larger area;  
- Conduct flora species search and rescue efforts before ground clearing begins in order to reduce negative impacts on species of concern;  
- Remove and relocate any plants of botanical or ecological significance as indicated by the ecologist or Environmental Control Officer (ECO);  
- Clearly demarcate the entire development footprint prior to initial site clearance and prevent construction personnel from leaving the demarcated area;  
- Monitoring should be implemented during the construction phase of the development to ensure that minimal impact is caused to the flora of the area;  
- The ECO should advise the construction team in all relevant matters to ensure minimum destruction and damage to the environment. The ECO should enforce any measures that he/she deem necessary. Regular environmental training should be provided to construction workers to ensure the protection of the habitat, fauna and flora and their sensitivity to conservation;  
- Limit pesticide use to non-persistent, immobile pesticides and apply in accordance with label and application permit directions and stipulations for terrestrial and aquatic applications; |
| Fauna                   | Site clearing for construction activities leading to loss of species diversity and habitat characteristics | 2  3  2  3  10                  | - Where trenches pose a risk to animal safety, they should be adequately cordoned off to prevent animals falling in and getting trapped and/or injured. This could be prevented by the constant excavating and backfilling of trenches during pipeline construction;  
- Poisons for the control of problem animals should rather be avoided since the wrong use thereof can have disastrous consequences for the raptors (refer to Appendix C) occurring in the area. The use of poisons for the control of rats, mice or other vermin should only be used after approval from an ecologist; |
<table>
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<tr>
<th>Environmental Component</th>
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<tr>
<td></td>
<td></td>
<td>E  D  I  P  Total  Rating</td>
<td></td>
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</table>
| Noise pollution          | Increase in noise pollution due to, excavations, site clearing, construction vehicles and personnel, operation of cement mixer machines, blasting and or drilling. | 1   1   2   3   7               | • Locate noisy machines and equipment maintenance areas as far away from sensitive receptors as possible  
  • All equipment and activities to comply with noise regulations  
  • Adherence to acceptable working hours  
  • Adherence to Occupational Health and Safety Act  
  • Ear protection for workers that may be affected by noise |
| Visual integrity         | Visibility of dust, waste pollution and construction activities from surrounding roads and properties | 2   2   3   3   10              | • Apply dust control measures diligently, especially on provincial roads  
  • Apply recommendations of specialist regarding colour and construction of site structures during the Construction Phase  
  • Indigenous plants or trees must be retained where appropriate to provide screens to make the construction site less visually intrusive.  
  • Lighting on site is to be sufficient for safety and security purposes, but shall not be intrusive to neighbouring residents or disturb wildlife  
  • No litter or unsightly waste storage on site |
| Sites of cultural significance | Destruction of areas or features of cultural significance | 1   4   2   1   8               | Should any other potentially culturally significant artifacts or graves, etc be found during construction activities all activities should be stopped until an assessment by a Cultural Heritage practitioner has been completed |
| Safety and security      | • Compromised safety of public due to construction works,  
  • Increase in crime resulting from influx of construction personnel. | 1   2   1   2   6               | • Proper management and planning  
  • Only security guards will be allowed to sleep on site, however within a cordoned-off secure area.  
  • All staff will carry identification, access control will be enforced, and the site will be swept and a search will be done each night  
  • The development will have 24-hour access control and security.  
  • If necessary, a Community Liaison Officer can be appointed. The CLO (Community Liaison Officer) to be consulted regarding employment of members of the surrounding communities. |
<table>
<thead>
<tr>
<th>Environmental Component</th>
<th>Potential Impact</th>
<th>Environmental Significance Score</th>
<th>Mitigation Measures</th>
</tr>
</thead>
</table>
| Human health             | • Mobilisation of contamination within soils and ground movement of water.        | E 2  D 3  I 2  P 2  Total 9 | • No Land rehabilitation necessary  
• Lime might have to be added to sulphur containing materials to ensure adequate neutralisation to ameliorate excessive acidity. |
|                         | • Risk posed by developing on aluminium dams                                      |                                  |                                                                                                                                                      |
|                         | • Gypsum, sulphur and other salt pollution plumes due to surface flows and subsurface leaching. |                                  |                                                                                                                                                      |
| Traffic                 | • Impeded flow of traffic due to presence of construction vehicles.               | E 2  D 2  I 2  P 3  Total 9 | • The access of large trucks will be investigated to provide a suitable access route that does not become a nuisance to existing residents  
• Construction vehicles and activities must aim to avoid peak hour traffic times (weekdays 7-8am and 5-6pm)  
• Establish an all-weather site access and wheel wash or shake down to prevent soil and materials from being trekked onto the road  
• Effective barriers and signage implemented. |
|                         | • Increase in traffic on roads due to presence of construction vehicles           |                                  |                                                                                                                                                      |
| Employment opportunities | • Employment opportunities created.                                             | E 2  D 2  I 3  P 3  Total 10 | • Local labour to be used as far as possible for the installation of services and the construction activities;  
• Contract requirements to involve BEE companies  
• Local products, goods and services to be utilised as far as possible during the construction phase; |
|                         | • Decrease in unemployment and crimes related to unemployment.                   |                                  |                                                                                                                                                      |
### Table 9: Preliminary quantification of impacts during the operation phase

<table>
<thead>
<tr>
<th>Environmental Component</th>
<th>Activity Potential Impact</th>
<th>Environmental Significance Score</th>
<th>Mitigation Measures</th>
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<tbody>
<tr>
<td>Physical Impacts</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Geology and soils</td>
<td>Possible soil erosion of the banks of the stream and stormwater discharge points.</td>
<td>1 1 1 2 5</td>
<td>• Reinforced concrete strip foundations to be placed within the pebblemarker transported, partly developed ferricrete, pedogenic, reworked residual granodiorite and residual granodiorite with in-situ soil consistencies of medium dense and better for single storey structures and medium dense to dense and better for double storey structures.&lt;br&gt;• Reinforced concrete pad foundations to be placed within the partly developed ferricrete, pedogenic, reworked residual granodiorite and residual granodiorite with in-situ soil consistencies of very dense and better, should the allowable bearing capacity requirement be limited to 250kPa, or VERY SOFT ROCK AND HARDER, fully developed hardpan ferricrete, pedogenic or granodiorite bedrock. The minimum allowable bearing capacity of the VERY SOFT ROCK, hardpan or granodiorite can be taken as 300kPa. It should however be noted that continuous VERY SOFT ROCK AND HARDER, fully developed hardpan ferricrete must however be confirmed prior to founding of pad foundations, should the hardpan ferricrete be considered as founding medium.</td>
</tr>
<tr>
<td>Ground and surface water</td>
<td>Risk from polluted water</td>
<td>2 3 2 2 9</td>
<td>• Seal off surface water areas from polluted soils.&lt;br&gt;• Manage stormwater areas on the surface and channel away from polluted soils and areas.</td>
</tr>
<tr>
<td>Air quality</td>
<td>Emissions from vehicles and operations affecting ambient air quality</td>
<td>2 2 1 2 7</td>
<td>• Trucks and vehicles to be properly maintained;&lt;br&gt;• Minimize the amount of land disturbance and develop and implement stringent erosion and dust control practices.&lt;br&gt;• Operations to meet air quality standards&lt;br&gt;• Roads will be paved and thus eliminate dust</td>
</tr>
<tr>
<td>Environmental Component</td>
<td>Activity Potential Impact</td>
<td>Environmental Significance Score</td>
<td>Mitigation Measures</td>
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<td>E</td>
<td>D</td>
</tr>
<tr>
<td><strong>Flora</strong></td>
<td>General human interference and impact leading to loss of species diversity and habitat characteristics</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>Fauna</strong></td>
<td>General human interference and impact leading to loss of species diversity and habitat characteristics</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>Environmentally sensitive area or wetland areas</strong></td>
<td>Loss of valuable landscape and habitat associated wetlands and streams</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td><strong>Socio-economic Impacts</strong></td>
<td>Noise pollution</td>
<td>Noise from industrial development and road infrastructure on proposed and existing residential areas</td>
<td>1</td>
</tr>
</tbody>
</table>

- Walkways throughout the open spaces and buffer zones will be strategically placed.
- Landscaping guidelines which include an allowable indigenous vegetation list that attracts fauna is to be formulated and implemented.
- Minimal to no exotic vegetation will be allowed.

- Noise abatement measures will be implemented.
<table>
<thead>
<tr>
<th>Environmental Component</th>
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<th>Mitigation Measures</th>
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</thead>
<tbody>
<tr>
<td>Visual integrity</td>
<td>• Higher density development and change in land use&lt;br&gt;• Change in sense of place of the specific site, however appropriate and good design will result in an improved urban character and will positively enhance the site and surrounding urban context potentially</td>
<td>1 3 2 3 9</td>
<td>Architectural guidelines (including aspects of roof and wall finishes, colours, heights of buildings, and lighting), as well as Landscape Architectural guidelines (screening, buffering, functioning, aesthetics etc) for the development will be developed to promote the enhancement of this urban area and therefore creating new and valuable places with a modified and positive urban mixed-use sense of place that is vibrant and diverse</td>
</tr>
<tr>
<td>Safety and security</td>
<td>Active operational phase with a variety of functions (residential, business and commercial) leading to a decrease in crime due to the creation of a more secure environment and minimising of vacant land</td>
<td>1 2 1 1 5</td>
<td>• Security provided via passive surveillance.&lt;br&gt;• Appropriate environmental design to address safety and security issues (CSIR publication)&lt;br&gt;• Good accessibility for emergency and police services.</td>
</tr>
<tr>
<td>Human health</td>
<td>Gypsum, sulphur and other salt pollution plumes due to surface flows and subsurface leaching&lt;br&gt;• Distinct irritation of skin, eyes;&lt;br&gt;• If inhaled irritate mucous membranes in sinus and lungs</td>
<td>2 3 2 2 2</td>
<td>• No Land rehabilitation necessary&lt;br&gt;• Lime might have to be added to sulphur containing materials to ensure adequate neutralisation to ameliorate excessive acidity.</td>
</tr>
<tr>
<td>Environmental Component</td>
<td>Activity Potential Impact</td>
<td>Environmental Significance Score</td>
<td>Mitigation Measures</td>
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</tr>
<tr>
<td>Traffic increase</td>
<td>• Increase of residents and users of the area</td>
<td>E 2 D 2 I 2 P 8</td>
<td>• All requirements of the municipality to be adhered to.</td>
</tr>
<tr>
<td></td>
<td>• Additional vehicles on road servicing industrial and commercial uses</td>
<td></td>
<td>• All improvements to road infrastructure as recommended by traffic engineer to be adhered to.</td>
</tr>
<tr>
<td>Local services</td>
<td>Availability of services in the area.</td>
<td>E 1 D 2 I 3 P 9</td>
<td>• The engineers to ensure that adequate measures are in place for adequate service delivery that does not impact negatively on surrounding areas.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• All requirements of the municipality to be adhered to regarding service reticulation and delivery.</td>
</tr>
<tr>
<td>Fires</td>
<td>There are no expected operational related occurrences other than normal urban activities that may result in site fires.</td>
<td>E 1 D 1 I 1 P 4</td>
<td>Adequate positioning of fire hydrants according to City of Tshwane standards.</td>
</tr>
<tr>
<td>Employment and improved tax base for municipality</td>
<td>• Employment of local workers during the operational phase.</td>
<td>E 2 D 3 I 2 P 10</td>
<td>• Local labour and employees to be made use of as far as possible for all aspects of the operational phase.</td>
</tr>
<tr>
<td></td>
<td>• Decrease in unemployment and crimes related to unemployment</td>
<td></td>
<td>• BEE companies to be trained and involved in during the operational phase of the development – e.g. Management of retail facilities, maintenance, landscaping, etc.</td>
</tr>
<tr>
<td></td>
<td>• Employment and opportunities for BEE and local companies</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Increase in demand for local goods and services</td>
<td>E 2 D 2 I 3 P 9</td>
<td>Local products, goods and services to be utilised as far as possible during the operational phase.</td>
</tr>
<tr>
<td></td>
<td>• Decrease in unemployment and empowerment of local trade and industry</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environmental Component</td>
<td>Activity Potential Impact</td>
<td>Environmental Significance Score</td>
<td>Mitigation Measures</td>
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</tr>
<tr>
<td></td>
<td>• Increase in service delivery and number of erven</td>
<td>E 2 D 2 I 3 P</td>
<td>None required</td>
</tr>
<tr>
<td></td>
<td>• Increase in taxes raised on property</td>
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<table>
<thead>
<tr>
<th>Score</th>
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<th>Total</th>
<th>Rating</th>
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<td>3</td>
<td>9</td>
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</table>
6.0 PUBLIC PARTICIPATION PROCESS

This section provides an overview of the public participation process undertaken to date and that to be undertaken during EIR phase.

6.1 Objectives of public participation

The public consultation process is designed to provide information to and receive feedback from interested and affected parties (I&AP). That feedback is in turn fed into the EIA process. This provides organisations and individuals with the opportunity to raise concerns and make comments and suggestions regarding the proposed activity. By being part of the assessment process, stakeholders have the opportunity to influence the Project Layout, design and the Plan of Study for the EIA.

The approach to communication with the community is aligned with the principles of the NEMA as elaborated upon in General Notice 657, titled “Guideline 4: Public Participation” (Department of Environmental Affairs and Tourism, 19 May, 2006), which states that: “Public participation process means a process in which potential interested and affected parties (I&APs) are given an opportunity to comment on, or raise issues relevant to specific matters.”

Public participation is an essential and regulatory requirement for an environmental authorisation process and must be undertaken in terms of the Environmental Impact Assessment (EIA) Regulations GNR. 982 (December 2014). Public participation is a process that is intended to lead to a joint effort by stakeholders, technical specialists, the authorities and the proponent/developer who work together to produce better decisions than if they had acted independently.

During the Scoping Phase the public participation process enables Interested and Affected Parties to:
  - Understand the context of the EIA;
  - Become informed and educated about the proposed project and its potential impacts;
  - Raise issues of concern and suggestions for enhanced benefits;
  - Verify that their comments, issues of concern and suggestions have been recorded;
  - Assist in identifying reasonable alternatives; and
  - Contribute relevant local information and traditional knowledge to the environmental impact assessment process.

During the EIR phase, the public participation process assists I&AP to:
  - Contribute relevant information and local and traditional knowledge to the environmental impact assessment process;
  - Verify that their issues and suggestions have been evaluated and considered in the environmental investigations and feedback has been provided;
  - Comment on the findings of the EIA; and
  - Identify further issues of concern from the findings of the EIA.

During the decision-making phase the process enables I&AP to be advised of the outcome, i.e. the authority decision and how the decision can be appealed.

6.2 Identification of I&APs

I&APs will be initially identified through liaison with potentially affected parties in the study area through newspaper advertisements, placement of site notices and distribution of BID sheets along with a registration process involving completion of a registration and comment sheet.

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6.3 Notification process

In order to facilitate the identification of potential interested and affected parties as well as government departments that administer laws that might impact on the activity, the following was undertaken:

- Advertising in a local newspaper to notify potential interested and affected parties to register and to submit comments on the proposed activity;
- Distribution of notices to land owners and occupiers adjacent to the site notifying them of the proposed activity;
- Distributing email notifications to government departments;
- Notifying the councillor of the area about the proposed project;
- Affixing site notices within and at the boundaries of the site to notify potential interested and affected parties of the proposed activity.
- Inviting potential I&AP as well as government departments to access the website for additional information.

6.4 Register of I&APs

The NEMA Regulations (GNR.982) distinguishes between I&APs and registered I&APs. I&APs, as contemplated in NEMA include: “(a) any person, group of persons or organisation interested in or affected by an activity; and (b) any organ of state that may have jurisdiction over any aspect of the activity”.

In terms of the Regulations an EAP managing an application must open and maintain a register which contains the names, contact details and addresses of:

- All persons who have submitted written comments or attended meetings with the applicant or EAP;
- All persons who have in writing requested the applicant or EAP managing the application, for their names to be placed on the register; and
- All organs of state which have jurisdiction in respect of the activity to which the application relates.

Following the notification process, a Register for I&APs will be opened. All stakeholders are invited to review the Scoping Report. As per the EIA Regulations, future consultation during the Impact Assessment phase will only take place with registered I&APs. All stakeholders who were involved in the consultation process will be added to the register as the I&AP register will be updated throughout the EIA process.

6.5 Public participation during Scoping

This section provides a summary of the public participation process followed during the Scoping Phase of the EIA. The availability of the Draft Scoping Report (DSR) for public review for 30 days will be announced via an advert in a Newspaper circulating nationally and email communication to interested and affected parties including government departments. Briefly, the process will be undertaken as follows:

- Delivery of the Draft Scoping Report (DSR) to organs of state;
- Placing of hard copy reports at accessible venues near the site for public review;
- Notifying adjacent occupiers/landowners of the availability of the report;
- Placing of the BID and scoping report on the EAP website for review;
- All comments will be attended to and incorporated into the Scoping Report.
- The final report will then be made available to the Registered Interested & Affected parties including organs of state and submitted to GDARD at the same time.
Details pertaining to the public participation information and the comments received are provided in Appendix 5.

6.6 Competent authority’s decision on the scoping report

According to the Regulations, GDARD is expected to decide on the scoping report within 43 days of receipt of the report. Should the report be accepted with or without conditions, the plan of study for environmental impact assessment will be implemented. If the scoping report is considered inadequate, then an opportunity will be provided for the report to be amended to comply with the Regulations.
7.0 PLAN OF STUDY FOR EIA

The Impact Assessment (IA) Phase will follow completion of the Scoping Phase (this phase). During the IA phase, specialist studies will be conducted that will inform the impact assessment. Issues raised by I&APs and the potential physical, biological and socio-economic impacts of the establishment on the fabric of the area will be examined in detail. In this way stakeholder issues will assist to drive the EIA process.

When completed, the findings of the specialist studies will be integrated into a single report, the Draft EIA report, for comment by I&APs. This report will be presented for comment towards the end of 2018.

The Draft EIA Report will be finalised by incorporating any additional comments received from I&APs and an Environmental Management Programme (EMPr) will be developed from the findings and recommendations of the impact assessment studies. The Final EIA Report and EMP will be presented to the authorities for decision-making.

7.1 Objectives of the EIA process

The objectives of the EIA process, as per the NEMA EIA Regulations 2014 are to, through a consultative process:

a) determine the policy and legislative context within which the activity is located and document how the proposed activity complies with and responds to the policy and legislative context;

b) describe the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;

c) identify the location of the development footprint within the preferred site based on an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects of the environment;

d) determine the
   • nature, significance, consequence, extent, duration and probability of the impacts occurring to inform identified preferred alternatives; and
   • degree to which these impacts can be reversed, may cause irreplaceable loss of resources, and can be avoided, managed or mitigated;

e) identify the most ideal location for the activity within the preferred site based on the lowest level of environmental sensitivity identified during the assessment;

f) identify, assess, and rank the impacts the activity will impose on the preferred location through the life of the activity;

g) identify suitable measures to avoid, manage or mitigate identified impacts; and

h) Identify residual risks that need to be managed and monitored.

7.2 Key tasks during the EIR phase

The findings of the environmental and socioeconomic baseline information inform the scope of work to be undertaken during the EIAR phase. The plan of study for the EIA will meet the objectives of an EIA report as described above. The key tasks associated with the EIA Phase include:

- Reviewing the Scoping Report and Plan of Study for EIA comment and subsequent approval by GDARD;
- Conducting specialist investigations as required, on the significant issues identified in the Scoping Process;
- Undertaking a detailed impact assessment process, assessing alternatives, options and potential mitigation measures;
- Documenting the findings of the Impact Assessment into an Environmental Impact Report (EIR);
- Compiling a draft environmental management programme (EMPr).

The plan of study therefore includes the following:
- Aspects to be assessed to inform the Environmental Impact Report;
- A description of the proposed method of assessing the environmental aspects, including aspects to be assessed by specialists;
- A description of the proposed method of assessing the duration and significance of impacts;
- An indication of the stages at which the competent authority will be consulted;
- Particulars of the public participation process that will be conducted during the environmental impact assessment process; and
- A description of the tasks that will be undertaken as part of the environmental impact assessment process;
- Identify suitable measures to avoid, reverse, mitigate or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored.

The impact assessment component of the EIA will entail several environmental aspects to be studied as detailed below. Specialists to undertake the studies have been appointed and will be required to deliver their assessment as per the terms of reference for the specialist investigations provided in the NEMA EIA Regulations 2014, Appendix 6 Specialist Reports and as set out below. The description is presented in fairly general terms, but all the issues that need to be addressed by the studies are captured.

7.3 Specialist studies for the EIR

7.3.1 Ecological Assessment

An update of the terrestrial ecological assessment that fulfils the requirements of the EIA in terms of the NEMA (1998) and the associated regulations will be compiled. The provisions of all relevant databases such as the NFEPA, SANBI and GDARD C-Plan V3 will be consulted. Below is a brief presentation of the approaches and methodology for the various assessments.

7.3.1.1 Floral assessment

A detailed assessment of the development site as well as the surrounding zone of influence will be undertaken. The field assessment will aim to identify or confirm:
- The various habitat types and the conservation importance and present ecological state;
- Floral species associated with each habitat component
- Habitat types and associated vulnerability
- Areas of severe alien and invader encroachment;
- Veld conditions which will be compared to the typical vegetation for the vegetation type of the area according to Mucina & Rutherford (2006);
- Sensitive areas and detailed description of the ecological integrity of each sensitivity zone;
- The general impacts as well as cumulative impacts on floral assemblages.
- The presence of RDL and protected plants as listed within the National Forest Act, (Act 84 as amended) and any relevant provincial legislation and guidelines.

7.3.1.2 Faunal assessments

Faunal assemblage will be determined using the following methods:
- The ecological importance and sensitivity (EISC) of the study area according to the relevant
conservation databases. The relevant databases for the QDS will be consulted:

- Visual observations of actually occurring species;
- Identification of evidence of occurrence, e.g. call spoor, droppings etc;
- The reports produced include sensitive habitat types and impacts from habitat disturbance, faunal assemblages at risk (especially avifauna) and an assessment of impacts on migratory routes;
- An assessment of cumulative impacts on faunal assemblages in the region was made, with specific emphasis on avifauna;
- Consideration of the RDSIS index to quantify the importance of the study area in terms of RDL faunal conservation;
- Recommendations on management and mitigation measures with regards to the construction and operation of the proposed activities in order to manage and mitigate impacts on the faunal assemblage of the area.

The following field assessment methodologies will be followed as deemed necessary:

- **Avifauna:**
  - The Southern African Bird Atlas Project 2 species list for the quarter degree square will be compared with the database of birds identified on the study area during the field surveys. Field surveys will be undertaken utilising a pair of binoculars and birdcall identification techniques will also be utilised during the assessment in order to accurately identify avifaunal species;
  - Potential biodiversity list;
  - Habitat evaluation for RDL species and areas of avifaunal importance.
  - Extensive consideration will be given to impacts on avifaunal ecology with specific mention of impacts on migratory species and migratory corridors.

- **Mammals:**
  - A potential biodiversity list will be compiled from available literature sources;
  - Short habitat descriptions of all habitat types pertaining to RDL species will be given;
  - The habitat types will be evaluated for potentially supporting RDL species;
  - If deemed necessary, field assessments will employ trapping techniques (aimed at determining the small mammal species community structure);
  - The field assessment will identify the presence of various mammalian species through direct (visual observations) and indirect (spoor, burrow and scat identifications);
  - A species list, detailing their specific conservation status will be compiled from the field observations;
  - If considered necessary, the survey will be extended to a nocturnal survey to potentially enable augmentation of the data. The use of surveillance techniques such as automated camera traps will then be considered;

- **Herpetofauna:**
  - A complete potential biodiversity list will be provided;
  - The conservation status of each species listed will be determined.

The potential species list in accordance to the habitat availability will also be compiled:

- The species recorded during the field survey will be listed;
- Habitat evaluations will be undertaken for suitability for supporting various RDL species recorded from the region;
- Identification through call identification and direct observation;
- Site searches within the various habitat type units will be employed for determining the species community structures within the site with special mention of searching of target areas including rocky outcrops and wetland areas;
7.3.2 Wetland delineation and assessment

A site assessment will be undertaken, and the different sections of the features identified within the study area assessed using the following methodology:

- Delineation of the wetland and riparian features will take place according to “DWAF, 2005: A practical Guideline Procedure for the Identification and Delineation of Wetlands and Riparian Zones”. Aspects such as soil morphological characteristics, vegetation types and wetness will be used to delineate the various zones of the wetland (permanent and temporary) according to the guidelines. A buffer zone will be allocated to the wetland feature;
- The wetland classification assessment will be done according the Classification System for Wetlands and other Aquatic Ecosystems in South Africa. User Manual: Inland systems (Ollis et al., 2013);
- The wetland EIS will be defined based on the DWA 1999 method;
- The wetland services provided by the resources on the subject property will be assessed according to the Method of Kotze et al (2009) in which services to the ecology of the site will be defined and services to the people of the area will be defined;
- The wetland Health/IHI will be assessed according to the resource directed measures guideline as advocated by Macfarlane et al., (2008) and DWA (2007), respectively;
- The wetland areas will be mapped according to the ecological sensitivity of each wetland hydrogeomorphic unit in relation to the study area. In addition to the wetland boundaries wetland buffers will be generated as applicable.

The study already undertaken is considered adequate and no further wetland studies will done for the site.

7.3.3 Noise impact assessment

Given the nature of the proposed development, no noise impact assessment will be undertaken. Although the potential noise-sensitive receptor as well as noise generators will be identified as part of the general impact assessment, no specific study or noise propagation modelling will be undertaken for the activity.

7.3.4 Cultural and Heritage Resources

Site investigations were carried out by the National Cultural History Museum in December 2006 for the entire Modderfontein site.

7.3.5 Contaminated land assessment - for aluminium sulphate on Modderfontein dams and surrounding areas

The Modderfontein area is earmarked for residential development. The historic land uses on the site include a number of activities associated with AECI and Kynoch. These activities have contributed to elevated levels of especially nitrates and possible heavy metals in the soils of the affected areas.

The site to be investigated has been referred to as the “aluminium sulphate dams” area and has been the subject of historical disposal of a range of liquid waste materials from the AECI plant (Mr Leon Baben, AECI, personal communication). The main issue with the site is the unknown materials and concentrations currently present in the earth dam structures and soils.

The assessment and remediation of contaminated land is addressed in the National Norms and Standards for the Remediation of Contaminated Land (NSCLA) (GN R.331 of 2014) and the handling of
waste material is addressed in the National Environmental Management Waste Act (NEMWA) (Act 59 2008).

Therefore, a detailed assessment is required to characterise the contamination plume as well as the appropriate measures to manage or treat the material. Subject to the outcome of the assessment, the affected land could be considered and once cleaned out, these basins could be incorporated into the Highlands stormwater management system as unlined detention/retention basins and that the seepage of clean rainwater from the ponds be used to flush out and dilute the chemical contamination in the downslope plume, if any.

7.3.6 Air quality study

The quantification and assessment of air quality impacts, including:

- The establishment of an atmospheric emissions inventory. Pollutants quantified will include particulate matter (TSP, PM10 and PM2.5), and potentially VOCs and selected criteria gaseous pollutants i.e. carbon monoxide (CO), oxides of nitrogen (NOx) and sulfur dioxide (SO2) will also be included if considered significant, especially during the construction phase. Published emissions factors from the US EPA and Australian National Pollutant Inventory (NPI) may be used to calculate emissions from the operations.
- Atmospheric dispersion modelling to determine ambient air pollutant concentrations and dustfall rates. The US EPA AERMOD model will be used. AERMOD is a Gaussian plume steady state model.
- The screening of simulated ambient pollutant concentrations against air quality criteria.

7.3.7 Other specialists’ inputs

Other specialist assessments or inputs to be undertaken and findings incorporated into the EIR include the following:

- Geotechnical assessment;
- Engineering services report;
- Town planning motivation;
- Traffic impact assessment including roads infrastructure;
- Contaminated Land Assessment for The Aluminium Sulphate Dams Area on The Modderfontein Site;
- Electricity infrastructure, etc.

7.4 Impact Assessment Methodology

The impact assessment methodology and aspects to be assessed has been discussed in Section 5.0 above. Further, section 5 provides the preliminary list of environmental aspects considered significant in terms of the proposed development. In addition, preliminary list of measures to avoid, mitigate or manage the identified impacts have also been suggested under the same section.

7.5 Public participation during the EIR phase

7.5.1 Notification of Interested and Affected Parties

- **Newspaper Advert** - A Newspaper Advertisement will be published in the Citizen newspaper or the Reckord as required by the Regulations.

- **Written notices** - written notices will be given to any organ of state having jurisdiction in respect of any aspect of the activity as well as the City of Johannesburg Metropolitan Municipality.

- **Basic Information Document** - A Background Information Document (BID) will be posted, faxed, emailed or hand delivered to I&APs. Written acknowledgement will be gathered from each of these landowners. The BID document provides information concerning the proposed development. Interested and affected parties will be invited to submit written comments concerning the proposed development and become part of the process.

- **Site Notices** - Detailed site notices prepared in accordance with the requirements of the Regulations and will be placed at strategic and visible places alongside the property on which the proposed development will be located.

- **Public Meeting /focus groups meetings** - If required, meetings will be arranged with stakeholders that would have been identified to ensure that available information can be provided to Interested and Affected Parties.

- **Ward Councillor** - The Ward Councillor is one of the key community representatives within the area of development. Therefore, he/she should be informed, and be given an opportunity to provide comments and input into the process.

7.5.2 Written Correspondence from I&APs

Comments received from I&AP’s will be incorporated in the comments and response register that will be incorporated in the Final Scoping Report. Written comments are welcome throughout the process and will be included as part of the report as the process continues.

7.5.3 Issues and Concerns

A list of issues and concerns submitted will be drawn up and consolidated into a report. This will be submitted as part of the documentation submitted to the competent authority.

7.6 GDARD decision on the application

Once the GDARD has taken a decision on the proposed project, registered I&APs will be notified of this decision and of the opportunity to appeal. This notification will be provided through a letter or email to all registered I&APs, summarising the authority’s decision and explaining how to lodge an appeal should they wish to.
8.0 SUMMARY AND CONCLUSION

The purpose of this report is to provide the relevant authority with sufficient information on the potential impacts of the proposed development, so that an informed decision can be made with regards to the processes and subsequent authorisation of the proposed development. Potential impacts were identified through preliminary specialist assessment of the site as well as through the technical expertise and experience of the EAP.

The construction and operation of predominantly residential township comprising residential, educational facilities, and associated infrastructure uses can pose various risks to the environment as well as the residents in the vicinity of the development. The issues related to the development will be identified, discussed and assessed in terms of various criteria such as extent, duration, intensity and significance.

It is believed that the methodology and plan of study that will be used to assess the current state of the environment will be sufficient to identify potential impacts. The data will assist in the compilation of the Environmental Impact Assessment as an instrument in the decision making process. Mitigation measures for the impacts identified in this Scoping Report will be described in detail in the EIR.
9.0   EAP DECLARATION AND UNDERTAKING

I, Pirate Ncube, hereby confirm that the information provided in this report is correct at the time of compilation and the report was compiled with inputs provided by the applicant and some of the specialists appointed for the project.

I hereby also confirm that:

• all relevant information pertaining to the project has been submitted to potential interested and affected parties;
• all comments received from I&APs will be attended to and/or included in the final Scoping Report that will be submitted to the GDARD;
• a record will be kept of any subsequent comments received and submitted with the final EIA. This will be in the form of a Comments and Responses Report (CRR);
• the Plan of Study for the EIA will be implemented, and the findings of specialist studies will be presented in the EIA report.

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Signature

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Date
10.0 REFERENCES


Jordaan J. 2018. *A Motivating Memorandum in support of the Township Establishment to be known as Longlake Extension 34*: M&T Development (Pty) Ltd.

Appendix 1: Locality Map
Appendix 2: Layout Plan