ENVIRONMENTAL IMPACT ASSESSMENT REPORT

FOR THE AMENEDMENT APPLICATION:

MONAVONI EXTENSION 19

Part of Portions 3 of the Farm Stukground 382 JR, Part of the Remainder of Portion 5 of the Farm Mooiplaats 355 JR, Part of Portion 2 of the Farm Swartkop 383 JR, Part of the Farm Honeypark 437 JR and Part of Portion 13 of the Farm Brakfontein 399 JR.

Gaut 006/14-15/0104

Prepared for:
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1. INTRODUCTION AND BACKGROUND

M&T Development has submitted an application to the Gauteng Department of Agriculture and Rural Development, the competent authority, for the amendment of the Environmental Authorisation (EA), Monavoni Extension 19, and referenced Gaut: 002/05-06/1012. The amendment application has been issued with reference number Gaut 006/14-15/0104. The initial EA was issued on 13 April 2010 and allowed for the development of a mixed use township consisting of service industries, wholesale trade, showrooms, banks, restaurant, confectionary shops, medical suites, post office, gymnasium, sports and recreational facilities, crèche, nursery school and private open space, see Annexure 1.

With changes in the spatial economy and planning for the area the applicant is desirous of developing a high density residential township instead. According to the town planning memorandum attached as Annexure 2, the proposal entails development of a ‘Residential 3’ township of three stories on four erven and the allocation of the 5th erf for Public Open Space. Further, an extension to the validity of the EA has been applied for.

Figure 1: Locality of the site
2. MOTIVATION FOR THE PROPOSED AMENDMENT

At the time of the initial application, the Monavoni area was predominately a rural residential area with a few intense urban uses. The application then sought to provide urban uses inclusive of employment opportunities and recreational uses in support of the emerging residential node. This was in keeping with the then spatial framework for the area.

In addition, the findings of the geotech conditions informed the nature of possible development/land uses on the site. From the preliminary investigations, the site was considered mostly unsuitable for residential use.

While the spatial economy then was ideal for the development of retail, commercial and recreational uses on the site, the context has changed rendering such options unviable. With the recent developments in the area, specifically, the opening of the Forest Hill Regional Shopping Center in Monavoni, the growth of the Sunderland Ridge Industrial area and the Celtis Ridge Shopping Centre nearby, residential development in support of these higher order uses is considered appropriate. From a micro contextual perspective the site is located in the centre of a vast proposed residential development at an easily accessible intersection. The location can be considered to be prominent yet orientated towards the proposed type of land-use.

Factors in support of the above statement include the fact that the future planning of the area implies an extensive increase in the residential opportunities in order to ensure the feasibility of the envisaged BRT routes, community facilities and employment opportunities envisaged for the area. All current guidelines promote this interface of residential and commercial land-uses in close proximity to each other. Secondly, the proposed K52 is classified as a mobility spine with the capability of forming part of the public transportation network by means of the inclusion of the road in bus transport planning.

Thus, more recent municipal spatial plans have identified the Monavoni area as a development node that should accommodate intense urban land uses. Refer to Figure 2 for the context of the site in terms of the Monavoni Spatial Framework. The detailed Town Planning Motivation is attached as Annexure 2.
Recent geotech assessments that utilise advanced drilling methods show that, except for small sections of the site, high density residential development can be accommodated if appropriate exploratory work and founding is undertaken. Further investigations are, however, still being carried out to confirm the classification of the portions where structural developments were not recommended. Refer to Annexure 3 for confirmation of appropriateness of development by the Council for Geoscience.

Figure 3 below shows the resultant layout plan (proposed amendment) that takes into account the geotech conditions.
3. IMPACT ASSESSMENT METHODOLOGY

The assessment of environmental impacts resulting from the proposed amendment involved the identification of the environmental aspects and then applying the assessment criteria to determine their significance. The assessment included the construction and post construction phases of the project. Given that the development would be permanent no assessment of decommissioning was undertaken. Maintenance of infrastructure is addressed under the operational phase.
The amendment application pertains to the change in scope which includes some impacts which were not taken into account in the initial environmental authorisation process. In particular, the amendment seeks to change the nature of development from a mixed use to residential development. The development footprint (site) remains the same as well as most of the development parameters.

Therefore, the impact assessment focuses on those changes which have been brought about by the changes in the nature of development. It does not repeat the assessment of impacts if they do not substantially deviate from those assessed in the initial application process. However, those impacts deemed important to consider or state are included in the assessment.

3.1 METHODOLOGY USED

The potential environmental impacts associated with the project were evaluated according to the nature, extent, duration, intensity, probability and significance rating of the impacts as explained below.

**Table 1: Explanation of the methodology variables**

<table>
<thead>
<tr>
<th>Nature</th>
<th>classification of whether the impact is positive or negative, direct or indirect.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extent</td>
<td>spatial scale of impact and classified as:</td>
</tr>
<tr>
<td>Site</td>
<td>the impacted area is the whole or significant portion of the site (1).</td>
</tr>
<tr>
<td>Local</td>
<td>Within a radius of 2 km of the construction site (2).</td>
</tr>
<tr>
<td>Regional</td>
<td>impacted area extends to the immediate, surrounding and neighbouring properties.</td>
</tr>
<tr>
<td>National</td>
<td>the impact can be considered to be of national significance.</td>
</tr>
<tr>
<td>Duration</td>
<td>Indicates the lifetime of the impact and is classified as:</td>
</tr>
<tr>
<td>Short term</td>
<td>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</td>
<td>The impact will last for the period of the construction phase, where after it will be entirely negated.</td>
</tr>
<tr>
<td>Long term</td>
<td>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</td>
<td>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:** Mitigation for significant issues is incorporated into the EMP.

### 3.2 CRITERIA FOR RATING OF IMPACTS

**Table 2: Criteria for rating of impacts**

<table>
<thead>
<tr>
<th>Criteria for the rating of impacts</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extent</td>
<td>National</td>
</tr>
<tr>
<td>Duration</td>
<td>Permanent</td>
</tr>
<tr>
<td>Intensity</td>
<td>Very high</td>
</tr>
<tr>
<td>Probability</td>
<td>Definite</td>
</tr>
</tbody>
</table>

| Points allocation | 4 | 3 | 2 | 1 |

**Significance Rating of classified impacts**

- **Low** 4-6: 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.
- **Medium** 7-9: Mitigation is possible with additional design and construction inputs.
- **High** 10: 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.
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.

<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 (+)

### 3.3 ASSESSMENT OF IMPACTS

As the assessment relates to the amendment application, the identification and assessment of impacts focuses only on ‘new’ impacts or those considered different to those assessed during the initial application process. Therefore, this assessment must be read in conjunction with the assessments undertaken during the initial application process.

Pre-construction impacts are similar to those that would have resulted from the implementation of the authorised activity. Therefore, except where emphasis is placed on particular impacts, no additional assessment is done for the amendment application.

#### 3.3.1 Construction phase

<table>
<thead>
<tr>
<th>Potential aspect/impact</th>
<th>Significance before mitigation</th>
<th>Mitigation and Management Measures</th>
<th>Significance after mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Socio-economic impacts</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In-migration and effect on social dynamics</td>
<td></td>
<td>• No accommodation of construction workers permitted on site during; • Appoint as many workers from the local community • Implement proper screaming and code of conduct for workers; • Utilise established communication channels with community for awareness and information sharing.</td>
<td></td>
</tr>
<tr>
<td>Safety and security</td>
<td></td>
<td>• Safety Officer to be appointed to monitor safety conditions on site • Signage and use of safety equipment and PPE on site; • Only appropriately trained staff to handle chemicals</td>
<td></td>
</tr>
</tbody>
</table>
and/or hazardous material on site
- Construction site to be secured/fenced-off. Access to be controlled. No illegal squatting in the vicinity to be allowed.

<table>
<thead>
<tr>
<th>Employment generation and decrease in unemployment</th>
<th>No mitigation required, however, endeavour to use local construction companies/subcontractors as far as possible</th>
<th>Positive</th>
</tr>
</thead>
</table>
| Visual impact due to construction and site management | • Use proper screens and boundary wall to screen construction areas;
• Ensure construction site is neat and tidy;
• Effective waste management |  |
| Traffic congestion | • Construction vehicles' movement beyond site boundaries to be limited during peak hour traffic;
• Access to the site must through the extension of Perdeblom Street;
• Roads upgrade to be phased to avoid restrictions on through traffic at a time. |  |
| Noise from construction and disruptions in the quality of living | • Limit construction process to working hours as per the EMPr;
• Install proper signage for awareness and to warn public of construction activities;
• Identify and utilise dedicated routes for construction vehicles;
• All earth moving vehicles and equipment to be regularly maintained. |  |
| Dust and emissions nuisance | • Dust suppression measures implemented as per EMPr provisions;
• Loads to be covered to avoid loss of material during transportation;
• Dust and mud to be controlled at vehicle exit/entry points;
• All earth moving vehicles and equipment to be regularly maintained |  |
| Biophysical impacts | • Construction to be in accordance with the approval of the Council for Geoscience and the NHRBC
• Founding conditions for individual structures must be confirmed by a qualified structural engineer; |  |
- Ponding of water and leakage of underground pipes be avoided. Regular monitoring and immediate response to incidents.

3.3.2 Operational phase

<table>
<thead>
<tr>
<th>Potential aspect/impact</th>
<th>Significance before mitigation</th>
<th>Mitigation and Management Measures</th>
<th>Significance after mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increased housing stock and densification of the area</td>
<td>Increased population and demand on services</td>
<td>• Different housing typologies to be provided; • Effective use of infrastructure;</td>
<td>Positive</td>
</tr>
<tr>
<td>Increased population and demand on services</td>
<td>• Provision of infrastructure services as determined by the local authority;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>In-migration/new households and effect on social dynamics</td>
<td>• Integration of ‘new’ community into existing community structures</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improved infrastructure services</td>
<td>• New infrastructure such as sewer, water, stormwater and roads provided and upgraded as per the requirements of the municipality</td>
<td>Positive</td>
<td></td>
</tr>
<tr>
<td>Altered land use patterns and visual character</td>
<td>• Township establishment to be approved by the local authority to ensure compatibility with planning instruments; • Architectural designs to be aligned with the character of the area; • Use of internally focussed lighting to prevent light pollution; • Height of units to remain at 3-storeys as per the initial approval; • Use of open space to enhance internal quality of the environment.</td>
<td>Positive</td>
<td></td>
</tr>
<tr>
<td>Increased</td>
<td>• Waste to be collected and disposed of at</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Some of the main advantages associated with the proposed amendment include the following:

- Provision of housing stock within an area regarded as a development node. According to the IDP, the site falls within a Higher Development Priority Area while the Monavoni and Western Farms Development Framework indicates that the site is within a Residential expansion and densification zone.
- From the above, the proposed amendment will result in housing development which is compatible with the spatial plans of the municipality.
- The proposed densification will result in effective use of land within the urban fabric thereby contributing to optimal utilisation of infrastructure services while contributing to the avoidance of urban sprawl.
- Different housing typologies proposed will result in integrated development with an element of Inclusionary Housing which is in line with or is in support of government/housing policy.
- The proposed amendment will not result in any notable increase in environmental impacts. Potentially, the proposed development will result in reduced possible pollution and contamination which might result from service
industries. In addition, the above assessment indicates that the impacts identified can be mitigated to acceptable levels:

- The proposed land uses are complimentary to the development of the area. This means that unlike the use in the EA which will serve to compete with other developments in the area, proposed development present opportunities and infrastructure which is needed and desirable and will support the development and growth of the node.

The proposed development has few disadvantages as identified below:

- Reduction in the number of employment opportunities during the operation phase. Unlike retail and service industries that present a number of employment opportunities during the operational phase, housing development presents fewer opportunities mainly related to maintenance and housing upkeep;
- Traffic congestion during peak traffic periods. This will be mitigated through roads upgrades;
- Increased demand on infrastructure services. The necessary upgrades and/or installations will be as per the direction of the City of Tshwane Metropolitan Municipality.

5. AMENDMENTS TO THE EMPR

As the nature of the major impacts likely to result from the proposed amendments are similar to those that might have resulted from the approved land uses, only a few additions to the EMPr particularly given that the site is affected by dolomitic conditions have been identified. These are provided below.
AMENDMENTS AND/OR ADDITIONS TO THE EMPr

Amendment to **Section 1: Project outline:**

Under section 1:1, the project description is hereby amended by substituting the existing description for the following: *The proposed development will consist of five erven zoned ‘Residential 3’ to be developed at 70 units/erf with a height of three storeys and Public Open Space.*

Amendment to **Section 2: Risk statement:**

Inclusion as bullet nine, *Risk of sinkhole formation* as one of the environmental risks identified.

Amendments to **Section 4: Project activities:**

<table>
<thead>
<tr>
<th>4.1: Pre-construction phase</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type</strong></td>
</tr>
</tbody>
</table>
| Design and planning | Stability of structures and restrictions to land uses | To ensure stability of structures | 1. The layout must correspond to the stability zonation and development types recommended by the geotech engineer.  
2. The NHBRC precautionary measures for development on dolomite areas to be implemented | The land uses and layout corresponds to the recommended stability zonation and development types. | Developer Engineer |
| Geology and soils | Risk of sinkholes | To prevent the development of sinkholes after the installation of | 1) More detailed foundation investigation shall be done for each of the structures.  
1) Special precautionary measures and a dolomite risk management system must be compiled to manage the entire site. | More detailed foundation investigations done.  
1. Risk management system developed and | Geotechnical engineer Dolomite Risk Manager |
services or construction of buildings.  

2) A site specific dolomite risk management programme must be compiled and implemented to reduce the risk for sinkhole and doline formation.  
3) A storm water management plan must be implemented to prevent the concentration of storm water on site.  
4) Very stringent precautionary measures must be implemented to reduce any water ingress on site.  
5) A pro-active maintenance strategy for water bearing services and other infrastructure should be implemented.

<table>
<thead>
<tr>
<th>4.2 Construction phase</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Construction site</strong></td>
</tr>
<tr>
<td><strong>Geology and soils - Stability of structures due to geology</strong></td>
</tr>
</tbody>
</table>
| To ensure stability of structures  
Sinkholes are a danger due to underlying dolomite.  
Preventative foundation designs shall be done. Detailed foundation inspections should be carried out at the time of construction to identify any variances and adjust foundation designs accordingly if need be. The foundation recommendations from the geotechnical engineers must be adhered to.  
Stable structures and no sinkholes  
Engineers / Contractor / Individual Developer |

<table>
<thead>
<tr>
<th>4.3: Operational phase</th>
</tr>
</thead>
</table>
| **Dolomite Risk Management**  
Development of sinkholes due to lack of proper management  
Effective management of risks  
1) A Dolomite Risk Management Plan must be established and adhered to at all times.  
2) The HOA may appoint a Dolomite Risk Manager to implement the plan. Information on risk of doline formation and measures required to be communicated to all residents by the HOA.  
Risk management plan which is implemented  
Engineer / Contractor / Dolomite Risk manager as appointed by the home owner |
3) A Dolomite Risk Management system must be included in the Dolomite Risk Management Strategy of the City of Tshwane Municipality.
4) The introduction of a pro-active maintenance strategy for water bearing services and other infrastructure will be required. Such maintenance strategies and precautionary measures should be adhered to reduce the probability of the occurrence of ground movement events.
5) The management of run-off water draining across the site is of utmost importance.
6) On-going monitoring of groundwater levels on and in the immediate vicinity of the site. The local authority should be responsible for gathering the data and this monitoring process should form part of the Local Authority’s Dolomite Risk Management Strategy.
Annexure 1: Environmental Authorisation
Annexure 2: Town Planning Motivation
Annexure 3: Comments from Council for Geoscience