



## GAUTENG INDUSTRIAL DEVELOPMENT ZONE (GIDZ)

### PROPOSED DEVELOPMENT AND INCLUSION OF THE METAL CONCENTRATORS (METCON) REFINERY FACILITY IN THE JEWELLERY MANUFACTURING PRECINCT (JMP) WITHIN THE OR TAMBO INTERNATIONAL AIRPORT (ORTIA) SEZ, KEMPTON PARK, GAUTENG PROVINCE

# DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT (DEIAR)

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**GAUTENG INDUSTRIAL DEVELOPMENT ZONE (GIDZ)**

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TAMBO INTERNATIONAL AIRPORT (ORTIA) SEZ, KEMPTON PARK,  
GAUTENG PROVINCE**

**DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT (DEIAR)**

**Executive Summary**

Marang Environmental and Associates (Pty) Ltd (hereafter referred to as “Marang”) was appointed as the independent Environmental Assessment Practitioner (EAP) by the Gauteng Industrial Development Zone (hereafter referred to as the “GIDZ”) to undertake an Environmental Impact Assessment (EIA) process for the proposed development and inclusion of the Metal Concentrators SA (Pty) Ltd (hereafter referred to as “MetCon”) Refinery facility in the Jewellery Manufacturing Precinct (JMP) within the OR Tambo International Airport (ORTIA) Special Economic Zone (SEZ), Kempton Park, Gauteng Province (hereafter referred to as the “proposed project”).

The GIDZ, as appointed by the Gauteng Department of Economic Development (GDED), have been given the mandate to develop the JMP (located on Portion 282 of the Farm Witkoppie No. 64–IR) within the ORTIA SEZ. The JMP aims to increase employment opportunities and foreign direct investment in the jewellery manufacturing sector. A Basic Assessment (BA) process was undertaken in 2009 to obtain Environmental Authorisation (EA) for the development of the original JMP site. The BA was carried out in terms of the 2006 EIA Regulations. The GDED were subsequently issued with an approved EA (GDARD Ref No. GAUT002/09-10/N0021) for the original JMP development by the Provincial Authority, namely the Gauteng Department of Agriculture and Rural Development (GDARD), on 25 July 2011 (**Appendix 8**). The EA covers an area of approximately 6.5 hectares (ha). The EA was then amended in May 2018 and included a change in the licence holder details from the GDED to the GIDZ. This amendment was subsequently granted by the Department of Environmental Affairs (DEA), and the amended EA was issued on 11 May 2018 (DEA Ref No. 14/12/16/3/3/1/7/94/AM1) (**Appendix 8**). Although construction has commenced on the greater JMP site (**Appendix 15**), no construction has taken place for the proposed MetCon Facility, pending the approval and issuing of the necessary authorisations.

The current EA Application is for the proposed development of the MetCon refining facility that will occupy an area of approximately 0.55ha within the previously authorised JMP site. MetCon specialises in extracting precious and base metals from secondary gold materials (i.e. dorè sourced from other refineries and mines) through a chemical treatment refining process and has been identified as a key facility to be incorporated into the JMP SEZ site.

The development and inclusion of the proposed MetCon facility within the JMP requires an additional EA from the DEA due to the triggering of listed activities that require a full EIA process to be conducted. The EIA for the proposed development is being conducted in terms of the EIA Regulations of 2014, promulgated in terms of Chapter 5 of the National Environmental Management Act (NEMA) (Act No. 107 of 1998), which came into effect on 8 December 2014, and as amended on 7 April 2017. The proposed development triggers Activity 6 of Listing Notice 2 (GN R. 325, as amended) which applies to the development of facility for an activity that requires an Atmospheric Emissions License (AEL). Activity 6 above applies to the proposed development as it triggers sub-categories 4.2 and 4.17 of Section 21

of the National Environmental Management: Air Quality Act (NEM:AQA) (Act No. 39 of 2004). All relevant legislations and guidelines will be consulted and complied with during the EIA process.

In light of the above, and subsequent to the completed Scoping phase, Marang has compiled this Draft Environmental Impact Assessment Report (DEIAR) on behalf of MetCon and the GIDZ in order to comply with the requirements of the EIA Regulations of 2014 (as amended) in terms of the NEMA. The potential impacts associated with the proposed project have been identified and are described in the report.

This EIA process, where possible, culminates with the compilation of detailed mitigation measures to reduce impacts and the identification of sensitive areas within the site which may require more specific management measures. It also aims to optimise and improve potential positive impacts that may result from the proposed development. Furthermore, as an extension to this Draft Environmental Impact Assessment Report (DEIAR), a Draft Environmental Management Programmes (DEMPr) (**Appendix 13**) has been compiled which details mitigation and management measures, in response to the detailed assessment.

The FBAR compiled as part of the BA process undertaken for the original JMP project in 2009 concluded that the development of the JMP on the OR Tambo International Airport IDZ, is *“in line with the region’s Spatial Development Plan”*, as well as the adjacent land uses. It further states that the development will provide a number of *“job opportunities during the construction phase”* and thereby enhance the local economy. The property on Portion 282 of the Farm Witkoppie No. 64 - IR has *“no ecological, archaeological or geohydrological sensitivities”* which may be impacted on by the proposed development. If all mitigation measures as stipulated in the FBAR and in the EMPr are implemented, the significance of most, if not all, and the potential impacts, as listed above, will be *“reduced to ‘medium’ and ‘low’”* and reach *“environmentally acceptable levels”*.

In this EIA process, Heritage, Freshwater, Visual, Soil and Land Capability and Noise specialist reviews were obtained. An Air Quality Impact Assessment (AQIA) was conducted by Marang in order to assess the facility’s potential atmospheric impacts. In addition, Traffic and Geotechnical specialist studies were conducted to address the potential impacts relating to the proposed development in 2016 and 2015, respectively. Impact assessments were conducted as part of the specialist reviews and assessments to ascertain the level of each identified impact, as well as mitigation measures which may be required. The potential positive and negative impacts associated within these reviews and assessments have been evaluated and rated accordingly.

With regards to the specialist reviews conducted as part of this EIA process for the proposed development and inclusion of the MetCon facility within the JMP site, the overall conclusions of the reviewed specialist assessments for this EIA process are congruous with the first findings of the BA undertaken in 2009, highlighting no fatal flaws posed by the proposed project to the receiving environment.

A summary of conclusions in relation to each of the potential impacts, incorporating specialists’ reviews and/or assessments undertaken as part of this EIA process and all site and project historical information and documentation, is provided in **Table i** below.

**Table i: Conclusions Regarding Assessed Environmental Aspects.**

Aspect	Construction Impact		Operation Impact		Conclusion
	Pre-mitigation	Post mitigation	Pre-mitigation	Post mitigation	
Surface Water	-11 (low negative)	-8 (Low negative)	- 22 (low negative)	- 9 (Low negative)	<p>From the results of the review, it was determined that the findings of the Basic Assessment Report (BAR) are likely to still hold true but are not absolute. The recommendations presented in the BAR and Environmental Management Programme EMPr are appropriate, relevant/necessary, sensible and achievable; and the proposed mitigatory measures outlined in this report are considered the best options available.</p> <p>Based on the findings of the impact assessment, the construction and operation of the proposed precious metal refinery facility poses a low significance of impact on the freshwater resources of the area. Due to the distance between the activities and the watercourses in the area, and the presence of existing developments between the study area and watercourses of the area, limited to negligible impact from the proposed activities on the wetlands is expected to occur.</p>
Soil and Land Capability	- 15 (low negative)	- 9 (Low negative)	- 26 (low negative)	- 9 (Low negative)	<p>From the results of the review, it was determined that the findings of the Basic Assessment Report (BAR) are likely to still hold true but are not absolute. The recommendations presented in the BAR and Environmental Management Programme EMPr are appropriate, relevant/necessary, sensible and achievable; and the proposed mitigatory measures outlined in this report are considered the best options available.</p> <p>The study area is located within a highly industrialised and urbanised area with no active agricultural practices within or in the immediate vicinity of the study area. The eastern half of the study area is situated within the Environmental Management Framework (EMF) Zone 5 (Industrial and large commercial focus zone) (EMF, 2015). The proposed facility falls within the EMF Zone 5. In addition, the study area is currently under development and the soils have been anthropogenically transformed, thus these soils are likely to have little to no bearing on agricultural productivity. Thus, from a soil, land use and land capability point of view, the impact significance on the loss of high agricultural potential soils is anticipated to range between very low and negligible. Based on the findings of the impact assessment, the construction and operation of the proposed precious metal refinery facility poses a low significance of impact on soil, land use and land capability.</p>
Visual	- 28 (low negative)	- 10 (Low negative)	- 24 (low negative)	- 9 (Low negative)	<p>It was evident from the review of the Basic Assessment Report (BAR) that very little to no information was presented on visual impacts. However, based on the geographic setting</p>

Aspect	Construction Impact		Operation Impact		Conclusion
	Pre-mitigation	Post mitigation	Pre-mitigation	Post mitigation	
					<p>of the proposed MetCon facility, the development is not likely to lead to any change in the visual character and sense of place of the surrounding environment.</p> <p>Both the initial EMPr and the initial EA set conditions to limit the visual impact of the development. Should these conditions be adhered to, the significance of the impact on visual resources and the visual landscape are considered negligible.</p> <p>Since the surrounding area has been subject to development and the proposed facility site is situated within a footprint where buildings are already constructed, the visual character and sense of place of the area will not be significantly negatively affected. Furthermore, since the proposed development is situated adjacent to the OR Tambo International Airport, none of the buildings are permitted to be higher than two storeys (approximately 12m), therefore the proposed building is congruous with the surrounding existing buildings from the JMP. Based on the findings of the impact assessment, the proposed inclusion of the MetCon facility poses a low significance of impact on the visual character and aesthetics of the area.</p> <p>Additional information from desktop sources with emphasis on climate, topography, land uses and land cover as well as protected areas within a 10km radius from the proposed development was gathered to assist with decision making for additional listed activities for which authorisation may be required.</p>
Heritage	<p>A brief desktop study was undertaken which consisted of an assessment of old aerial photographs. Aerial photographs taken in 1941, 1952, 1969 and 1976 were obtained and included in the study. Neither one of these images depict any buildings or heritage sites within the study area.</p> <p>The fieldwork showed that the study area is almost entirely disturbed and construction on the jewellery precinct is at an advanced stage. As a result, there is no need for a Heritage Impact Assessment on this project.</p>				<p>Due to the fact that no heritage or archaeological resources were identified during the desktop investigation and site walkthrough, no impacts are anticipated from a heritage point of view. As such, the Heritage Specialist did not undertake an impact assessment as part of his review.</p>
Air Quality	N/A		- 23 (low negative)	- 17 (Low negative)	<p>Particulate and gaseous emissions were identified for operations associated with the proposed facility and will be emitted from the following key sources:</p> <ul style="list-style-type: none"> <li>▪ Jewellers secondary gold material incineration in roasting oven;</li> <li>▪ Gas (fuel) combustion installation (roasting oven);</li> <li>▪ Chemical refining process;</li> <li>▪ Melting of material in induction furnaces and adding fluxes; and</li> <li>▪ Casting of material.</li> </ul>

Aspect	Construction Impact		Operation Impact		Conclusion
	Pre-mitigation	Post mitigation	Pre-mitigation	Post mitigation	
					The abovementioned activities trigger sub-category 4.17 (precious and base metal production and refining) and 4.2 (combustion installations) in terms of S21 of NEM:AQA (Act No. 39 of 2004). As such, the proposed facility requires an AEL to operate. While there were other identified existing key sources of air pollution surrounding the project site which also need to be taken into account, Marang predicted low unmitigated incremental concentrations. MetCon do plan to install abatement equipment, as per their current design at the MetCon Centurion Plant. Under the mitigated scenario, very low concentrations were observed within 2 km from the facility, as the abatement equipment (scrubber and baghouse) has an associated emission control efficiency of approximately 98%. Therefore, Marang further concluded that the development be approved from an Air Quality point of view.
Noise	Medium (Old BAR)	Low (Old BAR)	- 12 (low negative)	- 12 (Low negative)	Current operations at the ORTIA produce noise levels between 65-to-70 dBA, covering the whole JMP site as well as portions of the north-western parts of Bonaero Park residential area. Potential noise levels produced by the MetCon facility are expected to only reach 70 dBA within the facility's boundary walls, with only about 45-to-50 dBA projected to reach the Bonaero Park residential area. As such, potential noise levels for the MetCon facility are expected to have significantly lower noise impact than currently imposed by the ORTIA.
Traffic	High (Old BAR)	Medium (Old BAR)	- 22 (low negative)	- 20 (Low negative)	The MetCon facility is not expected to add significant additional traffic to the JMP site, or the surrounding industrial/residential areas.
Waste	Medium (Old BAR)	Low (Old BAR)	- 76 (medium negative)	- 34 (medium negative)	Recommendations made in the BA, initial EMP, this impact assessment report, and its EMP, must be complied with in order to reduce potential waste impacts during construction and operation of the MetCon facility.
Socio-Economic	Medium (Old BAR)	Low (Old BAR)	+ 68 (medium positive)	N/A	As the overall socio-economic impact is generally positive in nature, no mitigation of the impacts is required.



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AEL	Air Emissions License
ACSA	Airport Company of South Africa
AGIS	Agricultural Geo-Referenced Information System
APPA	Atmospheric Pollution Prevention Act (Act No. 45 of 1965)
AQA	Air Quality Assessment
AQIA	Air Quality Impact Assessment
ATNS	Air Traffic and Navigation Services SOC Limited
ASTM D1739	The American Society for Testing and Materials standard method for collection and measurement of dust fall (Settleable Particulate Matter)
BA	Basic Assessment
C-Plan	Gauteng Conservation Plan
C&RR	Comments and Response Report
CAA	Civil Aviation Act, 2009 (Act No. 13 of 2009)
CARA	Conservation of Agricultural Resources Act No. 43 of 1983
CBA	Critical Biodiversity Area
CBD	Central Business District
CH <sub>4</sub>	Methane
CO	Carbon Monoxide
CO <sub>2-eq</sub>	Carbon Dioxide equivalents
CoE	City of Ekurhuleni
DD	Due Diligence
DEA	Department of Environmental Affairs
DEIAr	Draft Environmental Impact Assessment Report
DEMPr	Draft Environmental Management Programme
DSR	Draft Scoping Report
Dol	Declaration of Interest
DTI	Department of Trade and Industry
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
ECA	Environment Conservation Act (Act No 73 of 1989)
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMF	Environmental Management Framework
EMPR	Environmental Management Programme
ESA	Ecological Support Area
FBAR	Final Basic Assessment Report
FGM	Focus Group Meeting
FEIAr	Final Environmental Impact Assessment
Fe <sub>2</sub> O <sub>3</sub>	Hematite
FeOOH	Goethite
FSR	Final Scoping Report
GA	General Authorization
GDARD	Gauteng Department of Agriculture and Rural Development
GDED	Gauteng Department of Economic Development
GGDA	Growth & Development Agency
GHG	Greenhouse Gas

GIDZ	Gauteng Industrial Development Zone
GIFA	Gauteng Infrastructure Financial Agency
GN	Government Notice
GPS	Geographic Positioning System
HFCs	Hydrofluorocarbons
HPA	Highveld Priority Area
IPAP	Industrial Policy Action Plan
IRPTS	Integrated Rapid Public Transport System
JMP	Jewellery Manufacturing Precinct
MAP	Mean Annual Precipitation
MetCon	Metal Concentrators SA (Pty) Ltd
N <sub>2</sub> O	Nitrous Oxide
NAEIS	National Atmospheric Emissions Inventory System
NDP	National Development Plan
NEM:AQA	National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004)
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NEM:BA	National Environmental Management: Biodiversity Act 2004, (Act No. 10 of 2004)
NEM:PAA	National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003)
NFEPA	National Freshwater Ecosystem Priority Area
NHRA	National Heritage Resources Act No. 25 of 1999
NO <sub>2</sub>	Nitrogen Dioxide
NPAES	National Protected Areas Expansion Strategy
NRTA	National Road Traffic Act, 1996 (Act No. 93 of 1996)
NWA	National Water Act 1998 (Act No. 36 of 1998)
O <sub>3</sub>	Ozone
ORTIA	OR Tambo International Airport
PAEL	Provisional Air Emissions License
PFCs	Perfluorocarbons
PM	Particulate Matter
PMRF	Precious Metals Refinery Facility
PPP	Public Participation Process
SAHRA	South African Heritage Resources Agency
SANBI	South African National Biodiversity Institute
SANRAL	South African National Road Agency SOC Ltd
SANS	South African National Standards
SAPAD	South African Protected and Conservation Areas Databases
SEZ	Strategic Economic Zone (Special, Economic and Industrial Development Zones)
SF <sub>6</sub>	Sulphur hexafluoride
SHE	Safety, Health and the Environment
SIP	Strategic Infrastructure Projects
SO <sub>2</sub>	Sulphur Dioxide
WML	Waste Management License
WULA	Water Use License Authorisation

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# 1. INTRODUCTION

Marang Environmental and Associates (Pty) Ltd (hereafter referred to as “Marang”) was appointed, in terms of the National Environmental Management Act, 1998 (NEMA) (Act No. 107 of 1998) and the Environmental Impact Assessment (EIA) Regulations of 2014 (as amended in April 2017), by the Gauteng Industrial Development Zone (hereafter referred to as “GIDZ”) to undertake an EIA process for the proposed development and inclusion of the Metal Concentrators SA (Pty) Ltd (hereafter referred to as “MetCon”) refinery facility in the Jewellery Manufacturing Precinct (JMP) within the OR Tambo International Airport (ORTIA) Special Economic Zone (SEZ), Kempton Park, Gauteng Province (hereafter referred to as the “proposed project”).

The GIDZ, as appointed by the Gauteng Department of Economic Development (GDED), have been given the mandate to develop the JMP (located on Portion 282 of the Farm Witkoppie No. 64 – IR) within the ORTIA SEZ. The JMP aims to increase employment opportunities and foreign direct investment in the jewellery manufacturing sector. A basic assessment (BA) process was undertaken in 2009 to obtain Environmental Authorisation (EA) for the development of the original JMP site. The BA was carried out in terms of the 2006 EIA Regulations. The GDED were subsequently issued with an approved EA (GDARD Ref No. GAUT002/09-10/N0021) for the original JMP development by the Provincial Authority, namely the Gauteng Department of Agriculture and Rural Development (GDARD), on 25 July 2011 (**Appendix 8C**). The EA was then amended in May 2018 and included a change in the licence holder details from the GDED to the GIDZ. This amendment was subsequently granted by the Department of Environmental Affairs (DEA), and the amended EA was issued on 11 May 2018 (DEA Ref No. 14/12/16/3/3/1/7/94/AM1) (**Appendix 8D**). Although construction has commenced early 2013 on the greater JMP site (**Appendix 15**), no construction has taken place for the proposed MetCon Facility. This will only commence once the necessary approvals / authorisations have been obtained.

The current EA application is for the proposed MetCon refining facility that will occupy an area of approximately 0.55 hectares (ha) in one of the blocks within the authorised JMP site (please refer to the Site Layout Map attached in **Appendix 5**). MetCon specialises in extracting precious and base metals from secondary gold materials (i.e. dorè sourced from other refineries and mines) through a chemical treatment refining process and has been identified as a key facility to be incorporated into the JMP site. The activities proposed by MetCon trigger sub-category 4.2 (combustion installations) and sub-category 4.17 (precious and base metal production and refining) in terms of Section 21 (S21) of the National Environmental Management: Air Quality Act (NEM:AQA) (Act No. 39 of 2004) and will therefore require an Atmospheric Emissions Licence (AEL).

The development and inclusion of the proposed MetCon facility within the JMP therefore requires an additional EA from the DEA due to the triggering of listed activities that require a full environmental impact assessment to be conducted in terms of the EIA Regulations of 2014, promulgated in terms of the National Environmental Management Act (NEMA) (Act No. 107 of 1998), which came into effect on 8 December 2014, and as amended on 7 April 2017. The proposed development is listed as Activity 6 of Listing Notice 2 (GNR 325, as amended) which refers to:

*6. The development of facilities or infrastructure for any process or activity which requires a permit or licence or an amended permit or licence in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent,...*

It should be noted that the additional 1ha area along the north-western boundary of the JMP site, which the GIDZ originally proposed to include in this EIA process, is no longer being considered for this proposed project as per correspondence with the DEA (**Appendix 4**). In addition, the proposed MetCon facility is not

to be located on the 1ha land. As such, the removal of this additional land from this MetCon EIA process does not alter the EIA application significantly.

### 1.1. Objectives of Draft Environmental Impact Assessment Report

This Draft Environmental Impact Assessment Report (DEIAR) has been prepared as part of the EIA process to fulfil the required objectives of an EIA process as outlined in Appendix 3 of the NEMA EIA Regulations of 2014 (as amended). In terms of the NEMA EIA Regulations, 2014 (as amended), published under GN R. 326, the objective of the EIA process is 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 development footprint on the approved site as contemplated in the accepted scoping report;
- c) identify the location of the development footprint within the approved site as contemplated in the accepted scoping report 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—
  - (i) nature, significance, consequence, extent, duration and probability of the impacts occurring to inform identified preferred alternatives; and
  - (ii) degree to which these impacts—
    - (aa) can be reversed;
    - (bb) may cause irreplaceable loss of resources, and
    - (cc) can be avoided, managed or mitigated;
- e) identify the most ideal location for the activity within the development footprint of the approved site as contemplated in the accepted scoping report 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 development footprint on the approved site as contemplated in the accepted scoping report 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.

Furthermore, this DEIAR contains information as outlined in Section 3(1) of Appendix 3 of the NEMA EIA Regulations, 2014 (as amended), which is necessary for a proper understanding of the process, informing all preferred alternatives (including location alternatives), the scope of the assessment, and the consultation process to be undertaken through the EIA process. The content requirements for a DEIAR, as well as details of which section of the report fulfils these requirements, are shown in **Table 1-1** below.

**Table 1-1: Requirements of a DEIAR.**

Content Requirements	Applicable Section
<p>a) details of-</p> <ul style="list-style-type: none"> <li>i. the EAP who prepared the report; and</li> <li>ii. the expertise of the EAP, including a curriculum vitae;</li> </ul>	<p>Details of the EAP and project team are included in section 1.5. The expertise (including curriculum vitae) of the EAP and project team are included in <b>Appendix 2</b>.</p>
<p>b) the location of the development footprint of the activity on the approved site as contemplated in the accepted scoping report, including:</p> <ul style="list-style-type: none"> <li>i. the 21-digit Surveyor General code of each cadastral land parcel;</li> <li>ii. where available, the physical address and farm name;</li> <li>iii. where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;</li> </ul>	<p>The location of the proposed project is detailed in section 5.1 and section 5.2 of this report.</p>
<p>c) a plan which locates the proposed activity or activities applied for as well as the associated structures and infrastructure at an appropriate scale, or, if it is-</p> <ul style="list-style-type: none"> <li>i. a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or</li> <li>ii. on land where the property has not been defined, the coordinates within which the activity is to be undertaken;</li> </ul>	<p>A map of the regional locality is shown in section 5.1. Additionally, all project maps are included in <b>Appendix 5</b>. Coordinates are shown in section 5.2.</p>
<p>d) a description of the scope of the proposed activity, including-</p> <ul style="list-style-type: none"> <li>i. all listed and specified activities triggered;</li> <li>ii. a description of the activities to be undertaken, including associated structures and infrastructure;</li> </ul>	<p>The listed and specified activities triggered as per the NEMA are detailed in section 3.1. The technical project description is included in section 2. This includes a description of activities to be undertaken, including associated structures and infrastructure.</p>
<p>e) a description of the policy and legislative context within which the development is located and an explanation of how the proposed development complies with and responds to the legislation and policy context;</p>	<p>A description of all legal requirements and guidelines is provided in section 3. This includes key legal and administrative requirements as well as key development strategies and guidelines.</p>
<p>f) a motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred development footprint within the approved site as contemplated in the accepted scoping report;</p>	<p>Section 4.</p>
<p>g) a motivation for the preferred development footprint within the approved site as contemplated in the accepted scoping report;</p>	<p>Section 4.</p>
<p>h) a full description of the process followed to reach the proposed preferred activity, site and location of the development footprint within the site, including -</p> <ul style="list-style-type: none"> <li>i. details of all the alternatives considered;</li> <li>ii. details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;</li> <li>iii. a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them;</li> <li>iv. the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;</li> <li>v. the impacts and risks which have informed the identification of each alternative, including the nature, significance, consequence, extent, duration and probability of such identified impacts, including the degree to which these impacts- <ul style="list-style-type: none"> <li>(aa) can be reversed;</li> <li>(bb) may cause irreplaceable loss of resources; and</li> <li>(cc) can be avoided, managed or mitigated;</li> </ul> </li> <li>vi. the methodology used in identifying and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives;</li> </ul>	<p>Alternatives have been discussed in section 2.4. It should however be noted that no site or layout alternatives have been considered and/or assessed as part of this EIA process. Public Participation records are contained in section 8 and <b>Appendix 7</b> of this report. Environmental attributes of the site and possible impacts are explained in sections 7.</p>

<ul style="list-style-type: none"> <li>vii. positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;</li> <li>viii. the possible mitigation measures that could be applied and level of residual risk;</li> <li>ix. if no alternatives, including alternative footprints for the activity were investigated, the motivation for not considering such and</li> <li>x. a concluding statement indicating the location of the preferred alternative development footprint within the approved site as contemplated in the accepted scoping report;</li> </ul>	
<ul style="list-style-type: none"> <li>i) a full description of the process undertaken to identify, assess and rank the impacts the activity and associated structures and infrastructure will impose on the preferred development footprint on the approved site as contemplated in the accepted scoping report through the life of the activity, including— <ul style="list-style-type: none"> <li>i. a description of all environmental issues and risks that were identified during the environmental impact assessment process; and</li> <li>ii. an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures;</li> </ul> </li> </ul>	Description of impact assessment method is included in section 7.1 of this report.
<ul style="list-style-type: none"> <li>j) an assessment of each identified potential impact and risk, including— <ul style="list-style-type: none"> <li>i. cumulative impacts;</li> <li>ii. the nature, significance and consequences of the impact and risk;</li> <li>iii. the extent and duration of the impact and risk;</li> <li>iv. the probability of the impact and risk occurring;</li> <li>v. the degree to which the impact and risk can be reversed;</li> <li>vi. the degree to which the impact and risk may cause irreplaceable loss of resources; and</li> <li>vii. the degree to which the impact and risk can be mitigated;</li> </ul> </li> </ul>	Assessment of potential impacts and recommendations have been included in section 7.2.
<ul style="list-style-type: none"> <li>k) Where applicable, a summary of the findings and recommendations of any specialist report complying with Appendix 6 and an indication as to how these findings and recommendations have been included in the final assessment report;</li> </ul>	Specialist studies are included and explained in section 6 of this report and their respective reports in <b>Appendices 6 &amp; 9</b> .
<ul style="list-style-type: none"> <li>l) an environmental impact statement which contains— <ul style="list-style-type: none"> <li>i. a summary of the key findings of the environmental impact assessment;</li> <li>ii. a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred development footprint on the approved site as contemplated in the accepted scoping report indicating any areas that should be avoided, including buffers; and</li> <li>iii. a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;</li> </ul> </li> </ul>	A summary of impacts and recommendations is included in section 9 of this report.
<ul style="list-style-type: none"> <li>m) based on the assessment, and where applicable, recommendations from specialist reports, the recording of proposed impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation;</li> </ul>	Relevant mitigation recommendations have been made in section 9 of this report and the attached DEMPr ( <b>Appendix 13</b> ).
<ul style="list-style-type: none"> <li>n) the final proposed alternatives which respond to the impact management measures, avoidance, and mitigation measures identified through the assessment;</li> </ul>	No possible alternatives. As such, management measures have been included in section 9 and the DEMPr in <b>Appendix 13</b> .
<ul style="list-style-type: none"> <li>o) any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation;</li> </ul>	None have been identified. Only mitigation and management recommendations have been made in section 9 and in the DEMPr.
<ul style="list-style-type: none"> <li>p) a description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed;</li> </ul>	Where relevant, assumptions have been made by Specialists and included in section 7 of this report. Specialist reports are included in <b>Appendices 6 &amp; 9</b> .

q) a reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;	Opinions have been made in the conclusion in section 9.3 of this report.
r) where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required and the date on which the activity will be concluded and the post construction monitoring requirements finalised;	Not relevant. Activity includes operational aspects.
s) an undertaking under oath or affirmation by the EAP in relation to— (i) the correctness of the information provided in the reports; (ii) the inclusion of comments and inputs from stakeholders and I&APs; (iii) the inclusion of inputs and recommendations from the specialist reports where relevant; and (iv) any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties;	The EAP affirmation and declaration of interest is included in <b>Appendix 3</b> . The plan of study is included within this FSR which has been made available for review and comment by I&APs.
t) where applicable, details of any financial provision for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts;	Not applicable.
u) an indication of any deviation from the approved scoping report, including the plan of study, including— (i) any deviation from the methodology used in determining the significance of potential environmental impacts and risks; and (ii) a motivation for the deviation;	No deviations.
v) where applicable, any specific information required by the competent authority; and	A record of authority consultation is provided in section 1.4, section 1.5, and section 8.6, and details how the competent authority's comments have been addressed, taken into consideration and incorporated into this report.  Any further specific information requested will be detailed in the same manner in the Final Environmental Impact Assessment Report (FEIAR).
w) any other matter required in terms of section 24(4)(a) and (b) of the Act.	All requirements in terms of section 24(4)(a) and (b) of the Act have been met in this report.

## 1.2. Applicable documentation

The following documentation should be read in conjunction with this DEIAR:

- Gauteng Industrial Development Zone Strategic Plan (2014-2019) – Updated 2017 February.
  - This document, similar to any programme management and planning documentation, outlines all the programmes, objectives, targets and indicators of the GIDZ over a medium period as well as relevant legislative requirements and mandates thereof.
- South African Special Economic and Industrial Development Zones (SEZ).
  - The GIDZ Project, as described in page 12 of the SEZ document, forms part of the Special Economic Zones (SEZ) aimed at the stimulating economic development through the JMP project.

The above-mentioned documents have been provided in **Appendix 1**.

### 1.3. Specialist Reviews and/or Assessments

A BA process was undertaken in 2009 for the development of the existing JMP development site under the guidance of the NEMA, 1998 (Act No. 107 of 1998), as amended, and the EIA Regulations of 2006. Inputs were “*made by specialists to the extent that may be necessary*” in terms of Section 23(2)(j) of the NEMA EIA Regulations, 2006. As such, the Final Basic Assessment Report (FBAR) included the following environmental impacts for the construction, operation, and decommissioning phases of the original above-mentioned JMP development:

- Vehicular Access and Traffic Congestion,
- Biophysical (clearance of vegetation),
- Socio-economic impacts,
- Soil instability and erosion,
- Stormwater run-off volume and velocity,
- Increased Waste Generation,
- Noise pollution, and
- Increased demand/pressure on service infrastructure.

A Scoping Geotechnical Report was available as an extension to the BA process.

In 2015 and 2016, two (2) detailed specialist assessments were conducted. These included the following:

- Geotechnical; and
- Traffic Impact Assessment.

The above-mentioned Geotechnical and Traffic studies / assessments are included in **Appendix 9**.

During the original BA process, overall potential impacts of the proposed development were identified through a desktop study, a site visit, specialist studies and comments received during the public participation process. An assessment of the potential impacts was provided, identifying the impacts that are potentially significant including management recommendations and mitigation measures to reduce the impacts.

The FBAR concluded that the development of the JMP in the OR Tambo International Airport IDZ, is “*in line with the region’s Spatial Development Plan*”, as well as the adjacent land uses. It further stated that the development will provide a number of “*job opportunities during the construction phase*” and thereby enhance the local economy. The property on Portion 282 of the Farm Witkoppie No. 64 - IR has “*no ecological, archaeological or geohydrological sensitivities*” which may be impacted on by the proposed development. If all mitigation measures as stipulated in the FBAR and in the Environmental Management Plan (EMPr) are implemented, the significance of most, if not all, and the potential impacts, as listed above, will be “reduced to ‘medium’ and ‘low’” and reach “environmentally acceptable levels”.

A Scoping Geotechnical Report (assessing the topography, vegetation, geology, and surface and ground water in a geotechnical viewpoint) was also compiled as part of the BA process undertaken for the original JMP project in 2009 and is thus also available (**Appendix 9**). While this report raised concerns about the presence of a large trench that discharges to the “*triangular very wet area*” (wetland), it recommended feasible mitigations and concluded that the proposed development has “*no fatal flaws*”. Furthermore, a more extensive geotechnical assessment was completed for the JMP development site in 2015, approximately four (4) years after the EA was issued, which also was in consonance with the findings of the initial Scoping Geotechnical Report.

A Traffic Impact (scoping and extensive) Assessment was completed recently in 2016, for the same JMP development site. The Traffic Impact Assessment recommended road upgrades which will see the surrounding road network being able to accommodate the development traffic at acceptable levels, and further concluded that the development be approved from a traffic point of view.

Reviews of the above-mentioned specialist assessments / studies have been included as part of this EIA process for the proposed development and inclusion of the MetCon facility to assess relevancy and validity.

In addition, a full Air Quality Impact Assessment (AQIA) has been undertaken as part of this EIA process, the results of which have been included in this DEIAr and presented in **Appendix 6**, along with the other specialist reviews mentioned above.

## **1.4. Authority Consultation**

### *1.4.1. Competent Authority Consultation prior to current EIA process*

As mentioned, a BA process was undertaken in 2009 for the development of the JMP Industrial Development Zone (IDZ) at the ORTIA precinct. An EA was subsequently granted by GDARD to the then holder, namely the GDED, on 25 July 2011. The GIDZ was founded in 2009 as a subsidiary of the Gauteng Growth & Development Agency (GGDA) under the auspices of GDED to develop and operate the JMP IDZ. This meant that the details of the EA holder had to be amended from GDED to GIDZ.

In light of the above, Marang was appointed in December 2017 to undertake a Part 1 EA Amendment process in order to amend the holder details of the EA from GDED to GDIZ, as mentioned above. Prior to the EA Amendment application, it was noted that both the GDED and GDARD are regulated by, and report to, the same MEC. In terms of S24C, subsection 2(d)(ii), "*the Minister must be identified as the competent authority in terms of subsection (1), ..., if the activity is undertaken, or is to be undertaken, by a provincial department responsible for environmental affairs or any other organ of state performing a regulatory function and reporting to the MEC*". Therefore, the DEA was identified as the competent authority for this project.

As such, a Part 1 EA Amendment application (DEA Reference Number: **14/12/16/3/3/1/7/94/AM1**) was lodged with the DEA on 13 February 2018 in order to amend;

1. *the holder and contact details of the EA.*

The reason for the amendment was that the GDED had appointed GIDZ (as the Gauteng Provincial Industrial Development Agency,) to develop the project on behalf of the GDED. Therefore, the holder and contact details were subject to change.

2. *the authorised listed activities under the 2006 Environmental Impact Assessment Regulations to incorporate activities as per the EIA Regulations, 2014, as amended.*

The reason for the amendment was that the activities originally applied for and authorised in the EA dated 25 July 2011, had been delisted and replaced with the 2014 EIA Regulations, as amended. Furthermore, the EA needed to be amended to include an additional listed activity as the proposed MetCon facility triggers listed activities in terms of Section 21 of the National Environmental Management Air Quality Act (NEM:AQA) (Act No. 39 of 2004) and will require an AEL.

The proposed activities triggered by the MetCon facility include Listed Activity 6 in terms of the 2014 EIA Regulations Listing Notice 2 of the NEMA, 1998 (Act No. 107 of 1998) (NEMA), as amended.



On 11 May 2018, the DEA responded with a decision to approve the first amendment of the holder and contact details of the EA from GDED to GIDZ, including the change of EA contact details. However, the second amendment to include Listed Activity 6 of Listing Notice 2 of GN R. 325, was refused. The DEA's reason for the refusal was that "the EA was issued in terms of 2006 EIA Regulations and the EA cannot be amended to include similar listed activities as per the EIA Regulation 2014, as amended and this activity is activity 6 of GN R984".

In May 2018, Marang was subsequently further appointed to undertake an EIA process for the proposed development and inclusion of the MetCon refinery facility within the JMP site. Marang together with the GIDZ then requested a pre-application meeting with the DEA to confirm the triggered listed activities associated with the proposed development and to clarify the appropriate EIA process to be followed.

The meeting was held at the DEA's Head Office (473 Steve Biko, Arcadia, Pretoria) on 02 July 2018 with the following attendees:

- Vincent Chauke, Nyiko Nkosi and Chulumanco Myakaza representing the DEA;
- Sophia Rosslee, Veronique Evans and Sindiso Lubisi from Marang; and
- Pat Sibiyi as the representative for the GIDZ.

Listed Activity 6 (in terms of the 2014 EIA Regulations Listing Notice 2, as amended), as mentioned above, was confirmed as the only activity triggered by the proposed MetCon facility. Also, the DEA stated that specialists can include statements to certify that the findings on the impacts and mitigation recommendations stipulated in the FBAR (which was compiled as part of the BA process undertaken for the original JMP development) and any other relevant specialist assessments completed during the original BA process are still relevant for the site. The DEA further mentioned that this can be in the form of specialist review letters and may include any other additional recommendations (where applicable). These specialist review letters have been included in **Appendix 6**. In addition, a full AQIA has been undertaken as part of this EIA process. This has also been included in **Appendix 6**.

#### *1.4.2. Competent Authority Consultation during Scoping Phase of this EIA Process (All consultation documents included in **Appendix 4**)*

- 18 September 2018: The DSR, together with the Application for EA, was submitted to the DEA on Tuesday the 18<sup>th</sup> of September 2018. A proof of payment, details of the EAP and declaration of interest, project schedule, details of landowners, and locality map formed part of the application form and were submitted accordingly on the same date. An acknowledgement of receipt from the DEA was subsequently received on the same day and the project was allocated the following reference number: **14/12/16/3/3/2/1098**.
- 25 October 2018: The DEA sent a comments letter signed 09 October 2018 to Marang, providing comments on the DSR. This comment letter is provided in **Appendix 4**. Comments received from the DEA were addressed and incorporated in the Final Scoping Report (FSR).
- 01 November 2018: A FSR was submitted to the DEA for review.
- 07 November 2018: An acknowledgement letter was received from the DEA.
- 27 November 2018: A MetCon site visit was held at the JMP site with representatives from the DEA, Marang, GIDZ, and MetCon.
- 03 December 2018: A letter requesting clarity on the extra 1ha added on the north-western boundary of the JMP site was sent to DEA. This was to enquire about the appropriate authorisation processes required for this area, and whether or not it would be possible to exclude it from this EA application process.
- 12 December 2018: The DEA's Directorate: Biodiversity Conservation sent comments on the FSR.

- **12 December 2018:** A letter from the DEA was received, accepting the FSR and the Plan of Study for Environmental Impact Assessment. This letter also contained comments and recommendations to be addressed during the EIA phase and the EIA Report (EIAR).
- **14 December 2018:** A first response, in the form of a letter, was received from the DEA on the 14<sup>th</sup> of December 2018. This letter clarified the appropriate authorisation process for the extra 1ha. A follow up was made on the 14<sup>th</sup> of January 2019.
- **14 January 2019:** A second response, in the form of email, was received from the DEA clarifying that an amended *application form for environmental authorisation by excluding the addition 1ha in question as per your original query. Furthermore, the draft EIAR must also excludes that 1ha or the additional 1ha must not be assessed as part of the report to be submitted to the Department for review.*

## 1.5. Other Relevant Stakeholders Consultation

The following authorities were also consulted during this EIA process in order solicit comments relating to the project and where relevant, get the appropriate authorisations. Please refer to **Appendix 12**.

**Table 1-2:** Correspondence with other relevant Authorities.

Authority	Date	Type of Correspondence	Authority Response
Gauteng Department of Agriculture and Rural Development (GDARD). (Appendix 12A)	08 October 2018	<i>Email:</i> Notification Email & Background Information Document (BID).	<i>Letter:</i> Comments.
	18 December 2018	<i>Documents:</i> Final Scoping Report.	<i>Letter:</i> Comments.
City of Ekurhuleni. (Appendix 12B)	18 November 2008	<i>Letter:</i> Letter of enquiry.	<i>Letter:</i> JMP Development Authorisation.
	30 June 2015	<i>Documents:</i> Stormwater Management Plan.	<i>Letter:</i> SWMP Acceptance.
	08 July 2015	<i>Documents:</i> Traffic Report.	<i>Letter:</i> Traffic Recommendations.
	11 October 2016	<i>Letter:</i> Site Development Plan (SDP)	<i>Document:</i> Approved SDP.
	12 October 2018	<i>Documents:</i> Draft Scoping Report.	<i>Letter:</i> Comments.
	08 November 2018	<i>Documents:</i> Final Scoping Report.	<i>Letter:</i> Comments.
South African Civil Aviation Authority (SACAA). (Appendix 12C)	19 October 2018	<i>Email:</i> Notification Email & Background Information Document (BID).	<i>Email &amp; Documents:</i> Comments.
South African National Roads Agency (SANRAL). (Appendix 12D)	10 October 2018	<i>Email:</i> Notification Email & Background Information Document (BID).	<i>Email &amp; Telephone:</i> Not interested and requested to be taken out of EIA database.
Department of Water and Sanitation (DWS). (Appendix 12E)	31 December 2018	e-WULAA online registration for GA	<i>Email:</i> Acknowledgement.
South African Heritage Resources Agency (SAHRA). (Appendix 12F)	21 September 2018	SAHRIS registration.	None. Screenshots included.
Airports Company of South Africa (ACSA). (Appendix 12G)	17 September 2018	<i>Email:</i> Notification Email & Background Information Document (BID).	<i>Letter:</i> Comments.
	23 October 2018	<i>Telephone:</i> Request for ACSA noise impact.	<i>Document:</i> ACSA Noise Impact map.
Air Traffic and Navigation Services (ATNS). (Appendix 12H)	05 October 2018	<i>Email:</i> Notification Email & Background Information Document (BID).	<i>Email:</i> Comments and request for ANNEX14 Obstacle Limitation Surface assessment once MetCon facility is ready for construction.
	14 December 2018	<i>Email:</i> Notification Email & Background Information Document (BID).	<i>Email:</i> Comments on building heights.

## 1.6. Expertise of Environmental Assessment Practitioner (EAP)

Marang has experience in undertaking EIAs. The staff and specialists who have contributed to the completion of this report are detailed below in **Table 1-4** below.

**Table 1-3.** Marang Project Team.

Name and Organisation	Role
Claire Taylor (Scott) – Marang	Senior Environmental Assessment Practitioner (EAP)
Sindiso Lubisi – Marang	Environmental Assessment Practitioner (EAP)
Sophia Rosslee – Marang	Senior Air Quality Specialist
Stephen van Staden – Scientific Aquatic Services (SAA)	Soil and Land Capability; Surface Water & Visual
Polke Birkholtz – PGS Heritage	Heritage
Morné de Jager – Enviro Acoustic Research (EAR)	Noise

### **Designated EAP:**

Mr Sindiso Lubisi (EAP)

B.Sc. (Hons) Environmental Science (Univ. of Pretoria)

Sindiso is an EAP within Marang and has experience in the environmental management field, and has been involved in various basic assessments, air emissions licences, EA implementation programmes, section 24G applications, waste licences and environmental impact assessments.

### **Technical Project Manager:**

Ms Claire Taylor (Senior EAP)

B.Sc. (Hons) Environmental Modelling and Monitoring (UNISA)

Ms Claire Taylor has been working in the Environmental Management field for 14 years. During this time, she has carried out numerous EIAs (including Basic Assessments, Exemptions, full EIAs, & EMPs) Environmental Compliance Audits, Section 24G Reporting, Waste Management Licences, Tier 1 and Tier 2 Contamination Assessments, Remedial Action Plans and Sustainable Development plans and reporting. During the process of carrying out the abovementioned work, Ms Taylor has been required to conduct public participation meetings and reviewed numerous scientific reports and related them to possible environmental impacts of activities.

Please refer to **Appendix 2** for CV's of the team members and specialists. Declaration of Independence (Dols) from all specialists and the EAP Affirmations are included in **Appendix 3**.

## 2. TECHNICAL DESCRIPTION

### 2.1. Project Background

The GIDZ was founded in 2009 as a subsidiary of the GGDA and was given the responsibilities to develop and operate the designated IDZ within the grounds of the ORTIA. Located within the ORTIA (Portion 282 of the Farm Witkoppie No. 64 – IR), the proposed development entails identifying, designing, packaging and enabling focused export-driven manufacturing and beneficiation programmes that will increase industrialization and manufacturing capability in the region. Also, the project will be focused on the identification of jewellery manufacturers for export and will include enterprise mentorship between established and upcoming jewellery manufacturers. The JMP furthermore aims to increase employment opportunities and foreign direct investment in the jewellery manufacturing sector.

As mentioned, a BA process was undertaken in 2009 to obtain EA for the development of the original JMP site. The EA was subsequently issued by the DEA and covers an area of approximately 6.5ha. Construction at the JMP site is still currently underway (**Appendix 15**), however, construction at the proposed MetCon facility (as per this EA application) has not yet commenced. This will only commence once the necessary approvals / authorisations have been obtained.

The proposed MetCon facility will occupy an area of approximately 0.55ha within the existing JMP site and will specialise in extracting precious metals from secondary metal sources and manufacturing jewellery secondary materials through a chemical treatment refining process. A layout plan illustrating the proposed MetCon facility is provided in **Appendix 5**. It should be noted that the additional 1ha area along the north-western boundary of the JMP site, which the GIDZ originally proposed to include in this EIA process, is no longer being considered for this proposed project as per correspondence with the DEA (**Appendix 4**). In addition, the proposed MetCon facility is not to be located on the 1ha land. As such, the removal of this additional land from this MetCon EIA process does not alter the EIA application significantly.

## 2.2. Current Status of the Project

While construction at the JMP site has commenced as per the original EA, the proposed MetCon facility has not yet been constructed pending this EIA process and the issuing of an EA by the DEA.

The scoping phase of the EIA process was completed on the 12<sup>th</sup> of December 2018 as per the received FSR approval letter from the DEA (**Appendix 4**). As such, the EIA phase is currently underway with the Final EIA report planned to be submitted to the DEA no later than the 16<sup>th</sup> of April 2019 in terms of section 23(1) of the EIA Regulations, 2014.

## 2.3. Technical Project Description

The proposed MetCon facility will primarily specialize in extracting precious metals from secondary gold materials (i.e. dorè sourced from other refineries and mines), provide services to the jewellers in the JMP and the local South African market, and beneficiate gold, silver and platinum into finished products for export. MetCon will also undertake a minor process that will involve roasting a small amount of jeweller sweeps (mix of papers, bench sweeps, carpets and polishing residues) from manufacturing jewellers, to separate out the metallic components which will then be refined through MetCon's primary refining process. It should be noted that this minor roasting process will constitute about 1% of MetCon's production.

Metals will be chemically refined and concentrated by means of selective dissolution and recovery to separate the different components as shown in **Figure 2-1** of the refining process indicating inputs and outputs. The chemistry of this refining process consists of using an *aqua regia* solution, which is a combination of commercial nitric acid and hydrochloric acid mixed at specific ratios. Various chemicals such as, Sodium Hydroxide, Borax and Sodium Metabisulphate are also required in the process for neutralization and separation. Chemicals such as 25% Ammonia and ethanol will be used in MetCon's Laboratory. A portion of the gold and silver bullion will be electrolytically concentrated to 99.99% purity

Nitric acid is a powerful oxidizer and will be used to dissolve to virtually undetectable amounts of certain precious materials. The hydrochloric acid provides a ready supply of chloride ions (Cl<sup>-</sup>), which reacts with the ions of the precious materials to produce tetrachloroaurate (III) anions in a solution. The reaction with hydrochloric acid is an equilibrium reaction which favours formation of chloroaurate anions (AuCl<sub>4</sub><sup>-</sup>). This results in a removal of ions of the precious materials from the solution and allows further oxidation to take

place. The precious material dissolves to become chloroauric acid. In addition, precious materials may be dissolved by the free chlorine present in *aqua regia*.

Upon mixing the metals with *aqua regia*, chemical reactions occur resulting in the volatile products nitrosyl chloride and chlorine. Nitrosyl chloride can further decompose into nitric oxide and chlorine. This dissociation is equilibrium-limited. Therefore, in addition to nitrosyl chloride and chlorine, the fumes over *aqua regia* contain nitric oxide. Because nitric oxide reacts readily with atmospheric oxygen, the gases produced also contain nitrogen dioxide, NO<sub>2</sub>. These gaseous emissions are scrubbed in a caustic soda (sodium hydroxide) scrubber before being released into atmosphere. The resultant scrubber solution is neutralised to a pH of 7 before being disposed using the services of an approved waste collector. Liquid and solid effluent generated from the refining activities will be treated and the remaining sludge and filter cake sent for further refining by other refiners. Once refined, the precious metals will be cast into ingots using an induction furnace and then assayed to determine the purity of the metal. Emissions from the melting and casting process will be captured in a fume hood, then extracted via a baghouse filter to atmosphere. All air emissions arising from the various processes are extracted through the caustic scrubber and the baghouse filtration system, thereby meeting emissions standards.

In the minor process, a small amount of jeweller sweeps (mix of papers, bench sweeps, carpets and polishing residues) from manufacturing jeweller operations, will be processed by placing the jewellers sweeps in a gas-fired roasting oven and transformed them into ash within the roaster oven. It is important to note that, in this minor process, about 10 kg of these sweeps will be processed per day, and that the burning of these raw material/jewellers sweep in the roaster oven is a key part of the process to separate out the precious metals in the sweeps. The roaster oven extraction unit will be equipped with a baghouse filter to capture particles that are emitted from the process. The ash will then be removed from the oven and de-magnetized to remove any steel components contained within the ash. The remaining ash will then be put through a screening process to separate the metals and the ash. Once screening is complete, two (2) samples will be taken, the customer will be paid out and once enough material has accumulated, this will be sent to a third-party. Particulate matter (PM) as well as slag will be produced as by-products. These are valuable products and will be sent to a third-party company for further processing and refining.

In summary, MetCon plans to operate a variety of processes and activities on the site which will aid in achieving the desired productions. These will include:

- Chemical refining and concentration of precious metals.
- Roasting of jewellers' waste materials, known as jewellers sweep.
- Casting of precious metals into ingots by means of induction furnace.
- Electrolytic cell concentration of gold and silver to in excess of 99.99%.
- Manufacture of Jewellery.
- Manufacture of products for use by manufacturing jewellers.
- Cooling water by means of cooling towers.
- Storage of liquid and solid raw materials.
- Caustic soda chemical scrubbing of acid gas emissions from the chemical refining process.
- Collection of dust and particulates from the roaster and induction furnace by means of a bag filter.

The products from MetCon's facility will include refined precious metals of gold, silver and platinum which will be beneficiated and chemically refined into added value finished products such as minted bars, 1-kilogram bars, as well as jewellery pieces. Jewellery pieces and products for use by manufacturing jewellers will be sold into South Africa and some of the finished jewellery will be exported. Surplus gold will be melted into 400-ounce (oz) and 1-kilogram bullion bars and then exported.

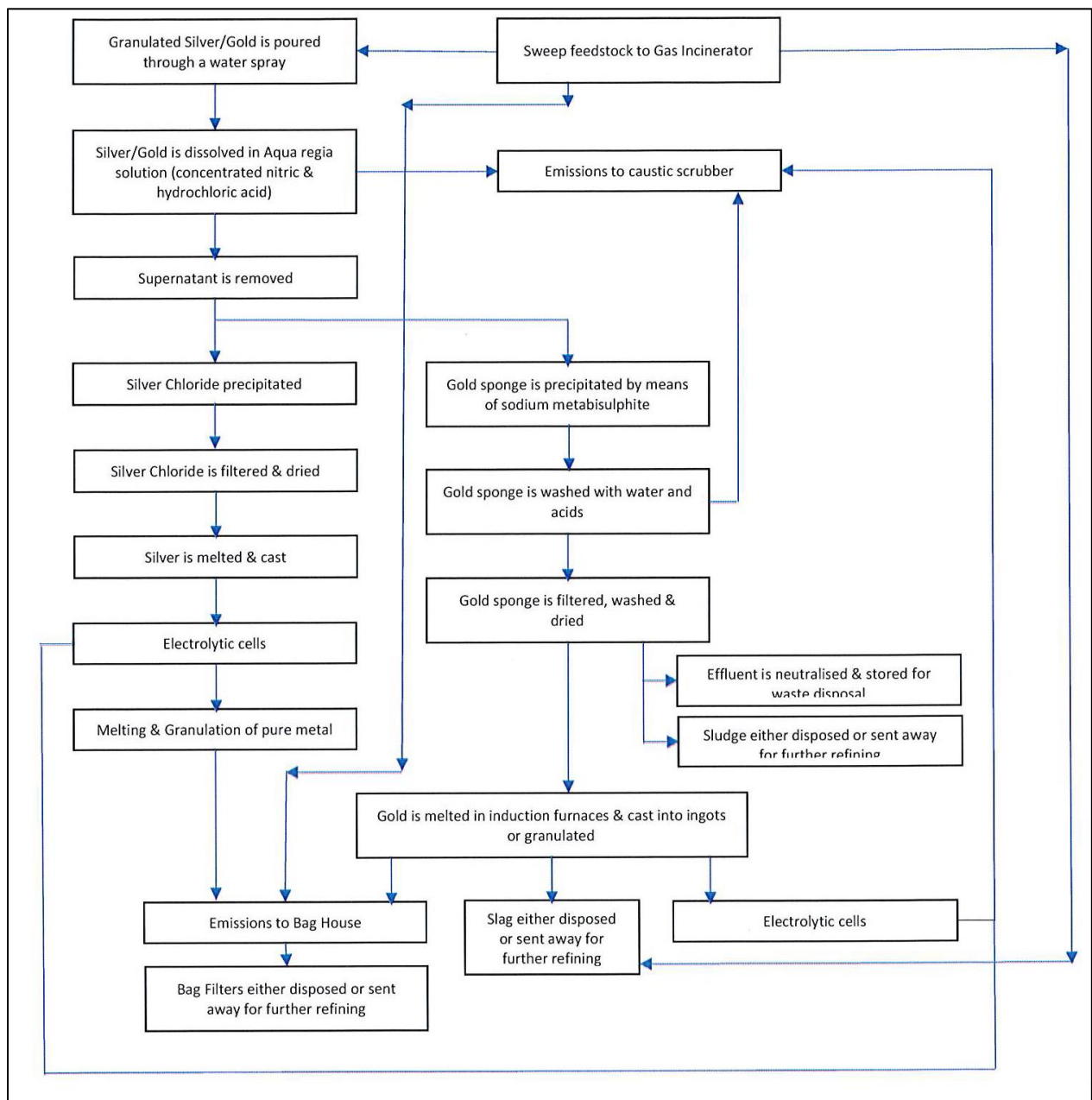
As an integral part of the refining process, the following quantities (in litres [ℓ]) of hazardous materials may be stored and handled at the proposed MetCon facility:

- 10 000 ℓ of nitric acid (HNO<sub>3</sub>);
- 20 000 ℓ of hydrochloric acid (HCL);
- 20 000 ℓ of sodium metabisulfite (SMB); and
- 20 000 ℓ of caustic solution.
- 10 x 25 ℓ Sulphuric Acid (H<sub>2</sub>SO<sub>4</sub>) drums/cans;
- 5 x 25 ℓ Hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) drums/cans; and
- 5 x 25 ℓ Ethanol Alcohol (C<sub>2</sub>H<sub>5</sub>OH) drums/tanks.

This results in a total combined capacity of dangerous goods of approximately 70.5m<sup>3</sup>. It should however be noted that these are not the total volumes of the hazardous substances but rather the total capacities of the storage tanks which the materials will be stored in. The volumes of the hazardous materials being stored and handled on site will thus be less than the above-mentioned quantities.

Borax, which is not hazardous, will also be handled. All hazardous material will be contained within bunded areas in line with SANS standards.

A process flow diagram of operations at the proposed MetCon Refinery Facility within the JMP is provided in **Figure 2-1** below.

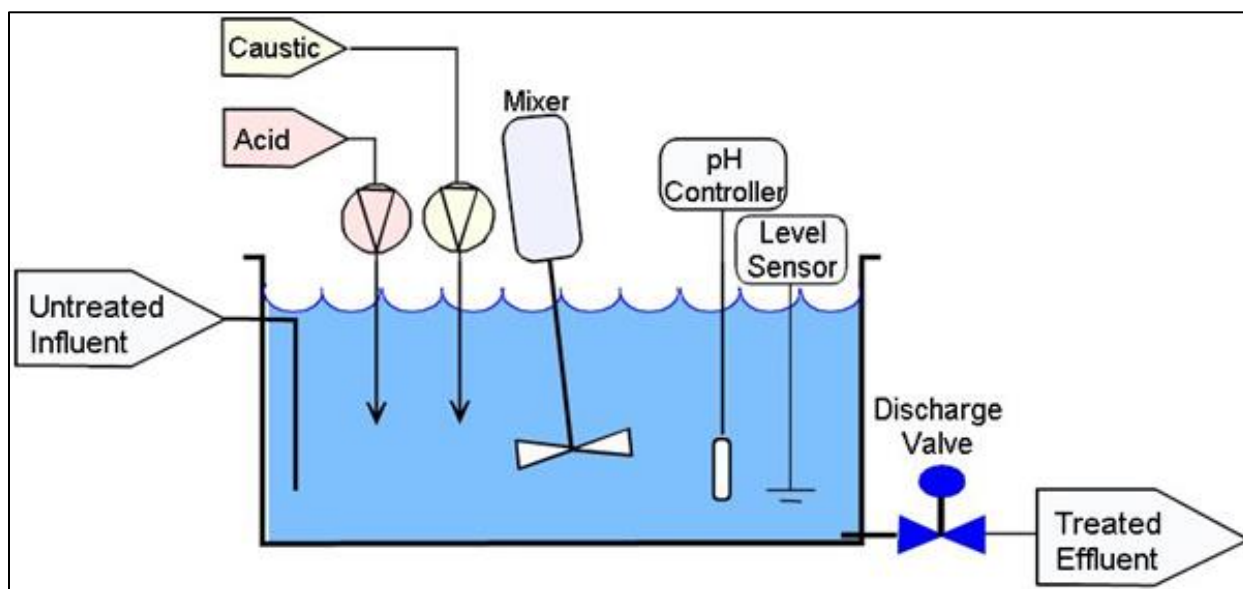


**Figure 2-1:** Process Flow Diagram of Operations at proposed MetCon Refinery Facility within JMP.

In terms of the treatment of effluent at the proposed facility, water coming from the refining process will be treated within a grey water treatment plant which consists of two (2) main components:

- 1 tank complete with agitator to stir the solution to be neutralised; and
- 1 Filter press.

A conceptual illustration of the grey water treatment plant is provided in **Figure 2-2** below.



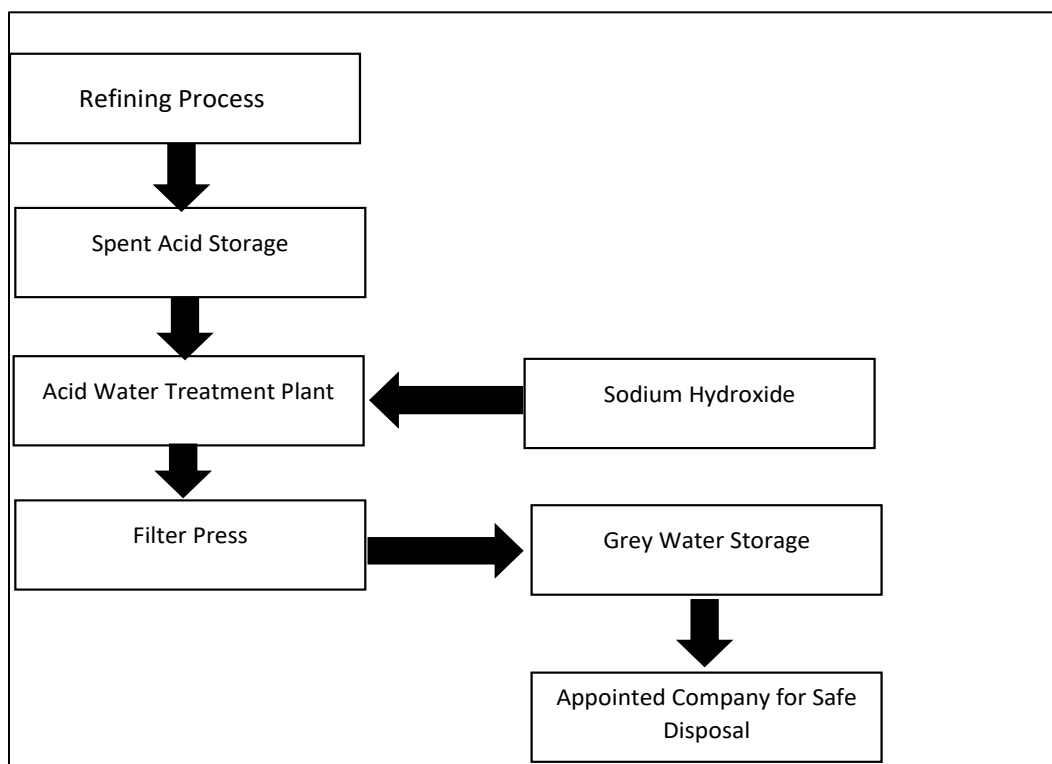
**Figure 2-2.** Conceptual Illustration of Grey Water Treatment Plant

The pump is provided with an electronic level control probe for the automatic starting and stopping of the plant. The system includes a treatment tank, mixer, acid and caustic metering pumps, a pH probe and controller, a level sensor, and a discharge valve. The influent flow enters the tank anywhere that is convenient and exits the tank via gravity near the bottom wherever a port can be conveniently located.

In the system, the untreated influent fills the tank to the high-level point as measured by the level sensor. Once the tank is full the pH adjustment process begins. The large batch volume is treated in one cycle. Once the tank contents are within the acceptable discharge range (pH of 8) and have been for a minimum period of time, the effluent Discharge Valve opens thereby draining the tank via gravity to the filter press feed pump. Once the tank is drained the cycle repeats. The filter press is used to filter the neutralised solutions and retain the hydroxides (copper, zinc, etc.). The grey water from the filter press will be transferred to the grey water tanks where it will be collected for safe disposal by a recognised waste disposal company and a certificate of safe disposal must be issued.

The effluent treatment process described above is detailed in the process diagram below.





**Figure 2-3.** Process Flow Diagram Illustrating Effluent Treatment Process.

## 2.4. Alternatives

As per Chapter 1 of the 2014 EIA Regulations (as amended), feasible and reasonable alternatives are required to be considered during the EIA process. Alternatives are defined as “*different means of meeting the general purpose and requirements of the activity*” These alternatives may include:

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

Each of these alternatives is discussed in relation to the proposed project in the sections below:

### 2.4.1. *The property on which or location where it is proposed to undertake the activity*

No feasible or reasonable alternatives are possible for the proposed MetCon project. The JMP site has been systematically identified as part of the National Strategic Infrastructure Projects (SIPs) and falls under the Aerotropolis Master plan developed by the host City of Ekurhuleni (CoE). It should further be noted that the Aerotropolis Master plan is part of the South African Special, Economic and Industrial Development Zones (SEZs), which are part of the SIPs. As such, the proposed MetCon facility can be considered as a key facility to be incorporated into the JMP site.

Furthermore, the JMP development falls under the OR Tambo Industrial Development Zone (IDZ) (Gauteng) of the South African SEZs. The OR Tambo IDZ aims to develop land around OR Tambo International Airport to stimulate economic development through the use of the IDZ mechanism. The OR Tambo IDZ supports the growth of the beneficiation of precious metals and minerals sector, with a focus on light, high-margin, export-oriented manufacturing of South African precious and semi-precious metals. Details regarding the above-mentioned IDZ and SEZ is included in **Appendix 1**. The inclusion of the proposed MetCon facility within the JMP site is therefore considered to be in line with the development plans and/or frameworks for the proposed area.

Development of the JMP will further transform the ORTIA property into an investment. Not only will the development provide formalized employment after construction, but it will provide employment during its construction phase. The development of the JMP would be able to provide approximately 3000 jobs during construction and about 500 specialized jobs after construction. The numbers for employment will depend on the market appetite. It should however be stressed that this is the potential employment opportunities created as a result of the construction and operation of the entire JMP and does not reflect employment opportunities associated with the construction and operation of the proposed MetCon facility. In terms of the proposed MetCon facility, it is envisaged that the new facility will have approximately 85 employees during the operational phase. In addition, it is anticipated that approximately 500 – 650 employees will be present throughout the construction phase.

#### *2.4.2. The type of activity to be undertaken;*

There are no feasible and reasonable alternatives for the type of activity to be undertaken by the MetCon facility. As outlined in the sections above, the proposed MetCon facility will specialize in extracting precious and base metals from secondary gold materials (i.e. dorè sourced from other refineries and mines) through a chemical treatment refining process. In addition, the proposed MetCon refinery facility is considered to be in line with the services which the JMP would want to offer and is thus in line with the ultimate objective of the JMP. Due to all the above mentioned, no other operational alternatives were considered or deemed applicable.

#### *2.4.3. The technology to be used in the activity;*

There are no feasible and reasonable alternatives for the technology used in the activity as these will be utilizing some of the most recent technology available for this purpose.

#### *2.4.4. The operational aspects of the activity; and*

No operational alternatives are applicable for the development as MetCon has standard operational activities relevant to the industry. In order to meet the perceived demand/outputs, the facility may be required to operate up to 24 hours a day. This is however unlikely. Also, double shifts may need to be implemented with each staff maintaining up to 12 hours a shift.

#### *2.4.5. No-go Alternative*

In addition to the refining processes, the MetCon facility will be aiding in the recovery of precious metals from jewellers secondary materials. The MetCon facility will contribute in the socio-economic factors of the surrounding community while enhancing the broader economic goals of the IDZ development project. Should the “no-go” option be selected, the above-mentioned socio-economic benefits would not be realized.

### 3. LEGAL REQUIREMENTS

#### 3.1. Key Legal and Administrative Requirements Related to Proposed Project

##### 3.1.1. Constitution of the Republic of South Africa (Act No. 108 of 1996)

The Constitution of the Republic of South Africa (Act No. 108 of 1996) is the supreme law of the Republic of South Africa and provides the legal foundation for the existence of the republic. It also sets out the rights and duties of its citizens and defines the structure of the government.

Environmental Law in South Africa has been strengthened by the inclusion of an environmental right in terms of Section 24 of the Constitution. It encompasses the preservation and conservation of the country's natural resources and includes the legal stipulations regarding economic and social issues relating to South Africa's biodiversity. The Section also provides a mandate on the State to ensure environmental protection and ecologically sustainable development. The aforesaid is achieved by way of laws and regulations. Private individuals, corporate entities and public authorities need to comply with such laws and regulations by way of putting the appropriate measures in place and, where compliance is lacking, enforcement mechanisms. Courts and the judiciary further play a key role in ensuring the enforcement of environmental rights. Before the State fulfils its mandate in terms of Section 24(b) of the Constitution, it will have to ensure that there is a balance, not only in environmental considerations, but also social and economic considerations, namely sustainable development. To achieve sustainability in most cases, the economic inequalities need to be reduced and social welfare concerns need to be addressed.

The environmental right, in terms of the Constitution, is interpreted to have a two-fold purpose. The first part guarantees a healthy environment to every person. The second part mandates the State to ensure compliance with the first part. The State is prohibited from infringing on the right to environmental protection and is further required to provide protection against any harmful conduct towards the environment.

According to Section 24 of the Constitution, everyone has the right –

- (a) To an environment that is not harmful to their health or well-being; and
- (b) To have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that –
  - (i) prevent pollution and ecological degradation;
  - (j) promote conservation; and
  - (k) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

This Section also incorporates International Environmental Law which includes the duty of care and that the "Polluter" will pay for polluting the environment, which creates liability for environmental damage caused.

South Africa has numerous goals to achieve sustainability in different fields, namely; ensure availability and sustainable management of water and sanitation for all; ensure access to affordable, reliable, sustainable and modern energy for all; take urgent action to combat climate change and its impacts (in line with the United Nations Framework Convention on Climate Change); conserve and sustainably use the oceans, seas and marine resources for sustainable development as well as protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forest, combat desertification, and halt and reverse land degradation and halt biodiversity loss (<http://www.polity.org.za/article/environmental-right-in-terms-of-the-constitution-2018-02-14>).

In light of the above, the proponent will need to adhere to Section 24 of the Constitution as far as possible in order to ensure environmental protection and ecologically sustainable development with regards to the proposed project. In addition, the proponent will need to take reasonable steps to prevent air, water, food or soil pollution as a result of the proposed project.

*3.1.2. The National Environmental Management Act (NEMA) (Act No. 107 of 1998) – NEMA EIA Requirements*

Due to the fact that the proposed project requires an EA, the National Environmental Management Act (NEMA) (Act No. 107 of 1998) needs to be considered.

The NEMA was promulgated in 1998 but has since been amended on several occasions from this date. This Act replaces parts of the Environment Conservation Act (ECA) (Act No. 73 of 1989) with exception to certain parts pertaining to Integrated Environmental Management.

The act intends to provide for:

- co-operative environmental governance by establishing principles for decision-making on matters affecting the environment;
- institutions that will promote co-operative governance and procedures for coordinating environmental functions exercised by organs of state;
- to provide for the prohibition, restriction or control of activities which are likely to have a detrimental effect on the environment; and
- to provide for matters connected therewith.

Sections 24 and 44 of the NEMA, 1998 (Act No. 107 of 1998), as amended, make provision for the promulgation of regulations that identify activities which may not commence without an EA, the result being that NEMA now governs the EIA process with the said promulgation of the EIA Regulations in December 2014. This EIA has therefore been undertaken in accordance with the NEMA EIA Regulations, 2014, as amended on 07 April 2017, contained in four (4) Government Notices (GN R. 324, 325, 326, and 327).

The listed activities triggered by the proposed MetCon facility include Listed Activity 6 in terms of the 2014 EIA Regulations Listing Notice 2 of the NEMA, 1998 (Act No. 107 of 1998) (NEMA), as amended. In terms of these Regulations, a full EIA is required for the proposed development based on the triggered activity listed in **Table 3-1** below.

**Table 3-1.** Listed Activities in terms of GN R. 325 triggered by the proposed MetCon facility

Listed activity as described in Listing Notice 2 of GN R. 325	Description of project activity that may trigger the listed activity
<p><b>Listed Activity 6:</b> The development of facilities or infrastructure for any process or activity which requires a permit or licence or an amended permit or licence in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent, excluding—</p> <ul style="list-style-type: none"> <li>i. activities which are identified and included in Listing Notice 1 of 2014;</li> <li>ii. activities which are included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case the National Environmental Management: Waste Act, 2008 applies;</li> </ul>	<p>The incorporation of the MetCon refinery facility within the JMP requires an AEL from the City of Ekurhuleni (CoE) before the facility can be operational. In order for them to apply for and AEL they are required to undertake an EIA and obtain an EA.</p>

<p>iii. the development of facilities or infrastructure for the treatment of effluent, polluted water, wastewater or sewage where such facilities have a daily throughput capacity of 2 000 cubic metres or less; or</p> <p>iv. (iv) where the development is directly related to aquaculture facilities or infrastructure where the wastewater discharge capacity will not exceed 50 cubic metres per day.</p>	
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### 3.1.3. National Environmental Management: Air Quality Act (NEM:AQA), 2004 (Act No. 39 of 2004)

Due to the fact that the operation of the proposed MetCon facility will result in emissions and impact on air quality, the National Environmental Management: Air Quality Act (NEM:AQA) (Act No. 39 of 2004) will be applicable for this EIA process.

The NEM:AQA (Act No. 39 of 2004) and as amended Act No. 20 of 2014 has shifted the approach of air quality management from source-based control to receptor-based control. The main objectives of the Act are to:

- Give effect to everyone's right 'to an environment that is not harmful to their health and well-being'
- Protect the environment by providing reasonable legislative and other measures that (i) prevent pollution and ecological degradation, (ii) promote conservation and (iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

The Act makes provision for the setting and formulation of National ambient air quality standards for 'substances or mixtures of substances which present a threat to health, well-being or the environment'. More stringent standards can be established at the provincial and local levels.

The control and management of emissions in the air quality assessment (AQA) relates to the listing of activities that are sources of emissions and the issuing of emission licenses. Listed activities are defined as activities which 'result in atmospheric emissions and are regarded as having a significant detrimental effect on the environment, including human health'. Listed activities have been identified by the Minister of the DEA and atmospheric emission standards have been established for each of these activities. These listed activities now require an atmospheric emission license to operate. The issuing of emission licenses for Listed Activities will be the responsibility of the Metropolitan and District Municipalities.

In addition, the Minister may declare any substance contributing to air pollution as a priority pollutant. Any industries or industrial sectors that emit these priority pollutants will be required to implement a Pollution Prevention Plan. Municipalities are required to 'designate an air quality officer to be responsible for coordinating matters pertaining to air quality management in the Municipality'. The appointed Air Quality Officer is responsible for the issuing of atmospheric emission licenses.

In terms of Section 21 of the NEM:AQA Act, 2004 (Act No. 39 of 2004), as amended, the MetCon facility is required to have an AEL to operate – as it triggers sub-category 4.2 (combustion installations) and sub-category 4.17 (precious and base metal production and refining) of Category 4 for a Metallurgical Industry.

**Table 3-2.** NEM:AQA Government Notice R. 893.

NEM: AQA Government Notice R893				
Listed Activity Number	Category of Listed Activity	Sub-category of the Listed Activity	Name of the Listed Activity	Description of the Listed Activity
1	4. Metallurgical Industry	4.2	Combustion Installations	Combustion installations not used for primarily for steam raising and electricity generation (except drying).
2	4. Metallurgical Industry	4.17	Precious and Base Metal Production and Refining	Production or processing of precious and associated base metals through chemical treatment (Excluding Inorganic Chemicals-related activities under Category 7).

*3.1.4. National Environmental Management Waste Act, 2008 (Act No. 59 of 2008) (NEM:WA), as amended*

The promulgation of the National Environmental Management Waste Act (NEM:WA) (Act no. 59 of 2008) sought to consolidate various legislation concerning waste within South Africa 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;
- to provide for institutional arrangements and planning matters;
- to provide for national norms and standards for regulating the management of waste by all spheres of government;
- to provide for specific waste management measures;
- to provide for the licensing and control of waste management activities;
- to provide for the remediation of contaminated land;
- to provide for the national waste information system; and
- to provide for compliance and enforcement; and to provide for matters connected therewith.

The waste act introduced the concept of dealing with waste according to a waste management hierarchy. The hierarchy approach places emphasis on waste reduction, followed by re-use, then recycling and composting, recovery for energy production and disposal as the last resort. In terms of NEM:WA, waste management activities that are listed in regulations published under NEM:WA may not be undertaken without a WML. The listed activities for which a WML is required are contained in GN R921 published in Gazette No 37083 on the 29<sup>th</sup> of November 2013, as amended on the 11<sup>th</sup> of October 2017. Category A activities require a WML and a BA must be conducted, and Category B activities require a WML and a full Scoping and EIA must be conducted.

In the case of the proposed MetCon facility, waste materials (also referred to as jewellers sweep) will be acquired from jewellery stores in sizes of about 10 kg per day. The jewellers sweep is photographed and weighed and then placed in a gas-fired roasting oven with no other pre-processes. Furthermore, MetCon plans to install abatement equipment such as baghouses and scrubbers for the particulate matter (PM) and effluent waste water. However, as outlined in the Technical Project Description section (section 2.3) above, the PM as well as the slag that will be produced as by-products are valuable and will be sent for further processing and refining.

The proposed MetCon facility will have an operational area of more than 500 m<sup>2</sup>. As such, the facility is expected to trigger Activity (3) of Category A in terms of NEM:WA: GN R. 921, 2013, as amended by GN 1093 and 1094 of 2017. A waste management license application will be lodged with the relevant Department.

### 3.1.5. National Heritage Resources Act (NHRA) (Act No. 25 of 1999)

The South African Heritage Resources Agency (SAHRA), has been established to manage the national estate and make provision for the establishment of provincial heritage resources authorities to manage provincial and local heritage resources in terms of section 4(d) of the NHRA (Act No. 25 of 1999). As such, all authorities, bodies and persons, including SAHRA, performing functions of exercising powers in terms of this Act for the management of heritage resources must recognize the principles set out in section 5 and 6 of the NAHRA. Various sections in Part 1 of Chapter II of the NAHRA make provision for the protection and management of South African heritage resources. As such, Chapter II, III, IV, V, and VI of the NAHRA Regulations, 2000, as amended, make provision for the application process of permits prior to a development impacting on any heritage resource.

The GIDZ JMP site is not regarded as a SAHRA conservation area. In addition, an overview heritage impact study has been conducted to explore how the proposed development may impact any heritage resources as well as identifying whether or not a permit may be required as per the NAHRA Act. In terms of this study, no evidence for any buildings or heritage sites could be found on any of the old depictions of the study area. Furthermore, the walkthrough also did not reveal any evidence for archaeology or heritage, even though sections of intact soil profiles that were exposed by construction were scrutinised during the walkthrough. As a result, it is the specialist's professional opinion that there is no need for a Heritage Impact Assessment on this project. The Heritage Screening Assessment which was undertaken as part of this EIA process is included in **Appendix 6**.

In addition, SAHRA has been notified about the EIA process and a heritage project case has been opened on the South African Heritage Resources Information System (SAHRIS) (**Appendix 12F**). A case officer by the name of Andrew Salomon has been assigned to the project. All relevant impact assessment documents have been made available to SAHRA, giving them the opportunity to comment on the project. Any comments, or recommendations in this regard will be included and incorporated in the final EIA report.

Despite the fact that no evidence for any buildings or heritage sites could be found on any of the old depictions of the study area and a walkthrough also did not reveal any evidence for archaeology or heritage, this Act is being included should any heritage or archaeological sites be discovered during construction, in which case this Act would be applicable.

### 3.1.6. National Water Act (NWA) (Act No. 36 of 1998, as amended)

The National Water Act, 1998 (Act No. 36 of 1998) (NWA) provides a framework to protect water resources against over exploitation. It is also in place to ensure that aquatic environment needs, socio-economic and economic development needs are all met. It is important to note that water resources are protected under the Act. The water resources, in terms of the NWA, are defined as watercourses, surface water, estuaries or aquifers. A watercourse is defined as a river or spring, a natural channel in which water flows regularly or intermittently, or a wetland, lake or dam into which, or from which water flows. 'Protection' in relation to a water resource entails the following:

- Maintenance of the quality of the water resource to the extent that the water use may be used in a sustainable way;
- Prevention of degradation of the water resource; and
- The rehabilitation of the water resource.

In terms of Section 19 of the NWA, owners / managers / people occupying land on which any activity or process undertaken which causes or is likely to cause pollution of a water resource must take all reasonable

measures to prevent any such pollution from occurring, continuing or recurring. These measures may include (*inter alia*):

- measures to cease, modify, or control any act or process causing the pollution;
- comply with any prescribed waste standard or management practice;
- contain or prevent the movement of pollutants;
- remedy the effects of the pollution; and
- remedy the effects of any disturbance to the bed and banks of a watercourse.

In the case of the MetCon facility, a surface water / freshwater specialist review has been conducted to explore how the proposed development may impact on surface water resources with a specific focus on the wetlands as protected by the Act. Based on the findings of the impact assessment undertaken as part of the specialist review, it was determined that the construction and operation of the proposed precious metal refinery facility poses a low significant impact on the freshwater resources of the area. Due to the distance between the activities and the watercourses in the area, and the presence of existing developments between the study area and watercourses of the area, limited to negligible impact from the proposed activities on the wetlands is expected to occur. The Surface Water / Freshwater Specialist Review which was undertaken as part of this EIA process is included in **Appendix 6**.

It should however be noted that fulfilment of Regulation GN R. 509 of 2016 needs to be considered for all wetland areas within 500m of the proposed development site. Due to the fact that the proposed site is located within 500m of a wetland, the Department of Water and Sanitation (DWS) Risk Assessment Matrix as promulgated in Regulation GN R. 509 of 2016 and the appropriate water use authorisation process (namely a General Authorisation) are currently being undertaken (**Appendix 12E**).

#### *3.1.7. National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004 as amended)*

The aim of the National Environmental Management: Biodiversity Act 2004, (Act No. 10 of 2004) (NEM:BA), within the framework of NEMA, is to provide for:

- The management and conservation of biological diversity within South Africa, and of the components of such biological diversity;
- The use of indigenous biological resources in a sustainable manner; and
- The fair and equitable sharing among stakeholders of benefits arising from bio-prospecting involving indigenous biological resources.

The South African National Biodiversity Institute (SANBI) was established by the NEM:BA with its purpose being to report on the status of the country's biodiversity and the conservation status of all listed threatened or protected species and ecosystems. Chapter 5 of NEM:BA provides a range of subsections for the protection of ecosystems and for the protection of species that are threatened or in need of protection, including a prohibition on carrying out a "restricted activity" involving a specimen of a listed threatened or protected species without a permit issued in terms of Chapter 7. Lists of critically endangered, endangered, vulnerable and protected species have been published and a permit system for listed species has been published under Government Notice R. 151 of 2004, as amended.

The closest Critical Biodiversity Area (CBA) to the JMP site is approximately 500m east of the JMP site and is thus located approximately 500m outside the site boundary.

#### *3.1.8. Conservation of Agricultural Resources Act No. 43 of 1983*



The Conservation of Agricultural Resources Act (CARA) (Act No. 43 of 1983) controls the utilization of natural agricultural resources in South Africa. The Act promotes the conservation of soil, water sources and vegetation as well as the combating weeds and invader plants. The Act has been amended in part by the Abolition of Racially Based Land Measures Act (Act No. 108 of 1991).

The primary objective of the Act is to conserve natural agricultural resources by:

- maintaining the production potential of land;
- combating and preventing erosion and weakening or destruction of the water resources;
- protecting vegetation; and
- combating weeds and invaders plants.

It is important to note that an agricultural impact assessment as part of the studies that explore any potential impacts on the agricultural production potential of the proposed site was not undertaken during the BA. While construction at the JMP site has already commenced and this study may be regarded negligible for this EIA process, a Soil and Land Capability overview study has been conducted to confirm any impacts that the JMP project may potentially have on the environment where it is located.

#### *3.1.9. National Road Traffic Act (NRTA) (Act No. 93 of 1996, as amended)*

The National Road Traffic Act, 1996 (Act No. 93 of 1996) (NRTA), provides for all road traffic matters and is applied uniformly throughout South Africa. The Act enforces the necessity of registering and licensing motor vehicles. It also stipulates requirements regarding fitness of drivers and vehicles as well as making provision for the transportation of dangerous goods.

All the requirements stipulated in the NRTA will need to be complied with during the construction and operational phases of the proposed development.

#### *3.1.10. Civil Aviation Act (Act No. 13 of 2009)*

The Civil Aviation Act, 2009 (Act No. 13 of 2009), controls and regulates aviation within Republic of South Africa. This Act makes provision for the establishment of a South African Civil Aviation Authority (SA CAA) and independent Aviation Safety Investigation Board in terms of the Annex 13 of the Chicago Convention. In addition, the objectives of the Act include:

- to repeal, consolidate and amend the aviation laws giving effect to certain International Aviation Conventions;
- to provide for the control and regulation of aviation within the Republic;
- to give effect to certain provisions of the Convention on Offences and Certain other Acts Committed on Board Aircraft;
- to give effect to the Convention for the Suppression of Unlawful Acts against the Safety of Civil Aviation;
- to provide for the National Aviation Security Program;
- to provide for additional measures directed at more effective control of the safety and security of aircraft, airports and the like; and
- to provide for matters connected thereto.

Although the Act is not directly relevant to the proposed development, it should be considered that the JMP is located within the bounds of an aviation sensitive site. While it should also be noted that the JMP site has been given consent as leased by ACSA for the JMP proposed development, the Air Traffic and Navigation Services SOC Limited (ATNS) and the Airport Company of South Africa (ACSA) have been

consulted throughout the EIA process to give them an opportunity to raise any comments or objections to the proposed MetCon project.

### 3.1.11. City of Ekurhuleni (CoE): Air Quality Management By-Law

Due to the fact that the proposed MetCon facility will result in emissions which will need to be governed by an AEL, the CoE Air Quality Management By-Laws will need to be considered and adhered to.

The air quality management by-law for the CoE was issued on 25 January 2005 (Report No.: APP/04/EMM02c of 2005). The purpose and objective of the by-law is to enable the local municipalities to protect, intervene, regulate and control activities which emit emissions and promote the long-term health, well-being and safety of people and environment within its jurisdiction area.

The by-law states that any person who is responsible for causing air pollution or creating a risk of air pollution within the municipality must take reasonable measures to:

- a) Prevent any potential air pollution from occurring; or
- b) Where the causing of any air pollution is permitted, not prohibited, or cannot be reasonably avoided or stopped, to minimise that pollution.

Reasonable measures, as provided by the by-law, include the following:

- a) Investigate, assess and evaluate the impact of air pollution on the environment;
- b) Inform and educate employees about the environmental risks of their work and how they can perform their work in order to avoid air pollution;
- c) Cease, modify or control any act, activity or process causing the air pollution;
- d) Contain or prevent the movement of pollutants or remedy the effects of the air pollution.

The municipality may direct any person causing significant air pollution either to cease the activity; investigate, evaluate and assess the impact of such; implement specific measures before a given date and continue with those measures in place. The municipality also has the authority to issue a directive. Should the person fail to comply with the directive, the municipality may take reasonable steps to remedy the situation or apply to court for appropriate relief.

The by-law has identified eight (8) priority air pollutants [particulate matter with an aerodynamic diameter of < 10 µm (PM<sub>10</sub>), nitrogen dioxide (NO<sub>2</sub>), sulphur dioxide (SO<sub>2</sub>), carbon monoxide (CO), ozone (O<sub>3</sub>), lead (Pb), benzene (C<sub>6</sub>H<sub>6</sub>) and dust fall which may present a threat on the health and well-being of people in the municipal area. The municipality may add more substances to the list in the future. The by-law makes provision for the CoE to develop and adopt local emissions standards for any of the identified substances. A person emitting any of the identified substances must comply with the relevant emission standards.

Under the Air Quality Management by-law for the CoE there are specific provisions pertaining to the several activities or emission sources that need to be complied with. In most instances, authorisation from the Municipality is required before the emitting activities can take place and in other instances the activity is prohibited. The relevant activities or emissions sources are summarised below:

- a) Emissions from domestic fuel burning.
- b) Emissions from mining operations and tailings impoundments.
- c) Any activity resulting in dust emissions.
- d) Road transportation emissions.
- e) Open burning emissions.
- f) Emissions from industrial and domestic waste disposal and treatment (e.g. landfill operations, incineration, sewage and waste water treatment works).

- g) Emissions caused by burning of garden waste.
- h) Emissions from industrial processes.
- i) Emissions from industrial fuel burning appliances.
- j) Emissions from electricity generation
- k) Emissions from aircraft engines
- l) Emissions from other sources like vehicle entrainment from unpaved public roads, agricultural activities, veld burning and railway transport.

### 3.1.12. Ambient Air Quality Standards

Due to the fact that the proposed MetCon facility will result in emissions which will need to be governed by an AEL, the National Ambient Air Quality Standards will need to be considered and adhered to.

National ambient air quality standards, including allowable frequencies of exceedance and compliance timeframes, were issued by the Minister of Water and Environmental Affairs on 24 December 2009 (**Table 3-3**). National standards for PM<sub>2.5</sub> were established by the Minister of Water and Environmental Affairs on 29 June 2012.

**Table 3-3.** National Ambient Air Quality Standards for Criteria Pollutants.

POLLUTANT	AVERAGING PERIOD	CONCENTRATION (µg/m <sup>3</sup> )	FREQUENCY OF EXCEEDANCE
Sulphur dioxide (SO <sub>2</sub> )	10 minutes	500 (191)	526
	1 hour	350 (134)	88
	24 hours	125 (48)	4
	1 year	50 (19)	0
Nitrogen dioxide (NO <sub>2</sub> )	1 hour	200 (106)	88
	1 year	40 (21)	0
Particulate Matter (PM <sub>10</sub> )	24 hours	75	4
	1 year	40	0
Particulate Matter (PM <sub>2.5</sub> )	24 hours	40 <sup>(1)</sup>	0
		25 <sup>(2)</sup>	
	1 year	20 <sup>(1)</sup> 15 <sup>(2)</sup>	0
Ozone (O <sub>3</sub> )	8 hours (running)	120 (61)	11
Benzene (C <sub>6</sub> H <sub>6</sub> )	1 year	5 (1.6)	0
Lead (Pb)	1 year	0.5	0
Carbon monoxide (CO)	1 hour	30 000 (26 000)	88
	8 hour (calculated on 1 hourly averages)	10 000 (8 700)	11

**Notes:**

\*Values indicated in blue are expressed in PPB.

(1) Compliance required by 1 January 2016 – 31 December 2029.

(2) Compliance required by 1 January 2030.

### 3.1.13. Greenhouse Gas (GHG) Emissions

On 14 March 2014, the following six (6) greenhouse gases were declared as priority air pollutants in South Africa:

- Carbon dioxide (CO<sub>2</sub>);
- Methane (CH<sub>4</sub>);
- Nitrous Oxide (N<sub>2</sub>O);
- Hydrofluorocarbons (HFCs);
- Perfluorocarbons (PFCs); and
- Sulphur hexafluoride (SF<sub>6</sub>).

National Greenhouse Gas (GHG) Emission Reporting Regulations (Government Gazette No. 40762 of 3 April 2017), were published by the DEA. A person identified as a Category A data provider in terms Annexure 1 of these regulations, must register their facilities by filling in the form under Annexure 2 and must submit a GHG emissions inventory and activity data in the required format given under Annexure 3 on an annual basis. All data must be provided annually, by the 31 March of the following year.

Updated draft National Pollution Prevention Plan Regulations (Draft Gazette No. 40996) were published on 21 July 2017 by the DEA. A pollution prevention plan will be required should the proposed development:

- Undertake any of the following activities identified in Annexure A of the National GHG Emission Reporting Regulations (Government Gazette No. 40762 of 3 April 2017), which involves the direct emission of GHG in excess of 0.1 Megatonnes (Mt) annually measured as carbon dioxide equivalents (CO<sub>2</sub>-eq); or
- Undertake any of the following activities identified in Annexure A of the Draft National Pollution Prevention Plan Regulations (Gazette No. 40996 of 21 July 2017) as a primary activity.

As such, the proposed MetCon refinery facility within the JMP would need to provide a pollution prevention plan, and report on GHG emissions by the 31 March of every year, should the total design net heat input capacity of all the stationary fuel combustion installations, associated with their activities, fall above the 10MW threshold as per Annexure 1.

#### *3.1.14. Highveld Priority Area Air Quality Management Plan*

As the proposed MetCon refinery is located within the CoE, which is located within a Highveld Air Quality Priority Area, the Highveld Priority Area Air Quality Management Plan is applicable.

The HPA was declared a priority area by the Minister of Environmental Affairs and Tourism on the 23 November 2007 under the NEM:AQA (Act No. 39 of 2004) (Government Gazette, No. 30518 of 23 November 2007). A Priority Area is usually associated with elevated ambient concentrations of criteria air pollutants such as PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub> and NO<sub>x</sub>. Generally, a high number of emitters (industrial and non-industrial) are also concentrated in these areas. In order to meet the requirements of Air Quality Act (Act No. 39 of 2004), an Air Quality Management Plan (AQMP) was compiled for the HPA and provides as a management tool that can be used and implemented by departments and industry to ensure effective air quality management within the area.

#### *3.1.15. Additional Relevant Legislation*

- Gauteng Conservation Plan Version 3.3 (C-Plan 3.3);
- Occupational Health and Safety Act (Act No. 85 of 1993);
- Development Facilitation Act (Act No. 67 of 1995);
- Water Services Act (Act No. 108 of 1998);
- Municipal Systems Act (Act No. 32 of 2000);

- Gauteng Noise Control Regulations (GN R. 5479 of 20 August 1999);
- South African Diamond & Precious Metals Regulator (SADPMR);
- Precious Metals Act, 2005 (Act No. 37 of 2005); and
- Applicable local by-laws.

### 3.1.16. Key Development Strategies and Guidelines

- Gauteng Growth development strategy;
- Gauteng development plan;
- South African Special, Economic and Industrial Development Zones (SEZs);
- City of Ekurhuleni (CoE) development plan; and
- City of Ekurhuleni (CoE) integrated development plan (IDP).

## 4. PROJECT NEED AND DESIRABILITY

The South African Government seeks to transform and improve the economy into a global competitive industrial economy. The National Development Plan (NDP) and various South African industrial policies, such as the Industrial Policy Action Plan (IPAP), outlines a long-term development path towards a prosperous and successful economy characterised by high levels of economic growth, employment generation and an equitable society. In addition, these plans and policies aim to address the South African Government's industrial agenda, prioritized industrial sectors and a range of interventions required to accelerate economic growth, create jobs, and fight poverty and underdevelopment. The Strategic Infrastructure Projects (SIPs) have been identified and implemented all over the country in attempts to achieve the best outcomes towards the latter objectives.

The GIDZ falls under the Aerotropolis Master plan developed by the host CoE and is part of the South African Special, Economic and Industrial Development Zones (SEZs) which further form part of the SIPs. The SEZ Programme, which was mandated by the SEZ Act, proclaimed on the 9<sup>th</sup> of February 2016, is one of the critical tools for accelerating the country's industrial development agenda. In terms of the Department of Trade and Industry (DTI), SEZs are a tool to help:

- promote industrial agglomeration;
- build the required industrial infrastructure;
- promote coordinated planning among key government agencies and the private sector; and
- guide the deployment of other necessary development tool.

The proposed JMP development falls under the OR Tambo Industrial Development Zone (IDZ) (Gauteng) of the South African SEZs. The OR Tambo IDZ aims to develop land around OR Tambo International Airport to stimulate economic development through the use of the IDZ mechanism. The OR Tambo IDZ supports the growth of the beneficiation of precious metals and minerals sector, with a focus on light, high-margin, export-oriented manufacturing of South African precious and semi-precious metals. In light of this, the proposed JMP development forms part of SIP 2. Furthermore, it is the objective of the GIDZ to significantly contribute to the realization of the competitive and inclusive economic growth within the Gauteng Province. Also, by the attracting both domestic and foreign investors and maximizing the provincial exports economic contribution, the JMP project will essentially position the Gauteng Province as a globally recognized city.

The OR Tambo IDZ JMP project will consist of several industry-specific entities which will occupy the facilities in the precinct. In order to achieve the objectives of the project and those of the broader plans, the GIDZ has strategically identified MetCon to be one of the occupants within the precinct. MetCon was established in 1989 in Pretoria to provide a service for the refining of precious metals to the Jewellery

industry. During 2004, the operation was expanded, and a second refinery was opened in Cape Town. MetCon chemically refines precious metals from jeweller's waste materials and casts the metals it into ingots. In addition, MetCon is also considered to be a major exporter of gold beneficiated from dorè. As such, MetCon has been identified as a key facility to be incorporated into the GIDZ JMP project.

## 5. PROJECT SITE DESCRIPTION

A general description of the project site and surrounding area is outlined in the section below.

### 5.1. Locality

The existing GIDZ JMP site is situated on Airports Company South Africa (ACSA) Ltd land (namely Portion 282 of the Farm Witkoppie No. 64 – IR), within the boundaries of the ORTIA. The location coordinates are as follows: S26.114351, E28.250192. The ORTIA is situated in close proximity to the commercial centre of Johannesburg and other economic development areas such as Wadeville and Alrode. As part of the CoE Airport City/ Aerotropolis economic development framework, the JMP project is aimed at achieving the economic potential of the City also through the promotion of industry-based enterprises located close to the ORTIA.

The site is further complemented by the linkages to some of Gauteng's major technical cities such as Alberton, Benoni, Germiston, Midrand, Centurion and the further City of Tshwane. Furthermore, the JMP project site is situated within a 10 km radius of the Rand Refinery (a large supplier of gold) and a 20 km radius of Jewel City, where most of South Africa's diamond trade takes place. The nearest residential area is the suburb of Bonaero Park, located within 100m of the proposed MetCon facility. A map showing the locality of the proposed project site is provided in **Figure 5-1** below.

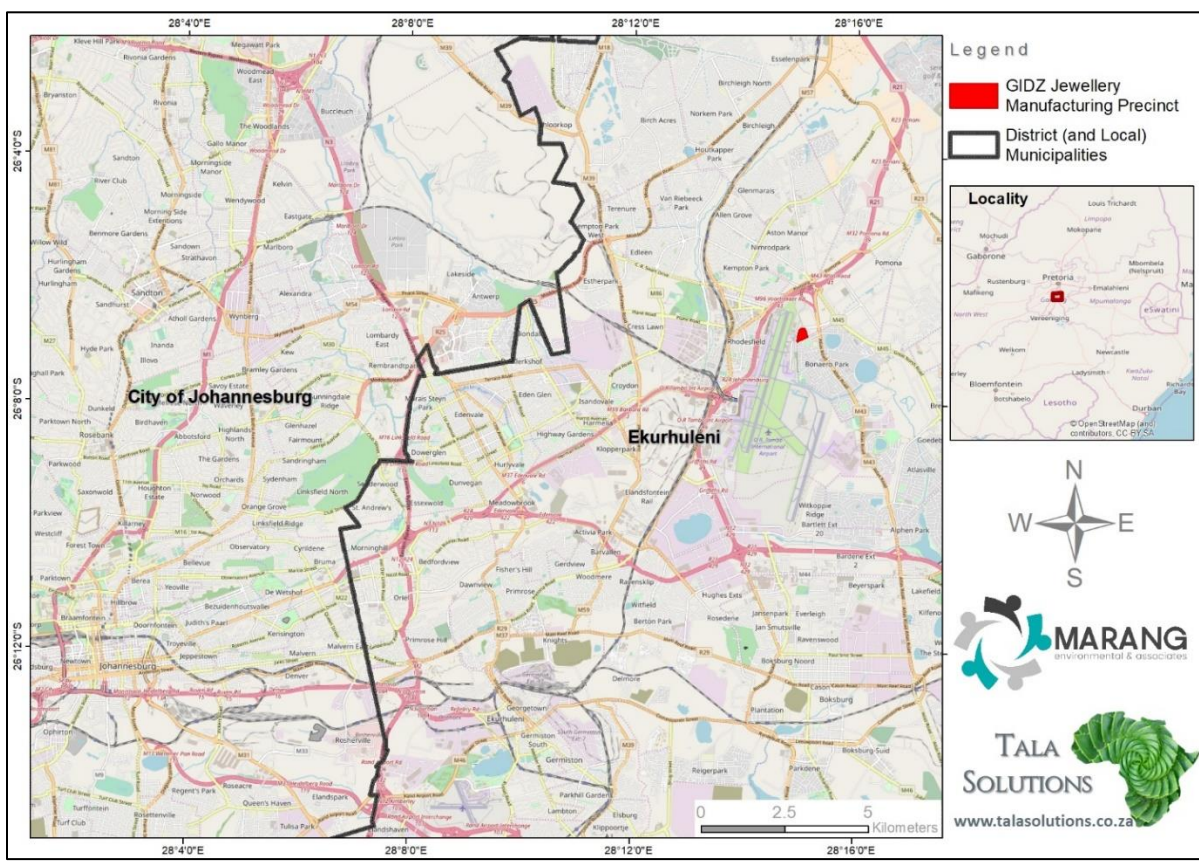


Figure 5-1: JMP development site locality map.

Table 5-1. 21-digit Surveyor General code of the JMP site.

T	0	I	R	0	0	0	0	0	0	0	0	0	0	0	6	4	0	0	0	6	9
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Table 5-2. Corner Points of the JMP site.

Corner	Latitude	Longitude
Corner 1	26° 6'45.34"S	28°15'4.15"E
Corner 2	26° 6'45.38"S	28°15'1.82"E
Corner 3	26° 6'46.06"S	28°14'58.35"E
Corner 4	26° 6'52.25"S	28°14'56.78"E
Corner 5	26° 6'58.13"S	28°14'56.89"E
Corner 6	26° 6'53.60"S	28°15'7.43"E

Table 5-3. Corner Point Coordinates of proposed MetCon Facility.

Corner Point	Latitude (S)	Longitude (E)
Corner 1	26° 6'52.60"S	28°15'2.78"E
Corner 2	26° 6'51.45"S	28°15'2.81"E
Corner 3	26° 6'51.44"S	28°15'5.14"E

Corner 4	26° 6'52.59"S	28°15'5.12"E
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**Table 5-4.** Centre Point Coordinates of proposed MetCon Facility.

Point	Latitude (S)	Longitude (E)
Centre Point	26° 6'52.05"S	28°15'3.98"E

## 5.2. Study site description

The GDED have signed a Notarial Deed of Lease agreement, which is defined as a long-term agreement on immovable property, for the JMP located on Portion 282 of the Farm Witkoppie No. 64 – IR in Kempton Park, within the CoE, Gauteng Province. The JMP site initially received an EA for the site from the provincial authority (namely GDARD) in 2011. The proposed MetCon facility will occupy approximately 0.55 ha within the authorised JMP site.

The JMP site has been cleared of vegetation and certain areas are under construction as per the original EA (from GDARD) and subsequent amended EA (from the DEA). However, construction of the proposed MetCon facility identified under the current EIA application, has not yet commenced. This will only commence once the necessary approvals / authorisations have been obtained.

The proposed MetCon facility will occupy block 2 of the existing JMP site as represented in the site layout diagram below (**Figure 5-2**). The infrastructure within the site will include office buildings, industry buildings, parking, and paved grounds as well as environment complementary components such as vegetation.

An attenuation pond / dam was constructed in the south-eastern corner of the study area during the construction of the original JMP site for the purpose of collecting run-off water and preventing overflow onto the nearby residential area. This attenuation pond is still present and will remain within the JMP site. A site layout plan (compiled for the development of the original JMP site in 2009) which illustrates the above-mentioned infrastructure is provided in **Appendix 5**.

The Jewellery Manufacturing Precinct will consist of jewellery manufacturers and retail outlets such as In2Food, Isondo, Julius Klein, Akapo Jewels, Diarough, Break Even and Ruzow Diamonds. The development area is close to major roads such as the R21, M43 and the M45 (Dann Road), although accessibility by public transport is limited.



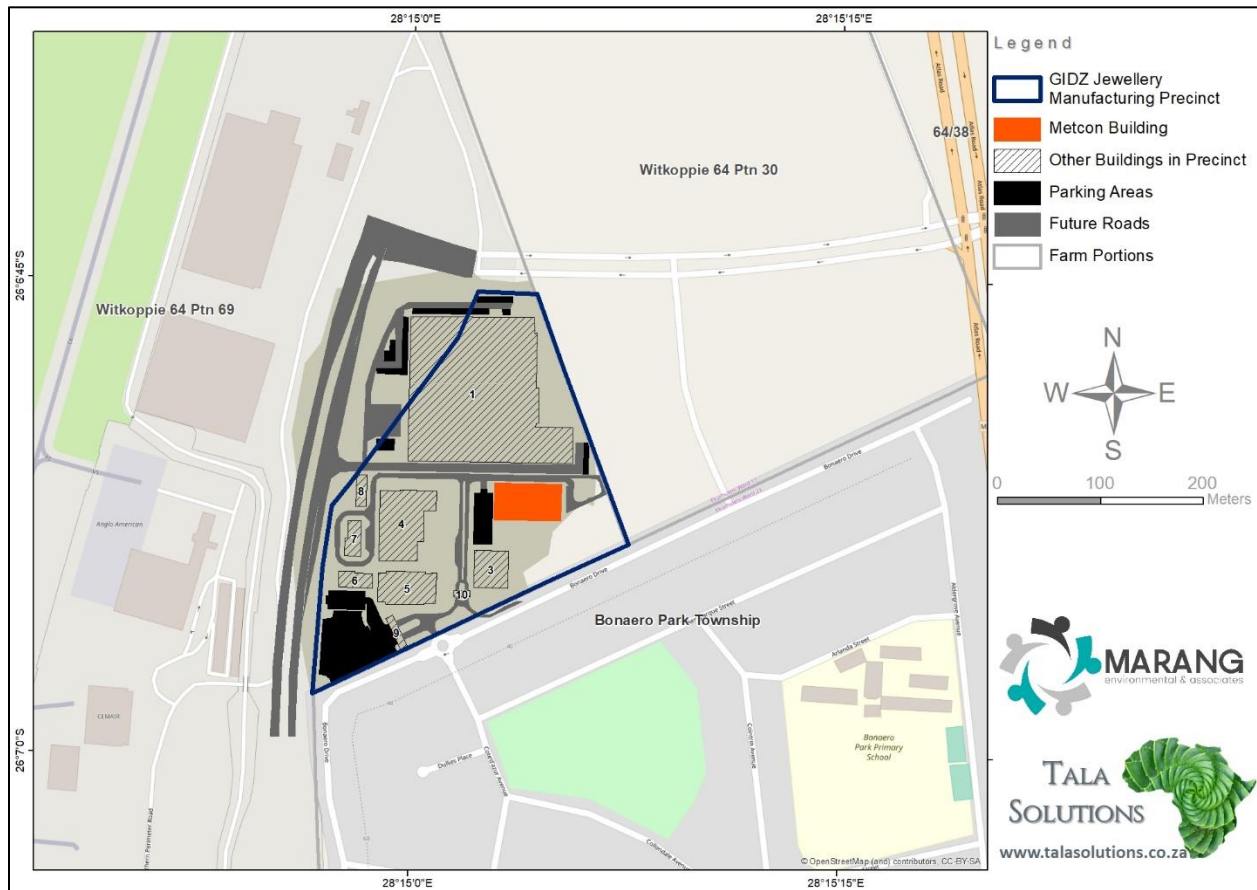
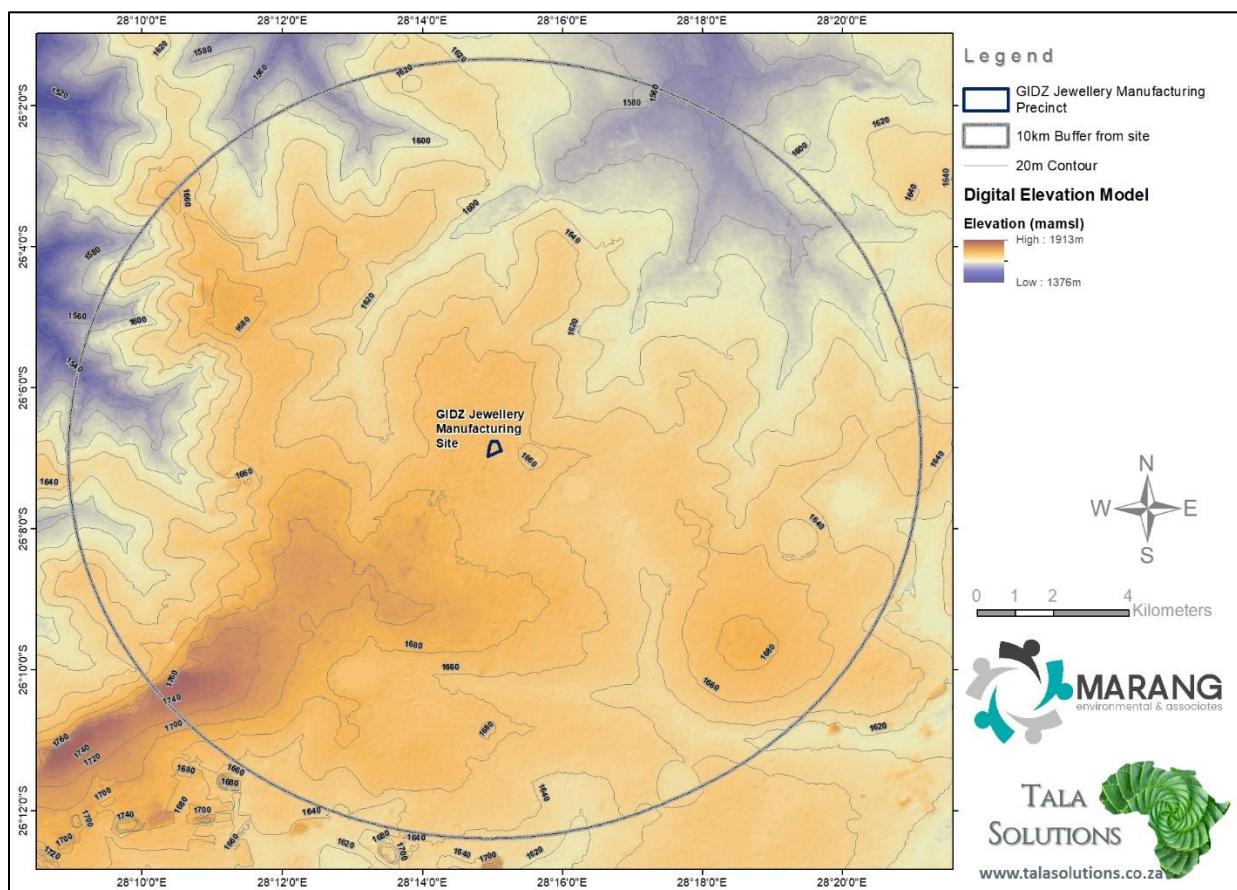


Figure 5-2: JMP Site Layout.

### 5.3. Topography

The topography surrounding the proposed development site is shown in **Figure 5-3** below. Surrounding elevations range from approximately 1376 – 1913 m above sea level. The proposed project site is situated approximately 1670 m above sea level; with increasing elevation towards the north-west.



**Figure 5-3:** Topography surrounding MetCon Jewellery Precinct Facility.

#### 5.4. Geology and Soil

The JMP development site sits on the Dwyka Group which is part of the oldest deposits found in the Karoo Supergroup basin (**Figure 5-4**). The geological history regarding the formation of the Karoo Supergroup records over 100 million years ago and was part of the supercontinent Gondwana, which was situated near the south pole and covered with ice. The development area is characterized by red, yellow, and greyish soils with low to medium base status, classified as Acrisols, which contain iron oxides such as hematite ( $\text{Fe}_2\text{O}_3$ ) and goethite ( $\text{FeOOH}$ ) with poor drainage (**Figure 5-5**). In addition, other soils with plinthic and gleyic properties may also be present.

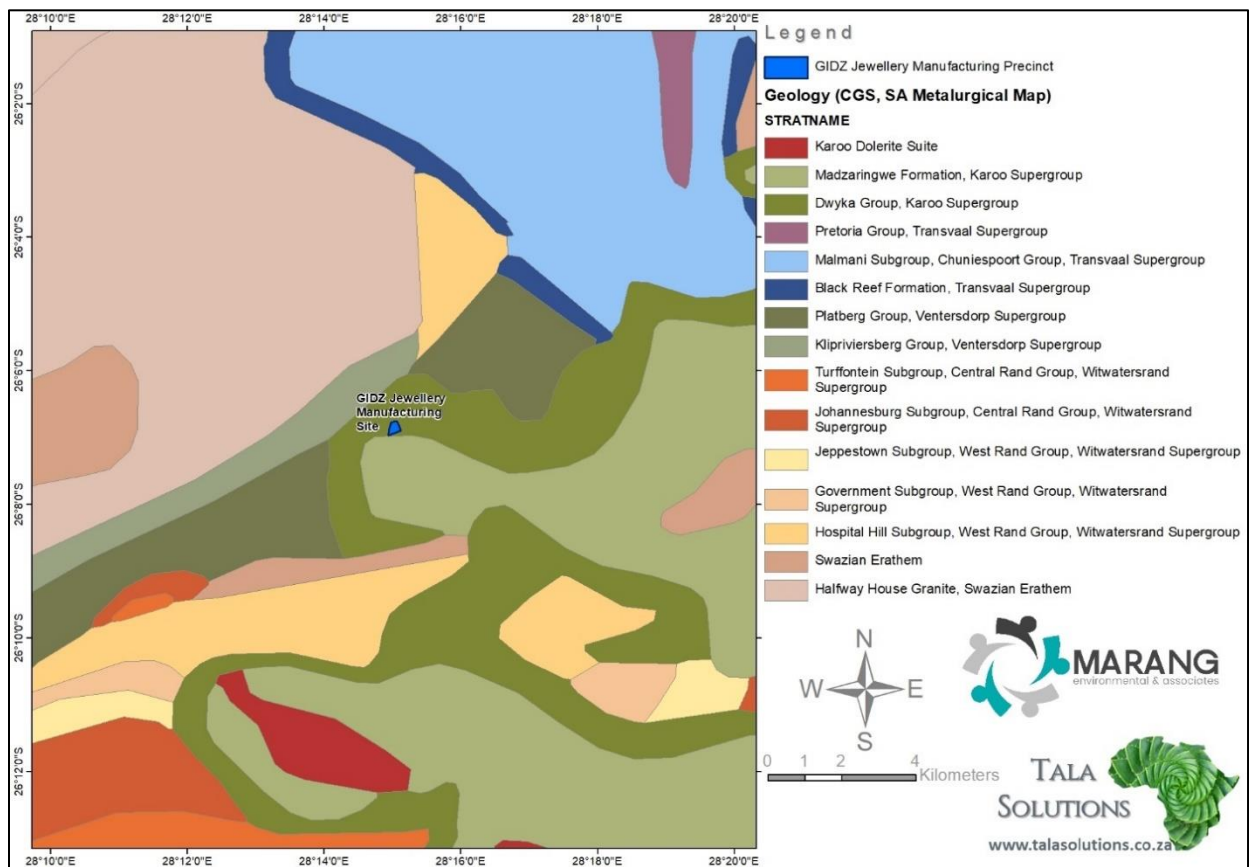


Figure 5-4: Geology of the area surrounding the proposed site.

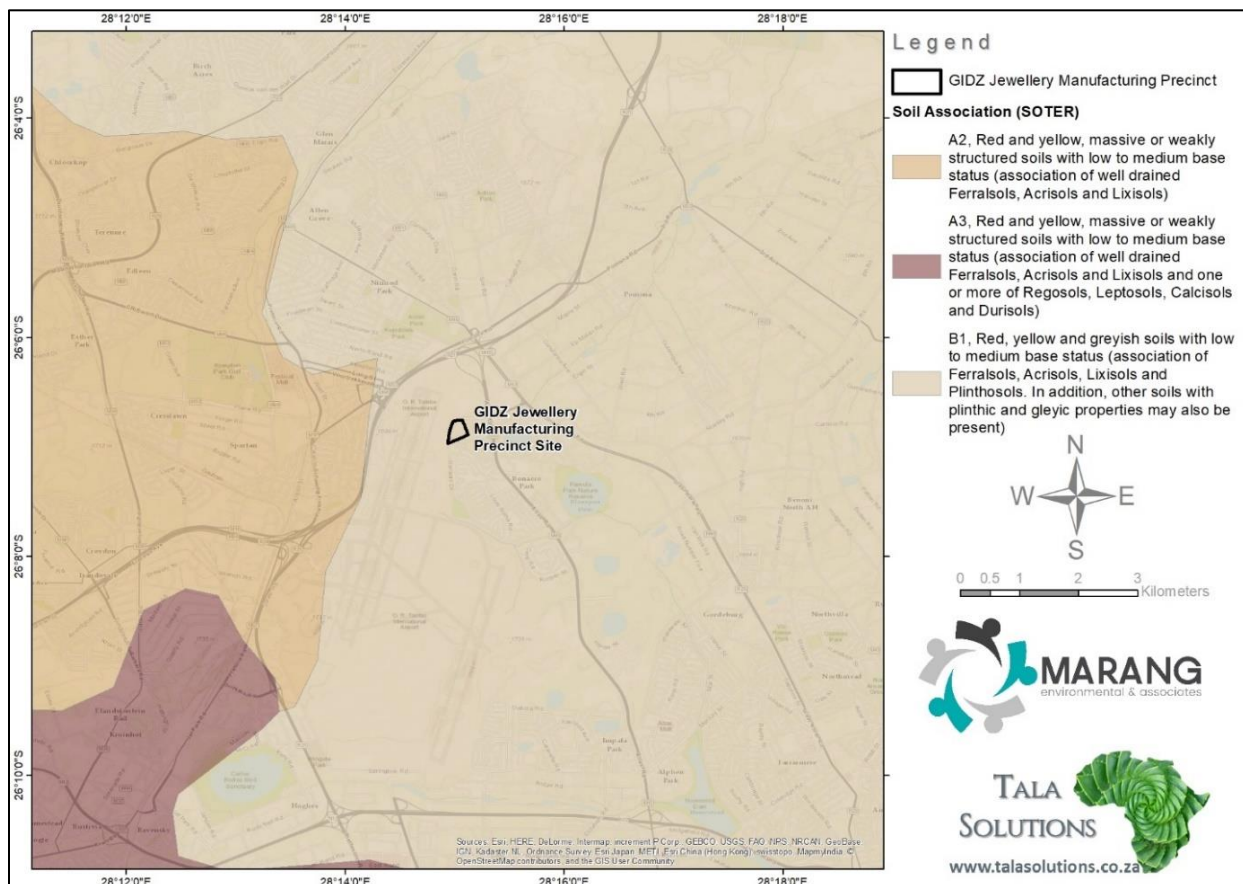


Figure 5-5: Soil characteristics of the development area.

## 5.5. Land use

The closest residential area is the urban residential area, Bonaero Park, which is located south of the project site (Figure 5-6). Some cultivated lands are sited within 500m north and north-east of the proposed development site. Urban built-up and urban smallholding areas are located approximately 1km north-east of the JMP site. The ORTIA runaway is located approximately 440 m west of the JMP site. The Kempton Park Central Business District (CBD), classified as urban commercial area, is situated further west, approximately 1.5km from the JMP site.

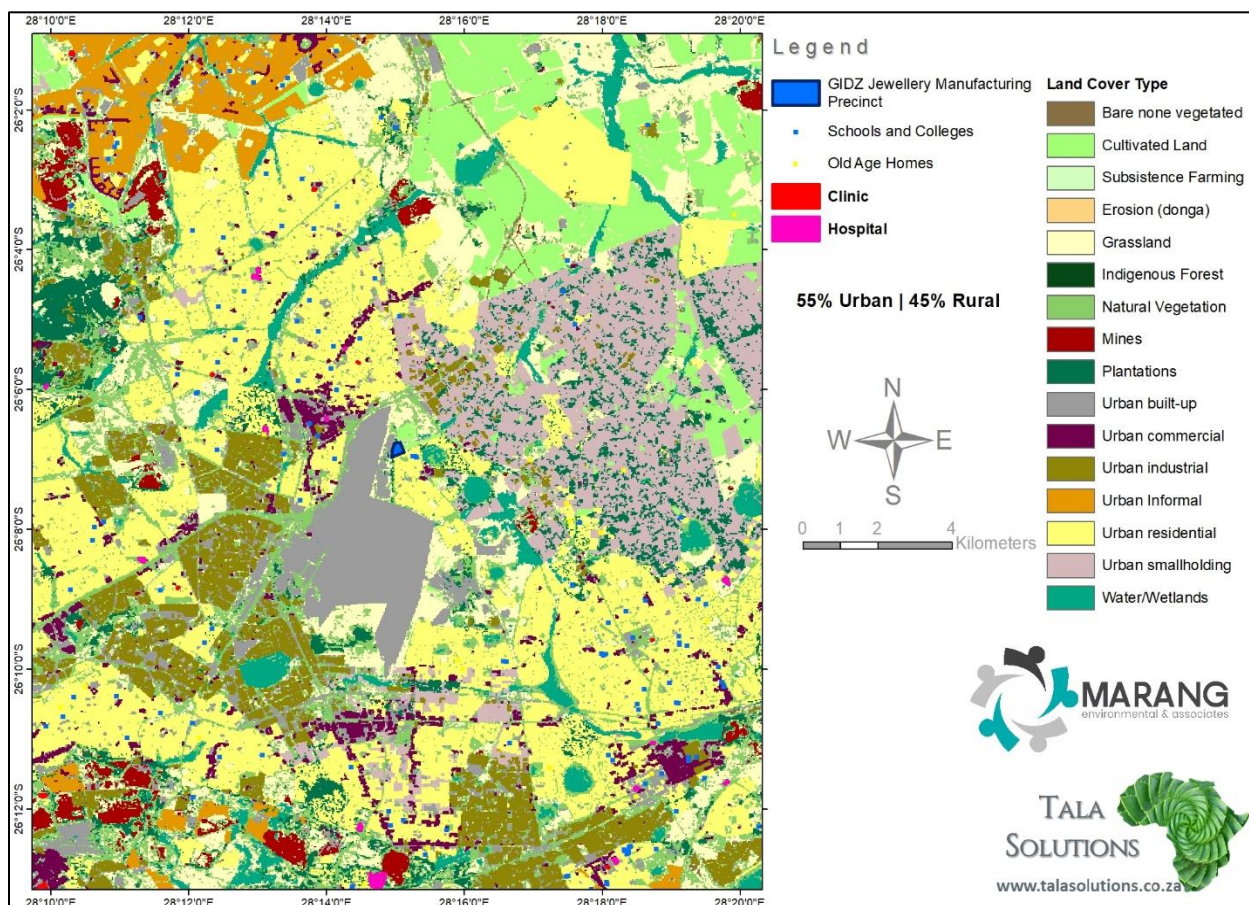


Figure 5-6: Map illustrating land use surrounding the JMP site.

## 5.6. Climate

Meteorological data for the project area was obtained from the ORTIA weather station for the period of January 2014 to December 2016. Details of the meteorological data obtained is summarised in **Table 5-5** below.

Table 5-5. Meteorological Data Details (SAWS, 2017).

Meteorological Data Details	
Met Data Information	Description
Source	South African Weather Services
Met data type	Surface Data
Station	OR Tambo International Airport
Latitude	26.143000° S
Longitude	28.234600° E
Time zone	UTC +2 hours
Period of record	January 2014 - December 2016
Met Station Parameters	Description

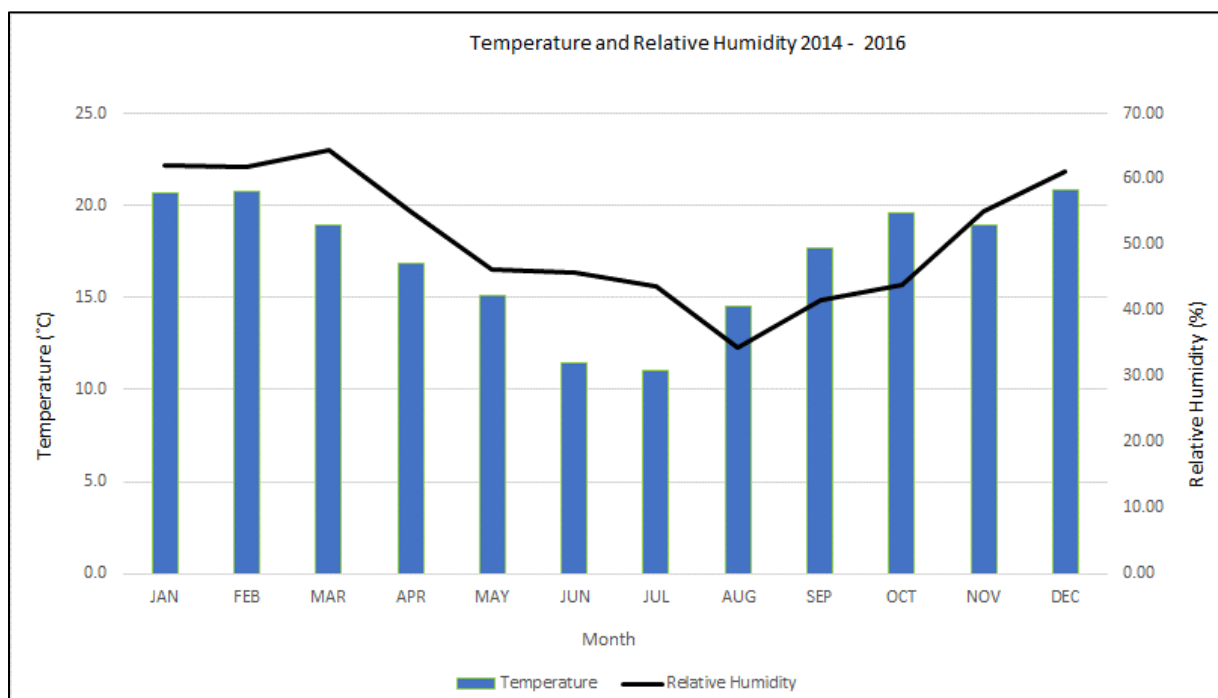
Anemometer height	Assumed 10m
Station base elevation	1711 m
Parameters	Wind speed, wind direction, cloud cover, temperature, relative humidity, rainfall
Format	Excel - hourly

### 5.6.1. Temperature and Relative Humidity

Monthly average temperatures and relative humidity profiles at the project site for the period of January 2014 to December 2016 are presented in **Table 5-6** below. Average monthly temperatures range from approximately 11.0 – 20.8 °C (**Figure 5-7**). Highest temperatures are observed during the spring and summer months (September – February) and minimum temperatures are observed during the winter months (June – August). Relative humidity is the highest during late spring to autumn months (i.e. November – March), and lower but consistent for the rest of the year (i.e. May – October).

**Table 5-6.** Hourly Minimum, Maximum and Monthly Average Temperatures for January 2014 - December 2016.

MINIMUM, MAXIMUM AND MONTHLY AVERAGE TEMPERATURES (°C)												
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Minimum	12.8	11.2	10.6	3.8	3.9	-1.3	-3.3	-1.9	3.3	2.8	4.4	10.5
Maximum	34.8	31	29.4	27.6	25.5	22.6	21.7	27.5	30.3	32.9	33	32.2
Average	20.7	20.7	19.0	16.9	15.1	11.4	11.0	14.5	17.7	19.6	19.0	20.8



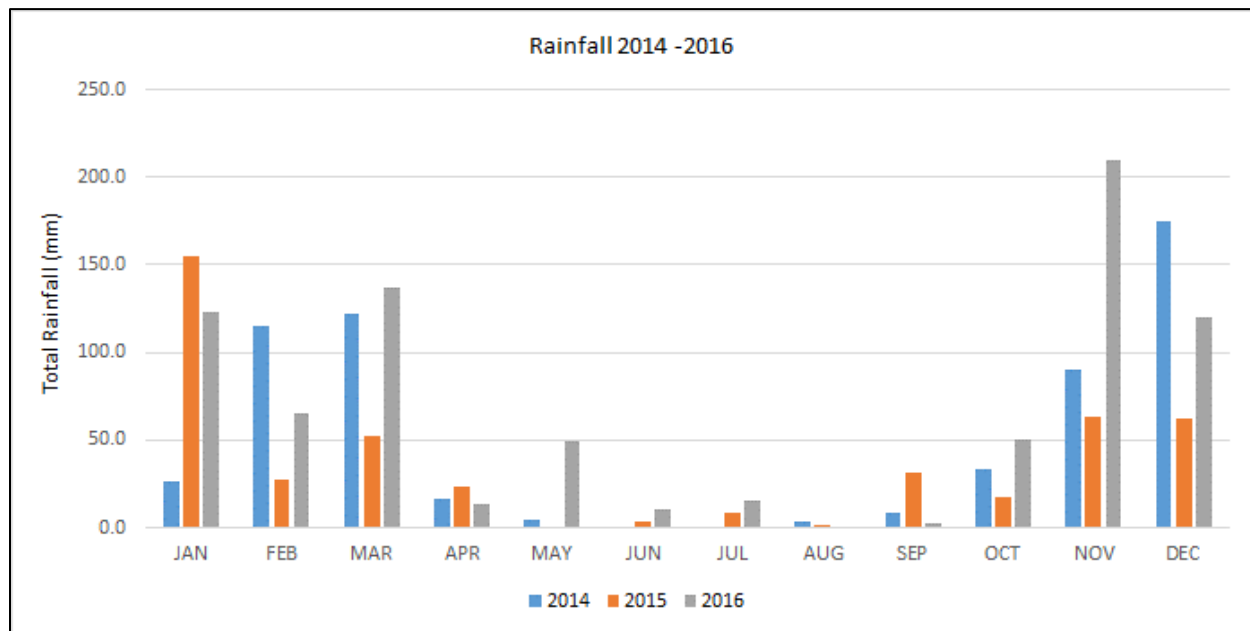
**Figure 5-7:** Monthly Average Temperature and Relative Humidity profiles for project site for January 2014 - December 2016.

### 5.6.2. Precipitation

Monthly total rainfall at the project site for the period of January 2014 to December 2016 is presented in **Figure 5-8** below. The area receives most of its rainfall during the spring, summer and early autumn seasons during the months October - March. Little to no rainfall is observed during the late autumn and winter seasons from April to August (**Table 5-7**).

**Table 5-7.** Total Monthly Rainfall for January 2014 - December 2016.

TOTAL MONTHLY RAINFALL (mm)												
YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2014	26.2	115.6	122.0	16.2	4.4	0.2	0.0	3.6	8.6	33.6	90.2	174.4
2015	155.0	27.8	52.2	23.2	0.0	3.4	8.2	1.4	31.2	17.6	63.0	62.4
2016	123.2	65.2	137.0	13.8	49.0	10.8	15.4	0.0	3.0	50.4	210.0	119.6



**Figure 5-8:** Total Monthly Rainfall (mm) for the project site for the period January 2014 - December 2016.

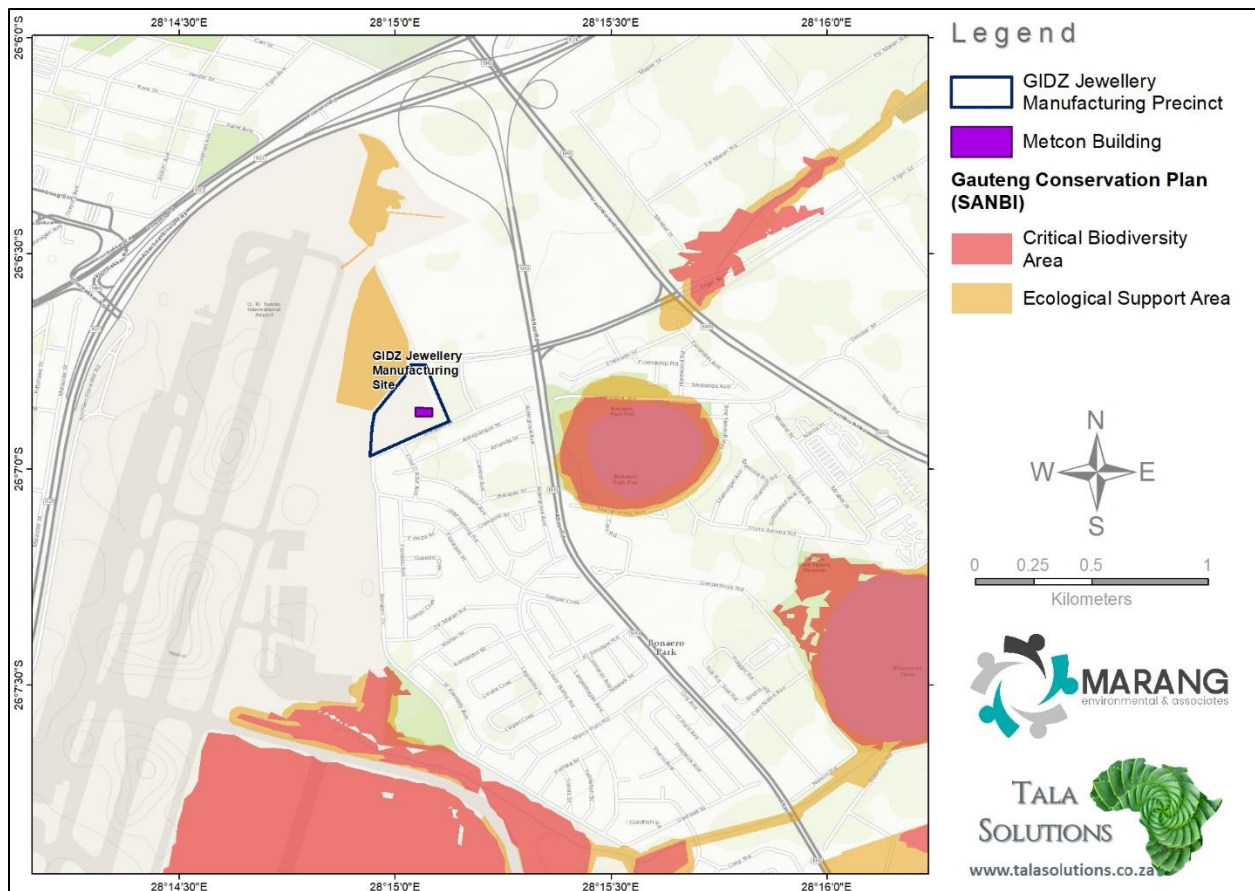
## 6. DESCRIPTION OF RECEIVING ENVIRONMENT

The sections below provide an understanding of the environmental context and sensitivity within which the proposed project activities are located. This assists in understanding the potential impacts associated with the proposed project. The sections below provide a description of the attributes and key sensitive receptors with regards to the biophysical (plants and animals) receiving environment of the study area or area of interest. Where applicable, a description of the receiving environment in relation to each specialist review and/or assessment which was undertaken as part of this current EIA process is provided.

## 6.1. Biodiversity

The closest Critical Biodiversity Area (CBA) to the JMP site is approximately 500m east and is located outside the site boundary. As mentioned, the north-west boundary of the site overlaps onto an ESA according to the SANBI Gauteng Conservation Plan (2011) (**Figure 6-1**). According to the SANBI, ESAs are not essential for meeting biodiversity targets but play an important role in supporting the ecological functioning of CBAs as well as delivering ecosystem services.

As mentioned in Section 5.2, most vegetation has been cleared at the site as per the previous authorisation. In addition, construction at the existing JMP site commenced in 2013 and is currently still underway. As such, much of the proposed project site has already been disturbed and a biodiversity assessment was thus not deemed necessary.



**Figure 6-1:** Map illustrating important Biodiversity areas around the JMP development site.

## 6.2. Surface water

A review of the original surface water findings, impacts and recommendations/mitigation measures, as provided in the FBAR compiled as part of the BA process undertaken in 2009 for the proposed development of the original JMP site, was undertaken by Stephen van Staden of Scientific Aquatic Services (SAS) and is provided in **Appendix 6B**.

A description of the receiving environment from a surface water perspective is provided in the sections below.



### 6.2.1. *Details of Study area in terms of the National Freshwater Ecosystem Priority Area (NFEPA) (2011) database*

According to the National Freshwater Ecosystem Priority Areas (NFEPA) database (NFEPA, 2011), the study area is situated within a sub-quaternary catchment considered an upstream management area, indicating that human activities need to be managed to prevent the downstream degradation of National Freshwater Ecosystem Priority Areas (NFEPAs) and Fish Support Areas. The NFEPA Database indicates the presence of a natural flat wetland which is situated in the western portion of the proposed JMP site. Additionally, one natural depression feature is situated approximately 460m east of the proposed MetCon site. According to the NFEPA database, these wetland features are in a heavily to critically modified ecological condition.

According to the NFEPA Database, there are no rivers associated with the study area, nor are there any rivers situated within a 5km radius of the study area. In addition, the study area falls within the Mesic Highveld Grassland Group 3 wetland vegetation type, considered to be Least Threatened (SANBI, 2012; Mbona et al, 2014).

### 6.2.2. *Details of Study area in terms of the Gauteng Conservation Plan (C-Plan V3.3, 2011)*

According to the Gauteng Conservation Plan (C-Plan) (2011), there are no wetland or river buffers associated with the study area. However, a pan buffer is associated with the investigation area (within 500m of the project site) (**Figure 6-2**). In terms of the NWA, as amended, a Pan means “*any depression collecting water or that is inward draining or a flow through system with flow contributions from surface water, groundwater or interflow or combinations thereof*”. A regulated area of a watercourse, in terms of section 21(c) of the NWA Act, includes a 500m radius from the delineated boundary (extent of any wetland or pan).

The north-western corner of the proposed site is situated within an ESA. ESAs are defined by GDARD as natural, near-natural, degraded or heavily modified areas required to be maintained in an ecologically functional state to support CBAs and/or Protected Areas.

Although rescinded as a policy document in the Gauteng Spatial Development Framework (SDF) in 2011, the Urban Edge nevertheless remains a useful indicator of where concentration [of development] should occur. According to the Gauteng C-Plan (2011) and the Gauteng Environmental Management Framework (EMF, 2015), the study area is located within the Urban Edge and the eastern half of the study area is situated within the EMF Zone 5, which is classified as an industrial and large commercial focus zone.



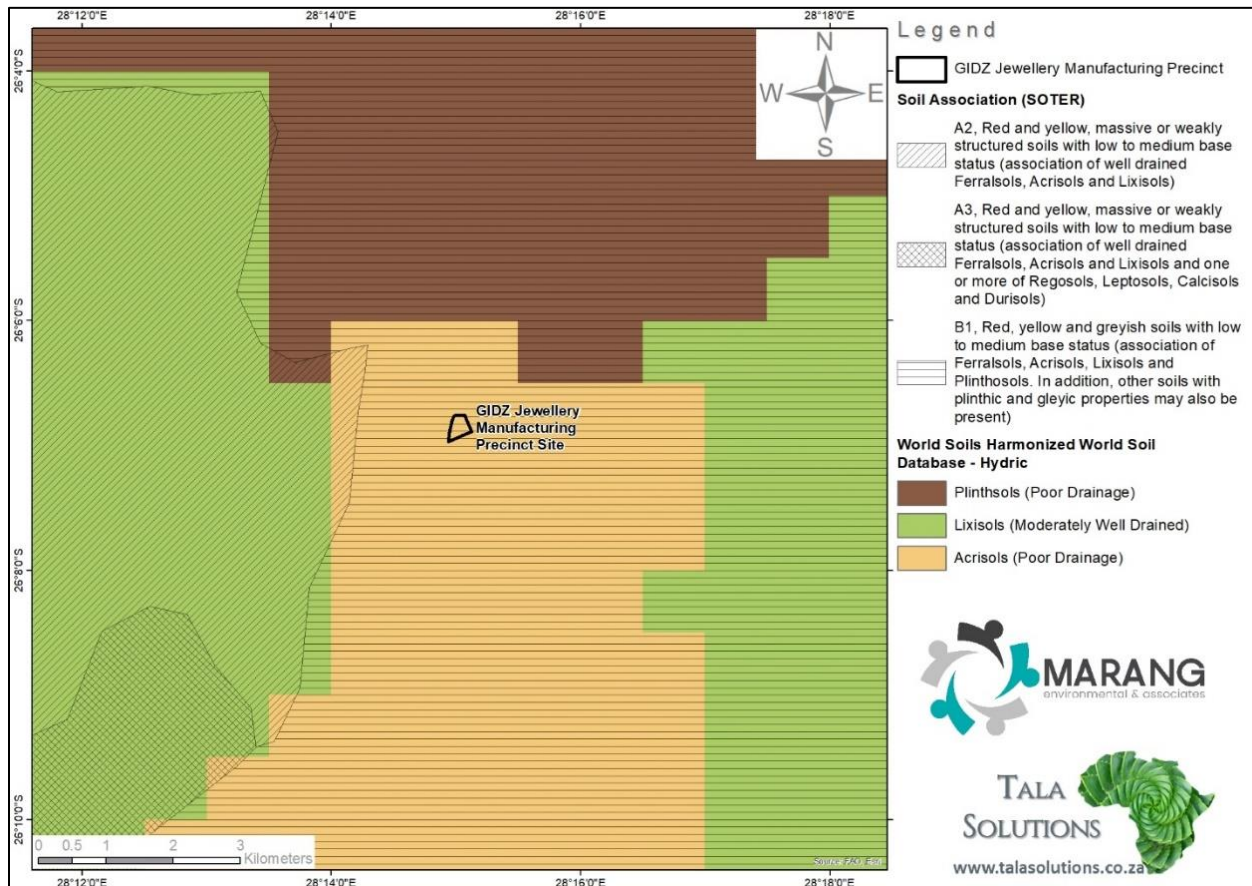
**Figure 6-2:** Map illustrating Surface Water features within the JMP development site and surrounding area.

### 6.3. Soils and Land Capability (i.e. Agriculture)

The following data is applicable to the study area and the operations proposed at the MetCon facility, according to various data sources including, but not limited to, the Agricultural Geo-Referenced Information System (AGIS):

- The Soil and Terrain (SOTER) database indicates that the entire study area is comprised of slightly or moderately weathered parent material with good structural stability, classified as Plinthic Acrisols (ACp) (**Figure 6-3**);
- Geology 2001: According to the Geology 2001 layer the southern portion of the study area is underlain by Shale;
- The databases reviewed indicate that the entire study area is comprised of High potential arable land (class II), which implies that the site has high agricultural potential for cultivated crops;
- According to the AGIS database, the livestock grazing capacity potential is estimated to be approximately 3 ha per large animal unit (Morgenthal et al., 2005);
- The natural soil pH is estimated to be range between 5.5 and 6.4, indicating that the soils within the study area are anticipated to be slightly acidic to neutral, as interpolated from topsoil pH values obtained from the National Soil Profile Database (AGIS database);
- Soils 2001: According to the Soils 2001 Layer the entire portion of the study area is situated within an area where the soils are classified as Sandy loams dominant;

- According to the Gauteng Agricultural Potential Atlas database there no crops nor cultivation activities that were identified within the study area, however a small portion located in close proximity (east) of the study area is said to be under cultivated pastures;
- The desktop assessment indicates that there no Agricultural Hubs situated within the study area and the surrounding areas; and
- Some of the surrounding areas have been urbanized and no longer used for food production purposes.



**Figure 6-3:** SOTER Database: Soil type of the JMP development site and surrounding areas.

#### 6.4. Vegetation

According to Mucina & Rutherford (2006), the MetCon facility is situated within the Grassland Bioregion, the Mesic Highveld Grassland Bioregion and is characterised by the Soweto Highveld Grassland Vegetation Type. This vegetation type is currently considered to be Least Threatened as per SANBI (2012); (Mbona et al, 2014).

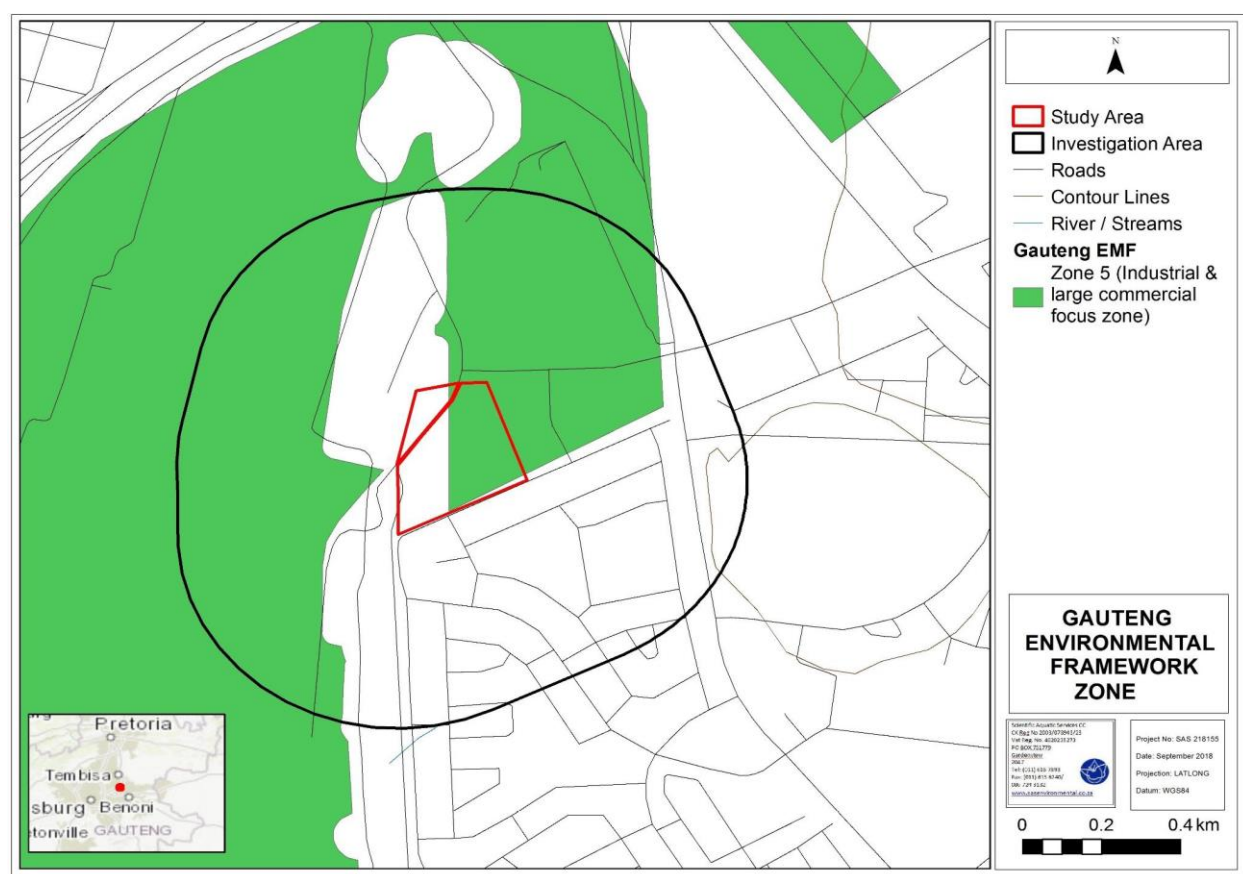
#### 6.5. Environmental Setting

According to the South African Protected and Conservation Areas Databases (SAPAD & SACAD, 2018) and the National Protected Areas Expansion Strategy (NPAES, 2009), the following nature reserves are situated within a 10km radius of the JMP site:

- The Korsman Bird Sanctuary (Local Nature Reserve) is situated approximately 9.1km southeast of the JMP. This Bird Sanctuary is otherwise known as the Westdene Pan Nature Reserve (Under SAPAD);
- The Pamula Park Private Nature Reserve is situated approximately 1.5km east of the MetCon facility; and
- No conservation areas are situated within a 10km radius of the MetCon facility.

The eastern portion of the MetCon facility is situated within the Industrial and Large Commercial Zone (Zone 5) of the Environmental Management Framework (EMF, 2015) (**Figure 6-4**).

Based on digital satellite imagery and surrounding area, the JMP site is situated directly east of the OR Tambo International Airport, north of the residential area Bonaero Park and Club Africa & Jubilee Guest Lodge & Golf Driving Range is situated approximately 470m north of the JMP site and open grassveld is situated east of the JMP site.



**Figure 6-4.** The Gauteng Environmental Management Framework Zone 5 applicable to the study area (Gauteng EMF, 2015).

## 6.6. Heritage

A Heritage Screening Assessment which provides the heritage related findings, impacts and recommendations/mitigation measures associated with the proposed development of the MetCon facility was undertaken by Polke Birkholtz of PGS Heritage and is provided in **Appendix 6A**.

A description of the receiving environment from a heritage perspective is provided in the section below.

#### 6.6.1. *History of site*

The brief desktop study comprises two (2) components, namely an assessment of a historic topographic sheet to assess the historic nature of the study area as well as a brief discussion on palaeontology.

- Early Farm Ownership History:

The ownership history for the farm Witkoppie was located at the National Archives (National Archives, RAK, 2874). As the historic property description for the study area is not known, only the early component of the farm ownership history will be discussed below.

The farm Witkoppie, which at the time comprised farm number 87 of the Suikerboschrand District, was first inspected on 24 April 1862 by J.G. Marais. On 13 January 1863 the farm was transferred to its first owner, Daniel Jacobus Oosthuizen. Oosthuizen remained in possession of the farm for more than five years. On 22 October 1868, the farm was transferred to Jacobus Steenkamp. Steenkamp owned the farm for only a year when, on 1 November 1869, the farm was transferred to Jan Hermanus Cronjé. For the subsequent three years, J.H. Cronjé remained in possession of the farm. On 28 February 1873 the farm was transferred to Abraham Cronjé, Johan Andries Muller and Cornelis Johannes Muller.

On 7 February 1874 a one third portion of the farm was transferred from Cornelis Johannes Muller to Daniel Wynand du Preez. On 18 April 1876, another one third portion of the farm was transferred from Abraham Cronjé to the same Daniel Wynand du Preez and on 20 February 1877 the third portion was transferred from Johan Andries Muller to Daniel Wynand du Preez. This last transaction meant that the entire farm was now owned by Daniel Wynand du Preez.

On 4 September 1886 the entire farm was transferred from Daniel Wynand du Preez to Charles Daniel Rudd, Cecil John Rhodes and Harry Stratford Caldecott. Cecil John Rhodes (5 July 1853 – 26 March 1902) was a famous British imperialist, businessman, mining magnate and politician. Charles Daniel Rudd (22 October 1844 – 15 November 1916) was a business partner of Rhodes and the two men inter alia were founding directors of the De Beers Diamond Mine ([www.wikipedia.org](http://www.wikipedia.org)). Harry Stratford Caldecott is known to have been a lawyer and Rudd's brother-in-law (Rotberg, 1990). The acquisition of the farm Witkoppie by mining men such as Rhodes and Rudd at this particular time was no coincidence. Seven months earlier, in February 1886, George Harrison had discovered an outcrop of the Witwatersrand Main Reef on the farm Langlaagte, a discovery which directly resulted in the Witwatersrand gold rush and establishment of Johannesburg ([www.wikipedia.org](http://www.wikipedia.org)). It is important to note that the acquisition of the farm Witkoppie by these three men did not mean that they had any intention of living on the farm or farming here. This acquisition was one of many that especially Rhodes and Rudd made during the rush for gold mining properties along the Witwatersrand during this time.

On 20 December 1888 three portions of the farm Witkoppie were transferred collectively from the three owners to each owner individually. In this way, Portion A was transferred to Cecil John Rhodes, Portion B to Charles Daniel Rudd and Portion C was transferred to Harry Stratford Caldecott. On 24 May 1889 the three portions were transferred from Rhodes, Rudd and Caldecott to the Witkopje Estate and Gold Mining Company Limited. On 31 March 1892, the three portions were transferred from the Witkopje Estate and Gold Mining Company Limited to Isaac Lewis. This meant that Isaac Lewis was now the owner of the entire farm Witkoppie. Lewis was an industrialist and businessman who for most of his life was in partnership with his friend and nephew Sammy Marks under the business name Lewis & Marks. On 16 July 1892, the three

farm portions were transferred from Isaac Lewis to the New Witkopje Estate and Gold Mining Company Limited.

The available farm ownership history ends with this transfer of 16 July 1892. It can be assumed that for the subsequent decades this history would have revolved around gold mining companies. Over time, individual persons would also have become owners of portions of the farm Witkoppie.

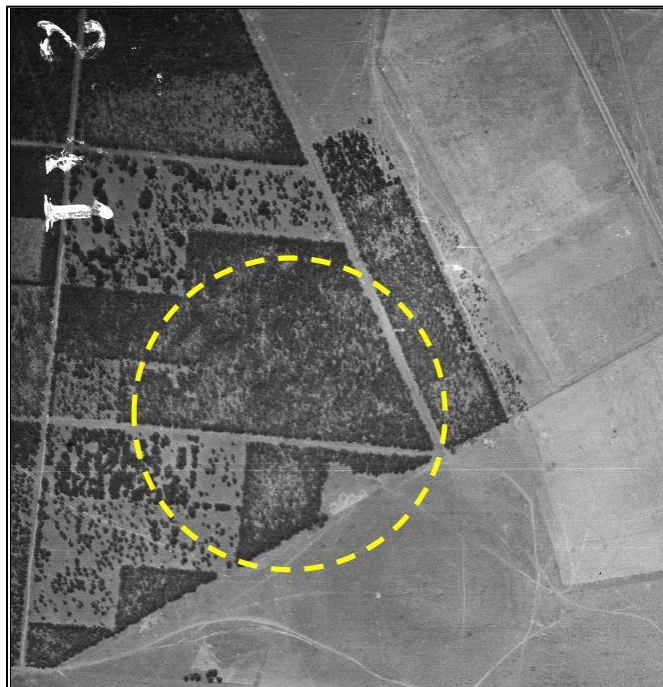
- Historical Aerial Photographs:

Aerial photographs provide a valuable tool in assessing the characteristics of a particular portion of land over time. A sequence of aerial photographs depicting the study area was obtained from National Geo-Spatial Information at the Department of Rural Development and Land Reform in Cape Town.

- The 1941 Aerial Photograph:

The 1941 aerial photograph (NGI, Aerial Photographs, 162\_07\_57193) represents the oldest aerial photograph depicting the study area that could be found. It was taken in October 1941. The following observations can be made from the depiction of the study area on this 1941 aerial photograph:

- A plantation is located across the study area and its surroundings.
- No buildings or other possible heritage features are shown within the study area or its immediate surroundings.
- No evidence for what is today known as the OR Tambo International Airport can be seen on the image.

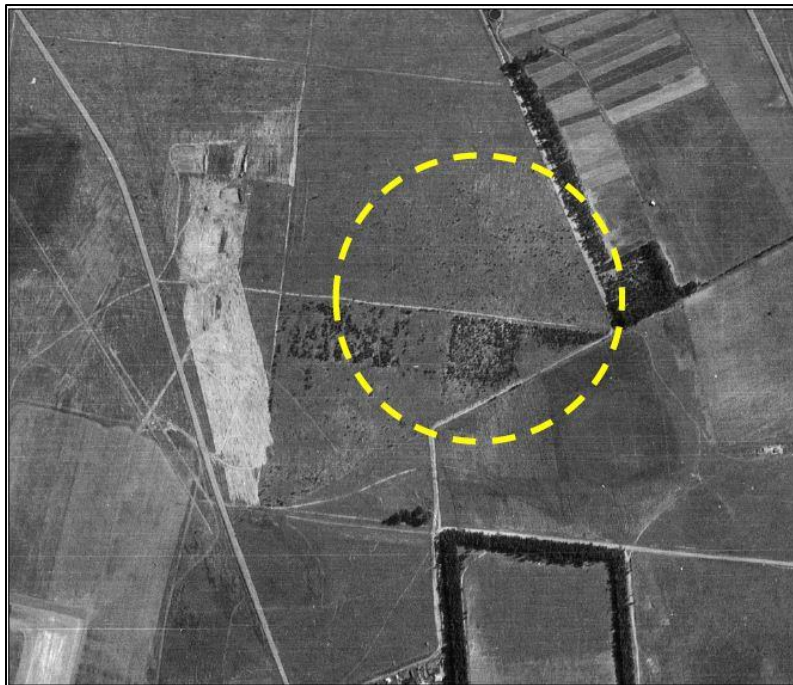


**Figure 6-5:** Section of the 1941 photograph (NGI, Aerial Photographs, 162\_07\_57193) showing the study area and its surroundings. The approximate position of the study area is marked in stippled yellow line.

- The 1952 Aerial Photograph:

The 1952 aerial photograph (NGI, Aerial Photographs, 314\_04\_44444) represents the second oldest aerial photograph depicting the study area that could be found. This particular aerial photograph was taken on 12 March 1952. The following observations can be made from the depiction of the study area on this 1952 aerial photograph:

- The plantation which had characterised the study area on the 1941 aerial photograph, had almost entirely been removed on this 1952 aerial photograph.
- No buildings or other possible heritage features are shown within the study area or its immediate surroundings.
- It is clear from the surroundings of the study area that construction work on what was then known as the Jan Smuts International Airport was already well underway. The main runway which at present extends some distance further to the north, was much shorter at the time (see bottom left corner of the depiction).



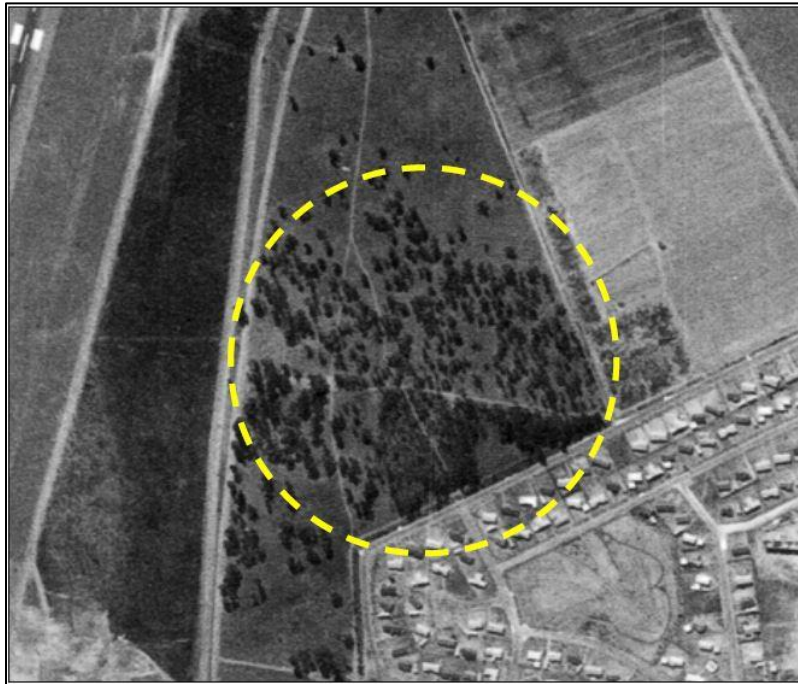
**Figure 6-6:** Section of the 1952 image (NGI, Aerial Photographs, 314\_04\_44444) showing the study area and its surroundings. The position of the study area is marked in stippled yellow line. The northern edge of the main runway at the airport can be seen in the bottom left-hand corner.

▪ The 1969 Aerial Photograph:

The 1969 aerial photograph (NGI, Aerial Photographs, 273\_1969\_02\_7490) represents the third oldest aerial photograph depicting the study area that could be found. The following observations can be made from the depiction of the study area on this 1969 aerial photograph:

- Within the study area, the trees from the plantation which had been partially removed between 1941 and 1952, appear to have expanded in an uncontrolled way across the study area. A number of smaller saplings can be seen.
- No buildings or other possible heritage features are shown within the study area or its immediate surroundings.

- The main runway at the airport was extended by some distance in a northern direction to its general position and length today.
- Immediately south of the study area, the residential area known as Bonaero Park is shown.



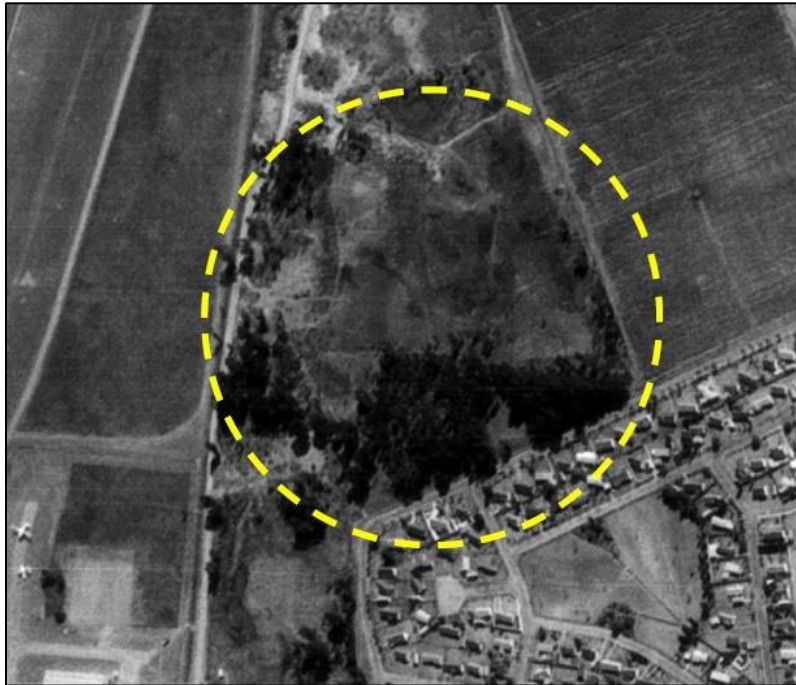
**Figure 6-7:** Section of the 1969 photograph (NGI, Aerial Photographs, 273\_1969\_02\_7490) showing the study area and surroundings. The position of the study area is marked in yellow stippled line. The residential area known as Bonaero Park is shown for the first time south of the study area. A section of the main runway at the airport can be seen in the top left-hand corner.

- The 1976 Aerial Photograph:

The 1976 aerial photograph (NGI, Aerial Photographs, 775\_02\_0282) represents the fourth oldest aerial photograph depicting the study area that could be found. This particular aerial photograph was taken on 8 June 1976. The following observations can be made from the depiction of the study area on this 1976 aerial photograph:

- Within the study area, sections of the plantation depicted on the 1941 aerial photograph, can still be seen. Some surface excavation and earthworks appear to have taken place within the study area.
- No buildings or other possible heritage features are shown within the study area or its immediate surroundings.
- In the surroundings of the study area, the first appearance of hangars on this side of the airport is shown. These first two hangars appear to be located where the hangars of the company Cem Air are located today.





**Figure 6-8:** Section of the 1976 photograph (NGI, Aerial Photographs, 775\_02\_0282) showing the study area and surroundings. The position of the study area is marked in yellow stippled line.

## 6.7. Air quality

An Air Quality Impact Assessment was undertaken by Sophia Rosslee of Marang Environmental and Associates (Pty) Ltd and is provided in **Appendix 6F**. As part of the Air Quality Impact Assessment, a Baseline Air Quality Assessment was undertaken to determine the prevailing meteorological conditions at the site, as well as to establish baseline concentrations of key air pollutants of concern, identify existing sources of emissions and identify key sensitive receptors surrounding the project site.

The findings of the Baseline Air Quality Assessment are provided in the sections below.

### 6.7.1. Sensitive Receptors

A sensitive receptor is defined as a person or place where involuntary exposure to air pollutants released by the site's activities could take place. Identified urban/residential areas which are located within 10km of the proposed facility are given in **Figure 6-9** below. Bonaero Park is situated along the south-eastern border of the JMP site.

Hospitals and schools located within 5km from the site are given in **Table 6-1**. No old age homes were identified to be within 5km of the site (through a desktop study).

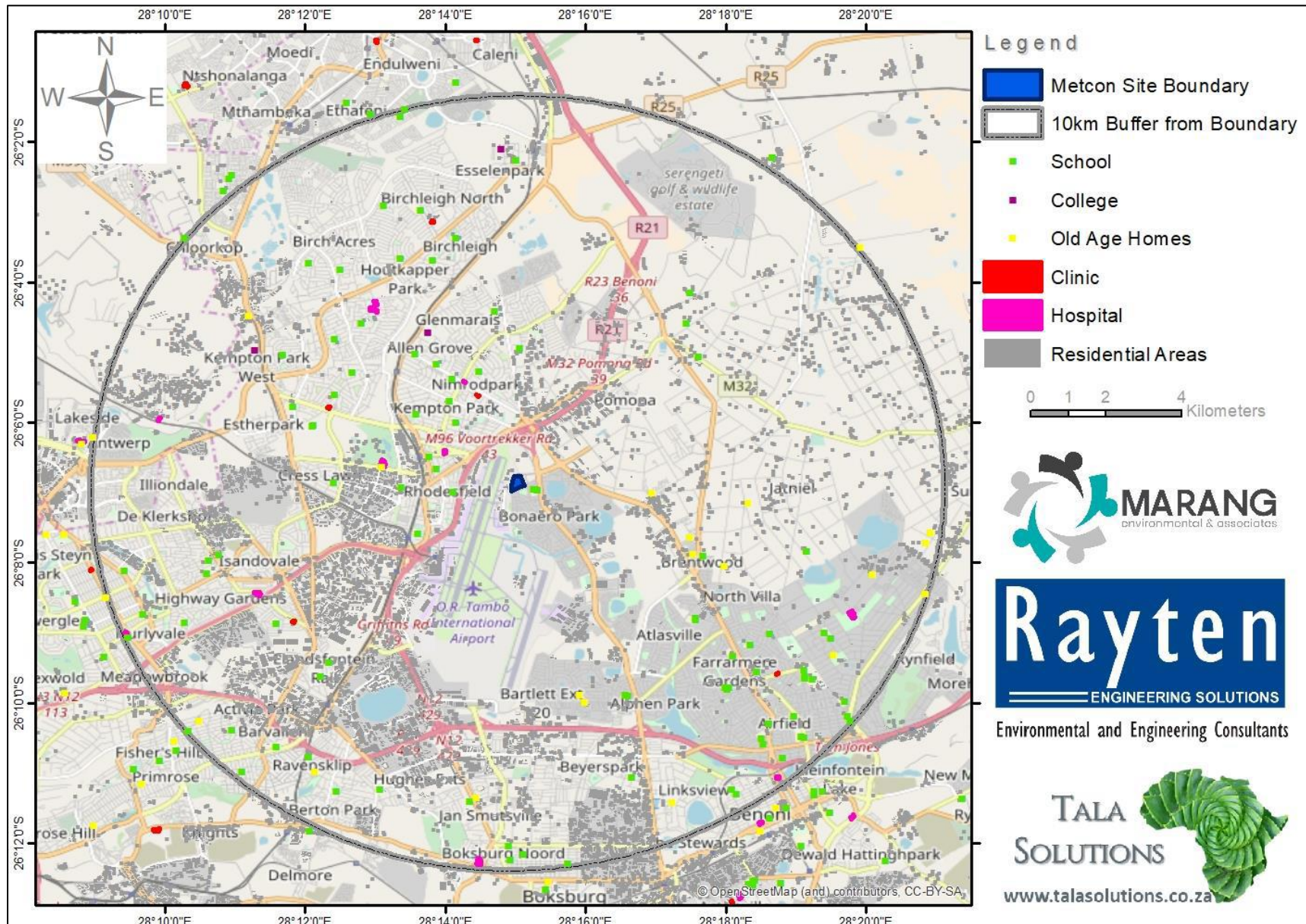


Figure 6-9. Residential receptors surrounding MetCon Jewellery Precinct Facility.

**Table 6-1.** Discrete receptors within 5km of proposed MetCon Jewellery Precinct Facility. Receptors were identified through a desktop study.

Receptor	Co-ordinate		Elevation m	Type	Approx. Distance km	Direction from project site
	x	Y				
Edu 1+2+3	-26.11687	28.25514	1669.69	Residential	0.3	E
Edu 4	-26.11042	28.23167	1666.95	Residential	1.79	WNW
Edu 5	-26.9976	28.23642	1673.96	Residential	2.58	NW
Edu 6	-26.10671	28.22901	1664.51	Residential	2.31	WNW
Edu 7	-26.11422	28.22291	1651.71	Residential	2.76	W
Edu 8	-26.11378	28.20704	1670.91	Residential	4.37	W
Edu 9+10	-26.10094	28.20106	1664.21	Residential	5.02	WNW
Edu 11	-26.08054	28.25125	1655.04	Residential	3.60	N
Hosp 1	-26.10764	28.23327	1652.32	Residential	1.96	NW
Hosp 2	-26.09377	28.24099	1671.83	Residential	2.56	NNW
Hosp 3	-26.09648	28.20458	1662.07	Residential	4.99	WNW
Hosp 4+5	-26.10953	28.21753	1651.41	Residential	3.36	W
Hosp 6	-26.09011	28.23783	1669.70	Residential	2.89	NNW
Hosp 7	-26.09314	28.24097	1671.22	Residential	2.45	NNW
Notes: Edu = educational/training facility Hosp = hospital / clinic Distance = indicated from centre of site						

## 6.7.2. Baseline Assessment

### 6.7.2.1. Meteorological Overview

Meteorological processes will determine the dispersion and dilution potential of pollutants emitted into the atmosphere. The vertical dispersion of pollution is governed by the stability of the atmosphere and the depth of the surface mixing layer. Horizontal dispersion of pollution is defined by dominant wind fields. Therefore, meteorological parameters including temperature, precipitation, wind speed and wind direction are of significance as they will influence the degree to which pollution will accumulate or disperse in the atmosphere.

As per the Code of Practice for Air Dispersion Modelling in Air Quality Management in South Africa (DEA, 2014), representativeness of the meteorological data is influenced by the following four factors:

- Proximity of the meteorological site to the area being modelled;
- Complexity of the terrain;
- Exposure of the meteorological measurement site; and
- Period of data collection.

Meteorological data for the project area was obtained from the Johannesburg/OR Tambo International Airport (hereafter "OR Tambo Station" - 26.143000° S; 28.234600° E) for the period of January 2014 to December 2016. Details of the meteorological data obtained is summarised in **Table 6-2** below.

**Table 6-2.** Meteorological Data Details (SAWS, 2017).

Meteorological Data Details	
Met Data Information	Description
Source	South African Weather Services
Met data type	Surface Data
Station	OR Tambo International Airport
Latitude	26.143000° S
Longitude	28.234600° E
Time zone	UTC +2 hours
Period of record	January 2014 - December 2016
Met Station Parameters	Description
Anemometer height	Assumed 10m
Station base elevation	1711 m
Parameters	Wind speed, wind direction, cloud cover, temperature, relative humidity, rainfall
Format	Excel - hourly
Models used to process met data	
Model used to process data for wind roses	WR Plot
Model used to process data for AERMOD	AERMET

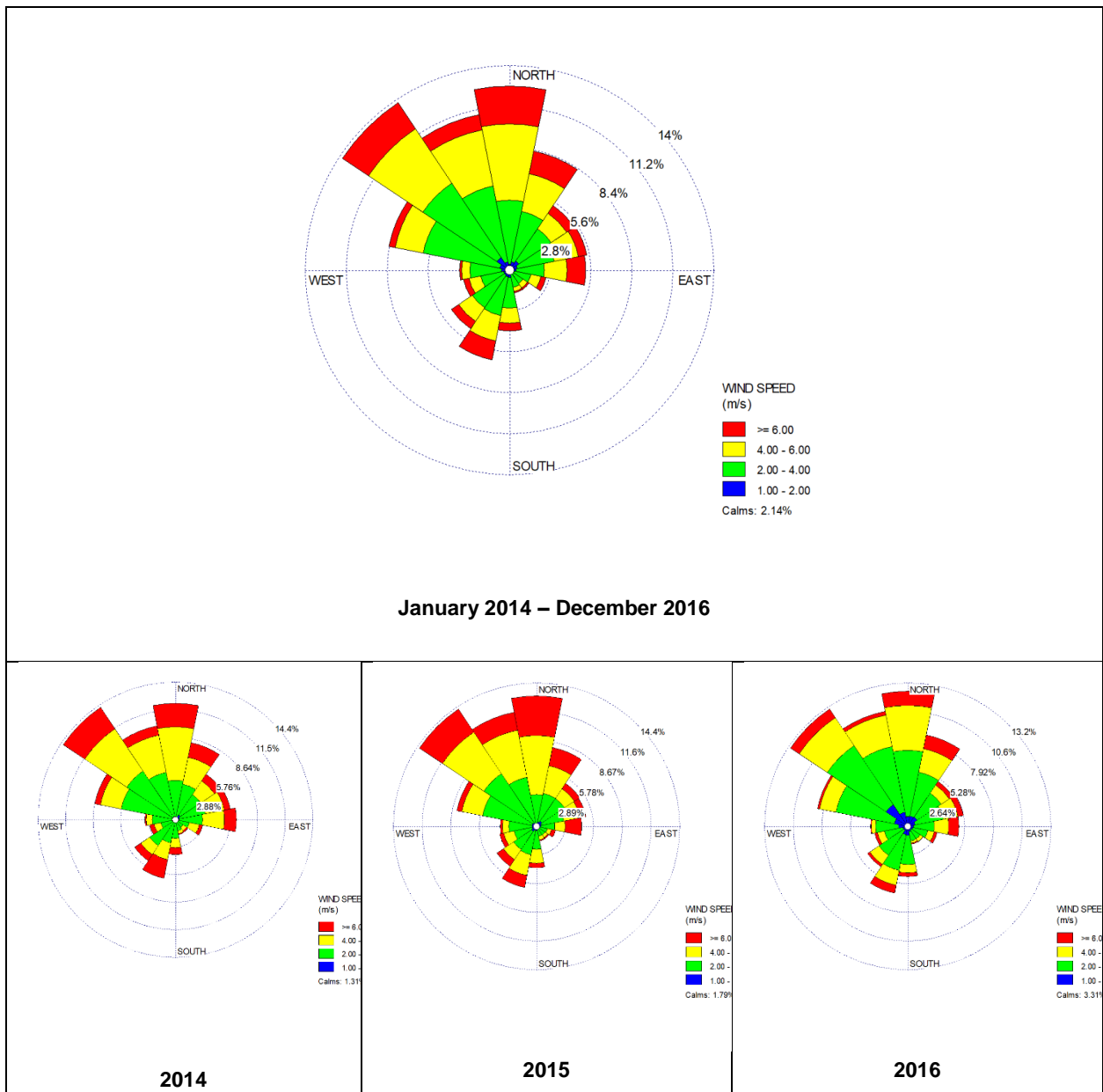
#### 6.7.2.2. Local Wind Field

**Figure 6-10** provides the period wind rose plot for the MetCon Jewellery Precinct Facility for the period January 2014 to December 2016. The predominant wind directions for the period are observed from the north-west (~14% of the time), north (~12.5% of the time) and north-north-west (~11.2% of the time). Wind speeds for the three (3)-year period were generally moderate to fast with calm conditions, defined as wind speeds less than 1 m/s, observed for 2.14 % of the time.

The morning (AM) and evening (PM) period wind rose plots for the period January 2014 to December 2016 are given in **Figure 6-11** and show diurnal variation in the wind field data. During the morning (AM) period, high frequency winds are observed from the north, north-north-east and north-west; as opposed to the evening (PM) period, where winds are predominantly observed from the north west (**Figure 6-11**).

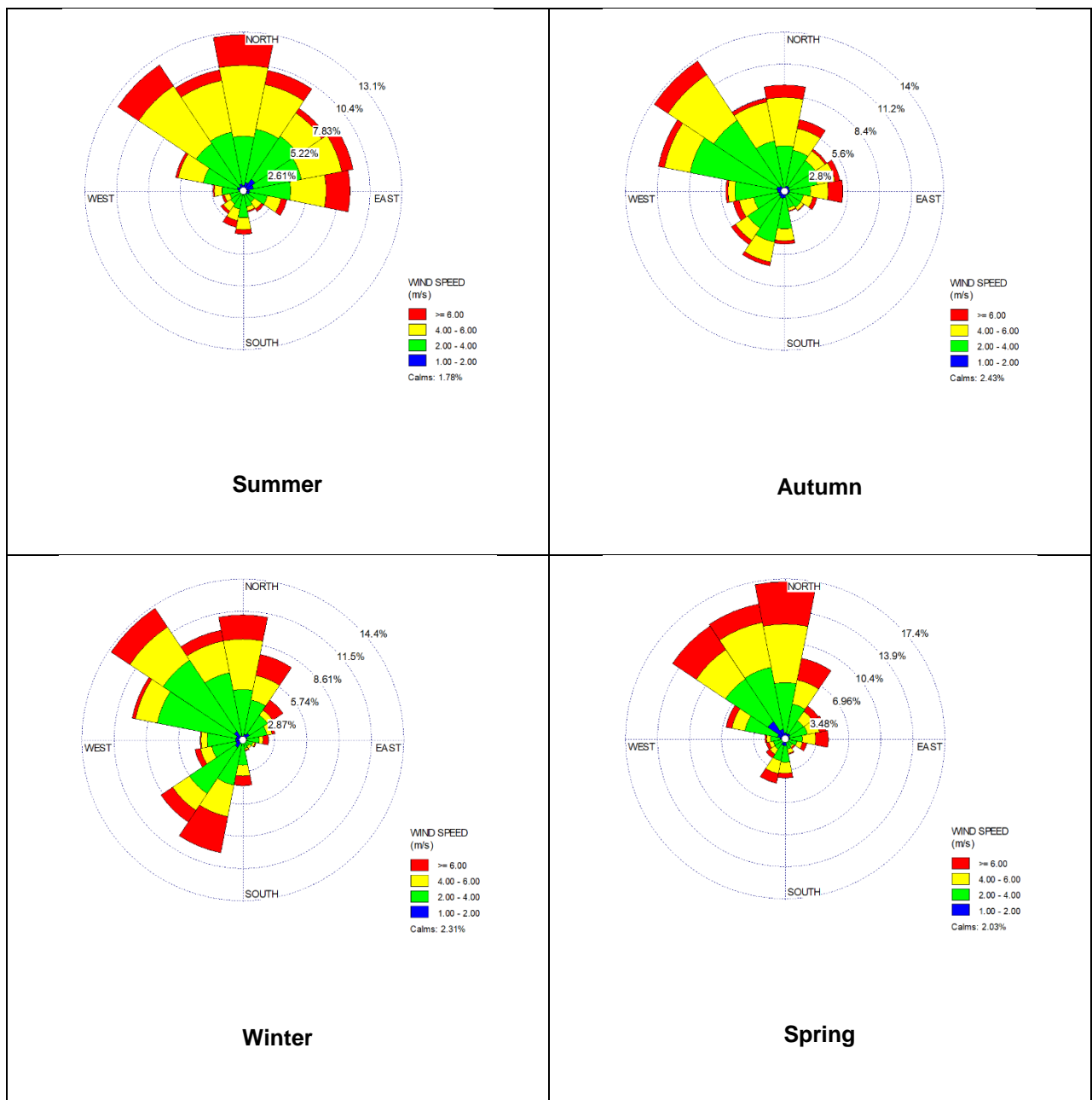
Seasonal variation in winds at the MetCon Jewellery Precinct Facility is shown in **Figure 6-12**. During the spring and summer seasons, winds originate predominantly from the northerly and north-westerly sectors. During the autumn season, winds originate predominantly from the north-westerly and west-north-westerly sectors. Winter months, in particular, exhibit greater variation in wind direction. with prevailing winds observed from the north-westerly, northerly and south-south-westerly quadrants.

Based on the prevailing wind fields for the period January 2014 to December 2016, emissions from operations at the facility will likely be transported towards the south-easterly, southerly, and south-south-easterly quadrants. Moderate to fast wind speeds observed during all time periods may result in effective dispersion and dilution of emissions.



**Figure 6-10:** Period Wind Rose Plots for the project site for the period January 2014 - December 2016.





**Figure 6-12: Seasonal Variation of Winds for the Project Site for the Period January 2014 - December 2016.**

### 6.7.3. Baseline Air Quality Concentrations

The existing air quality situation is usually evaluated using available monitoring data from permanent ambient air quality monitoring stations and dust fallout networks operated near the project site. The nearest air quality monitoring station to the project site is located at OR Tambo International Airport, however, this station has not been operational and air quality monitoring data could not be obtained. The next closest station to the project site is located in Bedfordview. Even though this station is located further away, data from this station can still be used to provide as an indicator of background air pollutant concentrations due to the similar nature in surrounding emission sources.

There was inadequate data from the station to present background concentrations for PM<sub>10</sub>, benzene and CO concentrations at the study site. However, there was background data available for PM<sub>2.5</sub>, SO<sub>2</sub>, NO<sub>2</sub> and ozone (O<sub>3</sub>), which is discussed below in section 6.6.4.1 below. Details of the station are provided in **Table 6-3** below.

**Table 6-3.** Air Quality monitoring station details.

<b>Bedfordview</b>	
Site Id:	192
Site Code:	1
Site Name:	Bedfordview
Provider:	Ekurhuleni Metropolitan Municipality
Network:	Ekurhuleni Metro
Description:	Traffic related pollution from adjacent N3 freeway.
Location:	N3 Freeway
Longitude:	28.133194
Latitude:	-26.178611
Data Interval:	10
Height above sea level (m):	1632
Monitoring Start Date:	2006/01/07
Province:	Gauteng
Municipality:	Ekurhuleni Metropolitan
Equipment Owner:	Ekurhuleni Metropolitan Municipality
Land Owner:	Ekurhuleni Metro
Equipment Housing:	Shelter
Monitoring Objectives:	Traffic pollution from the N3 highway
Site Topography:	Flat Terrain
Location and Description of Emission Sources:	vehicle emissions
Site Classification:	Traffic
Technician:	Rufus Sebati
SANAS Accredited:	Yes

#### 6.7.3.1. Baseline PM<sub>2.5</sub>, NO<sub>2</sub>, SO<sub>2</sub> and O<sub>3</sub> Concentrations

Data were analysed for the period of January 2014 to December 2017. Daily and hourly average PM<sub>2.5</sub>, NO<sub>2</sub>, SO<sub>2</sub> and O<sub>3</sub> concentrations for the period of 01 January 2014 – 31 December 2017 were investigated and it was found that daily average concentrations range from 5 – 35 µg/m<sup>3</sup> for PM<sub>2.5</sub>, 1 – 180 ppb (1.88 – 338.4 µg/m<sup>3</sup>) for NO<sub>2</sub>, 1 – 68 ppb (2.62 – 178.16 µg/m<sup>3</sup>) for SO<sub>2</sub>, and 5 – 65 ppb (10 – 130 µg/m<sup>3</sup>) for O<sub>3</sub>. Maximum hourly average concentrations were 110 µg/m<sup>3</sup> for PM<sub>2.5</sub>, 375 ppb (705 µg/m<sup>3</sup>) for NO<sub>2</sub>, 250 ppb (655 µg/m<sup>3</sup>) for SO<sub>2</sub> and 100 ppb (200 µg/m<sup>3</sup>) for O<sub>3</sub>.

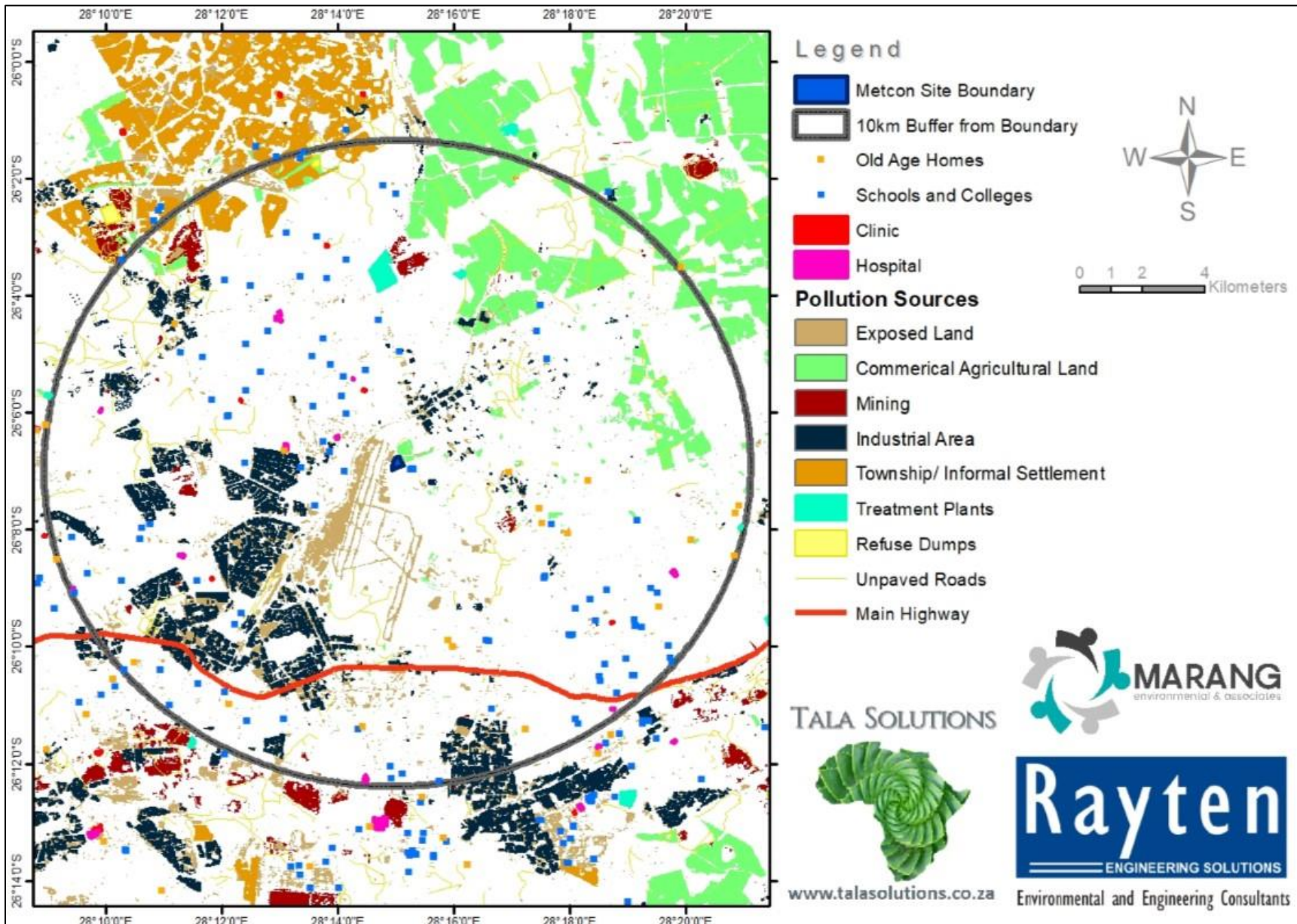
Exceedances of the daily and hourly ambient air quality standards, where applicable, were observed for PM<sub>2.5</sub>, NO<sub>2</sub>, SO<sub>2</sub> and O<sub>3</sub>. The 2014 - 2015 period is generally characterised by higher concentrations of all pollutants, while the 2016 – 2017 period is characterised by lower concentrations. Higher concentrations are generally observed over the winter to early spring seasons.

#### 6.7.4. Surrounding Sources of Air Pollution



Existing key sources of air pollution surrounding the proposed MetCon facility were identified during a desktop exercise and were identified to be:

- Wind erosion from exposed areas (e.g. stockpiles, open storage piles, exposed cultivated fields, degraded land, etc.);
- Potential veld fires;
- Agricultural activity and biomass burning;
- Refuse dumps,
- Industrial activity,
- Treatment plants;
- Township/Informal settlements;
- Vehicle emissions.



**Figure 6-13:** Identified surrounding emission sources within 10km of the proposed JMP MetCon facility.

#### *6.7.4.1. Wind Erosion from Exposed Areas*

There are open exposed areas such as bare soil, eroded natural land, etc. and stockpiles/storage piles surrounding the proposed site which represent a source of dust in the area. Dust emissions due to the erosion of open storage piles and exposed areas occur when the threshold wind speed is exceeded. The threshold wind speed is dependent on the erosion potential of the exposed surface, which is expressed in terms of the availability of erodible material per unit area (mass/area). Any factor which binds the erodible material or otherwise reduces the availability of erodible material on the surface thus decreases the erosion potential of the surface. Studies have shown that when the threshold wind speeds are exceeded, particulate emission rates tend to decay rapidly due to the reduced availability of erodible material.

#### *6.7.4.2. Veld Fires*

Veld fires could occur in surrounding open areas. Veld fires are a source of air pollutants, such as particulate matter, VOCs and CO. The intensity and frequency of veld fires depends on meteorological conditions, plant material characteristics and amount of combustible material over an area. Over most parts of South Africa, a higher frequency of veld fire incidents occurs during the dry winter season, when there is a greater amount of combustible plant material (fuel load) associated with a low moisture content. In the Western Cape, veld fires are most common during the dry summer months. Although veld fires are a naturally occurring phenomenon, they are a key source of emissions that contribute to background air pollution.

#### *6.7.4.3. Agricultural activity and biomass burning*

There are agricultural areas north to north-east of the project site. Emissions from agricultural activities are difficult to control due to the seasonality of emissions and the large surface area producing emissions. Expected emissions resulting from agricultural activities include particulates associated with wind erosion and burning of crop residue, chemicals associated with crop spraying and odiferous emissions resulting from manure, fertilizer and crop residue. Dust associated with agricultural practices may contain seeds, pollen and plant tissue, as well as agrochemicals, such as pesticides. The application of pesticides during temperature inversions increases the drift of the spray and the area of impact.

Dust entrainment from farming vehicles travelling on gravel roads may also cause increased particulates in an area. Dust from traffic on gravel roads increases with higher vehicle speeds, more vehicles and lower moisture conditions. The seasonal burning of the veld from July to September for field clearing in preparation for planting is also a source of smoke. The nature of the activity has a potential impact on air quality in the area.

#### *6.7.4.4. Domestic Fuel Combustion*

There are townships/informal settlements (that were identified during the desktop study) located within a 2km radius north-west from the site, and further off in the south-eastern quadrant. Domestic fuel combustion is prevalent in informal settlements where solid fuels are mostly used for cooking and indoor heating purposes. Indoor heating occurs more frequently in the cold late autumn to early spring months. Emissions from the solid fuels are thus expected to be high during the same months, and comparatively low during the warm spring and summer months. Combustion of domestic solid fuels results mainly in production of CO and particulates. If coal is being used, SO<sub>2</sub> and H<sub>2</sub>S might be additionally emitted in relatively smaller quantities.

#### 6.7.4.5. Urban Industrial Activities

There are several urban industrial activity areas surrounding the project site. The following activities are some common sources of air pollutants in industrial areas:

- Boiler stack emissions;
- Mobile equipment exhaust emissions (forklifts, front-end-loaders, bull dozers, etc.);
- Furnaces (e.g. foundries, metallurgical plants, etc.);
- Material handling & storage;
- Fuel combustion installations & activity;
- Material incineration;
- Chemical treatment and processes; and
- Crushing & screening of dry material.

Emissions from urban industrial activities can be controlled by use of suitable, specific abatement equipment and implementation of air pollution control measures. Expected emissions resulting from urban industrial activities include particulates, VOCs and gases such as NO<sub>x</sub>, SO<sub>2</sub> and CO.

#### 6.7.4.6. Landfill Dumps

There is a landfill dump approximately 9.5km north-north-west of the study site. The main processes associated with gas emissions at landfills are:

- evaporation of VOCs (e.g., solvents);
- chemical reactions between waste components; and
- microbial action (i.e. decomposition), during which bacteria breakdown organic waste.

Gases released from landfills include mainly CH<sub>4</sub> (Methane) and CO<sub>2</sub>, both of which are greenhouse gases. Trace amounts of other VOCs are also released.

#### 6.7.4.7. Treatment Plants

There are sewage treatment plants approximately 7km north of the project site. Operation of such treatment plants triggers the direct emission of greenhouse gases such as CO<sub>2</sub>, CH<sub>4</sub>, and nitrous oxide (N<sub>2</sub>O) from biological processes. Hydrogen sulphide (H<sub>2</sub>S) is also produced as a by-product of decomposition of organic material. Sewage treatment works are generally associated with odour impacts.

## 6.8. Noise

A description of the receiving environment from a noise perspective is provided in the sections below.

### 6.8.1. Appropriate noise limits and legal framework

The Gauteng Noise Control Regulations (GN R. 5479 of 20 August 1999) is based on the National Noise Control Regulations, and most of the regulations are the same. It prohibits the generation of a disturbing noise in any manner (Regulation 8) and defines and prohibits activities that can result in a noise nuisance (Regulation 9). Regulation 11(1) allows a local authority to designate a noise-controlled area as well as zone sound levels for specific areas and during specific times. It is not known if the area surrounding the ORT airport was designated as a noise control area (although considered highly unlikely).

The Gauteng Provincial Noise Control Regulations define a “**disturbing noise**” as:

“means a noise level that causes the ambient noise level to rise above the designated zone level, or if no zone level has been designated, the typical rating levels for ambient noise in districts, indicated in table 2 of SABS 0103<sup>1</sup>.”

Typical rating levels for ambient noise in different districts are given in **Table 6-4** below (from Table 2, SANS 10103:2008).

It must be noted that SANS 10103:2008 does state “for industries legitimately operating in an industrial district during the entire 24 h day/night cycle,  $L_{Req,d} = L_{Req,n} = 70$  dBA can be considered as typical and normal”. There is, however, no noise limits for industry and 61 dBA will be used as a reasonable noise limit at the industrial boundary closest to any residential area. This however has certain risks, especially when a residential area is located next to, in the close vicinity of an industrial area or activity. The World Health Organization recommends an outdoor noise level of 45 dBA at night to allow people acceptable quality of sleep.

Considering the developmental character of the area, as well as acceptable noise limits to allow a reasonable quality of sleep, night-time ambient noise levels (outside) should not exceed 50 dBA (the zone sound level).

**Table 6-4.** Typical rating levels for noise in districts.

	1	2	3	4	5	6	7
Type of district	Equivalent continuous rating level ( $L_{Req,T}$ ) for noise dBA						
	Outdoors			Indoors, with open windows			
	Day/night $L_{R,dn}^a$	Daytime $L_{Req,d}^b$	Night-time $L_{Req,n}^b$	Day/night $L_{R,dn}^a$	Daytime $L_{Req,d}^b$	Night-time $L_{Req,n}^b$	
a) Rural districts	45	45	35	35	35	25	
b) Suburban districts with little road traffic	50	50	40	40	40	30	
c) Urban districts	55	55	45	45	45	35	
d) Urban districts with one or more of the following: workshops; business premises; and main roads	60	60	50	50	50	40	
e) Central business districts	65	65	55	55	55	45	
f) Industrial districts	70	70	60	60	60	50	

#### 6.8.2. Current noise sources of significance

Current noise sources in the area include flights landing and taking off from around 05:00 – 24:00 at the ORTIA. The project area is within 1,000 m and noises from the airport definitely impact on this area, with the noises from planes raising the ambient sound levels every few minutes. The current operations at the ORTIA produce noise levels, between 65-70 dBA, covering the whole JMP site as well as part of the north-

<sup>1</sup> The latest SANS 0103 was renamed SANS 10103:2008

western parts of Bonaero Park residential area. **Figure 6-14** below shows the current noise impact generated by the current activities at the ORTIA and the location of the JMP site.

Other significant noise sources include the busy R21, M43 and M45 which are within 2,000 m from this development area. With the assumption that the above ORTIA noise impact will satisfy comparison to the proposed activities at the MetCon facility, noise levels generated from other sources have not been analysed.

The residential suburb of Bonaero Park is located just south-east from the proposed MetCon operation with the closest residential dwellings situated approximately 150m away. Considering the location of the residential area as well as the developmental character of the area, it is likely that the residential area falls within the typical noise rating level for an Urban District with one or more of the following: workshops; business premises and main roads. The acceptable zone sound level is 60 and 50 dBA during the day and night-time periods respectively. It should be noted that this is higher than the noise levels recommended by the World Health Organization for residential use at night (45 dBA).

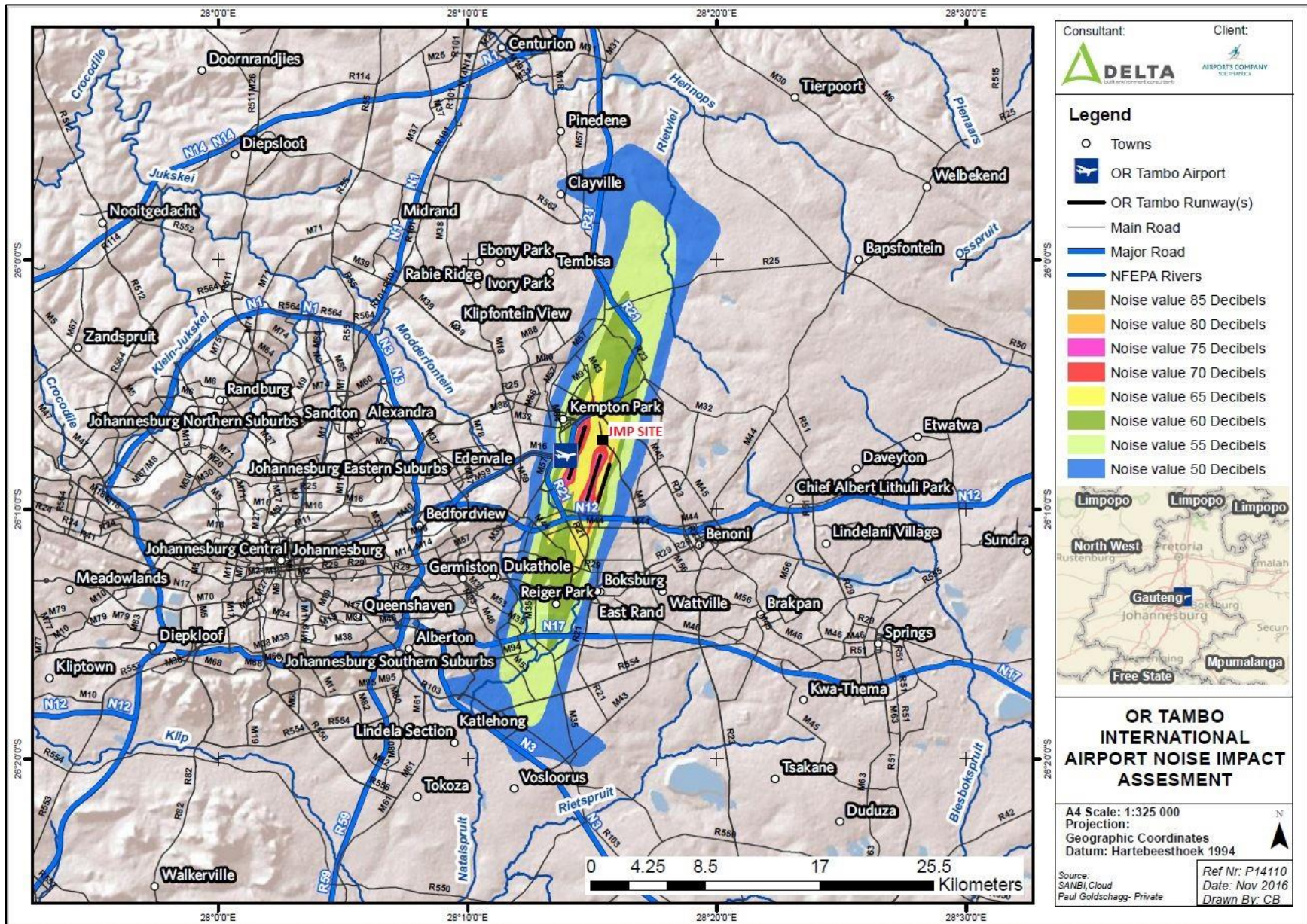


Figure 6-14: Current Noise Impact Generated by the ORTIA and the location of the JIMP site (Source: ACSA)

## 7. ENVIRONMENTAL IMPACT ASSESSMENT

During the BA that was undertaken in 2009, the overall potential impacts of the proposed development were identified through a desktop study, a site visit, specialist studies and comments received during the public participation process. An assessment of the potential impacts was provided, identifying the impacts that are potentially significant including management recommendations and mitigation measures to reduce the impacts. Furthermore, due to the nature of the proposed activity, Marang conducted a Full AQIA in March 2018 to assess the impacts of the proposed MetCon facility on air quality. This has been included in **Appendix 6F**.

The identified impacts, including those identified and assessed through the specialist studies, have been reviewed and included (where relevant) in this EIA, and assessed for significance in the sections below.

### 7.1. Methodology for Assessing Impacts

Impacts of the proposed project on the environmental sensitivities outlined in section 6 of this report above have been quantified using the EIA methodology detailed in **Table 7-1** below. This EIA methodology assists in evaluating the overall effect of the proposed development on the environment. The determination of the effect of an environmental impact on an environmental parameter have been determined through a systematic analysis of the various components of each impact. The evaluation of predicted impacts has been undertaken through an assessment of the significance of the impacts. Each impact has been assessed through the Planning, Construction, Operation and Decommissioning phases of the proposed development, where relevant. Where required, the proposed mitigation measure have been detailed.

#### 7.1.1. Determining Significance of Impacts

**Table 7-1** below provides an explanation of the parameters used to determine the significance of an impact, as well as what “*significance*” means in the context of this impact assessment. Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. The total number of points scored for each impact indicates the level of significance of the impact.

**Table 7-1.** Description of parameters used to establish impact significance.

<p><b>Extent = E</b> (The area over which the proposed impact will be experienced).</p> <p>5: International 4: National 3: Regional 2: Local 1: Site</p>	<p><b>Reversibility = R</b> (The degree to which the proposed impact can be reversed upon completion of the proposed development/activity).</p> <p>4: Irreversible 3: Barely Reversible 2: Partly Reversible 1: Completely Reversible</p>
<p><b>Status of Impact</b></p> <p>+: Positive (A benefit to the receiving environment) N: Neutral (No cost or benefit to the receiving environment) -: Negative (A cost to the receiving environment)</p>	
<p><b>Magnitude = M</b> (The severity of the proposed development/activity).</p> <p>5: Very high/ don't know 4: High 3: Moderate 2: Low</p>	<p><b>Duration = D</b> (The timeframe for which the proposed impact will be experienced).</p> <p>5: Permanent 4: Long-term (ceases with the operational life) 3: Medium-term (5-15 years) 2: Short-term (0-5 years)</p>



1: Minor 0: Not applicable/none/negligible	1: Immediate 0: Not applicable/none/negligible
<b>Probability = P</b> (The likelihood / degree of certainty of the proposed impact occurring). 5: Definite/don't know 4: Highly probable 3: Medium probability 2: Low probability 1: Improbable	<b>Cumulative Effect = C</b> (The impact of the proposed development/ activity on the environmental parameter being assessed when added to other existing or potential impacts). 4: High Cumulative Impact 3: Medium Cumulative Impact 2: Low Cumulative Impact 1: No Cumulative Impact 0: Not applicable
<b>Loss of Resources = L</b> (The degree to which a given resource will be lost as a result of the proposed development / activity.) 4: Complete Loss of Resources 3: Intermediate Loss of Resources 2: Low loss of resources 1: No Loss of resources	
Significance will be determined through the <i>Marang methodology for determining significance</i> . Significance will be determined through a synthesis of the assessed impact characteristics. Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. This describes the significance of the impact on the environmental parameter. The calculation of the significance of an impact uses the following formula:  <b>(Extent + probability + reversibility + loss of resources+ duration + cumulative effect) x magnitude/intensity.</b>  The summation of the different criteria will produce a non-weighted value. By multiplying this value with the magnitude/intensity, the resultant value acquires a weighted characteristic which can be measured and assigned a significance rating.	
<b>Significance</b>	<b>Environmental Significance Points</b>
High (positive)	>90
Medium (positive)	30 to 90
Low (positive)	<30
Neutral	0
Low (negative)	<-30
Medium (negative)	-30 to -90
High (negative)	>-90
	<b>Colour Code</b>
	H
	M
	L
	N
	L
	M
	H

### 7.1.2. Impact Rating System

The impact assessment must take account of the nature, scale and duration of effects on the environment and whether such effects are positive (beneficial) or negative (detrimental). The rating system is applied to the potential impact on the receiving environment and includes an objective evaluation of the mitigation of the impact. Impacts have been consolidated into one rating. An example of the impact assessment table used to assess the environmental impact associated with the proposed project are detailed below in **Table 7-2**.

**Table 7-2.** Example of impact assessment table.

IMPACT RATING TABLE FORMAT			
Item	Description	Pre-mitigation impact rating	Post mitigation impact rating
Environmental Parameter	Description of environmental impact		
Extent (E)	Description of the area over which the proposed impact will be experienced.	2	1
Probability (P)	Description of the likelihood/degree of certainty of the proposed impact occurring.	4	2
Reversibility (R)	Description of the degree to which the proposed impact can be reversed upon completion of the proposed development / activity.	2	1

Loss of Resources (L)	Description of the degree to which a given resource will be lost as a result of the proposed development / activity.	4	1
Duration (D)	Description of the time frame for which the proposed impact will be experienced.	5	0
Cumulative Effect (C)	Description of the impact of the proposed development / activity on the environmental parameter being assessed when added to other existing or potential impacts.	4	0
Magnitude or Intensity (M)	Description of the severity of the proposed development / activity.	5	2
Environmental Significance Points	Description of the importance of the proposed impact which indicates the Mitigation required.	- 105 (High negative)	+ 10 (Low positive)
Mitigation Measures	Detail the mitigation measures required to reduce the impacts that will arise from the proposed development / activity. The measures mentioned will be detailed in the EMPr as well.		

Marang's Impact Rating Methodology is presented in **Appendix 10**.

## 7.2. Assessment of Potential Impacts

The proposed project is likely to result in a variety of positive and negative impacts. Additionally, the proposed project could potentially result in collective and long-term impacts known as cumulative impacts. A cumulative impact is 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.

The DEIAr assists in identifying these potential and cumulative impacts. Furthermore, details associated with the construction and operation of the various activities and impacts associated with these have been included in this report.

The impacts that have been identified as being potentially significant are elaborated on in the sub-sections below. Although construction activities have been mentioned, it should be noted that construction of the site will fall under the original JMP authorisation which covered construction activities extensively for the whole site.

### 7.2.1. Surface Water Impact Assessment

**Table 7-3** and **Table 7-4** present the significance of potential impacts on the ecology of the wetlands associated with the proposed precious metal refinery facility and its investigation area during the construction and operational phases respectively. In addition, it also indicates the required mitigatory measures needed to minimise the perceived impacts of the proposed development and presents an assessment of the significance of the impacts taking into consideration the available mitigatory measures and assuming that they are fully implemented.

Following the assessment of the wetlands, an impact assessment was applied to ascertain the significance of perceived impacts on the key drivers and receptors (hydrology, water quality, geomorphology, habitat and biota) of the assessed wetlands associated with the proposed development.

The following potential impacts have been identified for the proposed project.

- **Construction Phase**

The following are the potential impacts during construction phase:

- Earthworks, leading to the exposure of soils, and thus to increased runoff, erosion, and the potential for sedimentation of the wetlands;
- Soil stockpiling;
- Increased sedimentation of the wetland habitat, leading to changes in instream habitat and potentially altering surface water quality;
- Decreased ecoservice provision by the wetlands; and
- Proliferation of alien vegetation due to disturbances.

**Table 7-3. Construction Phase Surface Water Impact Assessment**

IMPACT RATING TABLE FORMAT			
Item	Description	Pre-mitigation impact rating	Post mitigation impact rating
Environmental Parameter	Site preparation prior to construction activities related to the construction of the proposed precious metal refinery facility, including placement of contractor laydown areas and storage facilities within the 500m GN509 Zone of Regulation of a wetland.		
Potential Impacts	<ul style="list-style-type: none"> <li>• Earthworks, leading to the exposure of soils, and thus to increased runoff, erosion, and the potential for sedimentation of the wetlands;</li> <li>• Soil stockpiling;</li> <li>• Increased sedimentation of the wetland habitat, leading to changes in instream habitat and potentially altering surface water quality;</li> <li>• Decreased ecoservice provision by the wetlands; and</li> <li>• Proliferation of alien vegetation due to disturbances.</li> </ul>		
Extent (E)	Description of the area over which the proposed impact will be experienced.	2	2
Probability (P)	Description of the likelihood/degree of certainty of the proposed impact occurring.	2	1
Reversibility (R)	Description of the degree to which the proposed impact can be reversed upon completion of the proposed development / activity.	2	1
Loss of Resources (L)	Description of the degree to which a given resource will be lost as a result of the proposed development / activity.	1	1
Duration (D)	Description of the time frame for which the proposed impact will be experience	2	2
Cumulative Effect (C)	Description of the impact of the proposed development / activity on the environmental parameter being assessed when added to other existing or potential impacts.	2	1
Magnitude or Intensity (M)	Description of the severity of the proposed development / activity.	1	1
Environmental Significance Points	Description of the importance of the proposed impact which indicates the Mitigation required	- 11 (low negative)	- 8 (Low negative)
Mitigation Measures	<ul style="list-style-type: none"> <li>○ Contractor laydown areas and material storage facilities must be placed within the study area and must not be placed within 30m of the wetlands in line with GDARD and NEMA requirements;</li> <li>○ All vehicle re-fuelling is to take place on a sealed surface within the study area and must not be permitted to occur within 30m of the wetlands;</li> <li>○ All development footprint areas to remain as small as possible and vegetation clearing to be limited to what is absolutely essential;</li> <li>○ Retain as much indigenous vegetation as possible;</li> <li>○ Excavated materials should not be contaminated, and it should be ensured that the minimum surface area is taken up, however, the stockpiles may not exceed 2m in height;</li> <li>○ All exposed soils and temporary stockpiles must be protected for the duration of the construction phase in order to prevent erosion and sedimentation of the wetlands; and</li> <li>○ Immediate revegetation of all stockpiles which are to remain on site post-construction.</li> </ul>		

▪ **Operational Phase**

The following is the potential impact during operational phase:

- o Contaminated runoff may reach the wetlands resulting in impaired surface water quality.

**Table 7-4. Operational Phase: Surface Water Impact Assessment**

IMPACT RATING TABLE FORMAT			
Item	Description	Pre-mitigation impact rating	Post mitigation impact rating
Environmental Parameter	Operation of the precious metal refinery facility.		
Potential Impacts	<ul style="list-style-type: none"> <li>Contaminated runoff may reach the wetlands resulting in impaired surface water quality.</li> </ul>		
Extent (E)	Description of the area over which the proposed impact will be experienced.	2	2
Probability (P)	Description of the likelihood/degree of certainty of the proposed impact occurring.	2	1
Reversibility (R)	Description of the degree to which the proposed impact can be reversed upon completion of the proposed development / activity.	2	2
Loss of Resources (L)	Description of the degree to which a given resource will be lost as a result of the proposed development / activity.	2	2
Duration (D)	Description of the time frame for which the proposed impact will be experience	1	1
Cumulative Effect (C)	Description of the impact of the proposed development / activity on the environmental parameter being assessed when added to other existing or potential impacts.	2	1
Magnitude or Intensity (M)	Description of the severity of the proposed development / activity.	2	1
Environmental Significance Points	Description of the importance of the proposed impact which indicates the Mitigation required	- 22 (low negative)	- 9 (Low negative)
Mitigation Measures	<ul style="list-style-type: none"> <li>Clean and dirty water management must take place in order to prevent contaminated runoff from the precious metal refinery facility creating preferential flow paths which may reach the wetlands. Clean and dirty water management systems must be implemented prior to commencement of construction.</li> <li>Suitable waste disposal facilities should be provided. These facilities should regularly be emptied and taken to a registered waste disposal facility.</li> <li>Chemicals and dangerous goods should be stored appropriately including the use of bund walls that conform to SANS standards.</li> <li>No chemicals should be dispersed over bare soils.</li> <li>Sufficient training must be presented to the operator of the facility. Training is to include general facility operation, chemical handling, spill response and emergency procedures and site safety.</li> <li>A spill response kit composed of absorbent fibres and associated waste containers must be made available on site. All material used for the mopping up of surface spillages must be removed on a regular basis by an approved hazardous waste disposal contractor, to a registered hazardous waste disposal site.</li> </ul>		

Based on the outcome of the impact assessment, all the activities associated with the construction and operational phases were determined to have a low impact significance on the surface water, prior to and following the implementation of mitigation measures. This is mainly due to the distance between the activities and the surface water. However, specific mitigation measures are recommended to be implemented to ensure a very low impact significance and reduce overall potential impacts to the surface water.

### **7.2.2. Soils and Land Capability Impact Assessment**

A review of the original soils and land capability (i.e. Agriculture) related findings, impacts and recommendations/mitigation measures, as provided in the FBAR compiled as part of the BA process

undertaken in 2009 for the proposed development of the original JMP site, was undertaken by Stephen van Staden of Scientific Aquatic Services (SAS) and is provided in **Appendix 6C**.

The parameters which were assessed/investigated as part of the original BA process undertaken in 2009 from a soils and land capability perspective included soil instability and erosion. However, the BA process did not particularly assess and/or investigate agricultural potential of the site.

After a review of all available assessment documentation and considering the current status of the proposed development site, a description of potential impacts and possible mitigations for the receiving environment from a soils and land capability (i.e. Agricultural) perspective is provided below.

▪ **Construction Phase**

The following potential impacts have been identified during the construction phase:

- Earthworks, leading to the exposure of soils, and thus leading to dust emission, erosion and potential loss of soil;
- Soil compaction as a result of laydown area and construction machinery/equipment;
- Spillage of hydrocarbons resulting from construction vehicles, leading to soil contamination; and
- Proliferation of alien vegetation due to disturbances, leading to change of soil chemistry and quality.

**Table 7-5. Construction Phase: Soil and Land Capability Impact Assessment**

IMPACT RATING TABLE FORMAT			
Item	Description	Pre-mitigation impact rating	Post mitigation impact rating
Environmental Parameter	Site preparation prior to construction activities related to the construction of the proposed precious metal refinery facility, including topsoil stripping, excavation and stockpiling activities.		
Potential Impacts	<ul style="list-style-type: none"> <li>• Earthworks, leading to the exposure of soils, and thus leading to dust emission, erosion and potential loss of soil;</li> <li>• Soil compaction as a result of laydown area and construction machinery/equipment;</li> <li>• Spillage of hydrocarbons resulting from construction vehicles, leading to soil contamination; and</li> <li>• Proliferation of alien vegetation due to disturbances, leading to change of soil chemistry and quality.</li> </ul>		
Extent (E)	Description of the area over which the proposed impact will be experienced.	2	2
Probability (P)	Description of the likelihood/degree of certainty of the proposed impact occurring.	5	2
Reversibility (R)	Description of the degree to which the proposed impact can be reversed upon completion of the proposed development / activity.	2	1
Loss of Resources (L)	Description of the degree to which a given resource will be lost as a result of the proposed development / activity.	2	1
Duration (D)	Description of the time frame for which the proposed impact will be experienced	2	2
Cumulative Effect (C)	Description of the impact of the proposed development / activity on the environmental parameter being assessed when added to other existing or potential impacts.	2	1
Magnitude or Intensity (M)	Description of the severity of the proposed development / activity.	1	1
Environmental Significance Points	Description of the importance of the proposed impact which indicates the Mitigation required	- 15 (low negative)	- 9 (Low negative)
Mitigation Measures	<ul style="list-style-type: none"> <li>○ All development footprint areas to remain as small as possible;</li> <li>○ Laydown areas should be located within disturbed soils (anthrosols) to avoid compaction of natural soils</li> </ul>		

	<ul style="list-style-type: none"> <li>o All exposed soils and temporary stockpiles must be protected for the duration of the construction phase in order to prevent erosion;</li> <li>o Stockpile height should not exceed 2 meters (m)</li> <li>o Vehicle re-fuelling is to take place on a sealed surface within the study area; and</li> <li>o Contamination prevention measures should be addressed in the Environmental Management Programme (EMPr) for the proposed development, and this should be implemented and made available and accessible at all times to the contractors and construction crew conducting the works on site for reference.</li> </ul>
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▪ **Operational Phase**

The following are the potential impacts during operational phase:

- o Movement of transport vehicles off demarcated roads, thus leading to soil compaction in untarred/unpaved surfaces which consist of soil material; and
- o Contaminated surface runoff water resulting in soil contamination of the surrounding soils.

**Table 7-6. Operational Phase: Soil and Land Capability Impact Assessment**

IMPACT RATING TABLE FORMAT			
Item	Description	Pre-mitigation impact rating	Post mitigation impact rating
Environmental Parameter	Operation of the precious metal refinery facility and waste management.		
Potential Impacts	<ul style="list-style-type: none"> <li>• Movement of transport vehicles off demarcated roads, thus leading to soil compaction in untarred/unpaved surfaces which consist of soil material; and</li> <li>• Contaminated surface runoff water resulting in soil contamination of the surrounding soils.</li> </ul>		
Extent (E)	Description of the area over which the proposed impact will be experienced.	2	2
Probability (P)	Description of the likelihood/degree of certainty of the proposed impact occurring.	2	1
Reversibility (R)	Description of the degree to which the proposed impact can be reversed upon completion of the proposed development / activity.	2	1
Loss of Resources (L)	Description of the degree to which a given resource will be lost as a result of the proposed development / activity.	2	2
Duration (D)	Description of the time frame for which the proposed impact will be experience	3	2
Cumulative Effect (C)	Description of the impact of the proposed development / activity on the environmental parameter being assessed when added to other existing or potential impacts.	2	1
Magnitude or Intensity (M)	Description of the severity of the proposed development / activity.	2	1
Environmental Significance Points	Description of the importance of the proposed impact which indicates the Mitigation required	- 26 (low negative)	- 9 (Low negative)
Mitigation Measures	<ul style="list-style-type: none"> <li>o All vehicle should remain within demarcated roads as far as practically possible;</li> <li>o Stormwater management must take place in order to prevent contaminated runoff from the precious metal refinery facility;</li> <li>o Waste product should be recycled as best as practically possible so as to minimise sources of soil contamination; and</li> <li>o Contamination prevention measures should be addressed in the Environmental Management Programme (EMPr) for the proposed development, and this should be implemented and made available and accessible at all times to the contractors and construction crew conducting the works on site for reference.</li> </ul>		

**7.2.3. Visual Impact Assessment**

A specialist review letter commenting on the visual related findings, impacts and recommendations/mitigation measures associated with the proposed development of the MetCon facility was undertaken by Stephen van Staden of SAS and is provided in **Appendix 6D**.

The tables below present the significance of potential visual impacts that the proposed MetCon facility might have on the sense of place, visual character and overall aesthetics of the receiving environment. In addition, the tables below present recommendations and mitigation measures have been developed which will assist in minimising the MetCon facility's visual impact throughout the construction and operational phases of the project and an assessment of the visual impacts taking into consideration the mitigatory measures and assuming that they are fully implemented.

▪ **Construction Phase:**

The following are the potential impacts during construction phase:

- Excavation activities for the laying of the foundation for the proposed MetCon facility;
- Stockpiling of topsoil during excavation activities, potentially altering landform;
- Dust generation due to excavation and general construction activities including movement of construction vehicles and human activity leading to dust suppression;
- Construction of the MetCon facility (including the bag filtration plant and scrubber and associated stacks);
- Placement of temporary contractor's laydown areas and storage facilities in higher lying areas or in close proximity to Bonaero Park, and outside the demarcated footprint area; and
- Security lighting around the perimeter of the MetCon facility.

**Table 7-7. Construction Phase: Visual Impact Assessment.**

IMPACT RATING TABLE FORMAT			
Item	Description	Pre-mitigation impact rating	Post mitigation impact rating
Environmental Parameter	Further site preparation for construction activities related to the proposed Precious Metal Refinery Facility (PMRF), including excavation and stockpiling, laying of foundation for the buildings, construction of these buildings and associated stacks, placement of temporary contractor laydown areas and storage facilities if necessary.		
Potential Impacts	<ul style="list-style-type: none"> <li>• Excavation activities for the laying of the foundation for the proposed PMRF;</li> <li>• Stockpiling of topsoil during excavation activities, potentially altering landform;</li> <li>• Dust generation due to excavation and general construction activities including movement of construction vehicles and human activity leading to dust suppression;</li> <li>• Construction of the Precious Metal Refinery Facilities (including the bag filtration plant and scrubber and associated stacks);</li> <li>• Placement of temporary contractor's laydown areas and storage facilities in higher lying areas or in close proximity to Bonaero Park, and outside the demarcated footprint area; and</li> <li>• Security lighting around the perimeter of the PMRF.</li> </ul>		
Extent (E)	Description of the area over which the proposed impact will be experienced.	2	1
Probability (P)	Description of the likelihood/degree of certainty of the proposed impact occurring.	5	5
Reversibility (R)	Description of the degree to which the proposed impact can be reversed upon completion of the proposed development / activity.	2	1
Loss of Resources (L)	Description of the degree to which a given resource will be lost as a result of the proposed development / activity.	1	0
Duration (D)	Description of the time frame for which the proposed impact will be experience	2	2
Cumulative Effect (C)	Description of the impact of the proposed development / activity on the environmental	2	1

	parameter being assessed when added to other existing or potential impacts.		
Magnitude or Intensity (M)	Description of the severity of the proposed development / activity.	2	1
Environmental Significance Points	Description of the importance of the proposed impact which indicates the Mitigation required	- 28 (low negative)	- 10 (Low negative)
Mitigation Measures	<ul style="list-style-type: none"> <li>o The development footprint area should remain as small as possible;</li> <li>o No rubble should be disposed of at random within the site, but within relevant removable bins, where recyclable and non-recyclable waste is kept separate;</li> <li>o Contractor's laydown areas and temporary storage facilities should be located within the development footprint and cordoned off with shade cloth to conceal and minimise the visual impact;</li> <li>o Any topsoil stockpiled should either be utilised during landscaping or it should be shaped and rounded to blend in with the surrounding landscape and to minimise visual contrast;</li> <li>o Vegetation, especially large and tall trees bordering the Bonaero Park residential area south of the PMRF should be retained if feasible;</li> <li>o It must be ensured that the buildings fit into its surroundings through the appropriate use of colour and material selection. Natural Colours should be used in all instances. Should the stacks comprise metal surfaces, it must be painted in a colour that blends in with the natural environment. White structures are to be avoided;</li> <li>o A dust management plan must be implemented to reduce dust generation. Such dust control measures may include, but is not limited to; watering of the footprint area and any access roads, speed limits of 20km/h must be adhered to and should it be practical stockpiles should be covered with a tarpaulin on windy days to avoid soil and dust being blown away;</li> <li>o Construction activities should be restricted to daylight hours as far as possible;</li> <li>o A lighting engineer may be consulted to assist in the placement of temporary and permanent light fixtures, to reduce the visual impact associated with glare and light trespass; and</li> <li>o No naked / unshielded light sources are to be used. It is recommended that "full cut-off" light fixtures that direct light only below the horizontal is to be used.</li> </ul>		

▪ **Operational Phase**

The following potential impacts have been identified during the operational phase:

- o Operational activities of the PMRF and gas emissions at the stacks;
- o An increase in vehicular movement and level of human activity in the area due to operational activities;
- o Exterior and security lighting around the buildings and parking facilities, possibly contributing to light pollution;
- o Potential lighting at night from operational vehicles; and
- o Light sources temporarily stationed for maintenance activities conducted at night, in case of emergencies.

**Table 7-8.** Operation Phase: Visual Impact Assessment.

IMPACT RATING TABLE FORMAT			
Item	Description	Pre-mitigation impact rating	Post mitigation impact rating
Environmental Parameter	Operation of the Precious Metal Refinery Facility (PMRF) and emissions from the stacks		
Potential Impacts	<ul style="list-style-type: none"> <li>• Operational activities of the PMRF and gas emissions at the stacks;</li> <li>• An increase in vehicular movement and level of human activity in the area due to operational activities;</li> <li>• Exterior and security lighting around the buildings and parking facilities, possibly contributing to light pollution;</li> <li>• Potential lighting at night from operational vehicles; and</li> <li>• Light sources temporarily stationed for maintenance activities conducted at night, in case of emergencies.</li> </ul>		
Extent (E)	Description of the area over which the proposed impact will be experienced.	2	1



Probability (P)	Description of the likelihood/degree of certainty of the proposed impact occurring.	4	4
Reversibility (R)	Description of the degree to which the proposed impact can be reversed upon completion of the proposed development / activity.	2	1
Loss of Resources (L)	Description of the degree to which a given resource will be lost as a result of the proposed development / activity.	1	0
Duration (D)	Description of the time frame for which the proposed impact will be experience	2	2
Cumulative Effect (C)	Description of the impact of the proposed development / activity on the environmental parameter being assessed when added to other existing or potential impacts.	1	1
Magnitude or Intensity (M)	Description of the severity of the proposed development / activity.	2	1
Environmental Significance Points	Description of the importance of the proposed impact which indicates the Mitigation required	- 24 (low negative)	- 9 (Low negative)
Mitigation Measures	<ul style="list-style-type: none"> <li>o It is recommended that routine maintenance on buildings and other structures be implemented, to ensure that the paint of buildings is not weathered and that the buildings fit into the colour palette of the surroundings;</li> <li>o In the event that a green open space is demarcated and landscaped, it must be ensured that the vegetation be maintained and controlled to reduce the risk of potential alien floral species proliferation and to keep it aesthetically appealing to the receiving environment;</li> <li>o It is recommended that maintenance activities should not take place at night or on weekends, unless absolutely essential;</li> <li>o Making use of motion detectors on security lighting at buildings and parking facilities, ensures that the site will remain in relative darkness, until lighting is required for security and maintenance purposes;</li> <li>o No naked / unshielded light sources are to be directly visible from a distance.</li> <li>o Facility waste materials must be properly stored in appropriate containers and designated areas</li> <li>o The PMRF should be screened through the use of a clearVU fence, or equally approved, which will result in a more unified and tidy appearance.</li> </ul>		

Based on the outcome of the Visual Impact Assessment, it is evident that all the activities associated with the construction and operational phases of the proposed PMRF were determined to have a low impact significance on the sense of place and visual character of the area, prior to the implementation of mitigation measures. The contributing factors to the low impact significance levels include the current land use of the surrounding area characterised by urban and industrial development, the maximum height of 12m (equivalent to 2 storey) of the proposed PMRF buildings not exceeding the height of the surrounding buildings and the JMP buildings already constructed. From the above-mentioned factors it can be concluded that the PMRF is in keeping with the sense of place and visual character of the area. It should however be noted that due to the height of the stacks at 25m, these structures are likely to be more visible from various viewpoints in the surrounding area, however it is not considered significantly intrusive.

The specific mitigation measures as provided in the tables above are recommended to be implemented to ensure an even lower impact significance and reduce overall potential visual impacts on the receiving environment.

#### **7.2.4. Heritage Impact Assessment**

Due to the fact that no heritage or archaeological resources were identified during the desktop investigation and site walkthrough, no impacts are anticipated from a heritage point of view. As such, the Heritage Specialist did not undertake an impact assessment as part of his review.

### 7.2.5. Air Quality Impact Assessment

The current air quality in the vicinity of the proposed MetCon is assumed to be negatively affected by the traffic, commercial and industrial activities in the area, as well as the airport activities. Precious metal refineries are generally associated with air emissions which may be considered as a refineries most significant environmental impact. The air emissions associated with the proposed activities include PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub>, NO<sub>2</sub>, CL<sub>2</sub>, HCL, HF and NH<sub>3</sub> which are released during the various processes of the refinery. These emissions are regulated and require an air emissions licence as per the NEM:AQA (no 39 of 2004). As part of the EIA process, a specialist air quality assessment has been conducted by Marang and is presented in **Appendix 6F**.

As air quality impacts associated with the facility are only expected to commence during the operational phase, construction activities have not been incorporated. The level of impact of proposed activities associated with the MetCon facility during the operational phase is summarily assessed in **Table 7-9** below.

**Table 7-9.** Operational phase: Air Quality Impact Assessment

IMPACT RATING TABLE FORMAT			
Item	Description	Pre-mitigation impact rating	Post mitigation impact rating
Environmental Parameter	Air Quality		
Extent (E)	Area over which the proposed impact will be experienced.	3	2
Probability (P)	Likelihood/degree of certainty of the proposed impact occurring.	5	5
Reversibility (R)	Degree to which the proposed impact can be reversed upon completion of the proposed development / activity.	2	2
Loss of Resources (L)	Degree to which a given resource will be lost as a result of the proposed development / activity.	3	2
Duration (D)	Time frame for which the proposed impact will be experience.	6	4
Cumulative Effect (C)	Impact of the proposed development / activity on the environmental parameter being assessed when added to other existing or potential impacts.	4	2
Magnitude or Intensity (M)	Severity of the proposed development / activity. Activity may be audible during the day.	1	1
Environmental Significance Points	Description of the importance of the proposed impact which indicates the Mitigation required	- 23 (low negative)	- 17 (Low negative)
Mitigation Measures	<p>The proposed facility must install abatement equipment (baghouse and scrubber) as per their current design at the existing MetCon Centurion Plant. The abatement equipment must achieve at least 90% control efficiency and must ensure compliance with the minimum emission standards for sub-category 4.17 in terms of S21 of the NEM:AQA listed activities.</p> <p>Additional recommendations include:</p> <ul style="list-style-type: none"> <li>• MetCon must apply for an AEL prior to the commencement of operations. All conditions of the AEL must be complied with.</li> <li>• Appoint a responsible person, such as an emission control officer or safety, health &amp; environmental manager, to ensure compliance with the AEL.</li> <li>• Once operational, conduct stack emissions monitoring on all stacks for the relevant listed activity and ensure compliance with the minimum emission standards, with the use of abatement equipment. Ensure that monitoring is undertaken in accordance with nationally or internationally acceptable methods.</li> <li>• Ensure that all unit processes &amp; apparatus used for undertaking the listed activity in question, and all appliances and mitigation measures for preventing or reducing emissions, are at all times properly maintained and operated.</li> <li>• Submit an annual AEL report within the required timeframe.</li> <li>• Submit compliance audit reports annually.</li> <li>• Once operational, maintain and report monthly to the authority a complaint register. Should a complaint be logged, a report in the required format as per the AEL, should be submitted to the authority.</li> </ul>		

	<ul style="list-style-type: none"> <li>• Register and report on the NAEIS. Category A (listed activities) are required to report their emissions on the NAEIS annually. The NAEIS is a national emissions inventory.</li> <li>• Maintenance and pollution prevention plans should be developed for the facility.</li> <li>• Undertake regular training of all key employees to ensure effective implementation of the AEL requirements, maintenance and pollution prevention plans.</li> </ul>
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### **7.2.6. Noise Impact Assessment**

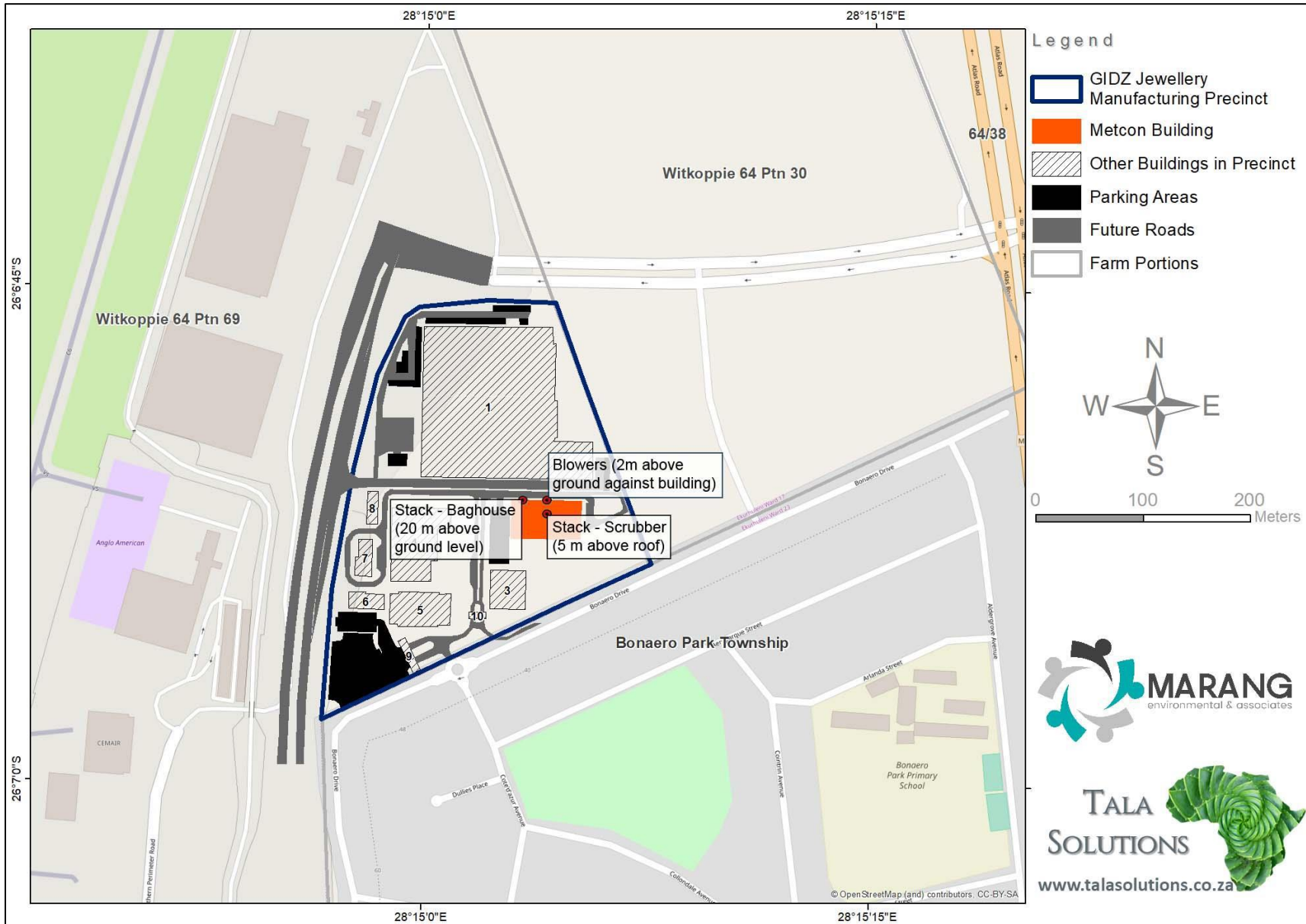
A specialist review letter commenting on the noise related findings, impacts and recommendations/mitigation measures associated the proposed development of the MetCon facility was undertaken by Morné de Jager of Enviro Acoustic Research (EAR) and is provided in **Appendix 6E**.

#### *7.2.6.1. Potential sources of noise at the MetCon facility*

Based on the Air Quality Impact Assessment compiled for the project, the potential sources of noise would be:

- A baghouse Stack (with an associated blower). The stack may be 20 m high and generate 99 dBA (based on a stack diameter of 0.58 m, exit velocity of 21 m/s);
- A Scrubber Stack (with an associated blower). The stack may be 5 m high and generate 94 dBA (based on a stack diameter of 0.36 m, exit velocity of 24 m/s);
- A blower generating 105 dBA, located on the far side of the building. This is an unmitigated scenario with the blower not enclosed (which will reduce noise levels from the blower).

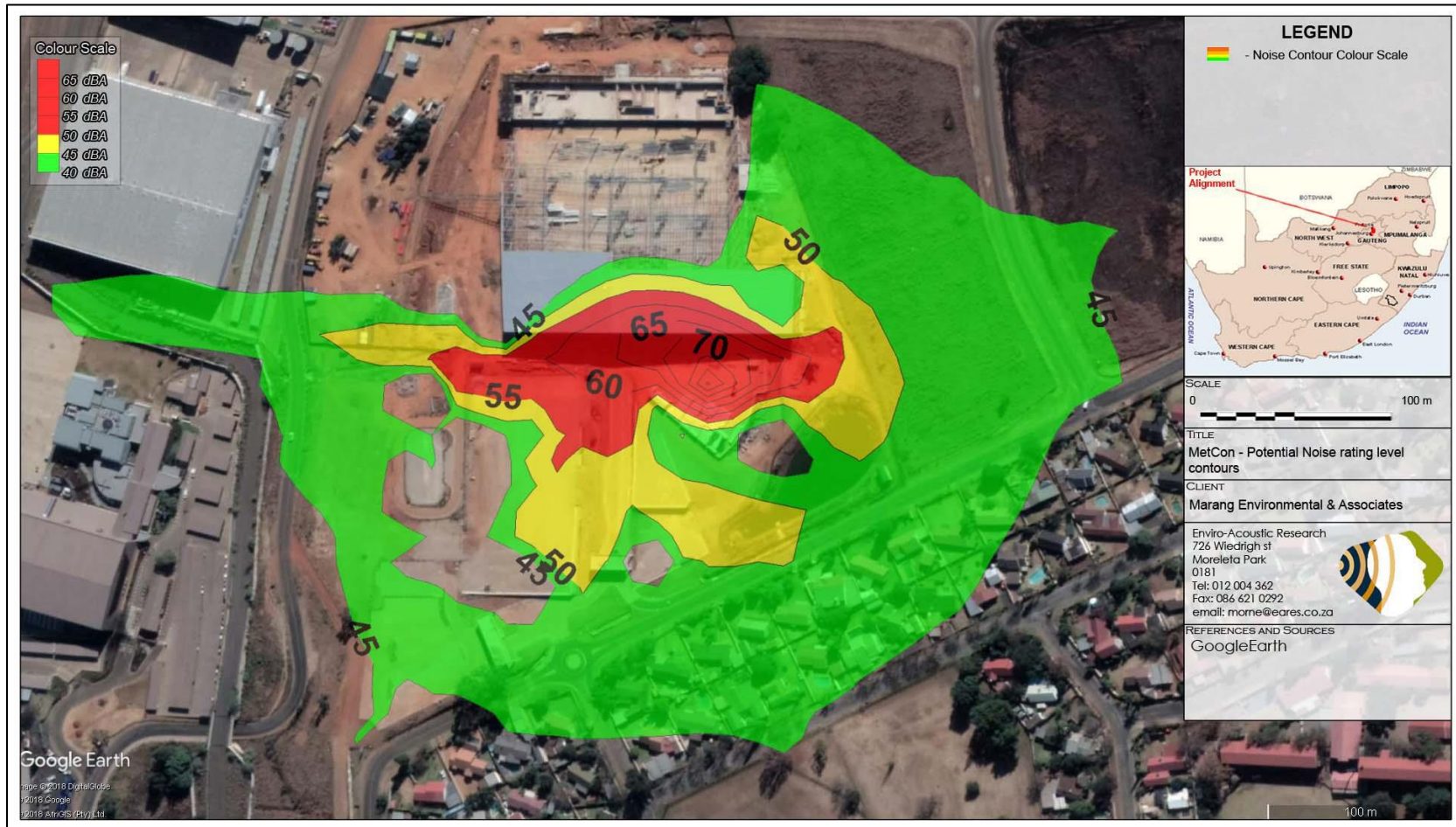
These conceptual noise sources are illustrated in **Figure 7-1** below. This assessment considers both the day (06:00 – 22:00) and night-time (22:00 – 06:00) scenario.



**Figure 7-1.** Description of main buildings and measurement locations

7.2.6.2. Potential noise levels

Potential noise level contours are presented in **Figure 7-2** below. Based on the noise contours, the first row of houses may be subject to noise levels of 45 – 49 dBA.



**Figure 7-2:** Potential noise rating levels in contours of constant sound levels.

7.2.6.3. Comparison between MetCon’s potential noise levels and Current noise levels

Current operations at the ORTIA produce noise levels between 65-to-70 dBA, covering the whole JMP site as well as portions of the north-western parts of Bonaero Park residential area (as shown in **Figure 6-14** above). Potential noise levels, as shown in **Figure 7-2** above, produced by the MetCon facility are expected to only reach 70 dBA within the facility’s boundary walls, with only about 45-50 dBA projected to reach the Bonaero Park residential area. As such, potential noise levels for the MetCon facility are expected to have significantly lower noise impact than currently imposed by the ORTIA.

7.2.6.4. The Preliminary Significance of the Noise Impact

▪ **Construction Phase**

As per the previously approved Basic Assessment Report, the following potential impacts have been identified during the construction phase:

- Noise barrier material for inclusion in construction should be investigated.
- Construction activities must be limited to normal working hours during the week, i.e. 07:00am until 17:00pm.
- If construction is required on the weekend or at night, permission to do so must be granted from the adjacent land owners and appropriate authorities beforehand.
- Construction vehicles must be kept in good working condition at all times to prevent becoming the source of excess noise.
- The construction crew must abide by the National Noise laws and the local “by-laws” regarding noise.

▪ **Operational Phase**

Ambient sound levels in the vicinity of the residential area would be impacted by the roads and existing activities such as the adjacent airport. The project may be audible during the day, but, if the operation is active at night, it may be clearly audible and may raise the ambient sound levels. Mitigation may reduce the noise levels, but the developer must consider the proposed measures during the planning stage to ensure that the recommendations are considered during this early phase.

**Table 7-10.** Impact Assessment considering daytime (06:00 - 22:00) noise levels

IMPACT RATING TABLE FORMAT			
Item	Description	Pre-mitigation impact rating	Post mitigation impact rating
Environmental Parameter	Noise Generation: Noise generation during day-time operations having the possibility of being a nuisance to adjacent landowners.		
Extent (E)	Area over which the proposed impact will be experienced.	2	2
Probability (P)	Likelihood/degree of certainty of the proposed impact occurring.	1	1
Reversibility (R)	Degree to which the proposed impact can be reversed upon completion of the proposed development / activity.	1	1
Loss of Resources (L)	Degree to which a given resource will be lost as a result of the proposed development / activity.	1	1
Duration (D)	Time frame for which the proposed impact will be experience.	4	4
Cumulative Effect (C)	Impact of the proposed development / activity on the environmental parameter being assessed when added to other existing or potential impacts.	2	2
Magnitude or Intensity (M)	Severity of the proposed development / activity. Activity may be audible during the day.	1	1

Environmental Significance Points	Description of the importance of the proposed impact which indicates the Mitigation required	- 12 (low negative)	- 12 (Low negative)
Mitigation Measures	No additional mitigation required.		

**Table 7-11.** Impact Assessment considering night-time (22:00 – 06:00) noise levels

IMPACT RATING TABLE FORMAT			
Item	Description	Pre-mitigation impact rating	Post mitigation impact rating
Environmental Parameter	Noise Generation: Noise generation during night-time operations having the possibility of being a nuisance to adjacent landowners.		
Extent (E)	Area over which the proposed impact will be experienced.	2	2
Probability (P)	Likelihood/degree of certainty of the proposed impact occurring.	1	1
Reversibility (R)	Degree to which the proposed impact can be reversed upon completion of the proposed development / activity.	1	1
Loss of Resources (L)	Degree to which a given resource will be lost as a result of the proposed development / activity.	1	1
Duration (D)	Time frame for which the proposed impact will be experience.	4	4
Cumulative Effect (C)	Impact of the proposed development / activity on the environmental parameter being assessed when added to other existing or potential impacts.	2	2
Magnitude or Intensity (M)	Severity of the proposed development / activity. Activity may be audible during the day.	1	1
Environmental Significance Points	Description of the importance of the proposed impact which indicates the Mitigation required	- 12 (low negative)	- 12 (Low negative)
Mitigation Measures	<p>If night-time activities are required, MetCon should measure the typical night-time ambient sound levels in the area prior to the project being developed (over the full night-time period). Once operational, measurements must be repeated to confirm that the implementation of the project did not raise the noise levels with more than 7 dB (Noise Control Regulations), ideally, no more than 3 dB (International Finance Corporation recommendation).</p> <p>Other measures include:</p> <ul style="list-style-type: none"> <li>• Minimise night-time activities that will require the use of the baghouse stack and blowers at night.</li> <li>• The design of the baghouse stack exit to ensure a more flared design, or the use of a silencing system at the exit.</li> <li>• Enclose the blowers in a structure to reduce the noise levels from this source.</li> <li>• The reduction of the gas exit velocities at night.</li> </ul> <p>The night-time noise level can be reduced with the implementation of the correct mitigation measures that will reduce the significance of the noise impact.</p>		

#### 7.2.6.5. Recommendations on the way forward

- If only daytime activities are planned, no mitigation measures are recommended.
- If night-time activities are planned (after 22:00 at night, before 06:00) it is recommended that MetCon:
  - measure the typical night-time ambient sound levels in the area prior to the project being developed (over the full night-time period). Once operational, measurements must be repeated to confirm that the implementation of the project did not raise the noise levels with more than 7 dB (Noise Control Regulations) and ideally, does not raise the ambient sound levels with more than 3 dB (International Finance Corporation recommendation).
  - select appropriate noise mitigation measures (to be considered during the planning stage) which may include:
    - Eliminating the noise source where possible at night;

- The installation of one or more acoustical silencer(s) or enclosures;
- Acoustical treatment of ducts and exhaust stacks;
- A change in equipment, controlling the speed of the fans/blowers; and
- Moving the noise source further from the residential area (if possible).

### 7.2.7. Traffic Impact Assessment

As part of the original BA process for the JMP site, an extensive traffic impact study was conducted. The study evaluated traffic as may result from the entire JMP site and thus is more extensive than the traffic that may result from the MetCon facility alone. The assessment included recommendations for various road improvements that were subsequently approved by the CoE. The specialist assessment and the relevant approvals are presented in **Appendix 9C**. The MetCon facility is not expected to add significant additional traffic to the JMP site, or the surrounding industrial/residential areas.

**Table 7-12. Operation Phase: Traffic Impact Assessment.**

IMPACT RATING TABLE FORMAT			
Item	Description	Pre-mitigation impact rating	Post mitigation impact rating
Environmental Parameter	Operation of the Precious Metal Refinery Facility (PMRF) and vehicles utilising the site		
Potential Impacts	<ul style="list-style-type: none"> <li>Increases in vehicle numbers in the area due to the operations of the MetCon facility.</li> </ul>		
Extent (E)	Description of the area over which the proposed impact will be experienced.	2	1
Probability (P)	Description of the likelihood/degree of certainty of the proposed impact occurring.	2	1
Reversibility (R)	Description of the degree to which the proposed impact can be reversed upon completion of the proposed development / activity.	1	1
Loss of Resources (L)	Description of the degree to which a given resource will be lost as a result of the proposed development / activity.	0	0
Duration (D)	Description of the time frame for which the proposed impact will be experience	4	4
Cumulative Effect (C)	Description of the impact of the proposed development / activity on the environmental parameter being assessed when added to other existing or potential impacts.	2	1
Magnitude or Intensity (M)	Description of the severity of the proposed development / activity.	2	1
Environmental Significance Points	Description of the importance of the proposed impact which indicates the Mitigation required	- 22 (low negative)	- 20 (Low negative)
Mitigation Measures	<ul style="list-style-type: none"> <li>Vehicles are to utilise the relevant entrance/exit points of the JMP site.</li> <li>Vehicles should avoid travel routes that may pass through residential areas. Only the planned access routes should be used. No new access routes should be created without the necessary approvals.</li> <li>Mitigation measures identified in the traffic impact assessment should be implemented where relevant.</li> <li>It must be ensured that there is sufficient space on site for vehicles and, as such, delivery vehicles should not obstruct the access roads.</li> <li>It must be ensured that the access road is in good condition and that all forms of damage are reported to the local authority.</li> <li>A traffic safety officer should be nominated to make all the necessary arrangements to maintain the required traffic measures for the duration of the facility.</li> <li>During periods of high traffic entering and exiting the site, it is recommended that flagmen should help direct the traffic. This will enable the safe movement of facility and public traffic at the entrance and reduce the number of potential conflicts.</li> <li>Recommendations made in the Traffic Impact Assessment must be implemented such as;</li> </ul>		



	<ul style="list-style-type: none"> <li>• Provide an exclusive slip lane on the Eastern approach, especially along Eglin Street.</li> <li>• Provide two right turning lanes on the Southern approach.</li> <li>• Change the control of the intersection to a traffic signal.</li> </ul>
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### 7.2.8. Waste Impact Assessment

The facility will aim to produce as little waste as possible, however wastes produced as a result of operations at the facility are unavoidable. In order to reduce the impact of waste, various mitigation measures may be employed depending on the type of produced waste. Waste produced by the site may include general and hazardous waste as well as effluent.

General waste should be separated into recyclable and non-recyclable waste in order to reduce solid waste entering the landfills.

Effluent is a result of the solution produced in the scrubber. Gaseous emissions produced from the refining processes including NO<sub>2</sub>, and nitric oxide, will be scrubbed in a caustic soda (sodium hydroxide) scrubber before being released into atmosphere. The resultant scrubber solution is neutralised to a pH of 7 before being disposed using the services of an approved waste collector. Effluent generated from the refining activities will be treated and the remaining sludge and filter cake sent for further refining by other refiners.

Particulate matter (PM) as well as slag will be produced as by-products. These are considered valuable products and will be sent to a third-party company for further processing and refining.

Potentially hazardous wastes not being further refined need to be collected by registered hazardous waste collectors and disposed of at the appropriate landfill. All wastes need to be stored in the correct manner and labelled appropriately.

The following potential impacts have been identified during the operational phase:

- General solid waste (disposed)
- Hazardous waste (disposed / further refined)
- Effluent (disposed – neutralised prior to disposal)

**Table 7-13.** Operation Phase: Waste production.

IMPACT RATING TABLE FORMAT			
Item	Description	Pre-mitigation impact rating	Post mitigation impact rating
Environmental Parameter	Production of waste as a result of operational activities of the proposed facility.		
Potential Impacts	<ul style="list-style-type: none"> <li>• Solid general waste resulting from operational phase (including office and kitchen wastes)</li> <li>• Hazardous wastes</li> <li>• Effluent</li> </ul>		
Extent (E)	Description of the area over which the proposed impact will be experienced.	2	2
Probability (P)	Description of the likelihood/degree of certainty of the proposed impact occurring.	5	5
Reversibility (R)	Description of the degree to which the proposed impact can be reversed upon completion of the proposed development / activity.	1	1
Loss of Resources (L)	Description of the degree to which a given resource will be lost as a result of the proposed development / activity.	2	2
Duration (D)	Description of the time frame for which the proposed impact will be experience	5	5

Cumulative Effect (C)	Description of the impact of the proposed development / activity on the environmental parameter being assessed when added to other existing or potential impacts.	4	2
Magnitude or Intensity (M)	Description of the severity of the proposed development / activity.	4	2
Environmental Significance Points	Description of the importance of the proposed impact which indicates the Mitigation required	- 76 (medium negative)	- 34 (medium negative)
Mitigation Measures	<ul style="list-style-type: none"> <li>o Appropriately labelled waste receptacles should be available throughout the site.</li> <li>o General waste should be separated into recyclable and non-recyclable waste in order to reduce solid waste entering the landfills.</li> <li>o Non-hazardous solid waste generated from the normal operation of the site should be disposed of in the correct manner at a registered general waste disposal site. Such waste can be collected by the Municipality as part of its regular service or removed by a reputable contractor.</li> <li>o Recycling of general waste should be encouraged with the use of appropriately labelled recycling receptacles according to waste types in terms of Section 26 of the NEM: WA</li> <li>o Solid waste deemed to be contaminated and non-recyclable must be stored and handled in accordance with appropriate regulations. Any removed waste should be transported to an appropriate hazardous waste disposal facility.</li> <li>o All material used for the mopping up of surface spillages should be stored in a container labelled "used material" and removed on a regular basis an approved hazardous waste disposal contractor.</li> <li>o Waste collected by the baghouses must be regarded as hazardous and where it is not refined further, it must be collected by a registered waste collector and disposed of at an appropriate waste disposal site.</li> <li>o Effluent is to be treated as per the SOPs and removed by approved waste contractors.</li> </ul>		

### 7.2.9. Socio-economic Impact Assessment

The current socio-economic environment in the area is that of heavy to light industrial (including the ORTIA) and commercial/retail activities within Kempton Park, CoE. The CoE is generally a highly urbanised municipality with 99.4% of the population residing in urbanised areas (including informal settlements) with approximately 1.6 million economically active individuals and an unemployment rate of 28.8%. (Stats SA 2011 census). The study area is surrounded by the residential areas of Bonaero Park and Kempton Park with a low to medium income generation capacity.

As previously indicated, the GIDZ falls under the Aerotropolis Master plan developed by the host CoE and is part of the South African Special, Economic and Industrial Development Zones (SEZs) which further form part of the SIPs. The SEZ Programme, which was mandated by the SEZ Act, proclaimed on the 9<sup>th</sup> of February 2016, is one of the critical tools for accelerating the country's industrial development agenda.

The OR Tambo IDZ JMP project will consist of several industry-specific entities which will occupy the facilities in the precinct. In order to achieve the objectives of the project and those of the broader plans, the GIDZ has strategically identified MetCon to be one of the occupants within the precinct.

It is expected that MetCon will provide permanent employment to approximately 80 employees during the operational phase, with up to 500 temporary employees and contractors utilized during the construction phase. These employees will be dependent on the facility for their livelihoods and supporting their respective families. The refinery will in turn be supportive of other companies and organisations through the supply chain and will thus contribute to the local and national economies apart from assisting the GIDZ with achieving their objectives.

As the overall socio-economic impact is generally positive in nature, no mitigation of the impacts is required.

**Table 7-14. Socio-economic impacts.**

IMPACT RATING TABLE FORMAT			
Item	Description	Pre-mitigation impact rating	Post mitigation impact rating
Environmental Parameter	Socio-economic aspects affected by the proposed facility.		
Potential Impacts	<ul style="list-style-type: none"> <li>• Creation of temporary employment during construction and decommissioning phases.</li> <li>• Creation of temporary employment for specialists and contractors through all phases of the project.</li> <li>• Creation of approximately 80 permanent employment positions during the operation phase of the project.</li> <li>• Contributions to the local and national economy through the supply chain.</li> </ul>		
Extent (E)	Description of the area over which the proposed impact will be experienced.	5	N/A
Probability (P)	Description of the likelihood/degree of certainty of the proposed impact occurring.	4	N/A
Reversibility (R)	Description of the degree to which the proposed impact can be reversed upon completion of the proposed development / activity.	1	N/A
Loss of Resources (L)	Description of the degree to which a given resource will be lost as a result of the proposed development / activity.	1	N/A
Duration (D)	Description of the time frame for which the proposed impact will be experienced	4	N/A
Cumulative Effect (C)	Description of the impact of the proposed development / activity on the environmental parameter being assessed when added to other existing or potential impacts.	2	N/A
Magnitude or Intensity (M)	Description of the severity of the proposed development / activity.	4	N/A
Environmental Significance Points	Description of the importance of the proposed impact which indicates the Mitigation required	+ 68 (medium positive)	N/A
Mitigation Measures	<ul style="list-style-type: none"> <li>○ As the impacts are positive in nature, no mitigation is required.</li> </ul>		

### 7.2.10. Resource usage

The MetCon facility will utilise a number of available resources including electricity, LPG gas and water supply. The various equipment on site require electricity to operate, including the furnace for the jewellery sweep roasting. In addition to electricity, an LPG gas-fired furnace will be operated at the MetCon facility. Water will be utilised in some of the processes, as well as for general domestic usage (such as sanitary facilities and potable water). The utilisation of resources may be seen as a cumulative impact particularly on non-renewable resources. In order to reduce the impact on resources, the MetCon facility will utilise the latest technology (more energy efficient) for their equipment and lighting. Furthermore, rainwater harvesting is planned for use in irrigation.

**Table 7-15. Operational Phase: Resource usage.**

IMPACT RATING TABLE FORMAT			
Item	Description	Pre-mitigation impact rating	Post mitigation impact rating
Environmental Parameter	Utilisation of resources by the proposed facility.		
Potential Impacts	<ul style="list-style-type: none"> <li>• Energy usage.</li> <li>• Water usage.</li> <li>• Other non-renewable resource usage.</li> </ul>		
Extent (E)	Description of the area over which the proposed impact will be experienced.	4	4

Probability (P)	Description of the likelihood/degree of certainty of the proposed impact occurring.	4	2
Reversibility (R)	Description of the degree to which the proposed impact can be reversed upon completion of the proposed development / activity.	2	1
Loss of Resources (L)	Description of the degree to which a given resource will be lost as a result of the proposed development / activity.	3	2
Duration (D)	Description of the time frame for which the proposed impact will be experience	4	4
Cumulative Effect (C)	Description of the impact of the proposed development / activity on the environmental parameter being assessed when added to other existing or potential impacts.	3	2
Magnitude or Intensity (M)	Description of the severity of the proposed development / activity.	3	2
Environmental Significance Points	Description of the importance of the proposed impact which indicates the Mitigation required	- 60 (medium neg)	-30 (low neg)
Mitigation Measures	MetCon should consider implementing the following at their site <ul style="list-style-type: none"> <li>o Energy efficient equipment</li> <li>o Energy efficient lighting</li> <li>o Lighting linked to motion sensors</li> <li>o Solar energy where possible</li> <li>o Rainwater harvesting</li> <li>o Grey water recycling.</li> <li>o Water leak detection sensors</li> </ul>		

### 7.3. Environmental Management Programme (EMPr)

An EMPr was submitted as part of the initial Impact Assessment (Basic Assessment) process for the development of the JMP and was authorised in the issued EA by GDARD in 2011. As such, the initially authorised EMPr (**Appendix 8B**), containing mitigation recommendations of possible environmental impacts during pre-construction and construction of all facilities within the JMP, must be complied with by the Applicant, contractors, sub-contractors, and all other responsible stakeholders during the construction of the MetCon facility.

A Draft Environmental Management Programmes (DEMP), included in **Appendix 13**, has been compiled to provide recommendations and guidelines according to which compliance and monitoring can be done during the operational and decommissioning phases of the MetCon facility, as well as to ensure that all relevant factors are considered to ensure an environmentally responsible development. In addition, it considers and incorporates all conditions and recommendations that were included in the original EA and its reports, as well as those received from the Authorities, Specialists, and relevant organisations during the current EIA process for the inclusion of the MetCon facility and is in line with Appendix 4 of the 2014 EIA Regulations (as amended).

## 8. PUBLIC PARTICIPATION PROCESS

The Public Participation Process (PPP) for this EIA process is governed by the principles set out in Chapter 6 of the 2014 EIA Regulations (as amended). The public participation process is based on two primary factors; firstly, ongoing interaction with the environmental specialists and the technical teams to achieve integration of technical assessment and public participation throughout. Secondly, to obtain the bulk of the issues to be addressed and provide environmental and technical evaluation of these issues. Findings are presented to stakeholders, giving them the opportunity to give further comments and verify all captured comments.

Inputs into the public participation process by members of the public and stakeholders can be given at two (2) stages of the EIA process, open for thirty (30) days each. The two (2) stages of the PPP are conducted during the Scoping phase and the EIA phase of the EIA process, respectively. This EIA process is currently in the EIA phase, the final stage for Interested and Affected Parties (I&APs) to forward relevant comments regarding the project. Additional registration as an I&AP for the project can take place at any time during this phase before the Final Environmental Impact Assessment report (FEIAR) is submitted to the decision-making authority, the DEA. The comment periods during the EIA Phase are as follows:

- Four (4) Calendar weeks, but also as and when an I&AP registers; and
- Comment period for the DEIAR: Four (4) Calendar weeks (30 days).

The following actions will be taken upon receiving comments/queries/issues:

- The contact details provided will be entered into the project database for use in future notifications.
- Confirmation receipts will be sent to those submitting comments.
- Comments will be addressed in the Comments & Response Report (C&RR).

### **8.1. Objectives of the Public Participation Process**

An understanding of what public participation is, and is what it is not, needs to be explored and must be clarified.

Public Participation is:

- A communication mechanism to inform I&APs regarding a proposed project; and
- A communication mechanism to record comments and/or concerns raised during the relevant phases of the EIA process by I&APs regarding a proposed project.

What Public Participation is not:

- A marketing exercise;
- A process to address grievances but rather to record comments and/or issues/concerns raised; and
- One-on-one consultation with each I&AP during the EIA process (not relevant to possibly affected landowners identified).

The primary aims of the PPP are:

- To inform I&APs and key stakeholders of the proposed development;
- To initiate meaningful and timeous participation of I&APs;
- To identify issues and concerns of key stakeholders and I&APs with regards to the proposed development;
- To promote transparency and an understanding of the proposed project and its potential environmental impacts;
- To provide information used for decision-making;
- To provide a structure for liaison and communication with I&APs and key stakeholders;
- To assist in identifying potential environmental impacts associated with the proposed development;
- To ensure inclusivity (the views, needs, interests and values of I&APs must be considered in the decision-making process);
- To focus on issues relevant to the project and issues considered important by I&APs and key stakeholders;
- To provide responses to I&AP queries and
- To encourage co-regulation, shared responsibility and a sense of ownership.

In addition to the guidance of the PPP in the 2014 EIA Regulations (as amended), every effort was also made to conform to the requirements of the Promotion of Administrative Justice Act 2000 (Act No. 3 of 2000).

## **8.2. Public Participation to date**

PPP during the Scoping phase was initiated in September 2018 and included the placement of printed site notices (**Appendix 7A**), newspaper adverts (local/regional) (**Appendix 7B**), distribution of Background Information Documents (BIDs), distribution of the Draft Scoping Report (DSR) to the local Bonaero Park Public Library, Focus Group Meetings (FGMs) with stakeholders, surrounding landowners (LOs) and relevant Organs of State (OoS), as well as a public meeting with all I&APs at the Bonaero Park residential area.

The DSR was released on the 18<sup>th</sup> of September 2018 for a thirty (30)-day public review and comment period. Notifications were sent to all registered I&APs, stakeholders, LOs and OoS/Authorities informing them of the availability of the DSR and their opportunity to comment. Please refer to **Appendix 7C** for the full stakeholder database list.

It is required that this Draft EIA Report go through a similar PPP as per section 23(1)(a) of the EIA Regulations, as amended. Notifications of commencement of the PPP have been sent to all existing I&APs.

The stages that typically form part of the public participation process during the Scoping and EIA phases respectively are reflected in the figure below.

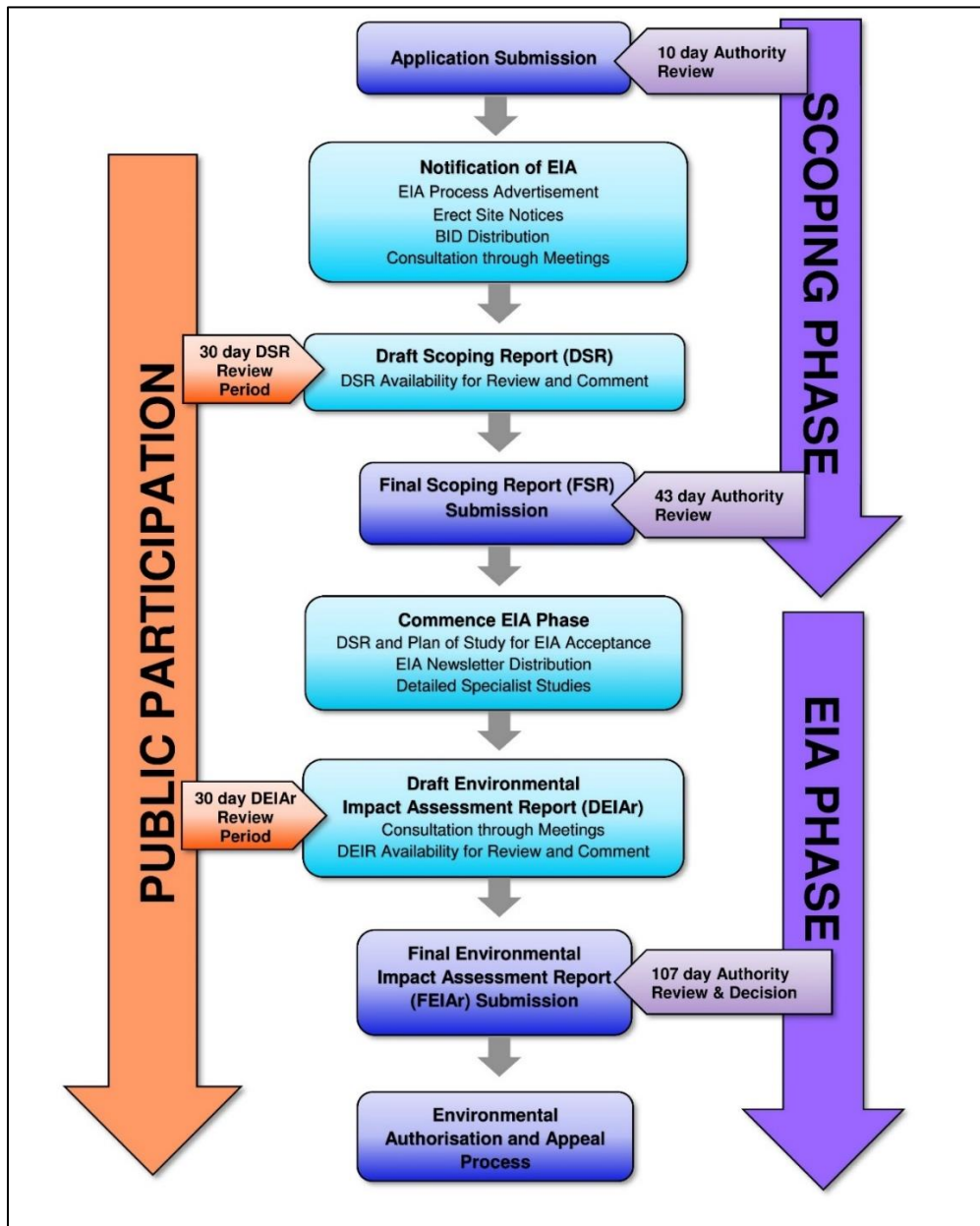


Figure 8-1: Typical EIA process

### 8.3. Consultation and Public Involvement

Relevant issues to be incorporated in the FEIAR will be identified and confirmed through a consultation process. Telephonic discussions and one-on-one consultation will be undertaken where relevant. Meetings with the public, landowners and authorities will take place prior to the submission of the FEIAR in order to identify key issues, needs and priorities for input into the proposed project. Special attention will be paid to the consultation with possibly affected landowners and communities within the study area to try and address their main concerns.

One Public Meeting and two FGMs will be undertaken during the EIA Phase if required. During the review period of the Draft Environmental Impact Assessment Report (DEIAR), meetings will be undertaken to present the proposed development to the public and solicit comments. The PPP will come to a close for the

proposed development when the decision on EA is received and is made available to the public. All registered I&APs will be notified of the EA and appeal process.

#### **8.4. Stakeholders and I&APs**

In order to identify additional potential I&APs, the following mediums were used:

- print media – EIA process advertisements (Proof is included in **Appendix 7B**);
- site notices throughout the study area (Proofs included in **Appendix 7A**);
- referrals; and
- requesting databases and/or contact information from NGOs / CBOs and other organisations

Consultations were made with individuals, businesses, institutions and organisations, and the following sectors of society have been identified and were afforded the opportunity to comment (the full stakeholder database list is included in **Appendix 7C**):

- National Authorities;
- Provincial Authorities;
- City of Ekurhuleni;
- Government Structures such as SAHRA, SANBI, SANRAL, Eskom Telkom, etc.;
- Regional and local media (advertisements and public documents e.g. BID);
- Business and commerce;
- Schools;
- Department of Environmental Affairs: Biodiversity Section;
- Department of Water and Sanitation (DWS);
- Gauteng Industrial Development Zone (GIDZ);
- Gauteng Infrastructure Financing Agency (GIFA);
- Gauteng Growth and Development Agency (GGDA);
- Gauteng Province Economic Development (GDED);
- Community representatives such as Ward Councillors;
- Landowners;
- Airports Company South Africa (ACSA);
- South African Civil Aviation Authority (SACAA); and
- Air Traffic and Navigation Services (ATNS).

The I&AP database is a working database that allows potential I&APs to be added/removed throughout the EIA phase process.

#### **8.5. Notification and Announcement of the Opportunity to Participate**

Opportunities for participation for I&APs, stakeholders and LOs during the EIA phase are as follows:

- PPP invitation notifications to newly identified and already identified I&APs, stakeholders, LOs and OoS/Authorities during the EIA phase – via email, telephone, fax, etc. (**Appendix 7D**);
- Placement of Site Notices (**Appendix 7A**);
- Correspondence through Ward 23 Councillor (Mr. Andre du Plessis);
- Public Meeting and FGM email invitations;
- One (1) Public Meeting; and
- Up to two (2) Focus Group Meetings.

Notifications will be sent to all registered I&APs, stakeholders, LOs and OoS/Authorities regarding the open, and close of the PPP processes as well as five (5) days before PPP closing date as a reminder to comment.



Also, notification invitations with dates and venues for FGMs and public meetings will be sent to all relevant I&APs.

## **8.6. Summary of Relevant Issues to Date**

**Table 8-1** below contains a summary of all received relevant issues raised by various I&APS, including stakeholders and authorities during the scoping phase, and a description of how these have been addressed so far. The scoping Comments and Response Report (C&RR) details all issues, comments and concerns raised during the scoping phase and can be read in the scoping report as **Appendix 7E** of that report. Copies of all correspondence and comments received during the EIA process will be included in the C&RR for the EIA phase in the FEIAr.

**Table 8-1:** Summary of relevant main comments to date.

Issue	I&AP / Stakeholder Who Raised Comment	Response/ How it has been addressed
<b>Stormwater Management</b>	<ul style="list-style-type: none"> <li>● <b>Tendani Rambuda:</b> Control Environmental Officer: Impact Management. (GDARD).</li> <li>● <b>Andre du Plessis:</b> Ward 23 Councillor (CoE).</li> <li>● <b>Puleng Makhetha:</b> Junior Airport Planner Corporate Office (ACSA).</li> <li>● <b>Sifiso Ndwandwe:</b> Environmental Legal Admin; Legislative Compliance Department of Environmental Resource and Waste Management (CoE).</li> </ul>	<ul style="list-style-type: none"> <li>● A Stormwater Management Plan (SWMP) for the JMP site was approved by the CoE on the 30<sup>th</sup> June 2015 (Approval letter included in <b>Appendix 12B</b>).</li> <li>● The construction of all JMP facilities, including the proposed MetCon facility, are required to comply with the approved SWMP (report included in <b>Appendix 11</b>).</li> </ul>
<b>Air Quality</b>	<ul style="list-style-type: none"> <li>● <b>Malcolm Moore</b> Group Project &amp; Risk Manager In2Food Group (Pty) Ltd.</li> <li>● <b>Andre du Plessis</b> Ward 23 Councillor: City of Ekurhuleni (CoE).</li> <li>● <b>Kirstin Otten</b> Director: Mills &amp; Otten Environmental Consultants.</li> <li>● <b>Anel Hietbrink &amp; Sifiso Ndwandwe</b> Office of HOD: Environmental Resource and Waste Management (CoE).</li> </ul>	<ul style="list-style-type: none"> <li>● The nearest air quality monitoring station to the project site is located at OR Tambo International Airport, however, this station has not been operational and air quality monitoring data could not be obtained. The next closest station to the project site is located in Bedfordview. Even though this station is located further away, data from this station can still be used to provide as an indicator of background air pollutant concentrations due to the similar nature in surrounding emission sources.</li> <li>● In the AQIA report, air quality data used was from the Bedfordview air quality monitoring station. There was inadequate data from the station to present background concentrations for PM10, benzene and CO concentrations at the study site. However, there was background data available for PM2.5, SO2, NO2 and O3.</li> <li>● International Standards have been incorporated and compared to the proposed project in the AQIA report (<b>Appendix 6F</b>).</li> <li>● An Atmospheric Emissions Licence (AEL) application will be lodged with the CoE after this EIA process is complete and an EA has been issued by the DEA.</li> </ul>
<b>Sewage</b>	<ul style="list-style-type: none"> <li>● <b>Andre du Plessis</b> Ward 23 Councillor: City of Ekurhuleni (CoE).</li> </ul>	<ul style="list-style-type: none"> <li>● An application for approval for the JMP sewage system to connect to the existing CoE sewage line was lodged and approved by the CoE (<b>Appendix 15A</b>).</li> </ul>
<b>Traffic</b>	<ul style="list-style-type: none"> <li>● <b>Robert January</b> Attorney representing Owners of Portion 30 of the Farm Witkoppie No. 64-IR (Ansha 2 Trust) Glyn Marais Incorporated.</li> <li>● <b>Kirstin Otten</b> Director: Mills &amp; Otten Environmental Consultants.</li> <li>● <b>Tendani Rambuda:</b> Control Environmental Officer: Impact Management (GDARD).</li> <li>● <b>Puleng Makhetha</b> Junior Airports Planner Corporate Office Airports Company South Africa (ACSA)</li> </ul>	<ul style="list-style-type: none"> <li>● A traffic impact study with recommendations was submitted to the CoE on the 27<sup>th</sup> of May 2015 (<b>Appendix 9C</b>).</li> <li>● A letter of response from CoE was received on the 08<sup>th</sup> of July 2015, outlining the road upgrades and <u>accepting</u> the development with “no objection” (<b>Appendix 12B</b>).</li> <li>● Access roads into the MetCon facility will be in-line with the CoE recommendations and as per accepted Traffic Study (<b>Appendix 9C</b>).</li> </ul>
<b>Wetland</b>	<ul style="list-style-type: none"> <li>● <b>Anel Hietbrink &amp; Sifiso Ndwandwe</b> Office of HOD: Environmental Resource and Waste Management (CoE).</li> </ul>	<ul style="list-style-type: none"> <li>● The wetland within the development site is the attenuation pond/ dam on the south-western boundary of the site. It should be noted that this does not require any authorisations. However, a General Authorisation (GA) application has been lodged with the DWS by an appointed water Specialist. (<b>Appendix 12E</b>).</li> </ul>

<p><b>Zoning</b></p>	<ul style="list-style-type: none"> <li>• <b>Malcolm Moore</b> Group Project &amp; Risk Manager In2Food Group (Pty) Ltd.</li> <li>• <b>Robert January</b> Attorney representing Owners of Portion 30 of the Farm Witkoppie No. 64-IR (Ansha 2 Trust) Glyn Marais Incorporated.</li> <li>• <b>Kirstin Otten</b> Director: Mills &amp; Otten Environmental Consultants.</li> <li>• <b>Anel Hietbrink &amp; Sifiso Ndwandwe</b> Office of HOD: Environmental Resource and Waste Management (CoE).</li> </ul>	<ul style="list-style-type: none"> <li>• Correspondence with the CoE has confirmed that the site is located in Portion 282 of the Farm Witkoppie 64-IR. This has been rectified in this report (<b>Appendix 12B</b>).</li> <li>• A meeting was held with the CoE on the 27th of November 2008 to discuss the attainment of development rights for the establishment of the JMP on the 7-hectare ACSA site. Conclusion number 3 of the response letter from CoE (<b>Appendix 12B</b>) states that;  <i>The process required to attain the necessary rights on the site for the establishment of the JMP is the <b>submission of a Site Development Plan</b> for approval of the local authority.</i></li> <li>• The <u>Site Development Plan (SDP) was then submitted and approved</u> by the CoE (<b>Appendix 12B</b>). However, the response letter from CoE in this regard, further states that <b>it is the responsibility of ACSA</b>, as the landowner to instigate the re-zoning application.</li> <li>• It must further be noted, however, that this is not an environmental impact assessment issue and will be dealt with by the relevant authorities.</li> </ul>
<p><b>Waste</b></p>	<ul style="list-style-type: none"> <li>• <b>Tendani Rambuda:</b> Control Environmental Officer: Impact Management (GDARD).</li> <li>• <b>Sifiso Ndwandwe &amp; Anel Hietbrink</b> Office of HOD: Environmental Resource and Waste Management (CoE).</li> <li>• <b>Kirstin Otten</b> Director: Mills &amp; Otten Environmental Consultants.</li> </ul>	<ul style="list-style-type: none"> <li>• Waste management during construction is extensively covered by the BA report and initial EMPr (<b>Appendix 8A</b>). Additionally, this report and the DEMPr (<b>Appendix 13</b>) contains waste management and reporting recommendations.</li> <li>• MetCon plans to recover precious metals from all generated solid waste material with residues sent to a third-party company for further refining. Wastewater will be neutralised to pH levels of about 7 prior to being collected by an authorised waste collector for disposal.</li> </ul>
<p><b>Noise</b></p>	<ul style="list-style-type: none"> <li>• <b>Puleng Makhetha</b> Junior Airports Planner Corporate Office Airports Company South Africa (ACSA)</li> </ul>	<ul style="list-style-type: none"> <li>• The airport noise contours, together with the “SANS 10103: measurement and rating of environmental noise with respect to land use, health, annoyance and to speech communication” has been used as a guide to ensure that suitable placement of land uses within the airport noise contours.</li> <li>• As such, potential noise levels for the MetCon facility are expected to have significantly lower noise impact than currently imposed by the ORTIA. Please refer to Section 7.2 of this report.</li> </ul>
<p><b>Energy and Resource</b></p>	<ul style="list-style-type: none"> <li>• <b>Tendani Rambuda:</b> Control Environmental Officer: Impact Management (GDARD).</li> </ul>	<ul style="list-style-type: none"> <li>• Comment acknowledged. However, the following has been planned for the site: <ul style="list-style-type: none"> <li>○ relating to storm water management (<b>Appendix 11</b>). These include: <ul style="list-style-type: none"> <li>- attenuation up to a 1 in 2-year storm event;</li> <li>- Installation of rain water tanks, where feasible;</li> <li>- Harvesting of water for irrigation; and</li> <li>- Permeable paving in the areas which do not attract heavy traffic.</li> </ul> </li> </ul> </li> <li>• relating to energy saving technologies: MetCon facility will consider using and implementing these for their facility.</li> </ul>

<b>ATNS &amp; SACAA Building Requirements</b>	<ul style="list-style-type: none"> <li>• <b>Lizelle Stroh:</b> Obstacle Inspector, PANS-OPS Section, Air Navigation Services Department (SACAA).</li> <li>• <b>Puleng Makhetha</b> Junior Airports Planner Corporate Office Airports Company South Africa (ACSA)</li> <li>• <b>Simphiwe Masilela</b> Obstacle Evaluator Air Traffic Navigation Services (ATNS)</li> </ul>	<ul style="list-style-type: none"> <li>• While it should be noted that the heights of the planned MetCon facility should not be exceed 12 m, the comments were forwarded to the client for consideration. In addition, the client was informed about the SACAA/ ATNS application and evaluation processes which needs to be undertaken. These will be undertaken by the client in due course.</li> </ul>
<b>Health</b>	<ul style="list-style-type: none"> <li>• <b>Malcolm Moore</b> Group Project &amp; Risk Manager In2Food Group (Pty) Ltd.</li> <li>• <b>Sala Edwards</b> Resident of Bonaero Park</li> </ul>	<ul style="list-style-type: none"> <li>• MetCon con only comply to the legislative thresholds and requirements for the nature of the site and as directed by the conditions in all acquired authorisations and licenses from the relevant authorities.</li> <li>• MetCon will not use cyanide in the processes.</li> </ul>
<b>Security</b>	<ul style="list-style-type: none"> <li>• <b>Malcolm Moore</b> Group Project &amp; Risk Manager In2Food Group (Pty) Ltd.</li> </ul>	<ul style="list-style-type: none"> <li>• While it should be noted that this is note an environmental impact assessment issue, comment has been forwarded to the GIDZ. They have mentioned that a solid wall has been planned to be built between the two (2) JMP sites.</li> </ul>
<b>Socio-Economic</b>	<ul style="list-style-type: none"> <li>• <b>Kirstin Otten</b> Director: Mills &amp; Otten Environmental Consultants.</li> </ul>	<ul style="list-style-type: none"> <li>• In terms of the proposed MetCon facility, it is envisaged that the new facility will have approximately 85 employees during the operational phase. In addition, it is anticipated that approximately 500 – 650 employees will be present throughout the construction phase at any given time.</li> </ul>

## 8.7. Proof of Notification

**Appendix 7** includes all proof of notification of I&APs. All proof of notification of I&APs will further be recorded and incorporated in the FEIAR. Proof of notification includes:

- Site notice text (**Appendix 7A**);
- Photographs of site notices (**Appendix 7A**);
- Proof of advertisements in the newspapers (**Appendix 7B**);
- Correspondence to registered I&APs and key stakeholders (**Appendix 7D**).

## 8.8. Focus Group Meetings (FGMs)

Focus Group Meetings (FGMs) are smaller meetings with specific groups or organisations who have similar interests in or concerns about the project.

It should be noted that up to two (2) Focus Group Meetings (FGMs) will be held during the EIA phase comment period should they be required. This will include an Authority FGM, as well as a Landowner and Stakeholder FGM which will include affected and/or surrounding landowners and stakeholders (such as the other tenants of the JMP). Affected landowners and stakeholders and authorities will be invited to the respective FGMs via e-mail.

The primary aim of these meetings is to:

- disseminate information regarding the proposed development to I&APs;
- provide I&APs with an opportunity to interact with the EIA team and the GIDZ representatives present;
- supply more information regarding the EIA process;
- answer questions regarding the project and the EIA process;
- receive input regarding the public participation process and the proposed development.

Meeting minutes will be compiled, circulated to I&APs, and will be included in the FEIAR.

## 8.9. Public Meeting

A Public Meeting will be held during the EIA phase comment period. The aim of the meeting is to provide I&APs and members of the local community with information regarding the environmental impact of the proposed development, present the response to received comments to date and invite I&APs and members of the local community to raise any further comments and/or concerns that they may have.

Invitation letters will be sent via e-mail to all registered I&APs and stakeholders on the project's database.

Meeting minutes will be compiled, circulated to I&APs, and will be included in the FEIAR.

## 8.10. Comments and Response Report (C&RR)

The Comments and Response Report (C&RR) will document all issues, comments and concerns raised during the EIA public participation process. This report will be included in the FEIAR. The C&RR will provide a summary of the issues raised, as well as responses which were provided to all I&APs. All received comments and information will be incorporated into the evaluation of relevant impacts in the FEIAR.

### **8.11. Authority Review of the Draft Environmental Impact Assessment Report (DEIAR)**

In terms of section 40 (2) of the 2014 EIA Regulations (as amended), under Government Notices No R. 326, public participation must include consultation with “*all organs of state which have jurisdiction in respect of the activity to which the application relates*”.

**Table 8-2** below includes all the organs of state/Authorities who were notified of the availability of the DEIAR and e-mailed links to download electronic copies of the DEIAR (including all appendices). It should be noted that these OoS/Authorities are also afforded the opportunity to request hard copies of the DEIAR (including all appendices).

**Table 8-2.** Authorities follow-up consultation.

DISTRIBUTION TO ORGANS OF STATE/AUTHORITIES FOR COMMENT				
Name	Surname	Company/Department	Position	Email Address
<b>CITY OF EKURHULENI (COE)</b>				
André	Du Plessis	City of Ekurhuleni (CoE)	DA Ward Councillor: Ward 23	<a href="mailto:Andre.DuPlessis@ekurhuleni.gov.za">Andre.DuPlessis@ekurhuleni.gov.za</a>
Tracey	Bulter	City of Ekurhuleni (CoE)	DA Ward Councillor: Ward 17	<a href="mailto:starr@polka.co.za">starr@polka.co.za</a>
Flip	Visser	City of Ekurhuleni (CoE)	Air Quality Official	<a href="mailto:flip.visser@ekurhuleni.gov.za">flip.visser@ekurhuleni.gov.za</a>
Immanuel	Joemath	City of Ekurhuleni (CoE)	Environmental Health Practitioner	<a href="mailto:Immanuel.joemath@ekurhuleni.gov.za">Immanuel.joemath@ekurhuleni.gov.za</a>
Sifiso	Ndwandwe	City of Ekurhuleni (CoE)	Legislative Compliance: Environmental Resource and Waste Management Department	<a href="mailto:Sifiso.Ndwandwe@ekurhuleni.gov.za">Sifiso.Ndwandwe@ekurhuleni.gov.za</a>
Gerard	MacCarron	City of Ekurhuleni (CoE)	Environmental Assessment Practitioner (EAP)	<a href="mailto:Gerard.MacCarron@ekurhuleni.gov.za">Gerard.MacCarron@ekurhuleni.gov.za</a>
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## 9. RECOMMENDATIONS AND CONCLUSIONS

### 9.1. Summary of Findings and Recommendations

A summary of the findings and recommendations for each specialist review and/or assessment undertaken as part of this EIA process is provided in **Table 9-1** below.

**Table 9-1.** Summary of Findings and Recommendations.

Aspect	Fatal flaws	Outcomes & Recommendations
Surface Water	None	<ul style="list-style-type: none"> <li>• <b><u>Construction Phase Recommendations:</u></b> <ul style="list-style-type: none"> <li>○ Contractor laydown areas and material storage facilities must be placed within the study area and must not be placed within 30m of the wetlands in line with GDARD and NEMA requirements;</li> <li>○ All vehicle re-fuelling is to take place on a sealed surface within the study area and must not be permitted to occur within 30m of the wetlands;</li> <li>○ All development footprint areas to remain as small as possible and vegetation clearing to be limited to what is absolutely essential;</li> <li>○ Retain as much indigenous vegetation as possible;</li> <li>○ Excavated materials should not be contaminated, and it should be ensured that the minimum surface area is taken up, however, the stockpiles may not exceed 2m in height;</li> <li>○ All exposed soils and temporary stockpiles must be protected for the duration of the construction phase in order to prevent erosion and sedimentation of the wetlands; and</li> <li>○ Immediate revegetation of all stockpiles which are to remain on site post-construction.</li> </ul> </li> <li>• <b><u>Operational Phase Recommendations:</u></b> <ul style="list-style-type: none"> <li>○ Clean and dirty water management must take place in order to prevent contaminated runoff from the precious metal refinery facility creating preferential flow paths which may reach the wetlands. Clean and dirty water management systems must be implemented prior to commencement of construction; and</li> <li>○ Suitable waste disposal facilities should be provided. These facilities should regularly be emptied and taken to a registered waste disposal facility; and</li> <li>○ All recyclable waste should be recycled as far as possible.</li> </ul> </li> </ul>
Soil and Land Capability	None	<ul style="list-style-type: none"> <li>○ <b><u>Construction Phase Recommendations:</u></b> <ul style="list-style-type: none"> <li>○ All development footprint areas to remain as small as possible;</li> <li>○ Laydown areas should be located within disturbed soils (anthrosols) to avoid compaction of natural soils;</li> <li>○ All exposed soils and temporary stockpiles must be protected for the duration of the construction phase in order to prevent erosion;</li> <li>○ Stockpile height should not exceed 2 meters</li> <li>○ Vehicle re-fuelling is to take place on a sealed surface within the study area; and</li> </ul> </li> </ul>

Aspect	Fatal flaws	Outcomes & Recommendations
		<ul style="list-style-type: none"> <li>○ Contamination prevention measures should be addressed in the Environmental Management Programme (EMPr) for the proposed development, and this should always be implemented and made available and accessible to the contractors and construction crew conducting the works on site for reference.</li> <li>○ <b><u>Operational Phase Recommendations:</u></b> <ul style="list-style-type: none"> <li>○ All vehicles should remain within demarcated roads as far as practically possible;</li> <li>○ Stormwater management must take place to prevent contaminated runoff from the precious metal refinery facility;</li> <li>○ Waste product should be recycled as best as practically possible to minimise sources of soil contamination; and</li> <li>○ Contamination prevention measures should be addressed in the EMPr for the proposed development, and this should be implemented and made available and accessible at all times to the contractors and construction crew conducting the works on site for reference.</li> </ul> </li> </ul>
Visual	None	<ul style="list-style-type: none"> <li>• <b><u>Construction Phase Recommendations:</u></b> <ul style="list-style-type: none"> <li>○ The development footprint area should remain as small as possible;</li> <li>○ No rubble should be disposed of at random within the site, but within relevant removable bins, where recyclable and non-recyclable waste is kept separate;</li> <li>○ Contractor's laydown areas and temporary storage facilities should be located within the development footprint and cordoned off with shade cloth to conceal and minimise the visual impact;</li> <li>○ Any topsoil stockpiled should either be utilised during landscaping or it should be shaped and rounded to blend in with the surrounding landscape and to minimise visual contrast;</li> <li>○ Vegetation, especially large and tall trees bordering the Bonaero Park residential area south of the PMRF should be retained if feasible;</li> <li>○ It must be ensured that the buildings fit into its surroundings through the appropriate use of colour and material selection. Natural Colours should be used in all instances. Should the stacks comprise metal surfaces, it must be painted in a colour that blends in with the natural environment. White structures are to be avoided;</li> <li>○ A dust management plan must be implemented to reduce dust generation. Such dust control measures may include, but is not limited to; watering of the footprint area and any access roads, speed limits of 20km/h must be adhered to and should it be practical stockpiles should be covered with a tarpaulin on windy days to avoid soil and dust being blown away;</li> <li>○ Construction activities should be restricted to daylight hours as far as possible;</li> <li>○ A lighting engineer may be consulted to assist in the placement of temporary and permanent light fixtures, to reduce the visual impact associated with glare and light trespass; and</li> <li>○ No naked / unshielded light sources are to be used. It is recommended that "full cut-off" light fixtures that direct light only below the horizontal is to be used.</li> </ul> </li> <li>• <b><u>Operational Phase Recommendations:</u></b> <ul style="list-style-type: none"> <li>○ Operational activities of the PMRF and gas emissions at the stacks;</li> <li>○ An increase in vehicular movement and level of human activity in the area due to operational activities;</li> <li>○ Exterior and security lighting around the buildings and parking facilities, possibly contributing to light pollution;</li> <li>○ Potential lighting at night from operational vehicles; and</li> <li>○ Light sources temporarily stationed for maintenance activities conducted at night, in case of emergencies.</li> </ul> </li> </ul>

Aspect	Fatal flaws	Outcomes & Recommendations
		<ul style="list-style-type: none"> <li>○ It is recommended that routine maintenance on buildings and other structures be implemented, to ensure that the paint of buildings are not weathered and that the buildings fit into the colour palette of the surroundings;</li> <li>○ In the event that a green open space is demarcated and landscaped, it must be ensured that the vegetation be maintained and controlled to reduce the risk of potential alien floral species proliferation and to keep it aesthetically appealing to the receiving environment;</li> <li>○ It is recommended that maintenance activities should not take place at night or on weekends, unless absolutely essential;</li> <li>○ Making use of motion detectors on security lighting at buildings and parking facilities, ensures that the site will remain in relative darkness, until lighting is required for security and maintenance purposes;</li> <li>○ No naked / unshielded light sources are to be directly visible from a distance; and</li> <li>○ The PMRF should be screened through the use of a clearVU fence, or equally approved, which will result in a more unified and tidy appearance</li> </ul>
Heritage	None	<p>The following recommendations are made:</p> <ul style="list-style-type: none"> <li>▪ Despite the fact that study area was assessed by way of a detailed investigation of aerial photographs, no evidence for any buildings or heritage sites could be found on any of these old depictions of the study area. Furthermore, the walkthrough also did not reveal any evidence for archaeology or heritage, even though sections of intact soil profiles that were exposed by construction were scrutinised during the walkthrough.</li> </ul>
Air Quality	None	<ul style="list-style-type: none"> <li>○ <b><u>Operational Phase Recommendations:</u></b> <ul style="list-style-type: none"> <li>○ The proposed facility must install abatement equipment (baghouse and scrubber) as per their current design at the existing MetCon Centurion Plant. The abatement equipment must achieve at least 90% control efficiency and must ensure compliance with the minimum emission standards for sub-category 4.17 in terms of S21 of the NEM:AQA listed activities.</li> </ul> </li> </ul> <p>Additional recommendations include:</p> <ul style="list-style-type: none"> <li>○ MetCon must apply for an AEL prior to the commencement of operations. All conditions of the AEL must be complied with.</li> <li>○ Appoint a responsible person, such as an emission control officer or safety, health &amp; environmental manager, to ensure compliance with the AEL.</li> <li>○ Once operational, conduct stack emissions monitoring on all stacks for the relevant listed activity and ensure compliance with the minimum emission standards, with the use of abatement equipment. Ensure that monitoring is undertaken in accordance with nationally or internationally acceptable methods.</li> <li>○ Ensure that all unit processes &amp; apparatus used for undertaking the listed activity in question, and all appliances and mitigation measures for preventing or reducing emissions, are at all times properly maintained and operated.</li> <li>○ Submit an annual AEL report within the required timeframe.</li> <li>○ Submit compliance audit reports annually.</li> <li>○ Once operational, maintain and report monthly to the authority a complaint register. Should a complaint be logged, a report in the required format as per the AEL, should be submitted to the authority.</li> <li>○ Register and report on the NAEIS. Category A (listed activities) are required to report their emissions on the NAEIS annually. The NAEIS is a national emissions inventory.</li> <li>○ Maintenance and pollution prevention plans should be developed for the facility.</li> <li>○ Undertake regular training of all key employees to ensure effective implementation of the AEL requirements, maintenance and pollution prevention plans.</li> </ul>
Noise	None	<p>If only daytime activities are planned, no mitigation measures are recommended.</p> <p>If night-time activities are planned (after 22:00 at night, before 06:00) it is recommended that MetCon:</p>

Aspect	Fatal flaws	Outcomes & Recommendations
		<ul style="list-style-type: none"> <li>▪ measure the typical night-time ambient sound levels in the area prior to the project being developed (over the full night-time period). Once operational, measurements must be repeated to confirm that the implementation of the project did not raise the noise levels with more than 7 dB (Noise Control Regulations) and ideally, does not raise the ambient sound levels with more than 3 dB (International Finance Corporation recommendation).</li> <li>▪ select appropriate noise mitigation measures (to be considered during the planning stage) which may include: <ul style="list-style-type: none"> <li>○ Eliminating the noise source where possible at night;</li> <li>○ The installation of one or more acoustical silencer(s) or enclosures;</li> <li>○ Acoustical treatment of ducts and exhaust stacks;</li> <li>○ A change in equipment, controlling the speed of the fans/blowers;</li> <li>○ Moving the noise source further from the residential area (if possible).</li> </ul> </li> <li>○ <b><u>Operational Phase Recommendations:</u></b> <ul style="list-style-type: none"> <li>○ No additional mitigation required for activities during daytime (06:00 – 22:00) operations.</li> <li>○ If night-time activities are required, MetCon should measure the typical night-time ambient sound levels in the area prior to the project being developed (over the full night-time period). Once operational, measurements must be repeated to confirm that the implementation of the project did not raise the noise levels with more than 7 dB (Noise Control Regulations), ideally, no more than 3 dB (International Finance Corporation recommendation).</li> <li>○ Other measures include: <ul style="list-style-type: none"> <li>- Minimise night-time activities that will require the use of the baghouse stack and blowers at night.</li> <li>- The design of the baghouse stack-exit to ensure a more flared design, or the use of a silencing system at the exit.</li> <li>- Enclose the blowers in a structure to reduce the noise levels from this source.</li> </ul> </li> <li>○ The reduction of the gas exit velocities at night.</li> </ul> </li> </ul>
Traffic	None	<ul style="list-style-type: none"> <li>○ Vehicles are to utilise the relevant entrance/exit points of the JMP site.</li> <li>○ Vehicles should avoid travel routes that may pass through residential areas. Only the planned access routes should be used. No new access routes should be created without the necessary approvals.</li> <li>○ Mitigation measures identified in the traffic impact assessment should be implemented where relevant.</li> <li>○ It must be ensured that there is sufficient space on site for vehicles and, as such, delivery vehicles should not obstruct the access roads.</li> <li>○ It must be ensured that the access road is in good condition and that all forms of damage are reported to the local authority.</li> <li>○ A traffic safety officer should be nominated to make all the necessary arrangements to maintain the required traffic measures for the duration of the facility.</li> <li>○ During periods of high traffic entering and exiting the site, it is recommended that flagmen should help direct the traffic. This will enable the safe movement of facility and public traffic at the entrance and reduce the number of potential conflicts.</li> <li>○ Recommendations made in the Traffic Impact Assessment must be implemented such as; <ul style="list-style-type: none"> <li>• Provide an exclusive slip lane on the Eastern approach, especially along Eglin Street.</li> <li>• Provide two right turning lanes on the Southern approach.</li> <li>• Change the control of the intersection to a traffic signal.</li> </ul> </li> </ul>
Waste	None	<ul style="list-style-type: none"> <li>○ Appropriately labelled waste receptacles should be available throughout the site.</li> <li>○ Non-hazardous solid waste generated from the normal operation of the site should be disposed of in the correct manner at a registered general waste disposal site. Such waste can be collected by the Municipality as part of its regular service or removed by a reputable contractor.</li> </ul>

Aspect	Fatal flaws	Outcomes & Recommendations
		<ul style="list-style-type: none"> <li>o Recycling of general waste should be encouraged with the use of appropriately labelled recycling receptacles according to waste types in terms of Section 26 of the NEM: WA</li> <li>o Solid waste deemed to be contaminated and non-recyclable must be stored and handled in accordance with appropriate regulations. Any removed waste should be transported to an appropriate hazardous waste disposal facility.</li> <li>o All material used for the mopping up of surface spillages should be stored in a container labelled “used material” and removed on a regular basis an approved hazardous waste disposal contractor.</li> <li>o Waste collected by the baghouses must be regarded as hazardous and where it is not refined further, it must be collected by a registered waste collector and disposed of at an appropriate waste disposal site.</li> <li>o Effluent is to be treated as per the SOPs and removed by approved waste contractors.</li> </ul>
Socio-Economic	None	<ul style="list-style-type: none"> <li>o As the impacts are positive in nature, no mitigation is required.</li> </ul>
Resource Usage	None	<p>MetCon should consider implementing the following at their site</p> <ul style="list-style-type: none"> <li>o Energy efficient equipment</li> <li>o Energy efficient lighting</li> <li>o Lighting linked to motion sensors</li> <li>o Solar energy where possible</li> <li>o Rainwater harvesting</li> <li>o Grey water recycling.</li> <li>o Water leak detection sensors.</li> </ul>

## 9.2. Summary of Conclusions Relating to each Potential Impact

A summary of conclusions in relation to each of the potential impacts, incorporating specialists’ reviews and/or assessments undertaken as part of this EIA process and all site and project historical information and documentation, is provided in **Table 9-2** below.

**Table 9-2:** Conclusions Regarding Assessed Environmental Aspects.

Aspect	Construction Impact		Operation Impact		Conclusion
	Pre-mitigation	Post mitigation	Pre-mitigation	Post mitigation	
Surface Water	-11 (low negative)	-8 (Low negative)	- 22 (low negative)	- 9 (Low negative)	From the results of the review, it was determined that the findings of the Basic Assessment Report (BAR) are likely to still hold true but are not absolute. The recommendations presented in the BAR and Environmental Management Programme EMPr are appropriate, relevant/necessary, sensible and achievable; and the proposed mitigatory measures outlined in this report are considered the best options available.

Aspect	Construction Impact		Operation Impact		Conclusion
	Pre-mitigation	Post mitigation	Pre-mitigation	Post mitigation	
					Based on the findings of the impact assessment, the construction and operation of the proposed precious metal refinery facility poses a low significance of impact on the freshwater resources of the area. Due to the distance between the activities and the watercourses in the area, and the presence of existing developments between the study area and watercourses of the area, limited to negligible impact from the proposed activities on the wetlands is expected to occur.
Soil and Land Capability	- 15 (low negative)	- 9 (Low negative)	- 26 (low negative)	- 9 (Low negative)	<p>From the results of the review, it was determined that the findings of the Basic Assessment Report (BAR) are likely to still hold true but are not absolute. The recommendations presented in the BAR and Environmental Management Programme EMPr are appropriate, relevant/necessary, sensible and achievable; and the proposed mitigatory measures outlined in this report are considered the best options available.</p> <p>The study area is located within a highly industrialised and urbanised area with no active agricultural practices within or in the immediate vicinity of the study area. The eastern half of the study area is situated within the Environmental Management Framework (EMF) Zone 5 (Industrial and large commercial focus zone) (EMF, 2015). The proposed facility falls within the EMF Zone 5. In addition, the study area is currently under development and the soils have been anthropogenically transformed, thus these soils are likely to have little to no bearing on agricultural productivity. Thus, from a soil, land use and land capability point of view, the impact significance on the loss of high agricultural potential soils is anticipated to range between very low and negligible. Based on the findings of the impact assessment, the construction and operation of the proposed precious metal refinery facility poses a low significance of impact on soil, land use and land capability.</p>
Visual	- 28 (low negative)	- 10 (Low negative)	- 24 (low negative)	- 9 (Low negative)	<p>It was evident from the review of the Basic Assessment Report (BAR) that very little to no information was presented on visual impacts. However, based on the geographic setting of the proposed MetCon facility, the development is not likely to lead to any change in the visual character and sense of place of the surrounding environment.</p> <p>Both the initial EMPr and the initial EA set conditions to limit the visual impact of the development. Should these conditions be adhered to, the significance of the impact on visual resources and the visual landscape are considered negligible.</p> <p>Since the surrounding area has been subject to development and the proposed facility site is situated within a footprint where buildings are already constructed, the visual character and sense of place of the area will not be significantly negatively affected.</p>

Aspect	Construction Impact		Operation Impact		Conclusion
	Pre-mitigation	Post mitigation	Pre-mitigation	Post mitigation	
					<p>Furthermore, since the proposed development is situated adjacent to the OR Tambo International Airport, none of the buildings are permitted to be higher than two storeys (approximately 12m), therefore the proposed building is congruous with the surrounding existing buildings from the JMP. Based on the findings of the impact assessment, the proposed inclusion of the MetCon facility poses a low significance of impact on the visual character and aesthetics of the area.</p> <p>Additional information from desktop sources with emphasis on climate, topography, land uses and land cover as well as protected areas within a 10km radius from the proposed development was gathered to assist with decision making for additional listed activities for which authorisation may be required.</p>
Heritage	<p>A brief desktop study was undertaken which consisted of an assessment of old aerial photographs. Aerial photographs taken in 1941, 1952, 1969 and 1976 were obtained and included in the study. Neither one of these images depict any buildings or heritage sites within the study area.</p> <p>The fieldwork showed that the study area is almost entirely disturbed and construction on the jewellery precinct is at an advanced stage. As a result, there is no need for a Heritage Impact Assessment on this project.</p>				<p>Due to the fact that no heritage or archaeological resources were identified during the desktop investigation and site walkthrough, no impacts are anticipated from a heritage point of view. As such, the Heritage Specialist did not undertake an impact assessment as part of his review.</p>
Air Quality	N/A		- 23 (low negative)	- 17 (Low negative)	<p>Particulate and gaseous emissions were identified for operations associated with the proposed facility and will be emitted from the following key sources:</p> <ul style="list-style-type: none"> <li>▪ Jewellers secondary gold material incineration in roasting oven;</li> <li>▪ Gas (fuel) combustion installation (roasting oven);</li> <li>▪ Chemical refining process;</li> <li>▪ Melting of material in induction furnaces and adding fluxes; and</li> <li>▪ Casting of material.</li> </ul> <p>The abovementioned activities trigger sub-category 4.17 (precious and base metal production and refining) and 4.2 (combustion installations) in terms of S21 of NEM:AQA (Act No. 39 of 2004). As such, the proposed facility requires an AEL to operate. While there were other identified existing key sources of air pollution surrounding the project site which also need to be taken into account, Marang predicted low unmitigated incremental concentrations. MetCon do plan to install abatement equipment, as per their current design at the MetCon Centurion Plant. Under the mitigated scenario, very low concentrations were observed within 2 km from the facility, as the abatement equipment (scrubber and baghouse) has an associated emission control efficiency of approximately 98%. Therefore, Marang further concluded that the development be approved from an Air Quality point of view.</p>

Aspect	Construction Impact		Operation Impact		Conclusion
	Pre-mitigation	Post mitigation	Pre-mitigation	Post mitigation	
Noise	Medium (Old BAR)	Low (Old BAR)	- 12 (low negative)	- 12 (Low negative)	Current operations at the ORTIA produce noise levels between 65-to-70 dBA, covering the whole JMP site as well as portions of the north-western parts of Bonaero Park residential area. Potential noise levels produced by the MetCon facility are expected to only reach 70 dBA within the facility's boundary walls, with only about 45-to-50 dBA projected to reach the Bonaero Park residential area. As such, potential noise levels for the MetCon facility are expected to have significantly lower noise impact than currently imposed by the ORTIA.
Traffic	High (Old BAR)	Medium (Old BAR)	- 22 (low negative)	- 20 (Low negative)	The MetCon facility is not expected to add significant additional traffic to the JMP site, or the surrounding industrial/residential areas.
Waste	Medium (Old BAR)	Low (Old BAR)	- 76 (medium negative)	- 34 (medium negative)	Recommendations made in the BA, initial EMPr, this impact assessment report, and its EMPr, must be complied with in order to reduce potential waste impacts during construction and operation of the MetCon facility.
Socio-Economic	Medium (Old BAR)	Low (Old BAR)	+ 68 (medium positive)	N/A	As the overall socio-economic impact is generally positive in nature, no mitigation of the impacts is required.



### 9.3. Conclusion

During the original BA process undertaken in 2009, overall potential impacts of the proposed development were identified through a desktop study, a site visit, specialist studies and comments received during the public participation process. An assessment of the potential impacts was provided, identifying the impacts that are potentially significant including management recommendations and mitigation measures to reduce the impacts.

The FBAR compiled as part of the BA process undertaken for the original JMP project in 2009 concluded that the development of the JMP on the OR Tambo International Airport IDZ, is *“in line with the region’s Spatial Development Plan”*, as well as the adjacent land uses. It further states that the development will provide a number of *“job opportunities during the construction phase”* and thereby enhance the local economy. The property on Portion 282 of the Farm Witkoppie No. 64 - IR has *“no ecological, archaeological or geohydrological sensitivities”* which may be impacted on by the proposed development. If all mitigation measures as stipulated in the FBAR and in the EMP are implemented, the significance of most, if not all, and the potential impacts, as listed above, will be *“reduced to ‘medium’ and ‘low’”* and reach *“environmentally acceptable levels”*.

With regards to the specialist reviews conducted as part of this EIA process for the proposed development and inclusion of the MetCon facility within the JMP site, the overall conclusions of the reviewed specialist assessments and this EIA process are congruous with the first findings of the BA undertaken in 2009, highlighting no fatal flaws posed by the proposed project to the receiving environment.

In conclusion, taking the available information and site observations into account, the proposed activity may have some impacts upon the receiving environment. However, the successful implementation of relevant management procedures and mitigation measures, as described in this report (including the environmental management plan as presented under Appendix 13), will ensure that the impacts of the activity will be minimal. During the rating and ranking procedure of possible impacts, no impact had a “no-go” implication for aspects of the project and all impacts could be successfully countered by appropriate mitigation. Significance ratings following mitigation range from *Low* to *Medium*. It is recommended that the proposed activity be approved subject to the following.

The following aspects were into consideration when coming to this conclusion:

- The site is located within an area that is characterised by industrial and commercial concerns, including the ORTIA. The site is therefore in line with the ‘sense of place’ of the area.
- The activity will provide socio-economic benefits to its employees and the wider economy of organisations that will utilise products.
- The potential pollution associated with the functioning of the proposed activity will be minimal and will not have a significant impact on the surrounding environment.
- No impacts are rated high significance following mitigation.
- MetCon is committed to ensuring all possible environmental mitigation measures are incorporated into the operations of the activity, and that the company aims to abide by all relevant environmental legislation.

It is recommended that the proposed activity be approved subject to the following:

- All mitigation measures as detailed in this report are to form an extension of the EA thus ensuring applicant/operator adherence.
- The specific conditions as detailed in the EA are to be enforced on site

- The Environmental Management Programme is to become a binding document on site during the Operational and Decommissioning Phases. The EMP is binding to all contractors associated with MetCon.
- An external Environmental Control Officer is to be appointed to audit the project at various relevant stages during the operational phase.
- Incidences of non-compliance by contractors and site operators are to be dealt with in manner so as to ensure practical control of main phases of the project.

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