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DRAFT AMENDMENT APPLICATION TECHNICAL REPORT IN SUPPORT OF THE APPLICATION FOR PART 2 AMENDMENT FOR THE PROPOSED RONDEBULT OUTFALL SEWER PIPELINE, WITHIN THE CITY OF EKURHULENI METROPOLITAN MUNICIPALITY, GAUTENG PROVINCE.

GDARD REFERENCE NUMBER: GAUT 006/21-22/E0070
MANYABE CONSULTANCY (PTY) LTD PROJECT CODE: 201917B

Prepared for:

City of Ekurhuleni

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COMPANY REG: 2014/063679/07

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ABOUT THE ENVIRONMENTAL ASSESSMENT PRACTITIONER

Manyabe Consultancy (Pty) Ltd (MC) is a 100% black female youth owned entity which offers sustainable development solutions to both public and private sectors, including parastatals (Mining, Waste, Energy and Industry). The company was founded in 2014 by Mpho Manyabe who is the Managing Director.

MC seeks to maintain its strategic position in the Environmental Management Services by providing service of excellence to its clients. This is achieved by providing a professional and efficient service to our clients, providing the highest possible level of customer care, upholding the highest ethical and moral principles in our actions, words and thoughts and upholding of the highest possible level of integrity.

The objective of MC is to create an environment in which enthusiastic, highly skilled and motivated professionals seek professional opinions for contribution to the environmental, social and economic development in South Africa. MC is an emerging entity which currently has turnover of less than R10 million rand and is a level 1 contributor with 135% Broad Based Black Economic Empowerment (BBBEE) procurement.

Mpho Manyabe: BSc Honours in Environmental Management, UNISA, 2016; National Diploma Environmental Sciences, Tshwane University of Technology (TUT), 2008

Mpho Manyabe currently holds a BSc Honours Degree in Environmental Management. She is completing her Master of Science Degree with the University of South Africa (UNISA) in Environmental Science. She has fourteen (14) years of work experience in the field of Environmental Management from different consulting companies.

She was previously nominated to be in the Gauteng Department of Agriculture and Rural Development (GDARD) Environmental Impact Assessment (EIA) Environmental Assessment Practitioner (EAP) committee which was launched on 31 March 2015 comprising of EAPs and GDARD officials to provide quarterly reports to the Executive Authority (Member of the Executive Committee (MEC)) on issues identified as blockages to the improved efficiencies the department seeks to achieve.

She has been nominated to become a member of the Academic Advisory Committee for the Environmental Science programme in the Department of Environmental, Water and Earth Sciences in the Faculty of Science at the TUT, to serve for a period of three (3) years, where she will be assisting with preparation and provision of relevant, high quality teaching and learning content for students. She has been identified based on her expertise in the field of Environmental Sciences/Management in order to make a positive contribution to what TUT is offering students in terms of course content and on how to better run programmes to the benefit of students.

Managing Director: Mpho Manyabe

MANYABE CONSULTANCY

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SECTION 1: INTRODUCTION

The City of Ekurhuleni Metropolitan Municipality (herein referred to as CoE) is intending to carry out activities that require a Part 2 Amendment Application process to be followed, on the Remainder of Portion 1 of Farm Leeuwpoort 113-IR, in Boksburg, within the CoE, Gauteng Province. The proposed site is located just north of the N17, within the East Rand Mine owned by Ergo Mining Operations (Proprietary) Limited.

1-1 BACKGROUND AND MOTIVATION

MDCC Consulting Civil and Structural Engineers (MDCC) was appointed by the CoE to design the Rondebult outfall sewer pipeline. MDCC appointed Shangoni Management Services, as an independent Environmental Assessment Practitioner (EAP), to lodge Water Use License (WUL) and Environmental Authorisation (EA) applications to the Department of Water and Sanitation (DWS) and Gauteng Department of Agriculture and Rural Development (GDARD), respectively.

The above-mentioned applications were for the refurbishment and reconstruction of the existing Rondebult outfall sewer pipeline, as it had reached the end of its design life and needs overall replacement as the infrastructure was deteriorating. The proposed refurbishment and reconstruction of the existing Rondebult outfall sewer pipeline will follow the route of the existing sewer pipeline. The existing route follows the natural contours (gravity flow).

The existing outfall sewer pipeline was built in the mid-1970s to accommodate urban expansion. This outfall sewer is directed to the large Rondebult Waste Water Treatment Works (WWTW). The existing Rondebult Outfall Sewer has exceeded its life span and has been retired from service due to the pipeline collapsing from the deterioration of the concrete pipe. The diameters commence at 600 mm and enlarge to 900 mm along the way. The refurbishment and re-commissioning of the Rondebult Outfall Sewer will add much needed capacity back to the sewer network. It should be noted that the pipeline will not be resized for larger capacity, but only replace the existing infrastructure along with more modern, durable materials.

It must be noted that the EA has been issued by the GDARD, for the sewer pipeline. However, the WUL has not yet been issued by the DWS. All the Water Use License Application (WULA) phases have been undertaken, and therefore, the application is pending the issuance of a WUL. While the project was awaiting the issuance of the WUL, the bridge was vandalised (refer to Figure 1 below).

1-2 PROPOSED AMENDMENTS

The CoE have appointed Manyabe Consultancy (Pty) Ltd (MC) as an independent EAP, to undertake the Part 2 Amendment Application process for the bridge associated with the outfall sewer pipeline.

MC is submitting this Part 2 Application in terms of Regulations 31 and 32 of the Environmental Impact Assessment (EIA) Regulations of 2014, promulgated in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended (NEMA), to the GDARD, on behalf of the applicant, in order to fulfil the requirements of the NEMA for the approval of the bridge associated with Rondebult Outfall Sewer pipeline, which was vandalised.

The bridge to be refurbished is 117,5m in length and .5m wide concrete columns will be constructed i.e. an area measuring 587.5 m^2 (approximately 0.06 hectares) will be constructed. Nine (9) 2000 X 500 reinforced concrete columns will be constructed within the wetland area. 800 X 1000 reinforced concrete arch will be constructed to support the bridge. The height of the bridge will range from 3.197m to 8.057m.

In terms of GNR. 327 (Listing Notice No.1: Activity 19) and GNR 324 (Listing Notice No.3: Activities 12 and 14), an EA with reference number GAUT002/18-19/E0168 was issued by the GDARD on 28 March 2019. A Part 2 Amendment Application process is required to obtain an amended EA from the GDARD, as the proposed bridge to be refurbished triggers the aforementioned listed activities

Figure 1: Illustration of the project area and vandalised bridge

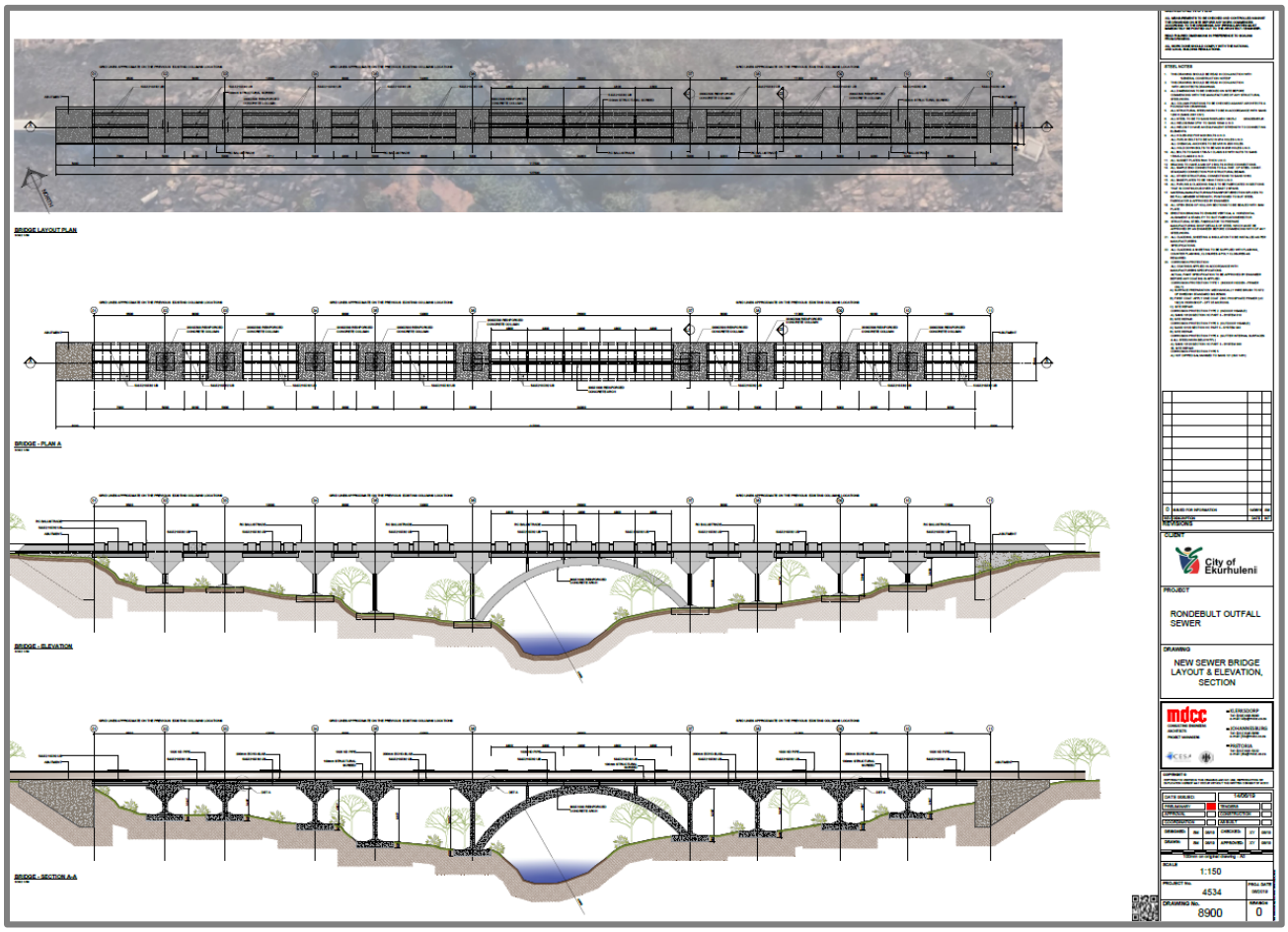

Figure 2: Illustration of proposed engineering design 1 (MDCC Consulting Engineers)

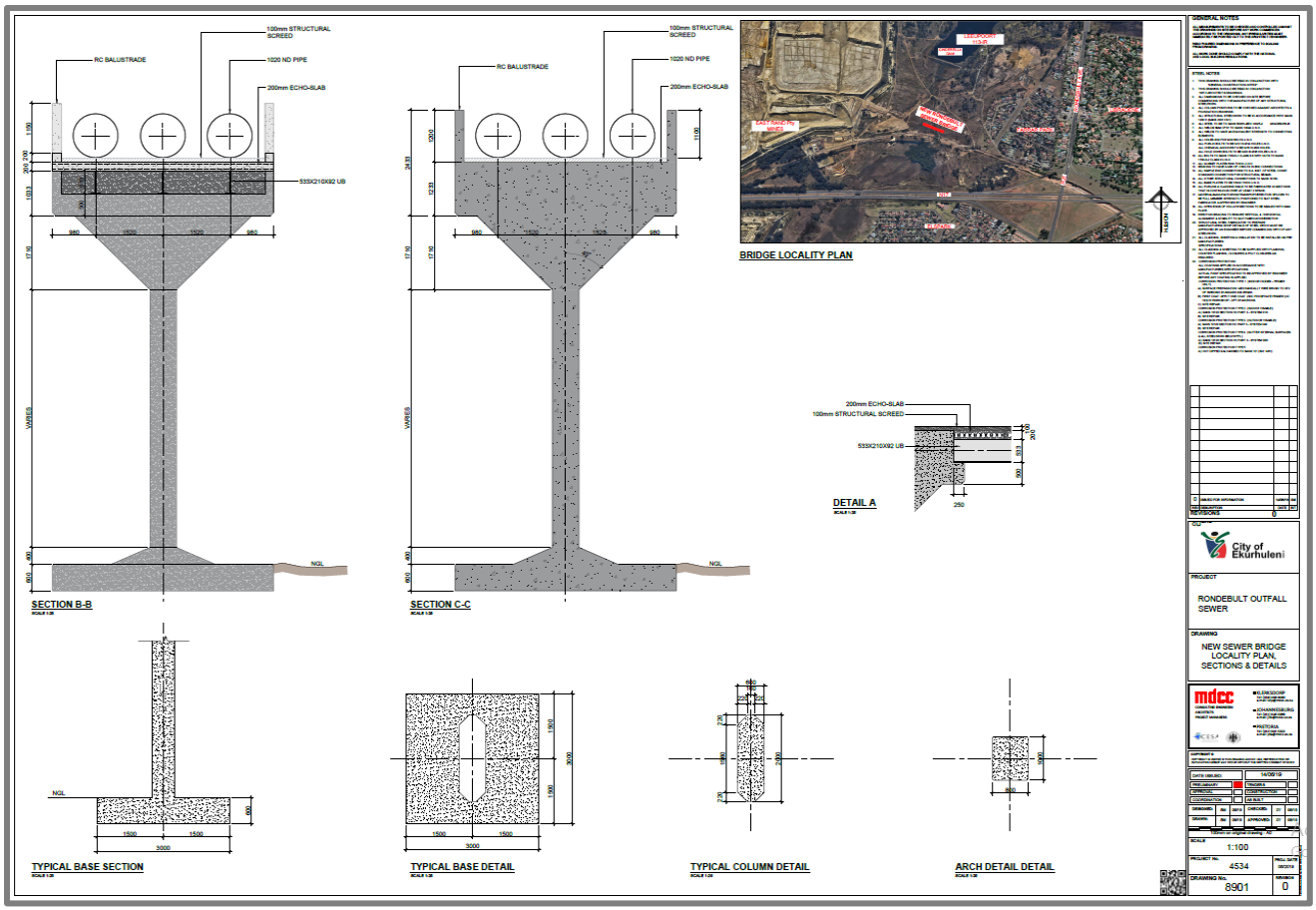

Figure 3: Illustration of proposed engineering design 2 (MDCC Consulting Engineers)

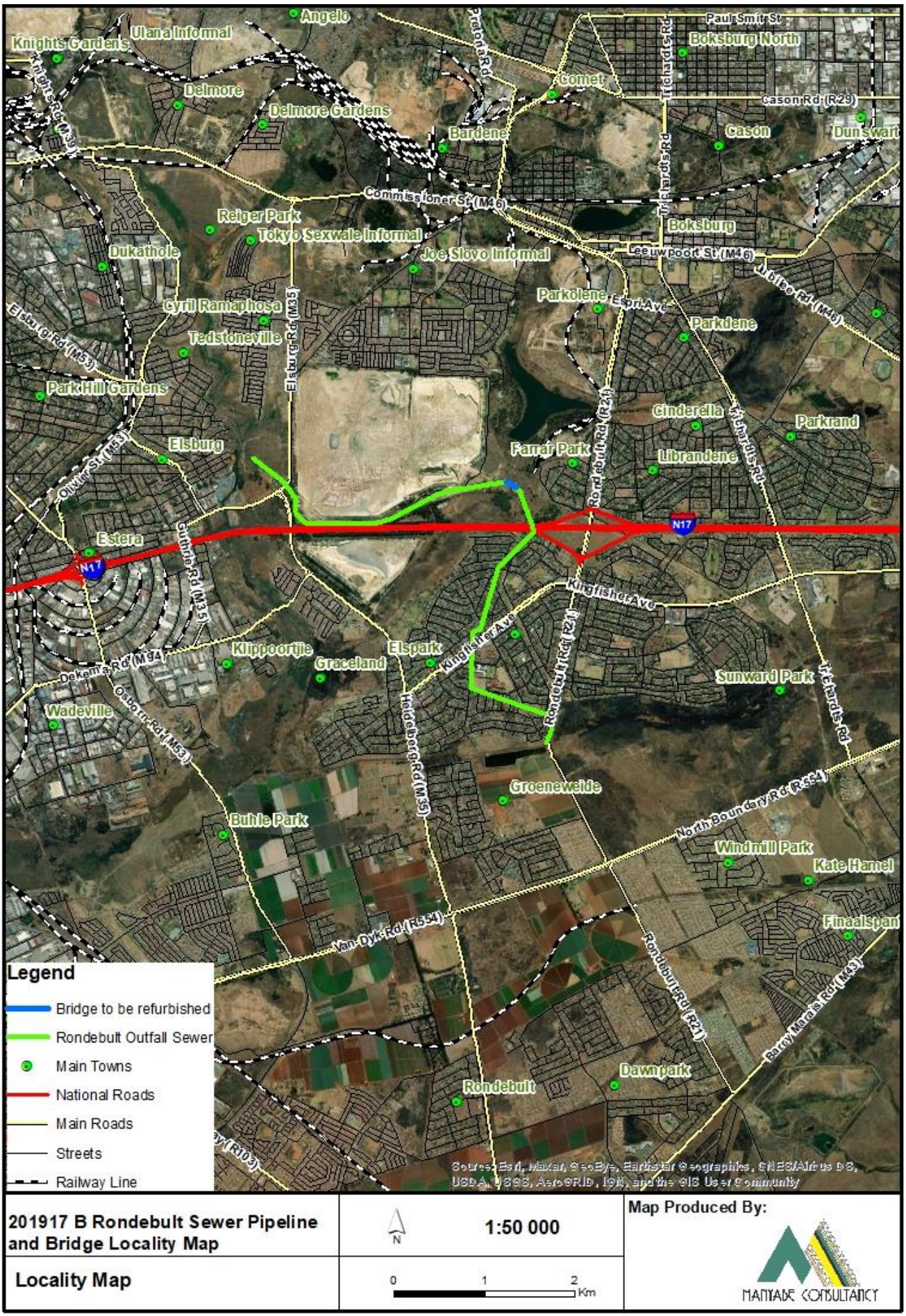

Figure 4: Locality Map of the proposed amendment

SECTION 2: LEGAL REQUIREMENTS

The purpose of this section is to list legislation, principles and policies that may relate to the management of anticipated impacts resulting from the proposed amendment. The reason for this is to ensure that the GDARD have access to the rich picture in terms of legislation. Legislation principles and policies as listed hereunder are relatively detailed.

2-1 THE CONSTITUTION OF SOUTH AFRICA NO 108 OF 1996

Section 24 of the Constitution of South Africa No. 108 of 1996 states that "…*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 (c) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development."* This protection encompasses preventing pollution and promoting conservation and environmentally sustainable development.

2-2 NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT NO. 107 OF 1998)

The NEMA provides 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 co-ordinating environmental functions exercised by State Departments and to provide for matters connected therewith.

On 21 April 2006, the Minister of the Department of Water and Environmental Affairs [DWEA, now called the Department of Forestry, Fisheries and Environment (DFFE) and the Department Water and Sanitation (DWS) separately] promulgated Regulations in terms of Chapter 5 of the NEMA. When these Regulations came into effect on 3 July 2006, they replaced the EIA Regulations that were promulgated in terms of the Environment Conservation Act, 1989 (Act No. 73 of 1989) (ECA) in 1997 and introduced new provisions for EIAs.

Subsequently, the National Environmental Management Amendment Act, 2008 (Act No. 62 of 2008) (NEMAA) was promulgated on 9 January 2009 and came into effect on 1 May 2009. The NEMAA made a number of significant amendments to the general provisions applicable to EIAs. On 18 June 2010, the Minister promulgated amended EIA Regulations in terms of Chapter 5 of NEMA. From the date of effect of these amended EIA Regulations, 2 August 2010, these amended EIA Regulations replaced the previous EIA Regulations that were promulgated on 21 April 2006.

In 2014 on 8 December, new EIA Regulations came into effect and replaced the previous EIA Regulations of 18 June 2010. The Regulations are as follows:

- Government Notice Regulation (GNR.) 982 provides with the methodology and format which needs to be considered when conducting a Basic Assessment (BA) and Scoping and Environmental Impact Reporting (S&EIR) processes.
- GNR. 983 (Listing Notice 1) provides for activities which require a BA process to be followed.
- GNR. 984 (Listing Notice 2) provides for activities which require a S&EIR to be followed.
- GNR. 985 (Listing Notice 3) also provides for activities which require a BA process to be followed.

The Minister of Environmental Affairs has again made amendments to the EIA Regulations, 2014, published under GNR. 982, GNR. 983, GNR. 984 and GNR. 985 of 4 December 2014, in terms of sections 24(5) and 44 of the NEMA through the promulgation of GNR. 324, GNR. 325, GNR. 326 and GNR. 327 of 07 April 2017.

The NEMA EIA Regulations define two broad processes for an EIA, namely: BA and S&EIR.

S&EIR is applicable to all projects likely to have significant environmental impacts due to their nature or extent, activities associated with potentially high levels of environmental degradation, or activities for which the impacts cannot be easily predicted.

BA is required for projects with less significant impacts or impacts that can easily be mitigated.

As mentioned above, the EA with reference number GAUT002/18-19/E0168 was issued by the GDARD on 28 March 2019, for the following listed activities:

Table 1: Triggered activity listed under GN R.327 (Listing Notice 1)

Activity Number	Description
19	The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from-(i) a watercourse.

Table 2: Triggered activities listed under GN R.324 (listing Notice 3)

Activity Number	Description
12	The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan. c. Gauteng ii. Within Critical Biodiversity Areas or Ecological Support Areas identified in the Gauteng Conservation Plan or bioregional plans
14	The development of (ii) infrastructure or structures with a physical footprint of 10 square metres or more; where such development occurs (a) within a watercourse; In Gauteng iv. Sites identified as Critical Biodiversity Areas (CBAs) or Ecological Support Areas (ESAs) in the Gauteng Conservation Plan or in bioregional plans; vi. Sensitive areas identified in an environmental management framework adopted by the relevant environmental authority;

A Part 2 Amendment Application process is required to obtain an amended EA from the GDARD, as the proposed bridge to be refurbished triggers the aforementioned listed activities

The amendment will require that a Part 2 Amendment Application be undertaken under the NEMA as follows:

In terms of Regulation 31 and 32 of the 2014 NEMA EIA Regulations, an EA may be amended by following the process prescribed in Part 2 if the amendment will result in a change to the scope of a valid EA where such change will result in an increased level or change in the nature of impact where such level or change in nature of impact was not—

a) assessed and included in the initial application for EA; or
b) taken into consideration in the initial EA;

and the change does not, on its own, constitute a listed or specified activity.

The applicant must within 90 days of receipt by the competent authority of the application made in terms of regulation 31, submit to the competent authority— (a) a report, reflecting— (i) an assessment of all impacts related to the proposed change; (ii) advantages and disadvantages associated with the proposed change; and iii) measures to ensure avoidance, management and mitigation of impacts associated with such proposed change; and (iv) any changes to the Environmental Management Programme (EMPr) which report—

- had been subjected to a public participation process, which had been agreed to by the competent authority, and which was appropriate to bring the proposed change to the attention of potential and registered interested and affected parties, including organs of state, which have jurisdiction in respect of any aspect of the relevant activity, and the competent authority, and
- reflects the incorporation of comments received, including any comments of the competent authority.

2-2.1 National Water Act, 1998 (Act No. 36 of 1998)

Water uses listed under Section 21 of the NWA were triggered by the proposed project. The WULA was lodged with the DWS. Triggered water uses identified in terms of Section 21 of the NWA are as follows:

c) impeding or diverting the flow of water in a watercourse.

i) *altering the bed, banks, course or characteristics of a watercourse.*

It must be noted that WUL has not yet been issued. All the WULA phases have been undertaken. While the project was awaiting the issuance of the WUL, the bridge was vandalised.

2-2.2 Gauteng Provincial Environmental Management Framework

The Gauteng Provincial Environmental Management Framework (GEMF) is a legal instrument in terms of the Environmental Management Framework (EMF) Regulations, 2010. The proposed bridge will be constructed within the boundaries of a wetland and within the urban edge. The development site is located within the Urban Development EMF **Zone 1** and EMF **Zone 2** and the proposed activity is not excluded from an EIA.

Zone 1: The intention with Zone 1 is to streamline urban development activities in it and to promote development infill, densification, and concentration of urban development within the urban development zones as defined in the Gauteng Spatial Development Framework (GSDF), in order to establish a more effective and efficient city region that will minimise urban sprawl into rural areas.

Zone 2: High control zone (within the urban development zone): Sensitive areas within the urban development zone must be conserved and where linear development (roads etc.) cannot avoid these areas, a proper assessment and implementation of alternatives must be undertaken.

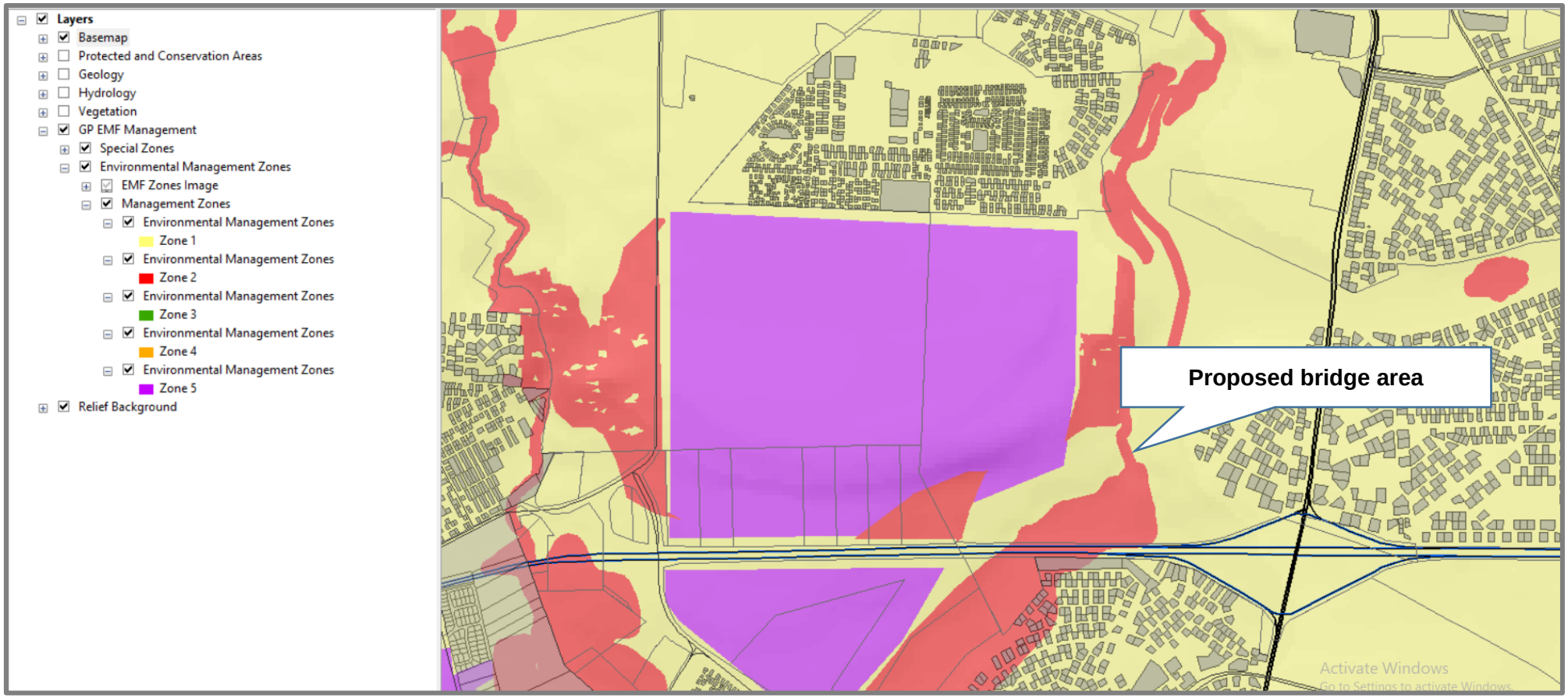

Figure 5: GEMF Management Zones

SECTION 3: ADVANTAGES AND DISADVANTAGES ASSOCIATED WITH THE PROPOSED AMENDMENT

3-1.1 Advantages

- The proposed activity does not alter the existing land use rights as it is located north of the N17, within the East Rand Mine owned by Ergo Mining Operations (Proprietary) Limited.
- The proposed bridge will not result in any additional nor new EIA listed activities as listed under the EIA 2014 Regulations and their amendments, other than the ones which have been authorised.
- The proposed bridge is associated to the proposed sewer pipeline. The Water Services Act (No. 108 of 1997) provides that everyone has a right of access to basic water supply and sanitation services.
- The sewer pipeline will enable safe and appropriate treatment and/or removal of human waste and wastewater in an environmentally friendly manner from the surrounding communities. The residents would therefore have access to decent sanitation facilities, that will not compromise their health and wellbeing and they will be able to use them with dignity.
- The existing environmental impacts which were previously assessed will not be significantly changed, and the mitigation measures as prescribed in the EMPr will be implemented.
- The proposed construction of the bridge will result in jobs being created during the construction phase for both women and men, some with disabilities. Youth will also be employed for the proposed development. 85% of the expected employees will accrue to previously disadvantaged individuals. Both skilled and semi-skilled workers will be employed. The proposed project will ensure skills development.
- The proposed sewer pipeline will be connected to the proposed bridge.
- The improved sewer conveyance will eliminate the risks of sewage spillage with consequent odours, spread of diseases and attraction of flies.

3-1.2 Disadvantages

- If the bridge is not approved by the GDARD, it would imply that the sewer pipeline would not operate. Alternatively, the sewer pipeline would have to then be constructed to encroach the wetland area.

SECTION 4: EA AMENDMENT PROCESS METHODOLOGY

MC are undertaking EA Amendment Application process for the proposed bridge. MC has in-depth knowledge of the process to be followed for the Amendment Application as required by the GDARD for the proposed project. MC believes that the relevant applicable legislation requirements have been met for the Amendment Application.

4-1 EA PART 2 AMENDMENT APPLICATION

An EA may be amended by following the process prescribed in Part 2 if the amendment will result in a change to the scope of a valid EA where such change will result in an increased level or change in the nature of impact where such level or change in nature of impact was not assessed and included in the initial application for EA or taken into consideration the initial EA; and the change does not, on its own, constitute a listed or specified activity.

4-1.1 Application Forms

MC is concurrently submitting application forms to the GDARD, with this Draft Amendment Application Technical Report also being put out on public review. The application forms were obtained from the GDARD.

The application forms have included information regarding the proponent, the proposed project, activities authorised as per the previous authorisation, amendment that is being applied for and a detailed motivation for the amendment requested, discussion of environmental impacts that are applicable to the amendment, and is being submitted together with a declaration of independence from MC.

4-1.2 Information Gathering/ Literature Review

MC has reviewed all the background information, reports, the EA which was previously issued for the Rondebult Outfall Sewer pipeline. The Literature Review was undertaken in order to gain knowledge of the project, for the effective submission of an EA amendment application form in terms of Section 31 and 32 of the GNR. 326 of the EIA Regulations 2014, as amended, to the GDARD for consideration.

4-1.3 Part 2 Amendment Application Assessment Report

MC is submitting this Draft Amendment Application Technical Report to the GDARD which comprises of the following information:

- An assessment of all impacts related to the proposed change.
- Advantages and disadvantages associated with the proposed change.
- Measures to ensure avoidance, management and mitigation of impacts associated with such proposed change.
- Any changes to the EMPr.

4-1.4 Public Participation Process

This Draft Amendment Application Technical Report is being subjected to a public participation process, in accordance to the NEMA EIA Regulations 2014, as amended.

The public participation process is appropriate in order to bring the proposed change to the attention of potential and registered I&APs, including organs of state, which have jurisdiction in respect of any aspect of the relevant activity, and the GDARD.

The comments which will be received from I&APs subsequent to the public review period (**from Tuesday, 08 February 2022 to Wednesday, 09 March 2022**) will be incorporated into the report for submission to the GDARD.

MC has taken into account all relevant guidelines applicable to public participation as contemplated in section 24J of the NEMA and is giving notice to all I&APs of the application which is being subjected to public participation by having undertaken the following:

a) Announcement of the project process and the Draft Part 2 Amendment Application Report availability

MC has compiled and is announcing the availability of the Draft Amendment Application Report and an EMPr. The reports are being subjected to a public participation process of at least thirty (30) days (**from Tuesday, 08 February 2022 to Wednesday, 09 March 2022**).

MC will engage with I&APs through an interactive web-based platform [Micro Soft Teams (MS Teams)] which will enable all I&APs to be involved. MS Teams is a platform that is currently being used across the Republic of South Africa (RSA) to visually present details regarding projects. On this platform, resources are readily available in a cloud-based location. The platform allows for instant feedback and comments to be submitted, in so doing saving time for the stakeholder and also giving the assurance that their comments have been submitted for inclusion in the project reporting.

Where I&APs do not have the applicable facilities i.e. access to internet, mobile phones, or computers, provision has been made to include these I&APs in the consultation process through use of telephonic and written consultation or by consulting with the Ward Councillors, the ward committee members, community representatives and local community forum members.

Subsequent to the 30 days' period, MC will submit the Final Technical Report to the GDARD, which will reflect the incorporation of comments received, including any comments of the Competent Authorities.

b) I&APs Database

An I&AP database will be opened and maintained which will include all potential I&APs in respect of the application in accordance with Regulation 42. I&APs will be provided with an opportunity to also register as I&APs on the online platform. Registration forms will also be left at Boksburg Public Library for 30 days.

c) Newspaper advert

One (1) advertisement will be placed in one local newspaper for advertising the project i.e. Boksburg Advertiser local Newspaper.

d) Site Notices

Two (2) site notice boards will be fixed at a place conspicuous to and accessible by the public at the boundary of the site where the activity to which the application relates.

e) Amendment Application Technical Document availability

The Amendment Application Technical Document will be made available at the Boksburg Public Library for 30 days. A sanitizer will be placed by the report for individuals to use prior to perusing the document. The report will also be made available on the MS Teams platform and MC website. The document will be available for a period of 30 days. The draft and final Amendment Application Technical Report will be submitted to GDARD in the format as provided by the GDARD.

f) Letters

Notification letters regarding the Amendment process will be sent via email to those who would have perused the site notices and newspaper adverts. Letters will also be left at the Boksburg Public Library, with the Amendment Application Technical Document.

Letters will be sent to all I&APs, written in any of the manners provided for in section 47D of the NEMA, announcing the project, containing project information and a locality map to the municipal councillor of the ward in which the site is situated and any organisations of ratepayers that represent the community in the area, the municipality which has jurisdiction in the area, any organ of state having jurisdiction in respect of any aspect of the activity; and any other party as required by the competent authority.

The letters will attach a sheet which will allow I&APs to register and / or comment. Subsequent to the 30 days' review period, MC will collect the sheets, and record all comments which would have been recorded in the comments sheets. The librarian will be requested to inform all stakeholders not to take the report with.

g) Identification and recording of comments

Subsequent to the 30 days' period, all comments and representations received from I&APs will be considered and recorded in the Comments and Responses Report (CRR). All I&APs who would have participated in the PPP will be thanked, and their comments acknowledged.

h) Announcement of the Decision

Registered I&APs will be notified of the decision on the application as well as be provided with access to the decision.

The following process will be followed in notifying I&APs of the decision:

- SMSes and emails will be sent to all registered I&APs.
- Newspaper advert in the local newspaper, where the project process was announced.

SECTION 5: RECEIVING ENVIRONMENT

5-1 WATER MANAGEMENT AREA

The study area falls within the Upper Vaal WMA. The Upper Vaal WMA is located towards the centre of the country. It covers part of four provinces. The southern half of the WMA extends over the Free State, the north-east mainly falls within Mpumalanga, and the northern and western parts in Gauteng and North West respectively.

Major rivers in the WMA are the Vaal and its tributary the Wilge River. Other tributaries of note are the Klip, Liebenbergsvlei, Waterval, Suikderbosrand and Mooi Rivers. The Upper Vaal is the uppermost WMA in the Vaal River catchment and one of five WMAs in the Orange River Basin, of which the Vaal River catchment forms a major component. It is surrounded by the Crocodile (West) and Marico, Olifants, Inkomati, Usutu to Mhlatuze, Thukela, Upper Orange and Middle Vaal WMAs, and adjoins Lesotho in the southern extreme. Refer to Figure 6 for the location and general layout of the WMA.

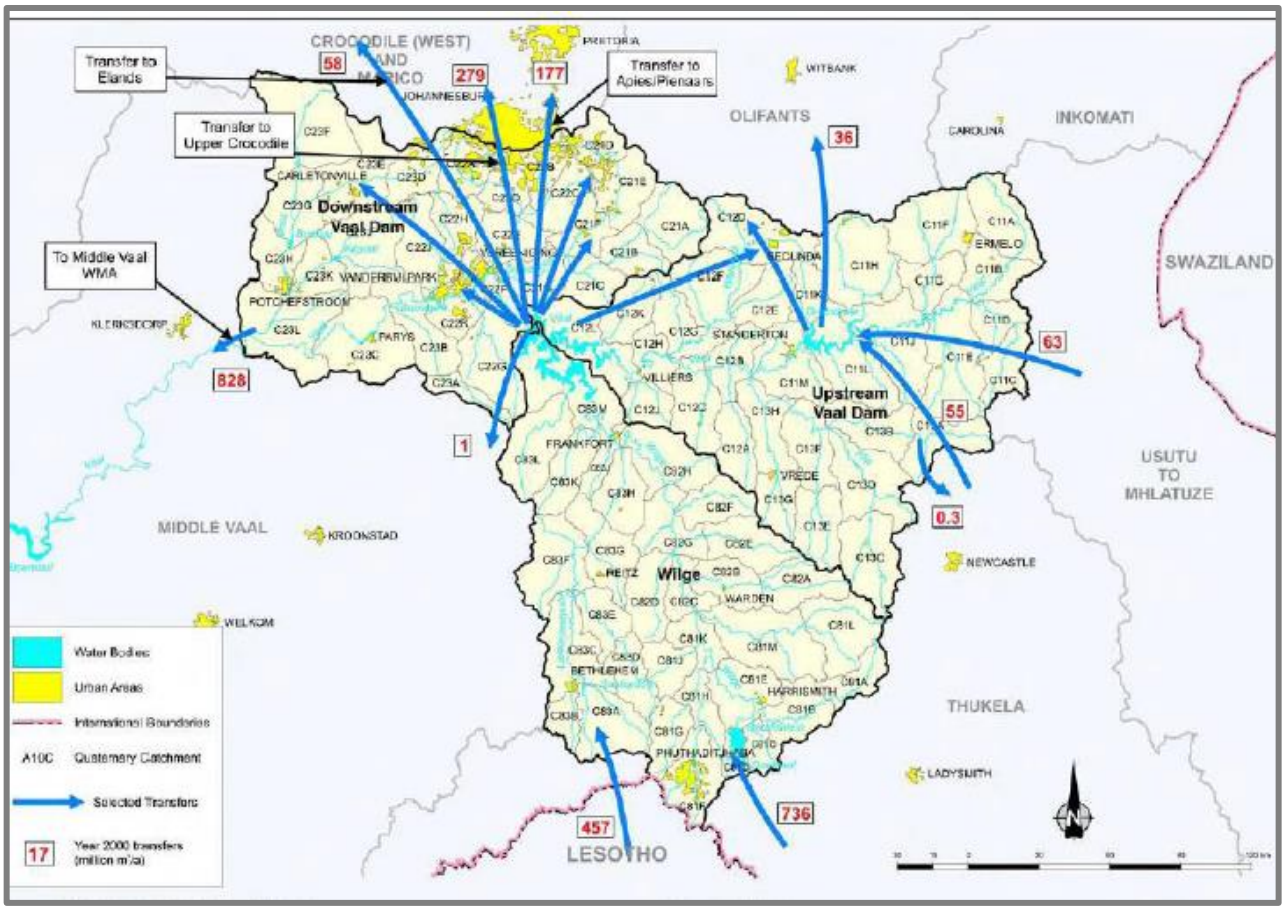

Figure 6: Upper Vaal Water Management Area

The study area falls within the Quaternary Catchment C22B. The bridge traverses a tributary of the Elsburgspruit River. The proposed project is located within a subWMA currently not considered important in terms of fish or freshwater resource conservation.

The site falls within the Ecological Support Areas (ESAs). ESAs are natural, near-natural, degraded or heavily modified areas required to be maintained in an ecologically functional state to support CBAs and/or Protected Areas. The site is also located on Critical Biodiversity Areas (CBAs) considered important for “Red” and “Orange” listed plant habitat and for Primary Vegetation. CBAs are considered to be 'best design' areas where options exist for meeting biodiversity targets, but where the identified network meets the targets in a spatially efficient and ecologically robust way that avoids conflict with other land uses where possible.

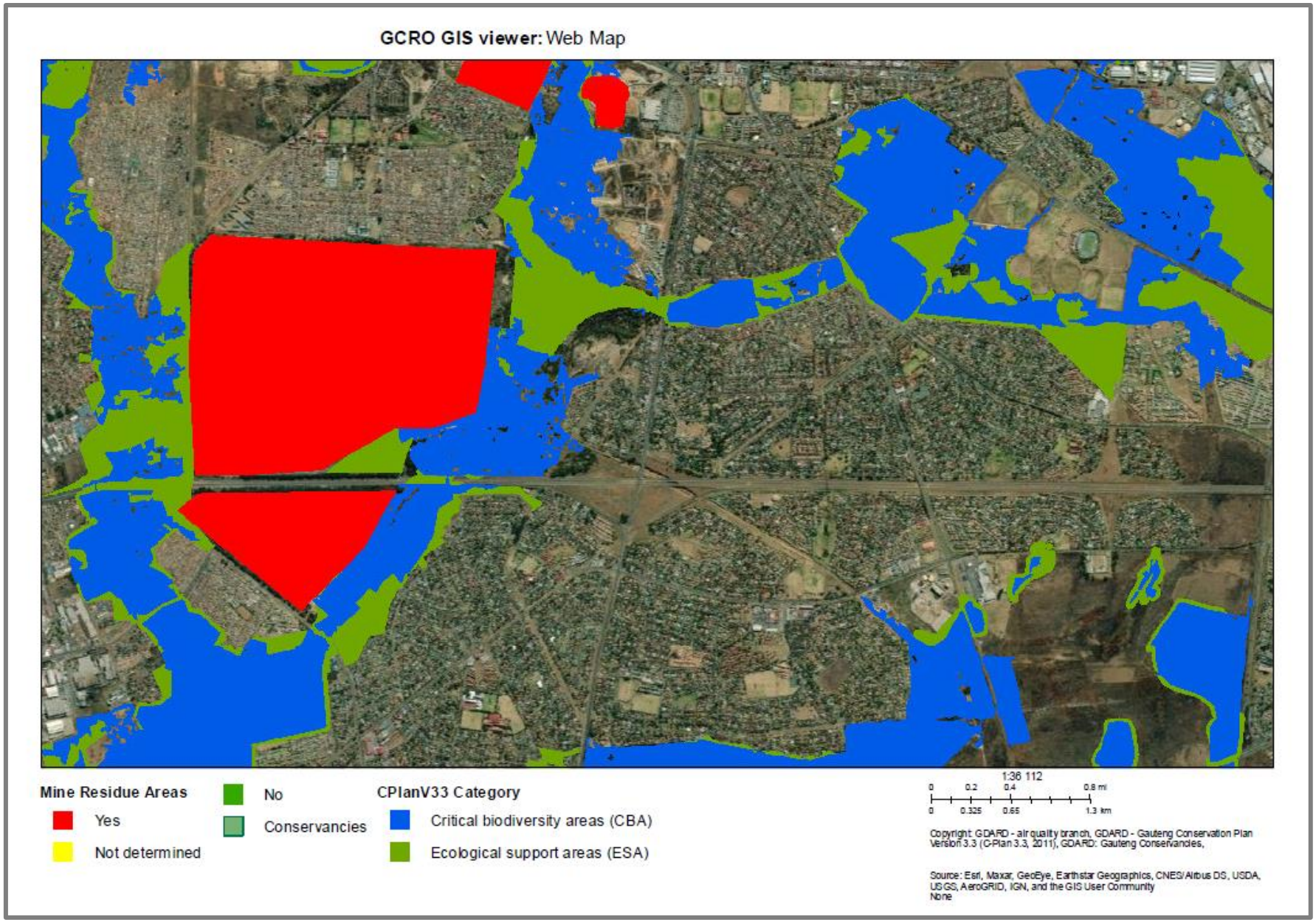

Figure 7: CBA and ESA Map

5-2 REGIONAL CLIMATE

The area falls under the Highveld Climatic Zone which is characterised by warm summers with rainfall. Winters tend to be mild to warm during the day to cold at night with sharp frosts. Johannesburg has an annual average of between 8 and 10 hours of sunshine per day and lies 1753 m above mean sea level (mamsl).

5-3 REGIONAL GEOLOGY

The published 1:250 000 geological map, Sheet 2628 EAST RAND, indicates the proposed project is partially underlain by quartzite, conglomerate and shale belonging to the Black Reef Quartzite Formation (Vbr), Transvaal Supergroup, which is considered dolomitic land. The route is, also, partially underlain by lava and tuff of the Klipriviersberg Group (Rk), Ventersdorp Supergroup. The boundary between the Black Reef Quartzite Formation and the Klipriviersberg Group is indicated by a dashed line which indicates that the boundary is inferred.

5-4 WETLANDS

According to the NFEPA Database, the proposed bridge site traverses a tributary of the Elsburgspruit River, while the Elsburgspruit River is situated approximately 140m west of the project (Figure 8). According to the Gauteng C-Plan, the proposed bridge traverses the wetland buffer associated with the tributary of the Elsburgspruit.

The proposed site is situated within the Mesic Highveld Grassland Group 2 (critically endangered) and Mesic Highveld Grassland Group 3 (least threatened) Wetland Vegetation Types.

5-5 VEGETATION AND LANDSCAPE FEATURES

The proposed project is situated within the Tsakane Clay Grassland (Gm9) vegetation type. The area is flat to slightly undulating plains and low hills. Vegetation is short, dense grassland dominated by a mixture of common highveld grasses such as *Themeda triandra, Heteropogon contortus, Elionurus muticus* and a number of *Eragrostis* species. Most prominent forbs are of the families *Asteraceae, Rubiaceae, Malvaceae,* Lamiaceae and Fabaceae. Disturbance leads to an increase in the abundance of the grasses Hyparrhenia hirta and *Eragrostis chloromelas*

5-6 ARCHAEOLOGICAL AND CULTURAL RESOURCES

The proposed site does not have any archaeological and cultural resources.

Figure 8: The delineated wetland area

5-7 DEMOGRAPHIC CONDITIONS

The study area falls within Ward 32 and 42 of the CoE, Boksburg.

5-7.1 Ward 32

According to the latest population census [Statistics South Africa (Stats SA), 2011], the total population for the ward is 24 276. The median age of the ward is 32 years of age, which is about 10% higher than that of Gauteng (28) and South Africa (25). As can be seen from Table 3 below, the majority of Ward 32 population is aged between 20 and 29 (18.2%). The 80+ years of age population is relatively small (1.6%).

Table 3: Population by age category

Column	Ekurhuleni Ward 32 (79700032)		Gauteng		South Africa	
0-9	14.3%	3,292	18%	2,096,919	21.3%	10,505,203
10-19	12.9%	2,963	14.9%	1,736,600	19.5%	9,598,363
20-29	18.2%	4,186	22.3%	2,598,656	18.9%	9,334,373
30-39	17%	3,907	17.3%	2,018,480	13.7%	6,764,424
40-49	14.2%	3,283	12.9%	1,502,946	11.3%	5,568,901
50-59	10.3%	2,367	7.8%	905,660	7.4%	3,631,868
60-69	7.2%	1,654	4%	463,406	4.3%	2,125,340
70-79	4.5%	1,033	2%	232,264	2.5%	1,229,598
80+	1.6%	365	0.9%	98,715	1.2%	578,589

Source: Statistics South Africa, 2011

Table 4 below indicates that the majority (61.9%) of Ward 32 population is white, which is much higher than that of Gauteng (15.6%) or South Africa (8.9%). This number is followed by 25.6% Black African persons, which is much higher than that of Gauteng (15.6%) or South Africa (8.9%).

Table 5 shows that the majority of persons within this ward speaks Afrikaans (39.7%) as their home language, which is more than double the figure for Gauteng (18.2%).

Table 4: Population group

Column	Ekurhuleni Ward 32 (79700032)		Gauteng		South Africa	
Black African	25.7%	6,243	77.4%	9,493,684	79.2%	41,000,937
Coloured	8.1%	1,967	3.5%	423,594	8.9%	4,615,401
Indian or Asian	3.2%	772	2.9%	356,574	2.5%	1,286,930
Other	1.1%	268	0.7%	84,527	0.5%	280,454
Unspecified	0%	0	0%	0	0%	0
White	61.9%	15,026	15.6%	1,913,884	8.9%	4,586,838

Source: Statistics South Africa, 2011

Table 5: Population by language most spoken at home

Column	Ekurhuleni Ward 36 (79700036)		Gauteng		South Africa	
Afrikaans	39.7%	9,649	18.2%	2,390,036	20.5%	11,587,374
English	37.2%	9,020	12.2%	1,603,464	8.7%	4,892,623
IsiZulu	4.8%	1,174	18.2%	2,390,036	20.5%	11,587,374
Other	3.4%	827	2.8%	371,575	1.5%	828,258
Not applicable	3.4%	814	1.5%	196,402	1.4%	809,117
IsiXhosa	2.6%	624	6.1%	796,841	14.4%	8,154,258

Source: Statistics South Africa, 2011

According to Stats SA (2011), Ward 32 has a total of 8 374 households. There is a total of 0.9% households in this ward that are classified as informal dwellings (shacks), which is less than 10% of the rate in Gauteng (17.77%) and less than 10% of the rate in South Africa (13.04%).

From these households, Table 6 below shows that a large percentage (94.3%) are getting water from a regional or local service provider, which is about the same rate in Gauteng (93.52%) and about 25% higher than the rate in South Africa (76.9%).

Table 6: Population by water source

Column	Ekurhuleni Ward 32 (79700032)		Gauteng		South Africa	
Service provider	94.3%	22,886	93.5%	11,477,568	76.9%	39,807,757
N/A	2.4%	592	0.1%	14,688	0.1%	59,057
Other	1.8%	438	2%	239,036	2.5%	1,298,645
Tanker	0.9%	206	1.5%	186,720	2.7%	1,382,835

Source: Statistics South Africa, 2011

In terms of access to flush or chemical toilets, 96.9% of the Ward 32 population have access to this service, which is about 10% higher than the rate in Gauteng (85.69%) and 1.5 times the rate in South Africa (62.52%). Table 7 indicates that only a small amount (0.6%) of households within Ward 32 does not have access to any toilets, which is about half the rate in Gauteng (1.19%).

Table 7: Population by toilet facilities

Column	Ekurhuleni Ward 32 (79700032)		Gauteng		South Africa	
Flush toilet	96.9%	8,117	84.5%	3,517,682	60%	9,042,843
Unspecified	1%	81	0.6%	25,839	0.5%	78,562
Bucket latrine	0.7%	60	1.9%	80,127	2.1%	321,117
None	0.6%	47	1.2%	49,631	5.2%	785,859
Other	0.9%	73	11.8%	491,363	32.1%	4,836,639

Source: Statistics South Africa, 2011

Another variable to consider when looking at service delivery indicators is access to refuse disposal. Within Ward 32, the majority (90.1%) of households are getting refuse disposal from a local authority or private company, which is a little higher that the rate in Gauteng (89.9%) and more than 1.5 times the rate in South Africa (59.4%) (Table 8 below).

Table 8: Population by refuse disposal

Column	Ekurhuleni Ward 32		Gauteng		South Africa	
Service provider (regularly)	90.6%	22,002	88.6%	10,871,269	58%	30,013,365
Communal dump	2.5%	607	1.5%	186,928	1.7%	894,542
N/A	2.4%	592	0.1%	14,688	0.1%	59,057
Service provider (not regularly)	2.2%	542	1.3%	161,211	1.4%	739,359
Other	2.2%	533	8.5%	1,038,169	38.8%	20,064,238

Source: Statistics South Africa, 2011

In terms of economic indicators, one can see from Table 9 that 67.8% of the Ward 32 population is employed, which is about 1.3 times the rate in Gauteng (50.59%) and more than 1.5 times the rate in South Africa (38.87%). From Ward 32 population, 26% are not economically active and 5.4% are unemployed.

Table 9: Population by employment status

Column	Ekurhuleni Ward 36 (79700036)		Gauteng		South Africa	
Discouraged work-seeker	0.8%	136	3.4%	296,450	5.4%	1,835,092
Employed	67.8%	11,783	50.6%	4,467,370	38.9%	13,180,077
Other not economically active	26%	4,510	28%	2,468,859	39.2%	13,295,256
Unemployed	5.4%	941	18.1%	1,598,044	16.5%	5,594,055
Unspecified	0%	0	0%	0	0%	0

Source: Statistics South Africa, 2011

When considering the monthly income of those that are employed (Table 10), the majority (22.6%) of the Ward 32 population earn between R150 000 – R300 000 per year. This is more than double the amount in Gauteng, which is between R20 0000 – R40 000 per year.

Table 10: Annual household income

Column	Ekurhuleni Ward 32 (79700032)		Gauteng		South Africa	
0	5.9%	693	7.7%	341,634	8.6%	1,132,167
Under R4800	1%	115	2.7%	119,771	3.2%	419,334
R5k - R10k	1.3%	150	4.4%	194,979	6%	796,136
R10k - R20k	3.9%	455	11.7%	524,456	16.8%	2,208,054

Column	Ekurhuleni Ward 32 (79700032)		Gauteng		South Africa	
R20k - R40k	8%	941	19.5%	871,916	18.7%	2,469,585
R40k - R75k	12.4%	1,458	15.9%	711,119	14.7%	1,940,963
R75k - R150k	20.9%	2,459	13.2%	590,990	12.5%	1,649,796
R150k - R300k	22.6%	2,667	11%	491,271	9.1%	1,203,627
R300k - R600k	11.1%	1,311	5.6%	250,465	3.8%	494,584
R600k - R1.2M	2.7%	321	2%	89,932	1.2%	155,154
R1.2M - R2.5M	0.7%	87	0.6%	25,970	0.4%	50,433
Over R2.5M	0.5%	61	0.4%	18,257	0.3%	37,034

Source: Statistics South Africa, 2011

5-7.2 Ward 42

The median age of the ward is 27 years of age, which is little less than Gauteng (28) and about 10% higher South Africa (25). As can be seen from Table 11 below, the majority of Ward 42 population is aged between 20 and 29 (23.8%). The 80+ years of age population is relatively small (0.3%).

Table 11: Population by age category

Column	Ekurhuleni Ward 42 (79700042)		Gauteng		South Africa	
0-9	19.1%	7,088	18%	2,096,919	21.3%	10,505,203
10-19	14.2%	5,260	14.9%	1,736,600	19.5%	9,598,363
20-29	23.8%	8,829	22.3%	2,598,656	18.9%	9,334,373
30-39	19.8%	7,369	17.3%	2,018,480	13.7%	6,764,424
40-49	12.5%	4,639	12.9%	1,502,946	11.3%	5,568,901
50-59	6.5%	2,427	7.8%	905,660	7.4%	3,631,868
60-69	2.8%	1,026	4%	463,406	4.3%	2,125,340
70-79	1.1%	416	2%	232,264	2.5%	1,229,598
80+	0.3%	102	0.9%	98,715	1.2%	578,589

Source: Statistics South Africa, 2011

Table 12 below indicates that the majority (74.4%) of Ward 42 population is Black African, which is much lower than that of Gauteng (77.4%) or South Africa (79.2%). This number is followed by 17% White persons, which is much lower than that of Gauteng (77.4%) or South Africa (79.2%). Table 13 shows that the majority of persons within this ward speaks Afrikaans (20.8%) as their home language, which is about 20% higher than Gauteng (18.16%).

Table 12: Population group

Column	Ekurhuleni Ward 32 (79700032)		Gauteng		South Africa	
Black African	74.4%	29,039	77.4%	9,493,684	79.2%	41,000,937
Coloured	6.6%	2,559	3.5%	423,594	8.9%	4,615,401
Indian or Asian	0.6%	239	2.9%	356,574	2.5%	1,286,930
Other	0.6%	227	0.7%	84,527	0.5%	280,454
Unspecified	0%	0	0%	0	0%	0
White	17.8%	6,944	15.6%	1,913,884	8.9%	4,586
Black African	74.4%	29,039	77.4%	9,493,684	79.2%	41,000,937

Source: Statistics South Africa, 2011

Table 13: Population by language most spoken at home

Column	Ekurhuleni Ward 36 (79700036)		Gauteng		South Africa	
Afrikaans	20.8%	8,119	18.2%	2,390,036	20.5%	11,587,374
IsiXhosa	15.9%	6,184	6.1%	796,841	14.4%	8,154,258
Sepedi	15.7%	6,126	9.8%	1,282,896	8.2%	4,618,576
IsiZulu	14.4%	5,615	18.2%	2,390,036	20.5%	11,587,374
Sesotho	11.2%	4,375	10.6%	1,395,089	6.8%	3,849,563
English	8.1%	3,174	12.2%	1,603,464	8.7%	4,892,623
Other	13.9%	5,415	25.1%	3,300,997	20.9%	11,813,083

Source: Statistics South Africa, 2011

According to Stats SA (2011), Ward 42 has a total of 14 444 households. There is a total of 30.5% households in this ward that are classified as informal dwellings (shacks), which is more than 1.5 times the rate in Gauteng (17.77%) and more than double the rate in South Africa (13.04%).

From these households, Table 14 below shows that a large percentage (90.6%) are getting water from a regional or local service provider, which is a little less than the rate in Gauteng (93.52%) and about 20% higher than the rate in South Africa (76.89%).

Table 14: Population by water source

Column	Ekurhuleni Ward 32 (79700032)		Gauteng		South Africa	
Service provider	90.6%	35,337	93.5%	11,477,568	76.9%	39,807,757
Other	5.8%	2,259	2%	239,036	2.5%	1,298,645
Borehole	1.8%	706	2%	244,695	6.2%	3,229,413
Vendor	1.1%	413	0.5%	55,431	1.3%	668,149

Source: Statistics South Africa, 2011

In terms of access to flush or chemical toilets, 80.2% of the Ward 42 population have access to this service, which is a little less than the rate in Gauteng (85.69%) and 1.3 times the rate in South Africa (62.52%). **Error! R eference source not found.** indicates that only a small amount (1%) of households within Ward 42 does not have access to any toilets, which is about 80% of the rate in Gauteng (1.19%).

Table 15: Population by toilet facilities

Column	Ekurhuleni Ward 32 (79700032)		Gauteng		South Africa	
Flush toilet	80.1%	11,568	84.5%	3,517,682	60%	9,042,843
Pit latrine without ventilation	13%	1,873	7.3%	304,382	18.9%	2,846,900
Other	3.4%	496	0.9%	36,669	2.1%	321,987
Bucket latrine	1.4%	203	1.9%	80,127	2.1%	321,11

Source: Statistics South Africa, 2011

Another variable to consider when looking at service delivery indicators is access to refuse disposal (Table 16). Within Ward 42, the majority (82.8%) of households are getting refuse disposal from a local authority or private company, which is about 90% of the rate in Gauteng (89.9%) and more than 1.4 times the rate in South Africa (59.4%).

Table 16: Population by refuse disposal

Column	Ekurhuleni Ward 32		Gauteng		South Africa	
Service provider (regularly)	82.8%	32,308	88.6%	10,871,269	58%	30,013,365
Own dump	10.3%	4,003	5.6%	691,453	31.4%	16,247,036
None	2.5%	976	1.9%	231,299	6%	3,090,002
Communal dump	2.4%	947	1.5%	186,928	1.7%	894,542
Other	2%	775	2.4%	291,316	3%	1,525,616

Source: Statistics South Africa, 2011

In terms of economic indicators, one can see from Table 17 that 51.2% of the Ward 42 population is employed, which is about the same rate in Gauteng (50.59%) and more than 1.3 times the rate in South Africa (38.87%). From Ward 42 population, 25.5% are not economically active and 51.2% are unemployed.

Table 17: Population by employment status

Column	Ekurhuleni Ward 36 (79700036)		Gauteng		South Africa	
Discouraged work-seeker	3.6%	1,012	3.4%	296,450	5.4%	1,835,092
Employed	51.2%	14,556	50.6%	4,467,370	38.9%	13,180,077
Other not economically active	25.5%	7,232	28%	2,468,859	39.2%	13,295,256
Unemployed	19.8%	5,617	18.1%	1,598,044	16.5%	5,594,055
Unspecified	0%	0	0%	0	0%	

Source: Statistics South Africa, 2011

When considering the monthly income of those that are employed (Table 18), it is clear that the majority (19.6%) of the Ward 42 population earn between R20 000 – R40 000 per year. This is the same amount in Gauteng, which is between R20 000 – R40 000 per year.

Table 18: Annual household income

Column	Ekurhuleni Ward 32 (79700032)		Gauteng		South Africa	
R0	6.6%	959	7.7%	341,634	8.6%	1,132,167
Under R4800	2.1%	304	2.7%	119,771	3.2%	419,334
R5k - R10k	4.9%	709	4.4%	194,979	6%	796,136
R10k - R20k	12.8%	1,863	11.7%	524,456	16.8%	2,208,054
R20k - R40k	19.6%	2,856	19.5%	871,916	18.7%	2,469,585
R40k - R75k	18%	2,617	15.9%	711,119	14.7%	1,940,963
R75k - R150k	15%	2,185	13.2%	590,990	12.5%	1,649,796
R150k - R300k	11%	1,598	11%	491,271	9.1%	1,203,627
R300k - R600k	3.1%	444	5.6%	250,465	3.8%	494,584
R600k - R1.2M	0.4%	63	2%	89,932	1.2%	155,154
R1.2M - R2.5M	0.2%	34	0.6%	25,970	0.4%	50,433
Over R2.5M	0.2%	26	0.4%	18,257	0.3%	37,034

Source: Statistics South Africa, 2011

SECTION 6: IMPACT ASSESSMENT

Following is the description of the methodology utilised in the rating of significance of impacts for the proposed bridge:

Extent

Rating	Description
Footprint/ site (1)	Extends only as far as the activity, such as footprint occurring within the total route area.
Local Area (2)	Affect the site.
Regional (3)	Affect the regions.
National (4)	Affects other provinces throughout the country.
International (5)	Affects other countries outside South Africa.

Intensity

Rating	Description
Very low (1)	Natural processes not affected
Low (2)	Natural processes slightly affected
Medium (3)	natural processes continue but in a modified manner A few times a month
Medium-high (4)	Natural processes are modified significantly
High (5)	Natural processes disturbed significantly so that they cease to occur (temporarily / permanently)

Duration

Rating	Description
Short-term- few days (1)	The impact will eventually not be felt due to the implementation of mitigation measures 0-5 years.
Short-term- few months (2)	The impact will eventually not be felt due to the implementation of mitigation measures 0-5 years.
Medium-term (3)	5 to 15 years from construction.
Long-term (4)	The impact will last for the entire operational phase, but will end at the end of operational phase due to natural processes or human interventions.
Permanent (5)	Mitigation either by human or natural interventions/ processes will not occur in such a way or in such a time span that the impact can be considered transient.

Probability

Rating	Description
Improbable (1)	The probability of an impact occurring is none, either due to the design, historic circumstances, design or experience.
Possible/ probable (2)	The probability is very low.
Likely (3)	The probability is low.
Highly probable/ possible (4)	It is most likely that the impact will occur.
Definite (5)	The impact will occur regardless of any prevention measures.

Determination of Significance without mitigation

Significance provides an indication of the importance of the impact in terms of both tangible and intangible characteristics. The significance of the impact without mitigation is the prime determinant of the nature and degree of mitigation required. Where the impact is positive, significance is noted as positive. Significance will be rated on the following scale:

SIGNIFICANCE = E+ I+ D + P

The minimum result should give a minimum value of 5, maximum of 25. This will determine whether the impact is negative or positive.

Rating	Description
No significance= <1	The impact is not substantial and does not require any mitigation action
Low = 1– 5	Low consequence, probably, minimal mitigation may be required.
Medium = 6 to 10	Medium consequence, probably, mitigation is advised / preferred. The impact is of importance and is therefore considered to have

	a negative impact. Mitigation is required to reduce the negative impacts to acceptable levels.
Medium–high = 11 to 15	Medium to high consequence, probably to very probable, mitigation is necessary. The impact is of major importance but through the implementation of the correct mitigation measures, the negative impacts will be reduced to acceptable levels.
High = 16 to 20	High consequence, probably / definite, mitigation is essential. The impact is of major importance. Failure to mitigate, with the objective of reducing the impact to acceptable levels, could render the entire development option or entire project proposal unacceptable. Mitigation is therefore essential.

Mitigation

The impacts that are generated by the project activity can be minimised if measures are implemented in order to reduce the impacts. The mitigation measures ensure that the project activity considers the environment and the predicted impacts in order to minimise impacts and achieve sustainable development.

Determination of Significance with mitigation

Determination of significance with mitigation refers to the foreseeable significance of the impact after the successful implementation of the necessary mitigation measures. Significance with mitigation will be rated on the following scale:

Rating	Description
No significance:	The impact will be mitigated to the point where it is regarded as insubstantial.
Low	Low consequence, probably, the impact will be mitigated to the point where it is of limited importance.
Medium	Medium consequence, probably, the negative impact will remain of significance. However, taken within the overall context of the project, the persistent impact does not constitute a fatal flaw;
Medium–high	Medium to high consequence, probably to very probable, mitigation is necessary. The impact is of major importance but through the implementation of the correct mitigation measures, the negative impacts will be reduced to acceptable levels.
High	High consequence, probably / definite, mitigation is essential. The impact is of major importance. Failure to mitigate, with the objective of reducing the impact to acceptable levels, could render the entire development option or entire project proposal unacceptable. Mitigation is therefore essential.
Extreme	Very high consequence, definite, fatal flaw!

This impact assessment will focus on the proposed bridge.

6-1 CONSTRUCTION PHASE

A. CONSTRUCTION PHASE

Briefly describe and compare the potential impacts (as appropriate), significance rating of impacts, proposed mitigation and significance rating of impacts after mitigation that are likely to occur as a result of the construction phase for the various alternatives of the proposed development. This must include an assessment of the significance of all impacts.

1. POTENTIAL IMPACT: POLLUTION OF SURFACE AND GROUNDWATER, SOILS AND HABITAT POLLUTION	
Hydrocarbons (oil, petrol and diesel) and other chemicals/ liquids will be required during the construction phase. Spills and/or leakages could occur from construction vehicles and/or equipment. These spills could contaminate the soil. Hydrocarbons-based fuels may be washed into the wetland. Stripping of topsoil will result in increased runoff of sediment from the site into watercourse associated with the study area. Should appropriate toilet facilities not be provided for construction workers at the construction crew camps, the potential exists for surface water resources and surrounds to be contaminated.	
Significance rating of impacts (positive or negative):	Extent: Site -1
	Intensity: Medium – 3
	Duration: Medium Term - 3
	Probability: Likely – 3
	Without mitigation = E+ I + D + P= 1+3+3+3= 10 Medium=10
	With mitigation Low (negative)
Significance rating of impacts after mitigation:	The significance of this impact is regarded as medium without mitigation. If spillages are effectively mitigated to reduce the likelihood of surface and/or ground water contamination, the significance will be reduced to low.
Risk of the impact and mitigation not being implemented	Contamination of surface and ground water, soils and habitat during heavy rainfall events.
Proposed mitigation:	• Storage of potentially hazardous materials (e.g. fuel, oil, bitumen and other hydrocarbons, cement, paint, etc.) should be placed outside the 50-year flood line, or more than 62m from a watercourse, drainage line or wetland (CSIR, 2000).

	The same limitation applies to storage, servicing and refuelling of mechanical plant and equipment, areas set aside for construction camps, lay down areas, batching plants and any stores in general. These activities can occur closer only if the ECO or Environmental Officer EO finds, in advance, no reasonable alternative and the contractors have taken appropriate steps (including secondary containment structures) to prevent spills and provide for prompt clean-up in the event of a spill. • Construction materials liable to spillage are to be stored in appropriate containment structures, adequately lined and bunded and appropriate management measures must be implemented in handling these materials. • Spillages of fuels, oils and other potentially harmful chemicals should be cleaned up immediately and contaminants properly drained and disposed of using proper solid/hazardous waste facilities (not to be disposed of within the natural environment). Any contaminated soil from the construction site must be removed and appropriately disposed of to avoid wash-off into nearby wetland. • Routinely check machinery/plant for oil or fuel leaks each day before construction activities begin and implement remedial action as necessary. • Provide drip-trays beneath standing machinery/plant. • Provide adequate waste disposal facilities (bins) and encourage workers not to litter or dispose of solid waste in the natural environment but to use available facilities for waste disposal. Such waste must be regularly cleared from the site. • A Spill Contingency or Emergency Response Plan must be drawn up and should include the following actions that need to be taken into account in the event of a spill: ✓ *Stop the source of the spill.* ✓ *Contain the spill.* ✓ *All significant spills must be reported to relevant authorities.* ✓ *Remove the spilled product for treatment or authorised disposal.* ✓ *Determine if there is any soil, groundwater or other environmental impact.* ✓ *If necessary, remedial action must be taken in consultation with the relevant Department; and* ✓ *Incident must be documented.* • Mechanical plant and bowsers must not be refuelled or serviced within or directly adjacent to any watercourse. • No stockpiling may take place within a wetland. • Any cement batching activities must occur outside of the wetland. Cement batching boards should be used. Cement products/wash not to be disposed of into the natural environment. • No forms of secondary pollution should arise from the disposal of sewage and refuse by the construction workforce on site. Any pollution problems arising from the above activity is to be addressed immediately by the CoE. • Make use of existing roads, rather than creating new routes through vegetated areas. • Vegetation and soil must be retained in position for as long as possible and removed immediately ahead of construction/ earthworks in that area. • Runoff from roads must be managed to avoid erosion and pollution problems. Where excessive loose sediment is created, attenuation swales and / or soils screens should be installed. • A walled concrete platform, dedicated store with adequate flooring or bermed area should be used to accommodate chemicals such as fuel, oil, paint, herbicide and insecticides, as appropriate, in well-ventilated areas. • Oil residue shall be treated with oil absorbent such as Drizit or similar and this material removed to an approved waste site. • Concrete, if used, is to be mixed on mixing trays only, not on exposed soil. • Concrete and tar shall be mixed only in areas which have been specially demarcated for this purpose. • All concrete and tar that is spilled outside these areas shall be promptly removed by the Contractor and taken to an approved dumpsite. • After all the concrete / tar mixing is complete all waste concrete / tar shall be removed from the batching area and disposed of at an approved dumpsite. • Storm water shall not be allowed to flow through the batching area. Cement sediment shall be removed from time to time and disposed of in a manner as instructed by the Consulting Engineer. • All construction materials liable to spillage are to be stored in appropriate structures with impermeable flooring. • Portable septic toilets are to be provided and maintained for construction crews. Maintenance must include their removal without sewage spillage. • Should portable septic toilets be used, they are to be located outside of the 1:100 year floodline. • No uncontrolled discharges from the construction crew camps to any surface water resources shall be permitted. Any discharge points need to be approved by the relevant authority. • Store all litter carefully so it cannot be washed or blown into any of the watercourse within the study area. • Provide bins for construction workers and staff at appropriate locations, particularly where food is consumed. • The construction site should be cleaned daily, and litter removed. • Conduct ongoing staff awareness programs so as to reinforce the need to avoid littering; and • Backfill must be compacted to form a stabilised and durable blanket.
2. POTENTIAL IMPACT:	SOIL EROSION AND SEDIMENTATION
Significance rating of impacts (positive or negative):	Extent: Site -1 Intensity: Low – 2 Duration: Medium Term - 3 Probability: Likely – 3 Without mitigation = E+ I + D + P= 1+2+3+3= 9 Medium= 9 With mitigation Low (negative)
Significance rating of impacts after mitigation:	The significance of this impact is regarded as medium without mitigation, however, if the proposed mitigation measures are effectively implemented, the significance will be reduced to low.
Risk of the impact and mitigation not being implemented	Soil erosion and sedimentation.

Proposed mitigation:	• Any clearing must be done immediately before construction, rather than leaving soils exposed for months (phased approach); • Construction on steep slopes will need to be such that adequate slope protection is provided, and runoff must be diverted away from all construction works; • Sediment barriers and other erosion control structures must be used where necessary and are to be regularly maintained and cleared so as to ensure effective drainage. These must be designed according to sound engineering principles using appropriate material. Structures must be monitored, modified and repaired as found to be necessary by the ECO. Erosion control must be implemented as soon as possible after detection of the need for such control. • Dewater, where necessary, any excavations (either on or off the construction right of way) in a manner that does not cause erosion and does not result in heavily silt-laden water flowing downslope. Any runoff from dewatering must be controlled in containment facilities or stable channels / slopes until it reaches stable areas in the natural environment. • If sandbags are used to temporarily divert water, then these bags should be in good condition. • Excavated and imported material should be stockpiled/stored away from areas of concentrated flow to limit the risk of sediment wash to downstream areas. • Where possible, construction in wetland should proceed during the dry winter months (low or zero flow periods) in order to limit the potential for erosion linked to high runoff rates. • If standing water or saturated soils are present, or if construction equipment causes ruts or mixing of the topsoil and subsoil in wetland use low-ground-weight construction equipment, or operate normal equipment on timber riprap, prefabricated equipment mats, or terra. • EO/ECO should perform periodic visual inspections of on-site water quality, identifying the source of any rapid increases in turbidity of wetland and remedying this where necessary. • Soil required for construction purposes must not be derived from the wetland. Any topsoil removed from wetland must be stockpiled separately from other soil material. It must not be buried, mixed with other material or subjected to compaction; and • Exposed soils must be rehabilitated as soon as practically possible to limit the risk of erosion. The channel embankments must be rehabilitated to ensure both longitudinal and cross sectional stability against summer floods. Depending on the circumstances, this may necessitate stabilising structures such as gabions or reno-mattresses as well as careful attention to rehabilitation.
3. POTENTIAL IMPACT:	DISTURBANCE OF WETLAND BANKS, AQUATIC VEGETATION AND SOILS
The construction of the proposed bridge could lead to the destruction of the wetland banks, aquatic vegetation and soils. Footprint of the proposed bridge could infringe or destroy wetland habitat and associated biota through removal of hydrophytic vegetation and or hydric soils if uncontrolled construction processes are allowed. The proposed bridge and associated foundations (or supporting infrastructure) could potentially impact on the wetland banks, surface and sub-surface flows (hydrology) of the wetland.	
Significance rating of impacts (positive or negative):	Extent: Site -1 Intensity: High – 5 Duration: Permanent - 5 Probability: Highly probable/ possible – 4 Without mitigation = E+ I + D + P= 1+5+5+4= 15 Medium to high= 15 With mitigation Low (negative)
Significance rating of impacts after mitigation:	The significance of this impact is regarded as medium to high without mitigation, however, if the proposed mitigation measures are effectively implemented, the significance will be reduced to low.
Risk of the impact and mitigation not being implemented	Disturbance of wetland banks, aquatic vegetation and soils.
Proposed mitigation:	• Ensure that construction activities are carefully monitored, and appropriate action taken if indicated as being necessary by the monitoring, to limit unnecessary impacts to wetland areas. • Any excavation which may result in the lowering of original water bodies must be backfilled with the same soil that was removed. • Re-directed flow must not be channelled towards the outer channel bank of wetlands where this could cause erosion. • Any abstraction of water from wetland for construction purposes must be approved by the DWS.
4. POTENTIAL IMPACT:	DECREASE IN BIO-DIVERSITY OF NATURAL PLANT COMMUNITIES
Site preparation and vegetation clearing activities will result in the loss of terrestrial habitat and species diversity, both floral and faunal. Should any SCC be located within the construction footprint; although deemed unlikely, these species will be impacted upon as a result of the clearing activities, either resulting the loss of these species from the immediate area (floral species) or the relocation of such species to similar habitat nearby.	
Significance rating of impacts (positive or negative):	Extent: Local Area- 2 Intensity: High- 5 Duration: Long-term - 4 Probability: Likely- 3 Without mitigation = E+ I + D + P= 2+5+4+3= 14 Medium to high = 14 With mitigation Medium - negative
Significance rating of impacts after mitigation:	The significance of this impact is regarded as medium to high without mitigation; however, the significance of the impact will be reduced to medium after the implementation of the mitigation measures. .
Risk of the impact and mitigation not being implemented	Decrease in bio- diversity of natural plant communities.
Proposed mitigation:	• Avoid disturbance of sensitive freshwater habitat units. • Should any SCC be encountered within the construction footprint, they are to be relocated to suitable habitat in the vicinity of the proposed bridge. • Demarcate the construction footprint and ensure that all construction activities remain within this footprint.

	• Ensure that the proposed development footprint area remains as small as possible, particularly within the areas adjacent to the freshwater habitat. • Restrict vehicles to travelling only on designated roadways to limit the ecological footprint of the proposed development. • Remove (strip) topsoil and stockpile for backfill and rehabilitation of the area. • Excavate the extent of the trench on a need's basis only, excavating the trench for the progress of the bridge, backfilling and rehabilitating concurrently. • If the material is firm normal excavation techniques will apply, but in soft material shoring of the trench sides may be required. In hard rock material trench excavation may require the use of pneumatic breakers or blasting; • Install temporary dewatering pumps to keep the excavation dry (if required due to groundwater ingress); • Construct stormwater diversion berms upslope of the trench where required. • Backfill to specification, replacing the soil in the original profile. • Dress backfill, topsoil and re-vegetate all exposed areas. • No informal fires are allowed by construction personnel outside of the development footprint.
5. POTENTIAL IMPACT: HERITAGE RESOURCES	
The Phase 1 HIA for the proposed project revealed no heritage resources.	
Significance rating of impacts (positive or negative):	The impact associated with construction of the proposed bridge on the destruction of heritage resources during the construction phase is predicted to be of negligible significance.
Significance rating of impacts after mitigation:	Not applicable
Risk of the impact and mitigation not being implemented	Not Applicable
Proposed mitigation:	• Construction activities should be limited to the proposed construction boundaries for the proposed bridge. • In terms of the National Heritage Resources Agency (NHRA), construction personnel must be alert and must inform the local heritage agency should they come across any findings of heritage resources within 24 hours. • Should any archaeological artefacts be exposed during construction activities, work on the area where the artefacts were found must cease immediately and the ECO must be notified within 24 hours. • Upon receipt of such notification, the ECO will arrange for the excavation to be examined by an Archaeologist. • Under no circumstances must archaeological artefacts be removed, destroyed or interfered. • Any archaeological sites exposed during construction activities must not be disturbed prior to authorisation by the SAHRA or the appropriate provincial heritage resource agency.
6. POTENTIAL IMPACT: TEMPORARY JOB CREATION	
The proposed construction of the bridge will result in jobs being created during the construction phase for both women and men, some with disabilities. Youth will also be employed for the proposed development. 85% of the expected employees will accrue to previously disadvantaged individuals. Both skilled and semi-skilled workers will be employed. The proposed project will ensure skills development. The bulk sewer conveyance system will reduce the risk of polluting water resources that is potentially used by the local people. This will positively impact on the surrounding community and local economy due to possible skills development and income generation. This impact is predicted to have a High positive significance.	
Significance rating of impacts (positive or negative):	Extent: Regional- 3 Intensity: High - 5 Duration: Short-term- few months- 2 Probability: Definite- 5 The impact is high positive.
Significance rating of impacts after mitigation:	Mitigation measures are not applicable.
Risk of the impact and mitigation not being implemented	Not Applicable
Proposed mitigation:	• Not applicable.
7. POTENTIAL IMPACT: DESTRUCTION OF WETLAND HABITAT AND POTENTIAL WETLAND FUNCTIONALITY	
The footprint of the proposed bridge will infringe wetland habitat and associated biota through removal of hydrophytic vegetation and or hydric soils if uncontrolled construction processes are allowed. The proposed bridge infrastructure and associated foundations (or supporting infrastructure) could potentially impact on surface and sub-surface flows (hydrology) of the wetland.	
Significance rating of impacts (positive or negative):	Extent: Site- 1 Intensity: High - 5 Duration: Permanent- 5 Probability: Highly probable/ possible- 4 Without mitigation = E+ I + D + P= 1+5+5+4= 15 Medium to high= 15 With mitigation Medium- Negative
Significance rating of impacts after mitigation:	The impact on wetland habitat during construction activities is predicted to be of a medium to high significance; however, the implementation of mitigation measures will reduce the significance of the impact to medium.
Risk of the impact and mitigation not being implemented	Destruction of wetland habitat and potential wetland functionality
Proposed mitigation:	• The construction vehicles and machinery must make use of existing access routes as much as possible, before adjacent areas are considered for access. • An alien invasive plant management plan needs to be compiled and implemented post construction to prevent the growth of invasives on cleared areas. • Bridge trenches and sandy bedding material may produce preferential flow paths for water across the project area perpendicular to the general direction of flow instead of angle. This risk can be reduced by installing clay plugs at intervals down the length of the trench to force water out of the trench and down the natural topographical gradient. • Trenches and foundations should be side dug (where possible) from the existing access routes.

	• Trenches should be dug on-line (where applicable) creating narrower trenches. • Where trench breakers are required, these must be imported appropriately and installed by the backfill crew, ahead of backfilling. • Ensure careful separation of soil types/ strata as identified for the removal of soil. The soils must be removed in such a way that they can be easily reinstated in the reverse order for backfilling. • To ensure correct backfilling, the soil that is removed from the trench at its deepest point must be laid closest to the trench. The first layer of topsoil must be laid furthest away from the trench. • It may be necessary to import small amounts of padding material upon which the pipe safely rests in the trench prior to backfilling. This material must be stored outside the wetland areas until it is required to be placed within the trench, and bunded with sandbags. • Any large boulders encountered during trenching operations must not be returned to the trench, but removed off site; and • If any spoil is generated this can be transported to another location and re-used if it is required, removed correctly to a licensed facility, or offered to the landowner.

B. OPERATIONAL PHASE

1. POTENTIAL IMPACT:	SOIL EROSION AND SEDIMENTATION
Significance rating of impacts (positive or negative):	Extent: Site -1 Intensity: Low – 2 Duration: Medium Term - 2 Probability: Likely – 3 Without mitigation = E+ I + D + P= 1+2+2+3= 8 Medium= 8 With mitigation Low (negative)
Significance rating of impacts after mitigation:	The significance of this impact is regarded as medium without mitigation, however, if the proposed mitigation measures are effectively implemented, the significance will be reduced to low.
Risk of the impact and mitigation not being implemented	Soil erosion and sedimentation.
Proposed mitigation:	• Vegetation should be retained where possible to avoid erosion. • Re-vegetation of disturbed surfaces must occur immediately after the construction activities are completed to encourage soil binding.
2. POTENTIAL IMPACT:	HYDROLOGY AND SEDIMENT DYNAMICS
Once the bridge is in position, the new infrastructure will make a permanent change to the flow dynamics of the wetland. This could result in loss of habitat.	
Significance rating of impacts (positive or negative):	Extent: Site- 1 Intensity: Low- 2 Duration: Permanent- 5 Probability: Definite – 5 Without mitigation = E+ I + D + P= 1+2+5+5= 13 Medium to high= 13 With mitigation Low (negative)
Significance rating of impacts after mitigation:	The significance of this impact is regarded as medium to high without mitigation, however, if the proposed mitigation measures are effectively implemented, the significance will be reduced to low.
Risk of the impact and mitigation not being implemented	Change to the flow dynamics of the wetland.
Proposed mitigation:	• Ensure that the wetland bed is rehabilitated to the equivalent of what it was prior to construction.

C. IMPACTS THAT MAY RESULT FROM THE DECOMISSIONING AND CLOSURE PHASE

At present, it is not anticipated that the proposed bridge will ever be decommissioned. Ongoing maintenance and upgrades, where necessary, will be carried out. In the unlikely event that decommissioning is necessary, a detailed rehabilitation plan has been prepared and will be implemented. Therefore, this section is not applicable.

D. NO GO OPTION

The no-go option means the proposed bridge associated with Rondebult Outfall Sewer project will not be constructed. The sewer pipeline will not be able to treat and/or remove human waste and wastewater in an environmentally friendly manner from the surrounding communities. The residents would therefore have no access to decent sanitation facilities, that will not compromise their health and wellbeing and they will not be able to use them with dignity. The risks of sewage spillage with consequent odours, spread of diseases and attraction of flies will remain.	
Significance rating of impacts (positive or negative):	Extent: Regional- 3 Intensity: High - 5 Duration: Permanent- 5 Probability: Definite- 5 Without mitigation = E+ I + D + P= 3+5+5+5= 18 High= 18

	With mitigation High- negative
Significance rating of impacts after mitigation:	The significance of this impact will remain high negative if the proposed bridge is not constructed.
Proposed mitigation:	• The mitigation measure would be for the GDARD to approve the bridge be constructed.

SECTION 7: CONCLUSION AND RECOMMENDATIONS

The relevant Specialist Studies were previously undertaken. All the environmental features, wetlands and their respective buffers have been delineated. All the mitigation measures which have been prescribed in the EMPr, and in this report, will be complied with. The layout plan for the proposed bridge associated with Outfall Sewer Pipeline has been compiled showing the proposed changes.

The environmental impacts related to the overall amendment, with the correct implementation of mitigation measures (as detailed in the tables above, and in the EMPr) can be effectively minimised, to allow the proposed amendment to be implemented. Based on the legislative processes followed, it is MC's opinion that the proposed amendment be authorised in order not to further delay the construction of the bridge and also the Outfall Sewer Pipeline that has been approved by the GDARD.

SECTION 8: REFERENCES

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APPENDICES

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APPENDIX 2: AUTHORITY CORRESPONDENCE

APPENDIX 3: PUBLIC PARTICIPATION PROCESS

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APPENDIX 5: ENVIRONMENTAL MANAGEMENT PROGRAMME

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APPENDIX 8: ECOLOGICAL ASSESSMENT REPORT

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APPENDIX 13 MAINTENANCE AND EMERGENCY RESPONSE PLAN

APPENDIX 14: PHOTO PLATE