GDARD Reference Number: GAUT 002/19-20/E0247

Richbay Chemicals (Pty) Ltd

PROPOSED VOSLOORUS CHEMICAL FILLING PLANT

Draft Environmental Impact Assessment Report

GDARD REF: GAUT 002/19-20/E0247
AUGUST 2023

PUBLIC

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CONTENTS

1	**INTRODUCTION**	**3**
1.1	PURPOSE OF THIS REPORT	3
1.2	BACKGROUND INFORMATION	3
1.3	KEY ROLE PLAYERS	4
1.4	ENVIRONMENTAL IMPACT ASSESSMENT TERMS OF REFERENCE	7
1.5	ENVIRONMENTAL IMPACT REPORT STRUCTURE	8
1.6	ASSUMPTIONS AND LIMITATIONS	10
2	**GOVERNANCE FRAMEWORK**	**13**
2.1	NATIONAL LEGAL AND REGULATORY FRAMEWORK	13
2.2	POLICIES AND PLANS	20
2.3	PROVINCIAL AND MUNICIPAL LEGAL AND REGULATORY FRAMEWORK	21
3	**SCOPING PHASE SUMMARY**	**28**
3.1	APPLICATION FOR ENVIRONMENTAL AUTHORISATION	28
3.2	AUTHORITY CONSULTATION	28
3.3	STAKEHOLDER CONSULTATION	30
3.4	SCOPING STUDY FINDINGS	32
4	**EIA PHASE METHODOLOGY**	**35**
4.1	DETAILED ENVIRONMENTAL ASSESSMENT	35
4.2	STAKEHOLDER ENGAGEMENT	39
4.3	DFFE WEB-BASED ENVIRONMENTAL SCREENING TOOL	41
5	**NEED AND DESIRABILITY OF THE PROJECT**	**49**
6	**PROJECT DESCRIPTION**	**53**
6.1	LOCATION OF THE PROPOSED PROJECT	53

6.2 SITE STATUS 56
6.3 PROPOSED PROJECT COMPONENTS AND PROCESSES 61
6.4 PROPOSED PROJECT DEVELOPMENT ACTIVITIES 68
6.5 PROJECT ALTERNATIVES 69

7 BASELINE ENVIRONMENT 72

7.1 PHYSICAL ENVIRONMENT 72
7.2 BIOLOGICAL ENVIRONMENT 78
7.3 SOCIAL AND ECONOMIC ENVIRONMENT 86

8 ENVIRONMENTAL IMPACT ASSESSMENT 94

8.1 AIR QUALITY 94
8.2 NOISE AND VIBRATION 99
8.3 SOIL AND AGRICULTURE 100
8.4 TERRESTRIAL BIODIVERSITY 106
8.5 HERITAGE AND CULTURAL RESOURCES 110
8.6 PALAEONTOLOGY 111
8.7 GEOTECHNICAL 111
8.8 TRAFFIC 113
8.9 SOCIAL IMPACT ASSESSMENT 116
8.10 HAZARDOUS SUBSTANCES AND POLLUTANTS 120
8.11 WASTE MANAGEMENT 128

9 CUMULATIVE IMPACT ASSESSMENT 132

9.1 AIR QUALITY 133
9.2 TERRESTRIAL BIODIVERSITY 133
9.3 HERITAGE AND PALAEONTOLOGY 134
9.4 SOCIAL 134
9.5 HAZARDOUS SUBSTANCES 136

10 ENVIRONMENTAL IMPACT STATEMENT 138

10.1 IMPACT SUMMARY 138
10.2 SITE SENSITIVITY 141
10.3 SPECIALIST CONCLUSIONS 144
10.4 RECOMMENDATIONS 145
10.5 IMPACT STATEMENT 147
11 CONCLUSION 148

TABLES

Table 1-1 – Details of Project Proponent 4
Table 1-2 – Competent Authority 5
Table 1-3 – Details of the EAP 5
Table 1-4 – Details of Specialists 6
Table 1-5 – Legislated Report Requirements as detailed in GNR 326 8
Table 2-1 – Applicable National Legislation 13
Table 2-2 – Applicable Regional Policies and Plans 20
Table 2-3 – Provincial Plans 21
Table 2-4 – Additional Permits and Authorisations required for the Proposed Project 24
Table 3-1 – Communication received from GDARD on the Proposed Project 28
Table 3-2 – Breakdown of stakeholders currently registered on the database 31
Table 3-3 – Advertisement publication dates 31
Table 3-4 – Identified Impacts in the Scoping Phase 32
Table 4-1 – Details of Specialists 35
Table 4-2 – Impact Assessment Criteria and Scoring System 36
Table 4-3 – Sensitivities identified in the DFFE Screening Report 42
Table 4-4 - Specialist Studies identified by the DFFE Screening Tool 43
Table 5-1 – Need and Desirability Assessment 50
Table 6-1 –Cadastral Information of the Site 53
Table 6-2 – Coordinate Points of the Cadastral Land Parcel 54
Table 6-3 - Historical Aerial Imagery of the Proposed Project site 56

Table 6-4 – Site Photographs 60
Table 6-5 - Filling Plant Chemicals 62
Table 6-6 - Acid Regeneration Plant Chemicals 63
Table 6-7 - Solvent Filling Plant Chemicals 64
Table 6-8 – Construction Activities 68
Table 6-9 - Operational Phase Activities 68
Table 7-1 – Characteristics of the receiving environment 72
Table 8-1 – Impact on ambient air quality during construction for the Preferred Alternative and Alternative 1 95
Table 8-2 – Impact on air quality during operation for Alternative 1 97
Table 8-3 – Impact on air quality during operation for the Preferred Alternative 98
Table 8-4 – Increase in daytime ambient sound levels for the Preferred Alternative and Alternative 1 99
Table 8-5 – Soil erosion and sedimentation for the Preferred Alternative and Alternative 1 100
Table 8-6 – Change in land use for the Preferred Alternative and Alternative 1 102
Table 8-7 – Change in land capability for the Preferred Alternative and Alternative 1 102
Table 8-8 – Soil contamination for the Preferred Alternative and Alternative 1 103
Table 8-9 – Erosion and sedimentation for the Preferred Alternative and Alternative 1 103
Table 8-10 – Soil contamination for the Preferred Alternative and Alternative 1 104
Table 8-11 –Land Use for the Preferred Alternative and Alternative 1 105
Table 8-12 –Continued disturbance and degradation of the vegetation community and encroachment by alien invasive plant species for the Preferred Alternative and Alternative 1 106
Table 8-13 – Displacement of faunal community due to habitat loss, direct mortalities and disturbance (noise, dust and vibration) for the Preferred Alternative and Alternative 1 107
Table 8-14 – Continued disturbance of vegetation communities and encroachment by alien invasive plant species for the Preferred Alternative and Alternative 1 108
Table 8-15 – Ongoing displacement, direct mortalities and disturbance of faunal community due to habitat loss and disturbances for the Preferred Alternative and Alternative 1 108
Table 8-16 – Spread of alien and invasive plant species for the Preferred Alternative and Alternative 1 110

Table 8-17 – Impacts to Heritage and Cultural Resources for the Preferred Alternative and Alternative 1 110

Table 8-18 – Impacts to palaeontology for the Preferred Alternative and Alternative 1 111

Table 8-19 – Impacts on Dolomite Stability for the Preferred Alternative and Alternative 1 112

Table 8-20 – Impact of road degradation during the construction phase for the Preferred Alternative and Alternative 1 114

Table 8-21 – Impact of dust during the construction phase for the Preferred Alternative and Alternative 1 114

Table 8-22 – Impact of intersection safety during the construction phase for the Preferred Alternative and Alternative 1 115

Table 8-23 – Impact on regional employment and household income during the construction phase for the Preferred Alternative and Alternative 1 116

Table 8-24 – Impact of influx of people during the construction phase for the Preferred Alternative and Alternative 1 117

Table 8-25 – Impact on surrounding landowners during the construction phase for the Preferred Alternative and Alternative 1 117

Table 8-26 – Impact on regional employment and household income during the operational phase for the Preferred Alternative and Alternative 1 118

Table 8-27 – Impact on surrounding landowners during the operational phase for the Preferred Alternative and Alternative 1 119

Table 8-28 – Impact of cross border supply of products for the Preferred Alternative and Alternative 1 119

Table 8-29 – Impact on regional employment and household income during the decommissioning phase for the Preferred Alternative and Alternative 1 120

Table 8-30 – Construction Impact of contaminants on soil, groundwater and surface water for the Preferred Alternative and Alternative 1 121

Table 8-31 – Impact of contaminants on soil, groundwater and surface water for the Preferred Alternative and Alternative 1 122

Table 8-32 - Hazard Analysis Breakdown 124

Table 8-33 – Pipe leaks or ruptures resulting in pool fires for the Preferred Alternative and Alternative 1 124

Table 8-34 – Toxic chlorine release for Alternative 1 only 127

Table 8-35 – Impact of improper waste management during construction for the Preferred Alternative and Alternative 1 129

Table 8-36 – Improper disposal of sanitation waste for the Preferred Alternative and Alternative 1 129

Table 8-37 – Impact of improper waste management during operation for the Preferred Alternative and Alternative 1 130

Table 9-1 – Cumulative Impact on ambient air quality for the Preferred Alternative and Alternative 1 133

Table 9-2 – Cumulative Impact on Terrestrial Biodiversity 133

Table 9-3 – Cumulative impact to archaeological resources during the construction, operation and decommissioning phases 134

Table 9-4 – Cumulative impact on regional employment and household income 134

Table 9-5 – Cumulative impact of influx of people 135

Table 9-6 – Cumulative impact of surrounding landowners 135

Table 9-7 – Cumulative impact on stimulating foreign trade 136

Table 9-8 – Worst Case Incident 136

Table 10-1 – Summary of Impacts associated with the Proposed Project 138

Table 10-2 - Environmental Sensitivities identified by specialists 141

FIGURES

Figure 2-1 – Business and industrial footprints in the EMM Spatial Development Framework (Region F) (SDF, 2015) 25

Figure 2-2 – Key land uses in the EMM (Region F) (SDF, 2015) 26

Figure 2-3 - Areas with environmental constraints in Region F (SDF, 2015) 27

Figure 4-1 - Mitigation Sequence/Hierarchy 39

Figure 6-1 - Locality map of the Proposed Filling Plant 55

Figure 6-2 - Tank Graphical Representation (Architectural Design Studio) 62

Figure 6-3 - Acid Regeneration Process Flow Diagram 64

Figure 6-4 – SWMP Layout of the Proposed Site 67

Figure 6-5 – Preferred Layout Alternative of the Proposed Site 70

Figure 7-1 - Meteorological Summary 73

Figure 7-2 – Local Wind Conditions at Vosloorus 74

Figure 7-3 – Topographical Map of the Proposed Site 75

Figure 7-4 – Geological map of the Project area 76

Figure 7-5 – Surface water and wetland surrounding the site 77

Figure 7-6 – The project area showing the vegetation type based on the Vegetation Map of South Africa, Lesotho & Swaziland (BGIS, 2018) 79

Figure 7-7 - The project area showing the ecosystem threat status of the associated terrestrial ecosystems (NBA, 2018) 80

Figure 7-8 - Project area in relation to the Gauteng CBA dataset 81

Figure 7-9 - Habitats within the project area; A & B) Degraded Grassland and C & D) Transformed Areas 82

Figure 7-10 - Habitats identified in the Project Area 83

Figure 7-11 - Plant species recorded in the project area 84

Figure 7-12 - Habitat sensitivity map of the Project area 85

Figure 7-13 - Land Cover Map 88

Figure 7-14 – Population Structure of the Ekurhuleni Municipality 89

Figure 7-15 – Sensitive receptors 91

Figure 7-16 - Hourly nitrogen dioxide concentrations measured at Thokoza 92

Figure 7-17 - Hourly sulphur dioxide concentrations measured at Thokoza 92

Figure 7-18 - Daily PM10 concentrations measured at Thokoza 93

Figure 8-1 - Individual Risk 123

Figure 8-2 – Catastrophic Chlorine Cylinder Failure 127

Figure 8-3 – Chlorine Valve Leak 127

APPENDICES

APPENDIX A

EAP CV

APPENDIX B

EAP DECLARATION

APPENDIX C

SPECIALIST DECLARATIONS

APPENDIX D

STAKEHOLDER ENGAGEMENT REPORT

APPENDIX E

MAPS

APPENDIX F

DFFE SCREENING TOOL REPORT

APPENDIX G

SPECIALIST STUDIES

APPENDIX G.1

DESKTOP GEOTECHNICAL ASSESSMENT

APPENDIX G.2

DOLOMITE AND GEOTECHNICAL ASSESSMENT

APPENDIX G.3

TERRESTRIAL BIODIVERSITY ASSESSMENT

APPENDIX G.4

ARCHAEOLOGICAL AND CULTURAL ASSESSMENT

APPENDIX G.5

PHASE 1 PALAEONTOLOGY ASSESSMENT

APPENDIX G.6

MHI ASSESSMENT REPORT

APPENDIX G.7

AIR QUALITY IMPACT ASSESSMENT

APPENDIX G.8

STORMWATER MANAGEMENT PLAN

APPENDIX H

EMPR

APPENDIX I

SITE LAYOUT

GLOSSARY

Abbreviation	Definition
AEL	Atmospheric Emissions License
AIA	Approved Inspection Authority
AIS	Alien and Invasive Species
AQI	Air Quality Impact Assessment
BA	Basic Assessment
CA	Competent Authority
CARA	Conservation of Agricultural Resources Act
CBA	Critical Biodiversity Area
CGS	Council for Geoscience
CRR	Comments and Response Report
DFFE	Department of Forestry, Environment and Fisheries
DSR	Draft Scoping Report
DWS	Department of Water and Sanitation
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EMM	Ekurhuleni Metropolitan Municipality
EMPr	Environmental Management Programme
FSR	Final Scoping Report
GA	General Authorisation
GDARD	Gauteng Department of Agriculture and Rural Development
GHS	Globally Harmonized System
H_2SO_4	Sulphuric Acid
HCL	Hydrochloric Acid

Abbreviation	Definition
HIA	Heritage Impact Assessment
I&AP	Interested and Affected Party
IDP	Integrated Development Plan
MES	Minimum Emission Standards
MHI	Major Hazardous Installation
NEMA	National Environmental Management Act
NEM: AQA	National Environmental Management: Air Quality Act
NEMBA	National Environmental Management: Biodiversity Act
NEM: WA	National Environmental Management: Waste Act
NFEPA	National Freshwater Ecosystem Priority Areas
NHRA	National Heritage Resources Act
NWA	National Water Act
PIA	Palaeontological Impact Assessment
QRA	Quantitative Risk Assessment
S&EIR	Scoping and Environmental Impact Reporting
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
SANBI	South African National Biodiversity Institute
ToR	Terms of Reference
WMA	Water Management Area
WML	Waste Management Licence
WUL	Water Use License

1 INTRODUCTION

WSP Group Africa (Pty) Ltd (WSP) was appointed by Richbay Chemicals (Pty) Ltd (Richbay), to undertake a Scoping and Environmental Impact Reporting (S&EIR) process in accordance with the National Environmental Management Act (No. 107 of 1998) (NEMA), Environmental Impact Assessment Regulations, 2014 as amended (EIA Regulations) for a proposed Filling Plant (Proposed Project) in Vosloorus, south-east of Johannesburg, Gauteng Province.

1.1 PURPOSE OF THIS REPORT

This Draft Environmental Impact Assessment Report (EIAR) documents the process and findings of the impact assessment phase of the S&EIR process for the Proposed Filling Plant.

The Environmental Impact Assessment (EIA) process is an interdisciplinary procedure to ensure that environmental considerations are included in decisions regarding projects that may impact the environment. The process identifies potential environmental impacts associated with a proposed project and management actions required to either mitigate or avoid the negative impacts or to enhance the positive impacts associated with a proposed project. In the context of this report, the purpose of the S&EIR process is to inform decision-makers and the public of the environmental consequences of the proposed project.

This Draft EIAR (this document) is a technical tool that identifies, predicts, and analyses impacts on the physical environment, as well as social, cultural, and health impacts. The report identifies alternatives and mitigation measures to reduce the environmental impact of the proposed project; and it also serves an important procedural role in the overall decision-making process by promoting transparency and public involvement.

1.2 BACKGROUND INFORMATION

Richbay Chemicals is a chemical manufacturer and international distributor of various speciality cleaning, maintenance, and water treatment chemical products, and is a major exporter of hydrochloric acid (HCl) and sulphuric acid (H_2SO_4) in packed form. Richbay Chemicals currently undertakes dangerous goods storage (below 80m^3) at the site in Vosloorus, Gauteng, however they are proposing to increase the storage capacity and to install a Filling Plant, as such, Richbay has initiated the Environmental Authorisation (EA) process required for the proposed Vosloorus Filling Plant.

According to the accepted Scoping Report (SR) Richbay Chemicals intended to undertake the following:

- Phase 1 for the construction of a Filling Plant;
- Phase 2 for the construction of an Acid Regeneration Plant; and
- Phase 3 for construction of a Solvent Filling Plant.

However, Richbay now proposes to only construct and operate Phase 1 and Phase 3 of the initial proposal, therefore this EIAR considers Phase 2 in addition to Phase 1 and 3 as an alternative.

The majority (approximately 95%) of the chemicals that will be stored are NSF60 chemicals which is used in the treatment of drinking water.

1.3 KEY ROLE PLAYERS

1.3.1 PROJECT PROPONENT

Richbay Chemicals is the project proponent (Applicant) with regards to this application for the construction and operation of the Filling Plant within the Gauteng Province. **Table 1-1** provides the relevant details of the project proponent.

Table 1-1 – Details of Project Proponent

Proponent:	**Richbay Chemicals**
Contact Person:	Mr MF Klopper
Postal Address	PO Box 368 Richards Bay 3900
Telephone:	035 751 1702
Email:	martink@richbay.co.za

1.3.2 COMPETENT AUTHORITY

Section 24C(2)(a) of the NEMA stipulates that the Minister of Forestry, Fisheries and the Environment (DFFE) ("the Minister") must be identified as the Competent Authority (CA) if the activity:

- Has implications for international environmental commitments or relations and where:
  - It is identified by the Minister by notice in the Gazette; or
  - It is an activity that takes place in an area protected by means of an international environmental instrument, other than:
    - A conservancy;
    - A protected natural environment;
    - A proclaimed private nature reserve;
    - A natural heritage site;
    - The buffer zone or transitional area of a biosphere reserve, or
    - The buffer zone or transitional area of a world heritage site.

The proposed filling is not associated with any of the above, as such the Minister will not act as the CA, therefore the Gauteng Department of Agriculture and Rural Development (GDARD) has been identified as the CA for the Proposed Project. The CA for the EA process was confirmed in email correspondence on 25 February 2020 when the GDARD issued a reference number (Ref Gaut 002/19-20/E0247) for the application for EA for the Filling Plant.

Table 1-2 provides the relevant details of the CA on the Project.

Table 1-2 – Competent Authority

Aspect	Competent Authority	Contact Details
Competent Authority: Environmental Authorisation	GDARD	Case Officer: Erick Moletsane Environmental Services Email: erick.moletsane@gauteng.gov.za

1.3.3 COMMENTING AUTHORITY

The commenting authorities for the project include but are not limited to:

- DFFE;
- GDARD;
- DFFE Biodiversity Conservation Unit;
- South African Resource Heritage Agency (SAHRA); and
- Ekurhuleni Metropolitan Municipality (EMM).

Refer to the Stakeholder Engagement Report (SER) in **Appendix D** for a full list of commenting authorities.

1.3.4 ENVIRONMENTAL ASSESSMENT PRACTITIONER

WSP was appointed in the role of Independent Environmental Assessment Practitioner (EAP) to undertake the Scoping and EIA process for the Proposed Project. The Curriculum Vitae (CV) of the EAP is available in **Appendix A**. The EAP declaration of interest and undertaking is included in **Appendix B**. **Table 1-3** provides details the relevant contact details of the EAP.

Table 1-3 – Details of the EAP

EAP	WSP Group Africa (Pty) Ltd
Contact Person:	Patricia Nathaniel
Physical Address:	1st Floor, Pharos House, 70 Buckingham Terrace, Westville 3629 South Africa
Telephone:	011 361 1398
Email:	Patricia.Nathaniel@wsp.com
EAP Qualifications:	▪ BSc (Hons) Environmental Management ▪ BSc (Geography)

EAP	WSP Group Africa (Pty) Ltd
EAPASA Registration Number:	EAPASA (2020/1120)

Statement of Independence

Neither WSP nor any of the authors of this Report have any material present or contingent interest in the outcome of this Report, nor do they have any business, financial, personal or other interest that could be reasonably regarded as being capable of affecting their independence. WSP has no beneficial interest in the outcome of the assessment.

1.3.5 SPECIALISTS

Specialist input was required in support of this application for EA. The details of the specialists are provided in **Table 1-4** below. The specialist studies are attached in **Appendix G** and their declarations in **Appendix C**. It should be noted that the specialists were appointed prior to the promulgation of the Procedure for the Assessment of the Minimum Criteria for Reporting on Identified Environmental Themes and as such the specialist studies does not meet this requirement.

Table 1-4 – Details of Specialists

Assessment	Name of Specialist	Company	Sections in Report	Specialist Report attached as
Biodiversity Baseline and Impact Assessment	Martinus Erasmus	The Biodiversity Company	▪ Section 7.2.1 ▪ Section 8.4	**Appendix G.3**
Desktop Geotechnical Study	Robert Leyland	WSP	▪ Section 7.1.3	**Appendix G.1**
Feasibility Dolomite Stability and Geotechnical Investigation	Deon Bester	Knight Piesold Consulting	▪ Section 7.1.3 ▪ Section 7.1.4	**Appendix G.2**
Major Hazard Installation	TC Thackwray	MHR Consultants	▪ Section 7.3.5 ▪ Section 8.10	**Appendix G.6**
Heritage Impact Assessment	A.C. van Vollenhoven	Archaetnos	▪ Section 7.3.1 ▪ Section 8.5	**Appendix G.4**
Desktop Palaeontological Impact Assessment	Dr. H. Fourie	Independent Specialist	▪ Section 7.3.2 ▪ Section 8.6	**Appendix G.5**

Assessment	Name of Specialist	Company	Sections in Report	Specialist Report attached as
Stormwater Management Plan	Le Roux Fourie	DMV Consultants	▪ Section 8.3	**Appendix G.8**
Air Quality Impact Assessment	L. Dyer	WSP	▪ Section 7.3.6 ▪ Section 8.1	**Appendix G.7**

1.4 ENVIRONMENTAL IMPACT ASSESSMENT TERMS OF REFERENCE

The proposed Richbay Chemicals Filling Plant project include activities that require to be subject to an S&EIR process due to the applicability of the NEMA, EIA Regulations, 2014 as amended and the associated EIA Listing Notices 1, 2 and 3 (GNR 327, 325 and 324). In order for the project to proceed, it will require an EA from the GDARD.

This EIAR follows the Scoping Phase of the S&EIR process. The Scoping Phase conducted involved consultation with Interested and Affected Parties (I&APs) and compilation of the Plan of Study for the EIA (POS for EIA) which culminated in the submission of a Final Scoping Report (FSR) to the GDARD on 14 September 2021.

The GDARD accepted the FSR and authorisation to proceed with EIA was received in a letter dated 20 October 2021 (**Appendix D**).

As defined in Appendix 3 of GNR 326, as amended, the objective of the EIA Phase is to, through a consultative process:

- 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;
- 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 SR;
- Identify the location of the development footprint within the approved site as contemplated in the accepted SR 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;
- Determine the—
    - nature, significance, consequence, extent, duration and probability of the impacts occurring to inform identified preferred alternatives; and;
    - degree to which these impacts—
        - can be reversed;
        - may cause irreplaceable loss of resources, and
        - can be avoided, managed or mitigated;

- 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;
- 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;
- Identify suitable measures to avoid, manage or mitigate identified impacts; and
- Identify residual risks that need to be managed and monitored.

The Public Participation Process (PPP) is a requirement of the S&EIR process; it consists of a series of inclusive interactions aimed at providing stakeholders with opportunities to express their views, so that these can be considered and incorporated into the S&EIR decision-making process. Effective public participation requires the prior disclosure of relevant and adequate project information to enable stakeholders to understand the risks, impacts, and opportunities of the proposed project. The objectives of the PPP can be summarised as follows:

- Identify relevant individuals, organisations and communities who may be interested in or affected by the Proposed Project;
- Clearly outline the scope of the Proposed Project, including the scale and nature of the existing and proposed activities;
- Identify viable proposed project alternatives that will assist the relevant authorities in making an informed decision;
- Identify shortcomings and gaps in existing information;
- Identify key concerns, raised by Stakeholders that should be addressed in the subsequent specialist studies;
- Highlight the potential for environmental impacts, whether positive or negative; and
- To inform and provide the public with information and an understanding of the proposed project, issues and solutions.

1.5 ENVIRONMENTAL IMPACT REPORT STRUCTURE

As per the EIA Regulations 2014, as amended, Appendix 3 of GNR 326 identifies the legislated requirements that must be contained within An EIR for the CA to consider and come to a decision on the application. **Table 1-5** below details where the required information is located within this report.

Table 1-5 – Legislated Report Requirements as detailed in GNR 326

Appendix 1 of GNR 326	Description	Relevant Report Section
3(1) (a)	Details of the EAP who prepared the report and the expertise of the EAP, including a curriculum vitae	Section 1.3.4 and **Appendix A**
3(1) (b)	The location of the activity	Section 6.1
3(1) (c)	A plan which locates the proposed activity or activities applied for as well as associated structures and infrastructure at an appropriate scale	Section 6.1 **Appendix I**

Appendix 1 of GNR 326	Description	Relevant Report Section
3(1) (d)	A description of the scope of the proposed activity	Section 6
3(1) (e)	A description of the policy and legislative context within which the development is proposed	Section 2
3(1) (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 location	Section 0
3(1) (g)	A motivation for the preferred site, activity and technology alternative	Section 6.5
3(1) (h)	A full description of the process followed to reach the proposed alternative within the site	Section 6.5
3(1) (i)	A full description of the process undertaken to identify, assess and rank the impacts the activity will impose on the preferred location through the life of the activity	Section 4.1
3(1) (j)	An assessment of each identified potentially significant impact and risk	Section 8
3(1) (k)	Where applicable, a summary of the findings and impact management measures identified in any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final report	▪ Section 8 ▪ Section 10
3(1) (l)	An environmental impact statement	Section 10
3(1) (m)	Based on the assessment, and where applicable, impact management measures from specialist reports, the recording of the proposed impact management objectives, and the impact management outcomes for the development for inclusion in the Environmental Management Programme (EMPr).	Section 8 **Appendix H**
3(1) (n)	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.	Section 10.4
3(1) (o)	A description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed	Section 1.6
3(1) (p)	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	Section 10.5

Appendix 1 of GNR 326	Description	Relevant Report Section
3(1) (q)	Where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required, the date on which the activity will be conducted, and the post construction monitoring requirements finalised	N/A
3(1) (r)	An undertaking under oath or affirmation by the EAP	**Appendix B**
3(1) (s)	Where applicable, details of any financial provisions for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts	N/A
3(1) (t)	Any specific information that may be required by the competent authority	N/A
3(1) (u)	Any other matters required in terms of section 24(4)(a) and (b) of the Act	N/A

1.6 ASSUMPTIONS AND LIMITATIONS

1.6.1 GENERAL ASSUMPTIONS AND LIMITATIONS:

- The EAP hereby confirms that they have undertaken to obtain project information from the client that is deemed to be accurate and representative of the Project.
- Site visits have been undertaken to better understand the project and ensure that the information provided by the client is correct, based on site conditions observed.
- The EAP hereby confirms their independence and understands the responsibility they hold in ensuring all comments received are accurately replicated and responded to within the EIA documentation.
- The comments received in response to the public participation process, will be representative of comments from the broader community.
- Based on the approval of the Scoping Phase, the CA would not require additional specialist input, in order to make a decision regarding the application.

1.6.2 TERRESTRIAL BIODIVERSITY ASSESSMENT

- As per the scope of work, the fieldwork component of the assessment comprised of one assessment only, which was conducted during the wet season.
- This study has not assessed any temporal trends for the respective seasons.
- Despite these limitations, a comprehensive desktop study was conducted, in conjunction with the detailed results from the surveys, and as such there is a high confidence in the information provided.

1.6.3 HERITAGE IMPACT ASSESSMENT

- Cultural Resources are all non-physical and physical man-made occurrences, as well as natural occurrences associated with human activity. These include all sites, structure and artifacts of importance, either individually or in groups, in the history,

architecture and archaeology of human (cultural) development. Graves and cemeteries are included in this.

- The significance of the sites, structures and artifacts is determined by means of their historical, social, aesthetic, technological and scientific value in relation to their uniqueness, condition of preservation and research potential. The various aspects are not mutually exclusive, and the evaluation of any site is done with reference to any number of these aspects.
- Cultural significance is site-specific and relates to the content and context of the site. Sites regarded as having low cultural significance have already been recorded in full and require no further mitigation. Sites with medium cultural significance may or may not require mitigation depending on other factors such as the significance of impact on the site. Sites with a high cultural significance require further mitigation.
- The latitude and longitude of any archaeological or historical site or feature, is to be treated as sensitive information by the developer and should not be disclosed to members of the public.
- All recommendations are made with full cognizance of the relevant legislation.
- It has to be mentioned that it is almost impossible to locate all the cultural resources in a given area, as it will be very time consuming. Developers should however note that the report should make it clear how to handle any other finds that might occur.

1.6.4 AIR QUALITY IMPACT ASSESSMENT

- Unless otherwise stated, operational information for the proposed development was provided by Richbay. Any errors, limitations or assumptions inherent in these datasets extend to this study. The following assumptions are also applicable to the information provided by Richbay:
  - Tank heights have been calculated based on tank diameter and tank capacity.
  - Tank working volumes have been calculated based on a maximum liquid height of 90%.
  - Average liquid heights are 50% of the maximum liquid height.
  - Net throughput of each tank is based on product consumption rates, the number of duplicate tanks (applicable to the Filling Plant only) and calculated working volumes.
  - Where required, the coordinates of each emission source have been adjusted to better align with the proposed plant layout.
  - Emission source IDs have been independently assigned by WSP to assist with the interpretation of data and findings presented in this AQIA. These IDs will not necessarily feed through to other specialist assessments conducted as part of the Richbay Vosloorus EIA, nor Richbay's record keeping going forward.
  - Richbay intend to duct the vents from HCl storage tanks through the HCl scrubber. HCl emissions from these storage tanks are thus emitted via the scrubber exhaust stack and not considered to be fugitive releases.
- In the absence of NPI emission factors for paraffin fired boilers, emission factors for the combustion of distillate (diesel) oil fired boilers less than 30 MW capacity have been substituted for criteria pollutants (excluding SO_2).

- SO_2 emission rates were calculated using a fuel analysis approach and a typical sulphur content (by mass) of paraffin in South Africa of 0.05%. This approach assumes that 100% of sulphur is converted to SO_2.
- Buildings downwash effects have been accounted for in the dispersion model using approximate building location and building shape provided in the proposed site layout plan. In line with the Modelling Regulations, all bulk storage tanks have been represented as circular buildings for downwash calculations. All buildings (with the exception of storage tanks) are assumed to be 3 m in height (i.e. the average height of a single storey).
- Variable emission rates have been applied to simulate a 10 hour/weekday operating scenario for the boiler (i.e. Monday to Friday from 07h00 to 17h00, inclusive). All other emission sources are considered continuous (i.e. 24 hours per day for 365 days per year).
- This study adopts a Tier 2 NO_x to NO_2 conversion ratio of 0.8, which is considered as a conservative ratio by the Modelling Regulations.
- While it is suspected that the 'Leondale' ambient air quality monitoring station is also located within 10 km of the study site, the exact location of this station could not be confirmed by SAWS or the EMM at the time this report was completed and thus has been omitted from this assessment.

1.6.5 PALAEONTOLOGICAL ASSESSMENT

- There are no assumptions and limitations associated with the Palaeontological Assessment.

1.6.6 MAJOR HAZARD INSTALLATION (MHI) RISK ASSESSMENT

- There are no assumptions and limitations associated with the MHI Assessment.

1.6.7 GEOTECHNICAL ASSESSMENT

- There are no assumptions and limitations associated with the Geotechnical Assessment.

1.6.8 STORMWATER MANAGEMENT PLAN

- There are no assumptions and limitations associated with the Stormwater Management Plan.

2 GOVERNANCE FRAMEWORK

2.1 NATIONAL LEGAL AND REGULATORY FRAMEWORK

The South African regulatory framework establishes well-defined requirements and standards for environmental and social management of industrial and civil infrastructure developments. Different authorities at both national and regional levels carry out environmental protection functions. The applicable legislation and policies are shown in **Table 2-1.**

Table 2-1 – Applicable National Legislation[1]

Legislation	Description of Legislation and Applicability
The Constitution of South Africa (No. 108 of 1996)	The Constitution cannot manage environmental resources as a stand-alone piece of legislation hence additional legislation has been promulgated in order to manage the various spheres of both the social and natural environment. Each promulgated Act and associated Regulations are designed to focus on various industries or components of the environment to ensure that the objectives of the Constitution are effectively implemented and upheld in an on-going basis throughout the country. In terms of Section 7, a positive obligation is placed on the State to give effect to the environmental rights.
National Environmental Management Act (No. 107 of 1998) **The GDARD is the competent authority**	In terms of Section 24(2) of the NEMA, the Minister may identify activities which may not commence without prior authorisation. The Minister thus published GNR 327 (Listing Notice 1), 325 (Listing Notice 2) and 324 (Listing Notice 3) listing activities that may not commence prior to authorisation (7 April 2017). The regulations outlining the procedures required for authorisation are published in GNR 326 [Environmental Impact Assessment Regulations (EIA)] (7 April 2017). Listing Notice 1 identifies activities that require a Basic Assessment (BA) process to be undertaken, in terms of the EIA Regulations, prior to commencement of that activity. Listing Notice 2 identifies activities that require an S&EIR process to be undertaken, in terms of the EIA Regulations, prior to commencement of that activity. Listing Notice 3 identifies activities within specific areas that require a BA process to be undertaken, in terms of the EIA Regulations, prior to commencement of that activity. WSP undertook a legal review of the listed activities according to the proposed project description to conclude that the activities listed in in this section are considered applicable to the development: A S&EIR process must be followed. An EA is required and will be applied for with the GDARD.

[1] It should be noted that all dimensions outlined in relation to Listing Notice 1, 2 and 3 are provisional and are subject to final design.

Legislation	Description of Legislation and Applicability
Listing Notice 1: GNR 983 **The GDARD is the competent authority**	***Activity 27*** *- The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for:* *(i)the undertaking of a linear activity; or* *(ii)maintenance purposes undertaken in accordance with a maintenance management plan* **Description:** Based on an initial evaluation during the Scoping Phase it was identified that the site is a total size of approximately 8 ha, of which over 3 ha is potentially covered by natural vegetation. A vegetation assessment was conducted to confirm that the vegetation type for the majority of the site is considered as transformed with the remaining extent of the site considered as degraded grassland. The vegetation species that dominate the site are alien and invasive species with scattered indigenous species that will not account for 1 hectare or more of the site, **therefore this activity is no longer being applied for.**
Listing Notice 1: GNR 983 **The GDARD is the competent authority**	***Activity 67 -*** *Phased activities for all activities—* *(i) listed in this Notice, which commenced on or after the effective date of this Notice similarly listed in any of the previous NEMA notices, which commenced on or after the effective date of such previous NEMA Notices.* **Description:** It is anticipated that Phase 1 will be constructed before Phase 3 therefore making this activity applicable.
Listing Notice 2: GNR 984 **The GDARD is the competent authority**	***Activity 4*** *- The development of facilities or infrastructure, for the storage, or storage and handling of dangerous goods, where such storage occurs in containers with a combined capacity of more than 500 cubic metres.* **Description:** Chemicals will be temporarily stored in bulk tanks at the Filling Plant prior to them being decanted and dispatched. At this point, it is anticipated that the plant will have a combined storage capacity of about 2000Mt to 2500Mt. 2500Mt is an approximate equivalent to 1.5 million cubic metres. Therefore, the anticipated combined storage exceeds the combined storage of the storage tanks.
Listing Notice 2: GNR 984 **The GDARD is the competent authority**	***Activity 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, excluding—*

<table>
<tr><th>Legislation</th><th>Description of Legislation and Applicability</th></tr>
<tr><td></td><td>
(i) activities which are identified and included in Listing Notice 1 of 2014;

(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;

(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

(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.

Description:

The proposed activity falls under Category 6: Organic Chemicals Industry, and Subcategory 7.2: Production of Acids of Government Notice Regulation 893 of 2013, promulgated in line with Section 21 of the National Environmental Management: Air Quality Act 39 of 2004 (NEM:AQA). As such, an Air Quality Impact Assessment (AQIA) is required as part of the EIA process to support the application for an Atmospheric Emissions License (AEL).
<table>
<tr><th>Section 21 category</th><th>Subcategory</th><th>Process trigger</th></tr>
<tr><td>6: Organic Chemicals Industry</td><td>N/A</td><td>The use of organic chemicals including 300 tonnes per annum of Formalin (formaldehyde)</td></tr>
<tr><td>7: Inorganic Chemicals Industry</td><td>7.2 Production of Acids</td><td>Secondary production of hydrochloric acid through regeneration.</td></tr>
</table>
</td></tr>
<tr><td>Listing Notice 3: GNR 985

The GDARD is the competent authority</td><td>
Activity 10 - The development of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such a storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic meters.

(c) In Gauteng:

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

Description:

A portion of the site contains natural vegetation that is classified as CBA (Important Area). The Filling Plant will have a combined storage capacity of about 1.5 million cubic metres at full filling production.
</td></tr>
</table>

Legislation	Description of Legislation and Applicability
Listing Notice 3: GNR 985 **The GDARD is the competent authority**	***Activity 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.;* ***In Gauteng, province:*** *ii) Within Critical Biodiversity Areas or Ecological Support Areas identified in the Gauteng Conservation Plan or bioregional plans;* **Description:** A portion of the site contains natural vegetation that is classified as a CBA. It is anticipated that more than 300 square meters of the CBA will be cleared for constructing the proposed Filling Plant and its associated infrastructure.
National Environmental Management: Waste Act (59 of 2008) (NEM:WA) **The DFFE is the competent authority**	In terms of section 19 of the NEM:WA, a list of waste management activities that have, or are likely to have a detrimental effect on the environment were published in GNR 921 (November 2013). WSP undertook a review of the listed activities according to the proposed project description to conclude that Listed Activities 2, 4 and 10 under Category B, Listed Activity 2 under Category C are considered applicable to Phase 2 of the project which is now considered as an alternative. A Waste Management Licence is therefore required for Phase 2 and will be applied for with the DFFE if it is to proceed.
GNR 921: Category B **The DFFE is the competent authority**	***Activity 2*** *- The reuse or recycling of hazardous waste in excess of 1 ton per day, excluding reuse or recycling that takes place as an integral part of an internal manufacturing process within the same premises.* **Description:** Waste HCl will be recycled into Ferric Chloride and a small portion of Calcium Chloride at the acid regeneration plant. It is expected that approximately 30Mt of HCl will be re-processed daily to produce the same amount of Ferric Chloride. A Waste Management Licence is therefore required for Phase 2 and will be applied for with the DFFE if it is to proceed.
GNR 921: Category B **The DFFE is the competent authority**	***Activity 4*** *- The treatment of hazardous waste in excess of 1 ton per day calculated as a monthly average; using any form of treatment excluding the treatment of effluent, wastewater or sewage.* **Description:** Waste HCl will be treated into Ferric Chloride and a small portion of Calcium Chloride at the acid regeneration plant. It is expected that approximately 30Mt of HCl will be re-processed daily to produce the same amount of Ferric Chloride. A Waste Management Licence is therefore required for Phase 2 and will be applied for with the DFFE if it is to proceed.

Legislation	Description of Legislation and Applicability
GNR 921: Category B **The DFFE is the competent authority**	***Activity 10*** *- The construction of a facility for a waste management activity listed in Category B of this Schedule (not in isolation to associated waste management activity).* **Description:** A Filling Plant, which will include an acid regeneration plant, will be constructed. The plant will be used for the handling & storage of chemicals, as well as the re-processing of waste HCl to produce Ferric Chloride, as well as the manufacturing of caustic soda. A Waste Management Licence is therefore required for Phase 2 and will be applied for with the DFFE if it is to proceed.
GNR 921: Category C **The DFFE is the competent authority**	***Activity 2*** *- The storage of hazardous waste at a facility that has the capacity to store in excess of 80m^3 of hazardous waste at any one time, excluding the storage of hazardous waste in lagoons or temporary storage of such waste.* **Description:** The Filling Plant will have a combined storage capacity of about 2 000Mt – 2 500Mt (2 204.6 tons – 2 755.7 tons) at full filling production. A Waste Management Licence is therefore required for Phase 2 and will be applied for with the DFFE if it is to proceed.
National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)	The National Environmental Management: Biodiversity Act, 2004 (No. 10 of 2004) (NEMBA) was promulgated in June 2004 within the framework of NEMA to provide for the management and conservation of national biodiversity. The NEMBA's primary aims are for the protection of species and ecosystems that warrant national protection, the sustainable use of indigenous biological resources, the fair and equitable sharing of benefits arising from bioprospecting involving indigenous biological resources. In addition, the NEMBA provides for the establishment and functions of a South African National Biodiversity Institute (SANBI). SANBI was established by the NEMBA with the primary purpose of reporting on the status of the country's biodiversity and conservation status of all listed threatened or protected species and ecosystems. The biodiversity assessment identifies CBAs which represent biodiversity priority areas which should be maintained in a natural to near natural state. The CBA maps indicate the most efficient selection and classification of land portions requiring safeguarding in order to meet national biodiversity objectives. As such, an Ecological Assessment will be undertaken as part of the EIA process. The Conservation of Agricultural Resources Act (No. 43 of 1983) (CARA) Regulations with regards to alien and invasive species have been superseded by the NEM:BA – Alien and Invasive Species (AIS) Regulations which became law on 1 October 2014. Specific management measures for the control of alien and invasive plants will be included in the Environmental Management Programme (EMPr).

Legislation	Description of Legislation and Applicability
The National Water Act (No. 36 Of 1998)	The National Water Act (No. 36 of 1998) (NWA) provides the framework to protect water resources against over exploitation and to ensure that there is water for social and economic development, human needs and to meet the needs of the aquatic environment. The Act defines water source to include watercourses, surface water, estuary or aquifer. A watercourse is defined in the Act as a river or spring, a natural channel in which water flows regularly or intermittently, a wetland, lake or dam into which or from which water flows, and any collection of water that the Minister may declare a watercourse. Section 21 of the Act outlines a number of categories that require a water user to apply for a Water Use License (WUL) and Section 22 requires water users to apply for a General Authorisation (GA) with the Department of Water and Sanitation (DWS) if they are under certain thresholds or meet certain criteria. The list of water uses that require a WUL under section 21 are presented below: a) Taking water from a water resource; b) Storage of water; c) Impeding or diverting the flow of water in a watercourse; d) Engaging in a stream flow reduction activity; e) Engaging in a controlled activity; f) Discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit; g) Disposing of waste in a manner which may detrimentally impact on a water resource; h) Disposing in any manner of water which contains waste from, or which has been heated in. any industrial or power generation process; i) Altering the bed, banks, course or characteristics of a watercourse; j) Removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people; and k) Using water for recreational purposes. There are no water uses anticipated for the proposed project, therefore, a WUL is not required.
The National Heritage Resources Act (No. 25 Of 1999)	The National Heritage Resource Act (No. 25 of 1999) (NHRA) serves to protect national and provincial heritage resources across South Africa. The NHRA provides for the protection of all archaeological and palaeontological sites, the conservation and care of cemeteries and graves by the South African Heritage Resources Agency (SAHRA), and lists activities that require any person who intends to undertake to notify the responsible heritage resources agency and furnish details regarding the location, nature, and extent of the proposed development. In terms of the Section 38 of NHRA, any person who intends to undertake a linear development exceeding 300m in length or a

Legislation	Description of Legislation and Applicability
	development that exceeds 5 000 m^2 must notify the heritage resources authority and undertake the necessary assessment requested by that authority. In the case of the proposed Filling Plant, a Heritage Impact Assessment (HIA) has been undertaken looking at Archaeology, Heritage and Palaeontology as the site is approximately 80 500m^2. The proposed project have been brought to the attention of SAHRA, as well as the provincial Heritage Resource Agencies, who will provide comment, and provide the required approval.
The National Environmental Management: Air Quality Act (Act 39 Of 2004) **The EMM is the competent authority**	According to Section 22 of the NEM: AQA, no person may, without a provisional atmospheric emission licence or an AEL, conduct an activity that is: ▪ Listed on the national list anywhere in the Republic; or ▪ Listed on the list applicable in a province anywhere in that province. Listed activities and associated minimum emission standards (MES) were published in Government Notice 248 of 2010, Government Gazette 33064 in-line with Section 21 of NEM: AQA. An amended list of activities was published in Government Notice 893 of 2013, Government Gazette 37054, in Government Notice 551 of 2015, Government Gazette 38863 and further in Government Notice 1207 of 2018, Government Gazette 42013. According to the listed activities and associated minimum emission standards, the proposed operations will trigger the following listed activities: ▪ Category 6 Organic Chemicals Industry; ▪ Category 7, Subcategory 7.2 :Production of Acids; and ▪ Subcategory 7.7 Production of Caustic Soda. An AEL will be applied for due to the associated triggers.
The Hazardous Substances Act (No. 15 Of 1973)	The Hazardous Substances Act (No. 15 of 1973) provides measures for the control of substances and certain electronic products that may be toxic, corrosive, irritant, strongly sensitizing or flammable in nature which may cause injury or ill-health to or death of human beings. The Act divides the substances or products into groups in relation to the degree of danger and makes provision for the prohibition and control of the importation, manufacture, sale, use, operation, application, modification, disposal or dumping of such substances and products. On review of the national standard SANS 10234:2008 Globally Harmonized System of classification & labelling of chemicals (GHS), WSP noted that a number of the chemicals proposed for storage at the site are listed in Appendix A of the Standard, therefore the Standard is applicable. Where substances are produced, used, handled or stored in such a form and quantity that it has the potential to cause a major accident, a Major Hazardous Installation (MHI) designation may be assigned to the facility. Therefore, a risk assessment was undertaken as part of the S&EIR process by an Approved Inspection Authority (AIA) in order to confirm whether the facility will be an MHI.

2.2 POLICIES AND PLANS

Table 2-2 summarised key policies and plans as an outline of the governance framework for the Project.

Table 2-2 – Applicable Regional Policies and Plans

Applicable Policy	Description of Policy
National Development Plan	The National Development Plan aims to eliminate poverty and reduce inequality by 2030. The NDP identifies a number of enabling milestones. Of relevance to the proposed development the NDP refers to the need to produce sufficient energy to support industry at competitive prices and ensure access for poor households, while reducing carbon emissions per unit of power by about one-third. In this regard the infrastructure is not just essential for faster economic growth and higher employment. It also promotes inclusive growth, providing citizens with the means to improve their own lives and boost their incomes. Infrastructure is essential to development. Chapter 3, Economy and Employment, identifies some of the structural challenges specific to South Africa, including an energy constraint that will act as a cap on growth and on options for industrialisation. The NDP notes that from an environmental perspective South Africa faces several related challenges. The reduction of greenhouse gas emissions and shift to a green low-carbon economy, is one of these challenges. In terms of implementation the NDP identifies three phases. The first two are of specific relevance to the proposed project. The first phase (2012–2017) notes that ensuring the supply of energy and water is reliable and sufficient for a growing economy. The second phase (2018–2023) involves building on the first phase to lay the foundations for more intensive improvements in productivity. The provision of affordable and reliable energy is a key requirement for this to take place. Chapter 4, Economic infrastructure, notes that economic infrastructure provides the foundation for social and economic development. In this regard South Africa must invest in a strong network of economic infrastructure designed to support the country's medium- and long-term economic and social objectives. The plan envisages that, by 2030, South Africa will have an energy sector that promotes: ▪ Economic growth and development through adequate investment in energy infrastructure. The sector should provide reliable and efficient energy service at competitive rates, while supporting economic growth through job creation. ▪ Environmental sustainability through efforts to reduce pollution and mitigate the effects of climate change. More specifically, South Africa should have adequate supply security in electricity and in liquid fuels, such that economic activity, transport, and welfare are not disrupted. The plan sets out steps that aim to ensure that, in 20 years, South Africa's energy system looks very different to the current

Applicable Policy	Description of Policy
	situation. In this regard coal will contribute proportionately less to primary-energy needs, while gas and renewable energy resources, will play a much larger role.
New Growth Path	Government released the New Economic Growth Path Framework on 23 November 2010. The aim of the framework is to enhance growth, employment creation and equity. The policy's principal target is to create five million jobs over the next 10 years and reflects government's commitment to prioritising employment creation in all economic policies. The framework identifies strategies that will enable South Africa to grow in a more equitable and inclusive manner while attaining South Africa's developmental agenda. Central to the New Growth Path is a massive investment in infrastructure as a critical driver of jobs across the economy. In this regard the framework identifies investments in five key areas namely: energy, transport, communication, water, and housing.

2.3 PROVINCIAL AND MUNICIPAL LEGAL AND REGULATORY FRAMEWORK

Table 2-3 – Provincial Plans

Applicable Plan	Description of Plan
Gauteng Conservation Plan	The Gauteng Conservation Plan (Version 3.3) (GDARD, 2014b) classified areas within the province on the basis of its contribution to reach the conservation targets within the province. These areas are classified as Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs) to ensure sustainability in the long term. The CBAs are classified as either 'Irreplaceable' (must be conserved), or 'Important'. CBAs are terrestrial and aquatic areas of the landscape that need to be maintained in a natural or near-natural state to ensure the continued existence and functioning of species and ecosystems and the delivery of ecosystem services. Thus, if these areas are not maintained in a natural or near natural state then biodiversity targets cannot be met. According to the Gauteng Terrestrial CBA Plan (C-Plan) a portion of the project area falls in a CBA: Important area.
Ekurhuleni Integrated Development Plan (2017/018)	The main purpose of the Integrated Development Plan (IDP) is to foster more appropriate service delivery by providing the framework for economic and social development within the municipality. In doing so it contributes towards eradicating the development legacy of the past, operationalises the notion of developmental local government and foster a culture of co-operative governance amongst the three spheres. Integrated development planning is a process whereby municipalities prepare strategic development plans for a five-

Applicable Plan	Description of Plan
	year period. IDPs are the main platform through which sustainable provision of service delivery could be achieved. They intend to promote co-ordination between local, provincial and national government. Once adopted by Council, these plans should inform planning, decision making, budgeting, land management, promotion of local economic development, and institutional transformation in a consultative systematic and strategic manner. The main objective of developing an IDP is the promotion of developmental local government, through the following: ■ Institutionalising performance management in order to ensure meaningful, effective and efficient delivery (monitoring, evaluation and review), speed up service delivery through making more effective use of scarce resources; ■ Enabling the alignment and direction of financial and institutional resources towards agreed policy objectives and programmes; and ■ Ensure alignment of local government activities with other spheres of development planning through the promotion of intergovernmental co-ordination. The IDP also aims to: ■ Create a higher level of focus and thereby improve the strategic nature of the document; ■ Align this strategic document with the limited financial and human resources; ■ Align the IDP with the activities of the municipality's departments and other social partners in other spheres of government; and Align the IDP with the various sector and management plans of the municipality.
Ekurhuleni Metropolitan Municipality Environmental Policy	The development of a policy for the EMM is a statutory mandate and responsibility placed on Local Governments to ensure a safe and healthy environment to those living and working within their area of jurisdiction. The purpose of this policy is: ■ To spearhead sustainable development ■ To improve the governance function of the municipality ■ To create environmental awareness within the municipality ■ To enhance a safe and healthy environment ■ To direct sustainability and responsible decision-making
Ekurhuleni Environmental Management Framework - 2007	The EMF provides a framework that sets out the environmental attributes of Ekurhuleni in a way that determines environmental opportunities and constraints for development of the area while Spatial Development Frameworks (SDFs) provides frameworks for interpreting the development vision, planning principles and structuring elements of Ekurhuleni. The EMF, in terms of the Environmental Impact Assessment Regulations, 2006, has been taken into account in this application for environmental authorisation.

Applicable Plan	Description of Plan
Ekurhuleni Metropolitan Spatial Development Framework - 2015	The SDF provides the framework for making resource-effective decisions. It can be a powerful lever for transforming cities and is instrumental in the realisation of a city's vision. Furthermore, it is a guide that can have an impact on the development of a city over the next 15 years and more if properly conceived and systematically executed. Thus, the purpose of the compilation of a SDF is to present a clear strategic vision for the future spatial growth of the region.
City of Ekurhuleni Land Use Scheme - 2021	According to Section 25(1) of the Spatial Planning and Land Use Management Act, 2013 the purpose of the City of Ekurhuleni Land Use Scheme, 2021 is to give effect to and be consistent with the approved Municipal SDF and to determine the use of Land and development of Land within the municipal area of City of Ekurhuleni Metropolitan Municipality in order to promote: (a) Economic growth; (b) Social inclusion; (c) Efficient land development; and (d) Minimal impact on health, the environment and natural resources; Based on the Land Use Scheme the appropriate categories of Land Use for each piece of land needs to be determined. The Land Use Scheme defines, Noxious Industry: means an activity where any one or more of the following activities are carried out: Blood boiling; tallow melting; fat melting or extracting; soap boiling; bone boiling; tripe boiling or cleaning; skin storing; bone storing; fellmongering; skin curing; blood drying; gut scraping; leather dressing; tanning; glue making; size making; charcoal burning; brick burning; lime burning; manure making; manure storing; parchment making; malt making; yeast making; cement works; coke ovens; salt glazing; sintering of sulphur-bearing materials; viscose works; smelting of ores and minerals; calcining; puddling and rolling of iron and other metals; conversion of pig-iron into wrought iron; reheating; annealing; hardening; forging; converting and carburizing iron and other metals; **works for the production of or which employ** carbon disulphide, cellulose lacquers, cyanogen's or its compounds, hot pitch or bitumen, pulverized fuel, pyridine, liquid or gaseous sulphur dioxide, sulphur chlorides; works for the production of amyl acetate, aromatic esters, butyric acid, caramel enamelled wire, glass, hexamine, iodoform, lamp-black, B-naphthol, resin products, salicylic acid, sulphonated organic compounds, sulphur dyes, ultramarine, zinc chloride, zinc oxide; and all refining and works dealing with the processing or refining of petrol or oil or their products, a Fuel Depot, taxidermist and an abattoir; Provided that where the Municipality adds or excludes to the list of noxious trades, such additions shall also be deemed to be included in the above definition and that all Health requirements are complied with.

Applicable Plan	Description of Plan
	None of the chemicals outlined in the definition of noxious industry will be utilised at the proposed project in terms of Phase 1 and Phase 3 (Preferred Alternative). The site is currently Zoned as Industrial 2 and a rezoning application to Industrial 1 is currently being undertaken as a separate process.

2.3.1 ADDITIONAL PERMITS AND AUTHORISATIONS

Table 2-4 – Additional Permits and Authorisations required for the Proposed Project

Permits / Authorisation	Legislation	Relevant Authority	Status
Section 38 (8) for the review of environmental documents	Section 38 (1) & (8) of the NHRA	SAHRA	Submitted (Case ID 16738)
Atmospheric Emissions License	Section 21 of NEM: AQA	EMM	Pending Submission

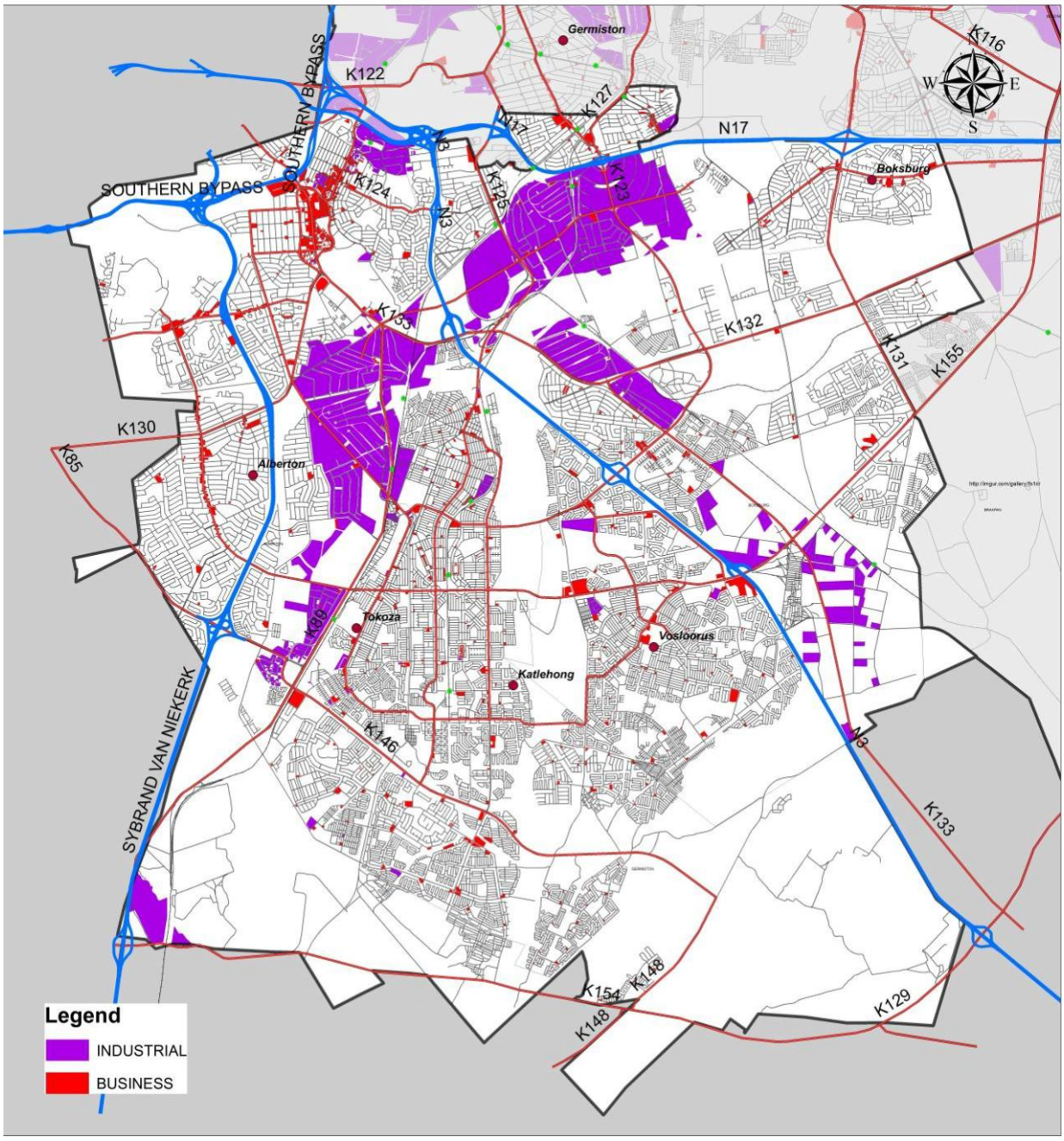

Figure 2-1 – Business and industrial footprints in the EMM Spatial Development Framework (Region F) (SDF, 2015)

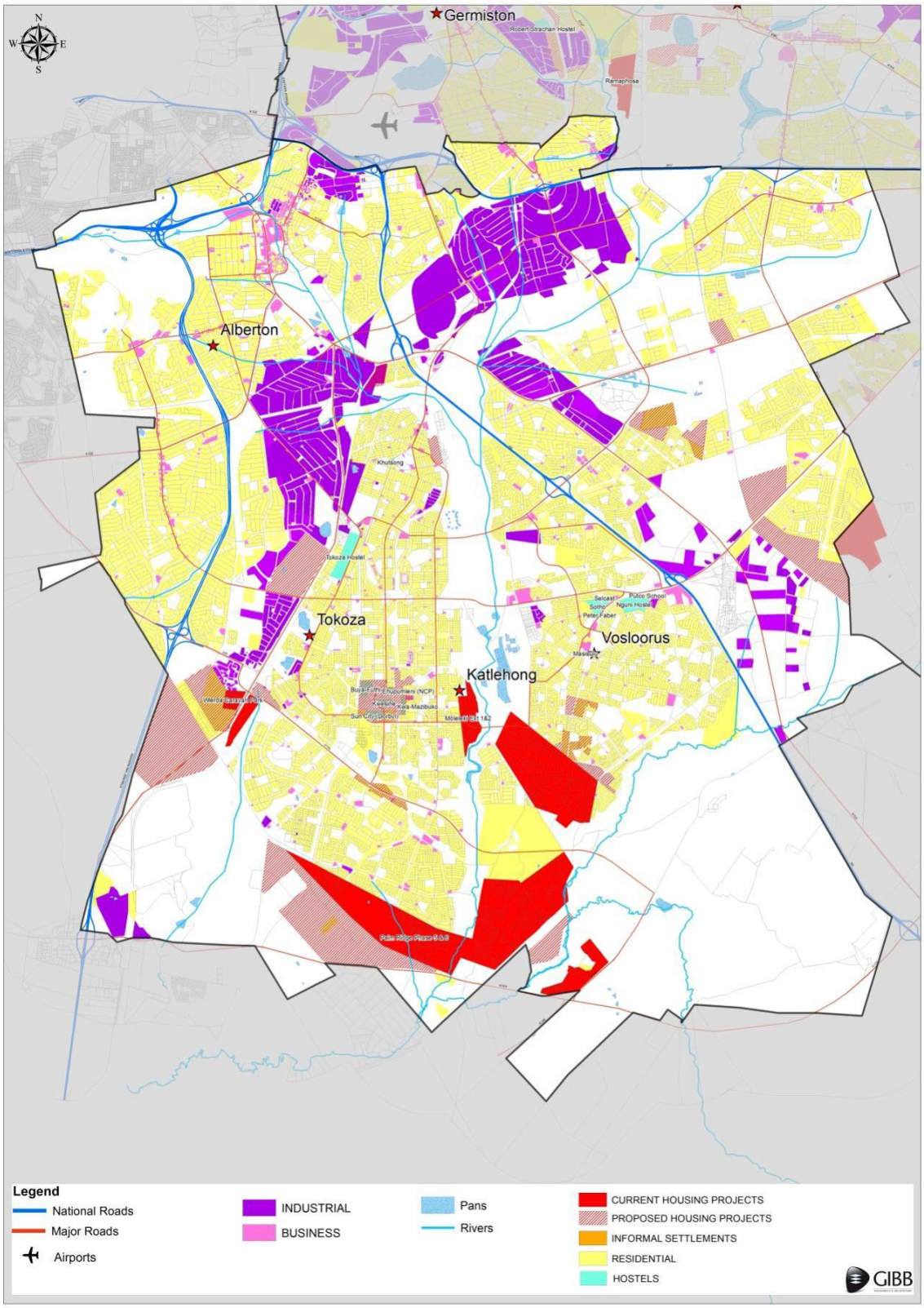

Figure 2-2 – Key land uses in the EMM (Region F) (SDF, 2015)

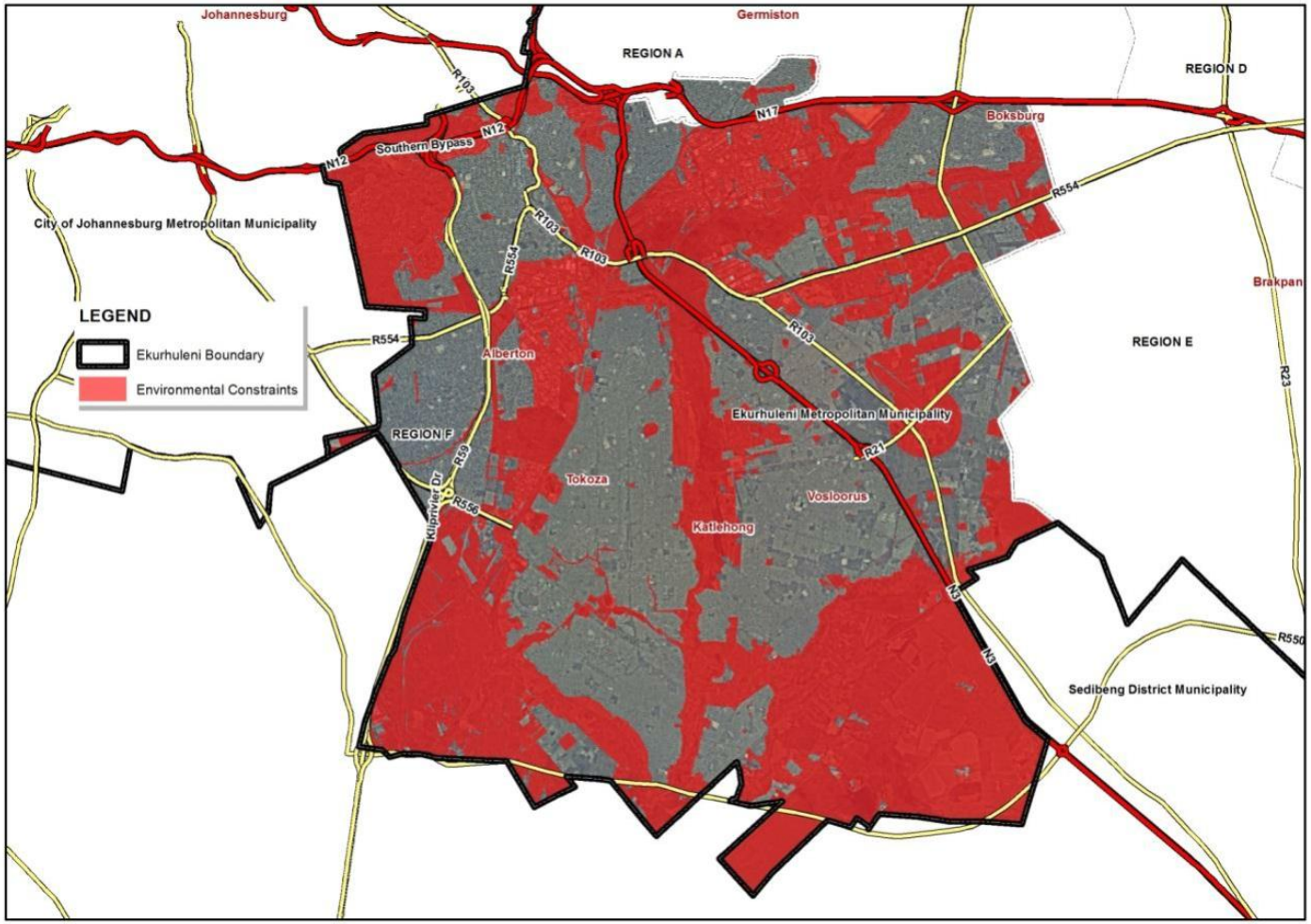

Figure 2-3 - Areas with environmental constraints in Region F (SDF, 2015)

3 SCOPING PHASE SUMMARY

3.1 APPLICATION FOR ENVIRONMENTAL AUTHORISATION

The application phase consisted of the completion of the relevant application form by the EAP and the Proponent as well as the subsequent submission and registration of the application for EA with the GDARD.

A reference number (Gaut 002/19-20/E0247 and *GAUT 002/21-22/E2957, as an online application is active*) was allocated for the EA application by the GDARD. The reference number will appear in all subsequent official S&EIR related correspondence with the authorities and the public. The DSR was submitted to the GDARD along with the application.

A copy of the acknowledgement of receipt of the application is included in **Appendix D.**

3.2 AUTHORITY CONSULTATION

WSP notified all registered Interested and Affected Parties (I&APs) including the commenting authorities of the Proposed Project and the associated comment period for the DSR via a notification letter dated 5 July 2021, these authorities included:

- DFFE;
- GDARD;
- DFFE Biodiversity Conservation Unit;
- SAHRA; and
- EMM.

The comments and responses received from the CA i.e. GDARD have been outlined in **Table 3-1** included in the SER (**Appendix D**).

Table 3-1 – Communication received from GDARD on the Proposed Project

Comment	Response
1. Description of the site/property/route and development The proposed development entails construction of a Filling Plant, acid regeneration plant and solvent Filling Plant on Portion 86 of the farm Vlakplaats 138 IR. The proposed site measures 8.5653 hectares in extent, the Departmental GIS shows that the proposed site is on an environmental sensitive area, as it shows Ecological Support Area and Critical Biodiversity Area with the presence of Primary Vegetation, Orange Listed Plant Habitat and Dolomite on the proposed site. The Gauteng Provincial Environmental Management Framework, 2015 identifies the proposed site as Environmental	The description is as per the Scoping Report and the sensitivities has been identified therein. The layout plan overlaid on a sensitivity map is provided Appendix G of the Final Scoping Report. The Gauteng Provincial Environmental Management Framework (GPEMF) Zone 1 is noted.

Comment	Response
Management 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.	
2. Listed activities applied for All listed Activities are noted, however the activities listed must be relevant to the application applied for. The final scoping report must indicate all related activities, as per the applications in terms of Environmental Impact Assessment Regulations, 2014 (GNR 983, 984 and 985 respectively) as amended.	Table 2-1 of the Final Scoping Report provides all the regulated activities in terms of GNR 983, 984 and 985 respectively.
3. Impacts Identification, Assessment and Mitigation The assessment of impacts included in the Draft report indicates that the impacts rating before the mitigation measures would be very low to high if mitigation measures are implemented correctly.	As per Section 8 of the Final Scoping Report the impacts before mitigation will range from very low to high.
4. Studies All specialist studies to be undertaken mentioned under Plan of Study on Page 66 in the final Scoping report submitted is supported.	Noted.
5. Need and desirability of the development The proposed development will assist with the shortage of employment opportunities in the City of Ekurhuleni, it will also assist with facilitating development and stimulating economic growth. Currently, one company in the country produces Ferric Chloride to South Africa and other neighbouring countries. This serves as motivation for Richbay to increase supply of the product.	Noted.
6. Maps, layout plans, service route positioning The locality map must be in colour and be to scale, clear, legible and indicate legend which corresponds with activity components. The Department will like the following recommendations to be included in the Final Scoping Report:	Appendix G of the Final Scoping Report includes various maps, including but not limited to the required maps, in A3 in colour. The locality map and Layout plan has been updated to reflect the site access. The layout plan has been overlaid on a sensitivity map and included in Appendix G of the FSR.

Comment	Response
— Locality map and Layout plan (A3 size) in colour and indicate the site's access point(s). — The layout plan must be overlaid on a sensitive map. — A description of all the activities to be undertaken must be listed. — Comments from Storm Water Department from City of EMM must be obtained, as well as stormwater management plan. Comments from Ekurhuleni Metropolitan Municipal Department of Environmental Resource must form part of the report.	Table 2-1 of the Final Scoping Report provides all the regulated activities in terms of GNR 983, 984 and 985 respectively. Comments has been requested from the Water Department from City of Ekurhuleni Metropolitan Municipality, as per Appendix D-5, however at the time of submission of the Final Scoping Report comments had not yet been received. The comments will be included and addressed in the Draft EIAR. Comments from Ekurhuleni Metropolitan Municipal Department of Environmental Resource have been obtained and are included in the Comment and Response Report.
7. Public Participation Process Please note a full public participation process should be undertaken in accordance with Regulation 41. In terms of a transparent and inclusive public participation process the interested and affected parties, particularly relevant authorities and other institutions which in terms of their mandates are legally required to comment on the proposed development, should be informed and given an opportunity to comment on the proposal. All evidence of the Public Participation Process being undertaken must be included in the report. The newspaper advert and site notices photos must be attached on the Scoping report.	A full public participation process in terms of Regulation 41 has been undertaken. The process undertaken is detailed in Section 3.5 of the Final Scoping Report and evidence is provided in Appendix D.

3.3 STAKEHOLDER CONSULTATION

Stakeholders were identified and will continue to be identified through several mechanisms. These include:

- Utilising existing databases from other projects in the area;
- Networking with local business owners, non-governmental agencies, community-based organisations, and local council representatives;
- Field work in and around the project area;
- Advertising in the press;
- Placement of community notices; and
- Completed comment sheets. .

All stakeholders identified to date have been registered on the project stakeholder database. The EAP endeavoured to ensure that individuals/organisations from referrals and networking were notified of the proposed project. Stakeholders were identified at the

horizontal (geographical) and vertical extent (organisations level). A list of stakeholders captured in the project database is included in the SER (**Appendix D**).

All concerns, comments, viewpoints and questions (collectively referred to as 'issues') received to date have been documented and responded to the SER included in **Appendix D**.

Table 3-2 provides a breakdown of stakeholders currently registered on the database.

Table 3-2 – Breakdown of stakeholders currently registered on the database

Representative Sector	Further Explanation	No. of Stakeholders
Government Departments/Commenting Authorities	All tiers of government, namely, national, provincial, local government and parastatal organisations including: ▪ GDARD ▪ DFFE: Waste Division ▪ DFFE: Biodiversity ▪ EMM ▪ SAHRA	27
Neighbouring Landowners	I&APs adjacent to and surrounding the project site	74

3.3.1 STAKEHOLDER NOTIFICATION

Direct Notification

Notification of the Proposed Project was issued to potential I&APs, via direct correspondence (i.e., site notices and e-mail) on 5 July 2021. Proof of the notification letter that was circulated and the site notices that were erected are included in the SER (**Appendix D**).

Newspaper Advertisements

In accordance with GNR 326 41(2)(c) of Chapter 6, an advert was placed in one local newspaper. The purpose of the advertisement was to notify the public about the proposed project and to invite them to register as stakeholders. A copy of the advert is included in **Appendix D**. The relevant scoping phase advertisement date is listed in **Table 3-3** below.

Table 3-3 – Advertisement publication dates

Newspaper	Publication Date	Language
Kathorus Mail	14 July 2021	English
Ekurhuleni News	14 July 2021	English
Taxi Times (online newspaper)	7 July 2023	English

3.3.2 DRAFT SCOPING REPORT AVAILABILITY

The DSR was available for public review from 5 July 2021 to 16 August 2021 on the WSP website (https://www.wsp.com/en-za/services/public-documents) and at the site. Subsequently the SR was finalised and submitted to the GDARD on 14 September 2021. The submission of the FSR was within 44 days of receipt of the application by the GDARD as required by GNR 326.

3.3.3 FINAL SCOPING REPORT AVAILABILITY

The Final Scoping Report was provided to all registered stakeholders for review.

The approval of the FSR and the plan of study for the EIA was received in a letter dated 20 October 2021 from the GDARD and is included in **Appendix D.**

3.4 SCOPING STUDY FINDINGS

The scoping phase identified a number of impacts associated with the proposed Filling Plant. The findings of the preliminary significance ratings undertaken during the scoping phase for the construction phase and operational phase are included in the **Table 3-4**. The impacts with a significance of medium or higher were further assessed in the EIA phase.

Table 3-4 – Identified Impacts in the Scoping Phase

Aspect	Impact	Nature	Probability	Consequence	Significance (Before Mitigation)	Further Assessment Required
Climate	Climate change	Negative	1	1	Very Low	No
Topography	Change in topography / slope	Negative	1	1	Very Low	No
Geology	Stability of the area	Negative	1	1	Very Low	No
Ecology	Loss of habitat / ecosystems	Negative	3	3	Medium	No
	Destruction of smaller animals	Negative	3	3	Medium	No
Air Quality	Dust and exhaust emissions during clearance	Negative	2	2	Low	Yes

Aspect	Impact	Nature	Probability	Consequence	Significance (Before Mitigation)	Further Assessment Required
Noise Emissions	Noise from vehicles, machines and clearance activities	Negative	2	2	Low	No
Land Capability	Impact on land capability	Negative	2	2	Low	No
Soil, Hydrology and geohydrology	Soil contamination	Negative	2	1	Very Low	No
	Contamination of surface water resources	Negative	2	2	Low	No
	Contamination of groundwater resources	Negative	2	2	Low	No
Heritage	Damage and demolition of any heritage resources	Negative	1	3	Low	Yes
Palaeontology	Damage of palaeontological resources	Negative	4	3	High	Yes
Visual	Visual impact on adjacent land users	Negative	1	1	Very Low	No
Socio-economic	Provision of employment and skills development	Positive	4	2	Medium	No
	Boost in local economy	Positive	1	1	Very Low	No

Aspect	Impact	Nature	Probability	Consequence	Significance (Before Mitigation)	Further Assessment Required
Health and Safety	Physical injury of personnel due to mobile machinery and equipment.	Negative	4	3	High	No
	Personnel injury due to exposure to hazardous substances.	Negative	4	3	High	Yes

4 EIA PHASE METHODOLOGY

4.1 DETAILED ENVIRONMENTAL ASSESSMENT

4.1.1 SPECIALIST STUDIES

Specialist studies were undertaken during the EIA phase to consider and assess environmental impacts associated with the Proposed Project. The outcomes of these studies are included in the relevant reports contained in **Appendix G**. **Table 4-1** below provides a list of the Specialist Studies that have been undertaken.

Table 4-1 – Details of Specialists

Assessment	Name of Specialist	Company
Biodiversity Baseline and Impact Assessment	Martinus Erasmus	The Biodiversity Company
Desktop Geotechnical Study	Robert Leyland	WSP
Feasibility Dolomite Stability and Geotechnical Investigation	Deon Bester	Knight Piesold Consulting
Major Hazard Installation	TC Thackwray	MHR Consultants
Heritage Impact Assessment	A.C. van Vollenhoven	Archaetnos
Desktop Palaeontological Impact Assessment	Dr. H. Fourie	Independent Specialist
Stormwater Management Plan	Le Roux Fourie	DMV Consultants
Air Quality Impact Assessment	L.Dyer	WSP

4.1.2 IMPACT ASSESSMENT METHODOLOGY

The EIR uses a methodological framework developed by WSP to meet the combined requirements of International Best Practice and NEMA 2014 EIA Regulations (GNR 326), as amended.

As required by the EIA Regulations, 2014 as amended, the determination and assessment of impacts will be based on the following criteria:

- Nature of the Impact
- Significance of the Impact
- Consequence of the Impact
- Extent of the impact
- Duration of the Impact
- Probability if the impact
- Degree to which the impact:
  - can be reversed;
  - may cause irreplaceable loss of resources; and

- can be avoided, managed or mitigated.

Following international best practice, additional criteria have been included to determine the significant effects. These include the consideration of the following:

- Magnitude: to what extent environmental resources are going to be affected;
- Sensitivity of the resource or receptor (rated as high, medium and low) by considering the importance of the receiving environment (international, national, regional, district and local), rarity of the receiving environment, benefits or services provided by the environmental resources and perception of the resource or receptor); and
- Severity of the impact, measured by the importance of the consequences of change (high, medium, low, negligible) by considering inter alia magnitude, duration, intensity, likelihood, frequency and reversibility of the change.

It should be noted that the definitions given are for guidance only, and not all the definitions will apply to all of the environmental receptors and resources being assessed. Impact significance was assessed with and without mitigation measures in place.

4.1.3 METHODOLOGY

The assessment of impacts and mitigation evaluates the likely extent and significance of the potential impacts on identified receptors and resources against defined assessment criteria, to develop and describe measures that will be taken to avoid, minimise or compensate for any adverse environmental impacts, to enhance positive impacts, and to report the significance of residual impacts that occur following mitigation.

The key objectives of the risk assessment methodology are to identify any additional potential environmental issues and associated impacts likely to arise from the proposed project, and to propose a significance ranking. Issues / aspects will be reviewed and ranked against a series of significance criteria to identify and record interactions between activities and aspects, and resources and receptors to provide a detailed discussion of impacts. The assessment considers direct, indirect, secondary as well as cumulative impacts.

A standard risk assessment methodology is used for the ranking of the identified environmental impacts pre-and post-mitigation (i.e., residual impact). The significance of environmental aspects is determined and ranked by considering the criteria presented in **Table 4-2.**

Table 4-2 – Impact Assessment Criteria and Scoring System

Criteria	Score 1	Score 2	Score 3	Score 4	Score 5
Impact Magnitude (M) The degree of alteration of the affected environmental receptor	Very low: No impact on processes	Low: Slight impact on processes	Medium: Processes continue but in a modified way	High: Processes temporarily cease	Very High: Permanent cessation of processes

Criteria	Score 1	Score 2	Score 3	Score 4	Score 5
Impact Extent (E) The geographical extent of the impact on a given environmental receptor	Site: Site only	Local: Inside activity area (Municipal)	Regional: Outside activity area (Provincial)	National: National scope or level	International: Across borders or boundaries
Impact Reversibility (R) The ability of the environmental receptor to rehabilitate or restore after the activity has caused environmental change	Reversible: Recovery without rehabilitation		Recoverable: Recovery with rehabilitation		Irreversible: Not possible despite action
Impact Duration (D) The length of permanence of the impact on the environmental receptor	Immediate: On impact	Short term: 0-5 years	Medium term: 5-15 years	Long term: Project life	Permanent: Indefinite
Probability of Occurrence (P) The likelihood of an impact occurring in the absence of pertinent environmental management measures or mitigation	Improbable	Low Probability	Probable	Highly Probability	Definite
Significance (S) is determined by combining the above criteria in the following formula:	$[S = (E + D + R + M) \times P]$ $Significance = (Extent + Duration + Reversibility + Magnitude) \times Probability$				
Impact Significance Rating					
Total Score	**4 to 15**	**16 to 30**	**31 to 60**	**61 to 80**	**81 to 100**
Environmental Significance Rating (Negative (-))	**Very low**	**Low**	**Moderate**	**High**	**Very High**

Criteria	Score 1	Score 2	Score 3	Score 4	Score 5
Environmental Significance Rating (Positive (+))	Very low	Low	Moderate	High	Very High

4.1.4 IMPACT MITIGATION

The impact significance without mitigation measures will be assessed with the design controls in place. Impacts without mitigation measures in place are not representative of the proposed projects' actual extent of impact and are included to facilitate understanding of how and why mitigation measures were identified. The residual impact is what remains following the application of mitigation and management measures and is thus the final level of impact associated with the development. Residual impacts also serve as the focus of management and monitoring activities during project implementation to verify that actual impacts are the same as those predicted in this report.

The mitigation measures chosen are based on the mitigation sequence/hierarchy which allows for consideration of five (5) different levels, which include avoid/prevent, minimise, rehabilitate/restore, offset and no-go in that order. The idea is that when project impacts are considered, the first option should be to avoid or prevent the impacts from occurring in the first place if possible, however, this is not always feasible. If this is not attainable, the impacts can be allowed, however they must be minimised as far as possible by considering reducing the footprint of the development for example so that little damage is encountered. If impacts are unavoidable, the next goal is to rehabilitate or restore the areas impacted back to their original form after project completion. Offsets are then considered if all the other measures described above fail to remedy high/significant residual negative impacts. If no offsets can be achieved on a potential impact, which results in full destruction of any ecosystem for example, the no-go option is considered so that another activity or location is considered in place of the original plan.

The mitigation sequence/hierarchy is shown in **Figure 4-1** below.

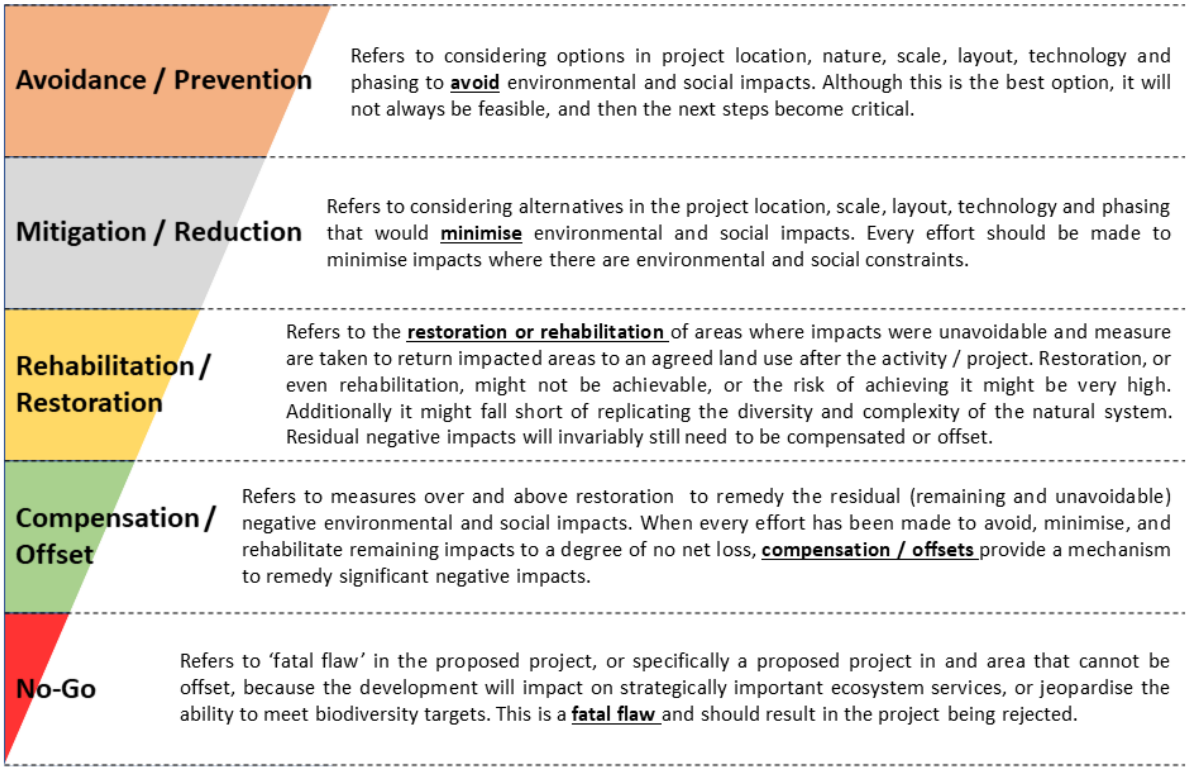

Figure 4-1 - Mitigation Sequence/Hierarchy

4.2 STAKEHOLDER ENGAGEMENT

Stakeholder engagement (PPP) is a requirement of the S&EIR process. It consists of a series of inclusive and culturally appropriate interactions aimed at providing stakeholders with opportunities to express their views, so that these can be considered and incorporated into the S&EIR decision-making process. Effective engagement requires the prior disclosure of relevant and adequate project information to enable stakeholders to understand the risks, impacts, and opportunities of the proposed project. The objectives of the stakeholder engagement process can be summarised as follows:

- Identify relevant individuals, organisations and communities who may be interested in or affected by the proposed project;
- Clearly outline the scope of the proposed project, including the scale and nature of the existing and proposed activities;
- Identify viable proposed project alternatives that will assist the relevant authorities in making an informed decision;
- Identify shortcomings and gaps in existing information;
- Identify key concerns, raised by Stakeholders that should be addressed in the specialist studies;
- Highlight the potential for environmental impacts, whether positive or negative; and
- To inform and provide the public with information and an understanding of the proposed project, issues, and solutions.

A SER (**Appendix D**) has been compiled and included in the Draft EIAR detailing the projects' compliance with Chapter 6 of the NEMA EIA Regulations 2014, as amended.

4.2.1 STAKEHOLDER AND AUTHORITY CONSULTATION

There will continue to be ongoing communication between WSP and stakeholders throughout the S&EIR process. These interactions include the following:

- A letter will be sent out to all registered stakeholders providing them with an update of the proposed project once the final scoping report has been approved;
- Interactions with stakeholders will be recorded in the comment and response report;
- Feedback to stakeholders will take place both individually and collectively; and
- Written responses (email, faxes or letters) will be provided to stakeholders acknowledging issues and
- information requested (dependent on availability).
- As per the GNR 326, particular attention will be paid to landowners, and neighbouring communities, specifically where literacy levels and language barriers may be an issue.

4.2.2 PUBLIC REVIEW

The Draft EIAR will be made available for public review for a period of 30 days from 15 September 2023 to 16 October 2023, at the following places:

- The proposed site i.e., Waterlands Road, Vosloorus (26°21'27.36"S; 28°14'17.16"E).
- WSP website (https://www.wsp.com/en-ZA/services/public-documents).

All registered stakeholders and authorising/commenting state departments will be notified of the public review period as well as the locations of the Draft EIAR via email and SMS. Proof of notification will be included in **Appendix D** of the Final EIAR.

4.2.3 COMMENTS AND RESPONSES REPORT

All concerns, comments, viewpoints and questions (collectively referred to as 'issues') will continue to be documented and responded to adequately in the Comment and Response Report. The Comment and Response Report records the following:

- List of all issues raised;
- Record of who raised the issues;
- Record of where the issues were raised;
- Record of the date on which the issue was raised; and
- Response to the issues.

The Comment and Response Report has been included in the SER in **Appendix D**.

4.2.4 SUBMISSION AND DECISION MAKING

Based on Regulation 21(2)(d), of the EIA Regulations (2014), as amended:

Subject to regulation 46, and if the findings of the scoping report is still valid and the environmental context has not changed, the submission of a scoping report as contemplated in subregulation (1) need not be complied with—

"if an environmental impact assessment report and the documents contemplated in regulation 23(1)(a), which must have been subjected to a public participation process of at least 30 days and which reflects the incorporation of comments received, including

any comments of the competent authority, is submitted within a period of two years from the date of the acceptance of the scoping report contemplated in paragraph (a).”

The FSR was accepted by the GDARD on 20 October 2021 and as such the Final EIAR will be submitted by no later than 20 October 2023, and a public participation process of at least 30 days must be undertaken.

Once submitted, the delegated CA (i.e., the GDARD) will be allocated 107 days to review the Final EIR in order to either grant or refuse and environmental authorisation. delegated competent authority must issue their decision within this specified timeframe.

4.2.5 NOTIFICATION OF EA

All stakeholders will be notified via email / sms at the end of the process notifying them of the authority’s decision, thanking them for their contributions, and explaining the appeals procedure as outlined in the National Appeal Regulations, 2014 (GNR 993 of 2014).

4.3 DFFE WEB-BASED ENVIRONMENTAL SCREENING TOOL

The DFFE has developed the National Web-based Environmental Screening Tool in order to flag areas of potential environmental sensitivity related to a site as well as a development footprint and produces the screening report required in terms of regulation 16 (1)(v) of the EIA Regulations (2014, as amended). *The Notice of the requirement to submit a report generated by the national web-based environmental screening tool in terms of section 24(5)(h) of the NEMA, 1998 (Act No 107 of 1998) and regulation 16(1)(b)(v) of the EIA regulations, 2014, as amended (GN 960 of July 2019)* states that the submission of a report generated from the national web-based environmental screening tool, as contemplated in Regulation 16(1)(b)(v) of the EIA Regulations, 2014, published under Government Notice No. R326 in Government Gazette No. 38282 of 4 December 2014, as amended, is compulsory when submitting an application for environmental authorisation in terms of regulation 19 and regulation 21 of the EIA Regulations, 2014 (as amended) as of 04 October 2019.

The Screening Report generated by the National Web-based Environmental Screening Tool contains a summary of any development incentives, restrictions, exclusions or prohibitions that apply to the proposed development footprint as well as the most environmentally sensitive features on the footprint based on the footprint sensitivity screening results for the application classification that was selected.

A screening report for the Proposed Project was generated on 15 April 2021 and is attached as **Appendix F**. The Screening Report for the project identified various sensitivities for the site. The report also generated a list of specialist assessments that should form part of the S&EIR Process based on the development type and the environmental sensitivity of the site. Assessment Protocols in the report provide minimum information to be included in a specialist report to facilitate decision-making.

Table 4-3 below provides a summary of the sensitivities identified for the development footprint.

Table 4-3 – Sensitivities identified in the DFFE Screening Report

Theme	Very High Sensitivity	High Sensitivity	Medium Sensitivity	Low Sensitivity
Agriculture Theme		X		
Animal Species Theme			X	
Aquatic Biodiversity Theme				X
Archaeological and Cultural Heritage Theme				X
Civil Aviation Theme			X	
Defence Theme				X
Palaeontology Theme	X			
Plant Species Theme			X	
Terrestrial Biodiversity Theme	X			

4.3.1 SITE SENSITIVITY VERIFICATION

Based on information gathered through a desktop study and site assessment, not all of the identified sensitivities apply to the site in its current state. The table that follow serve to:

- Verify land use and sensitivities identified in the Screening Tool Report (as indicated above);
- Provide motivation and evidence of either the verified or different use of the land and environmental sensitivity; and
- Confirm / refute the need for the various specialist inputs recommended in terms of the Screening Tool Report.

The report recognises that “it is the responsibility of the EAP to confirm this list and to motivate in the assessment report, the reason for not including any of the identified specialist study including the provision of photographic evidence of the footprint situation.”

Table 4-4 indicates the specialist studies commissioned and provides motivation for specialist studies not commissioned.

Table 4-4 - Specialist Studies identified by the DFFE Screening Tool

Specialist Study Identified	Applicability	Description
Agricultural Impact Assessment	Based on the site verification the majority of the site is disturbed and there are no agricultural potential remaining. As such it is deemed that a specialist study is not required.	N/A
Archaeological and Cultural Heritage Impact Assessment	An Archaeological and Cultural Heritage Impact Assessment has been undertaken by Archaetnos Culture & Cultural Resource Consultants	▪ Undertaking a literature survey; ▪ Undertaking a physical field survey; ▪ All sites, objects, features and structures identified will be documented; ▪ Assess the significance of the cultural resources in terms of their archaeological, historical, scientific, social, religious, aesthetic and tourism value; ▪ Describe the possible impact of the proposed development on these cultural remains, according to a standard set of conventions; ▪ Recommend suitable mitigation measures to minimize possible negative impacts on the cultural resources by the proposed development; ▪ Review applicable legislative requirements; and ▪ Compile a report.
Palaeontology Impact Assessment	A Palaeontological Assessment has been undertaken by Dr H Fourie.	▪ Undertaking a literature survey; ▪ Undertaking a Phase 1 field study; ▪ Background information on the project. ▪ Description of the property of affected environment with details of the study area; ▪ Description of the geological setting and field observations; ▪ Background to palaeontology of the area; and ▪ Heritage rating.
Terrestrial Biodiversity Impact Assessment	A Biodiversity Assessment has been undertaken by The Biodiversity Company.	▪ Desktop description of the baseline receiving environment specific to the field of expertise (general surrounding area as

Specialist Study Identified	Applicability	Description
		well as site specific environment); ▪ Identification and description of any sensitive receptors in terms of relevant specialist disciplines (biodiversity) that occur in the project area, and the manner in which these sensitive receptors may be affected by the activity; ▪ Identify 'significant' ecological, botanical and faunal features within the proposed development areas; ▪ Identification of conservation significant habitats around the project area which might be impacted by the proposed development; ▪ Site visit to verify desktop information; ▪ Provide a map to identify sensitive receptors in the project area, based on available maps, database information & site visit verification; and ▪ Identification of risk factors associated with the developments.
Aquatic Biodiversity Impact Assessment	The site is located approximately 1.5km north of the Rietspruit River that flows in a south-westerly direction into the Suikerbosrand Nature Reserve. No river or stream traverses the site and it is located about 1km north of the nearest wetland. As such it is deemed that a specialist study is not required.	N/A
Hydrology Assessment	The site is located approximately 1.5km north of the Rietspruit River that flows in a south-westerly direction into the Suikerbosrand Nature Reserve. No river or stream traverses the site and it is located about 1km north of the nearest wetland. As such it is deemed that a specialist study is not required.	N/A

Specialist Study Identified	Applicability	Description
Noise Impact Assessment	There are no sensitive noise receptors adjacent to the site. As such it is deemed that a specialist study is not required.	N/A
Traffic Impact Assessment	It is estimated that there will be 8 trucks a day and 15-30 light vehicles. The site has been used as an industrial facility for numerous years and this is not considered a significant increase. As such it is deemed that a specialist study is not required.	N/A
Geotechnical Assessment	A desktop Geotechnical Assessment has been undertaken by WSP and Dolomite Stability Assessment has been undertaken by Knight Piesold Consulting.	▪ Obtain dolomite stability reports and associated information on sites surrounding the proposed development site from the Council for Geoscience (CGS); ▪ Review existing information for the site; ▪ Create a general geotechnical model for the site area; ▪ Determine the potential for dolomite stability problems on the site; ▪ No site investigations are proposed; and ▪ The report will be provided in letter format.
Socio-Economic Assessment	It is anticipated that 50 employment opportunities will be generated during the construction phase and 45 during the operational phase. This is a low number. As such it is deemed that a specialist study is not required.	N/A
Plant Species Assessment	A Biodiversity Assessment has been undertaken by The Biodiversity Company.	▪ Desktop description of the baseline receiving environment specific to the field of expertise (general surrounding area as well as site specific environment); ▪ Identification and description of any sensitive receptors in terms of relevant specialist disciplines (biodiversity) that occur in the project area, and the manner in

Specialist Study Identified	Applicability	Description
		which these sensitive receptors may be affected by the activity; ▪ Identify 'significant' ecological, botanical and faunal features within the proposed development areas; ▪ Identification of conservation significant habitats around the project area which might be impacted by the proposed development; ▪ Site visit to verify desktop information; ▪ Provide a map to identify sensitive receptors in the project area, based on available maps, database information & site visit verification; and ▪ Identification of risk factors associated with the developments.
Animal Species Assessment	A Biodiversity Assessment has been undertaken by The Biodiversity Company.	▪ Desktop description of the baseline receiving environment specific to the field of expertise (general surrounding area as well as site specific environment); ▪ Identification and description of any sensitive receptors in terms of relevant specialist disciplines (biodiversity) that occur in the project area, and the manner in which these sensitive receptors may be affected by the activity; ▪ Identify 'significant' ecological, botanical and faunal features within the proposed development areas; ▪ Identification of conservation significant habitats around the project area which might be impacted by the proposed development; ▪ Site visit to verify desktop information; ▪ Provide a map to identify sensitive receptors in the project area, based on available maps, database information & site visit verification; and

Specialist Study Identified	Applicability	Description
		▪ Identification of risk factors associated with the developments.
Air Quality Impact Assessment	An Air Quality Assessment has been undertaken by WSP	▪ Undertake a baseline assessment of the current meteorological and ambient air quality situation in the area surrounding the proposed plant. ▪ Compile a comprehensive emissions inventory for the proposed plant. ▪ Use a Level Two (AERMOD) atmospheric dispersion model to determine the air quality impacts associated with the proposed plant. ▪ It is understood only one plant at one location requires assessment. ▪ Compile an Atmospheric Impact Report, detailing all findings from the baseline assessment, emissions inventory and dispersion modelling simulations; ▪ Provide recommendations on the scope of any mitigation measures d to reduce the air quality associated with the proposed plant; and ▪ Compile and submit an AEL for the proposed plant.
Hazardous Installation Risk Assessment	A Hazardous Risk Assessment has been undertaken by Major Hazard Risk Consultants	▪ Conduct a Quantitative Risk Assessment (QRA). ▪ Development of accidental spill and fire scenarios for the facility. ▪ Using generic failure rate data (for tanks, pumps, valves, flanges, pipework, gantry, couplings and so forth), determination of the probability of each accident scenario. ▪ For each incident developed, determination of consequences (such as thermal radiation, domino effects, toxic-cloud formation, etc). ▪ For scenarios with off-site consequences (greater than 1% fatality off-site), calculation of maximum individual risk (MIR),

Specialist Study Identified	Applicability	Description
		taking into account all generic failure rates, initiating events (such as ignition), meteorological conditions and lethality.

It must be noted that these aforementioned specialist assessments were conducted prior to the implemented of the DFFE Specialist Assessment Protocols and were approved by the GDARD as part of the FSR.

5 NEED AND DESIRABILITY OF THE PROJECT

The DEA&DP Guideline (2013) states that the essential aim of need and desirability is to determine the suitability (i.e., is the activity proposed in the right location for the suggested land-use/activity) and timing (i.e. is it the right time to develop a given activity) of the development. Therefore, need and desirability addresses whether the development is being proposed at the right time and in the right place. Similarly, the 'Best Practicable Environmental Option' (BPEO) as defined in NEMA is *"the option that provides the most benefit and causes the least damage to the environment as a whole, at a cost acceptable to society, in the long term as well as in the short term."*

Richbay has existing chemical Filling Plants in South Africa, however, to be closer to the northern market in South Africa a Filling Plant is required in Gauteng. The site in Gauteng is centrally located and near the major routes in the Province.

Ferric Chloride is used in a wide range of applications in the industrial sector including surface water clarification, heavy metal precipitation, industrial effluent treatment and phosphate precipitation in sewage treatment.

Currently, one company in the country produces and supplies Ferric Chloride to South Africa and other neighbouring countries. This serves as a motivation for Richbay to increase the supply of the product, particularly to the neighbouring countries located further north of the country and a great distance away from the existing supplier. This therefore entails that the Filling Plant located in Vosloorus, will have a competitive advantage owing to the shorter distance to be travelled to transport the product to these neighbouring countries and hence, enhance the economic benefits locally.

Local benefits of the proposed development include benefits to the local economy through possible job creation and local supplier procurement during the construction phase as well as during the operational phase of the development.

The Needs and Desirability Guidelines, in terms of the Environmental Impact Assessment Regulations, Government Notice 792 of 2012, as amended, highlights the need to consider how the proposed project may impact ecosystems and biological diversity; pollution; and renewable and non-renewable resources. It should also consider how the development may affect or promote justifiable economic and social development. The Need and Desirability is assessed in the table below.

Table 5-1 – Need and Desirability Assessment

PART 1 - NEED	
Is the land use associated with the activity being applied for considered within the timeframe intended by the existing approved SDF agreed to be the relevant environmental authority? Should the development, or if applicable, expansion of the town/area concerned in terms of this land use occurs here at this point in time?	Based on the SDF, the site is located within Region F in Vosloorus and situated outside of any areas identified with environmental constraints. The site is also zoned for industrial purposes.
Does the community/area need the activity and the associated land use concerned? This refers to the strategic as well as local level.	Currently, one company in the country produces and supplies Ferric Chloride to South Africa and other neighbouring countries. This serves as a motivation for Richbay to increase the supply of the product, particularly to the neighbouring countries located further north of the country and a great distance away from the existing supplier. This therefore entails that the Filling Plant located in Vosloorus, will have a shorter distance to be travelled to transport the product to these neighbouring countries and hence, enhance the economic benefits locally. Local benefits of the proposed development include benefits to the local economy through job creation and local supplier procurement during the construction phase as well as during the operational phase of the development.
Are the necessary services with adequate capacity currently available (at the time of application) or must additional capacity be created to cater for the development? Is this development provided for in the infrastructure planning of the municipality, and if not what will the implication be on the infrastructure planning of the municipality (priority and placement of the services and opportunity cost)?	The site is situated in an area that has existing service delivery by the municipality. Richbay will also investigate sustainable construction alternatives to reduce reliance on electricity and water.
Is the project part of a national programme to address an issue of national concern or importance?	The proposed project does not form part of a national programme. However, it does form part of the supply of chemicals needed for the purification of drinking water.
PART 2 - DESIRABILITY	
Is the development the best practicable environmental option for this land/site?	Despite the site being considered as a CBA: Important Area, the site verification conducted

	as part of the Biodiversity Assessment confirmed that the site is of low importance from a biodiversity perspective and is in a degraded and transformed state. Based on the SDF, the site is located within Region F in Vosloorus and situated outside of any areas identified with environmental constraints.
Would the approval of this application compromise the integrity of the existing approved and credible IDP and SDF as agreed to by the relevant authorities?	No, the project is aligned with the SDF and IDP of the EMM.
Would the approval of this application compromise the integrity of the existing environmental management priorities for the area (e.g., as defined in EMFs), and if so, can it be justified in terms of sustainability considerations?	Despite the site being considered as a CBA: Important Area in the EMF and the Gauteng C-Plan, the site verification conducted as part of the Biodiversity Assessment confirmed that the site is of low importance from a biodiversity perspective and is in a degraded and transformed state. Based on the SDF, the site is located within Region F in Vosloorus and situated outside of any areas identified with environmental constraints.
Do location factors favour this land use at this place? (this relates to the contextualization of the proposed land use on this site within its broader context).	The preferred location was chosen based on the following factors: ▪ The proposed site is zoned for industrial purposes. ▪ The proposed location is strategically situated in proximity to Gauteng's major transport routes therefore making it a favourable location for the transport of goods to the neighbouring countries. ▪ According to the EMF and the SDF, the site is situated outside of any area with environmental constraints.
How will the activity of the land use associated with the activity being applied for, impact on sensitive natural and cultural areas (built and rural/natural environment)?	According to the EMF and the SDF, the site is situated outside of any area with environmental constraints, this was confirmed by the specialist studies undertaken. Mitigation measures were recommended by the specialists where necessary and these have been included in the impact assessment section of this EIAR. Due to the activities associated with the project, an AEL will be applied for in terms of the NEM: AQA.

How will the development impact on people's health and well-being? (E.g. In terms of noise, odours, visual character and sense of place, etc.)?	Based on the impact significant screening, the impacts will range from very low to high without mitigation measures. The specialist studies undertaken during the EIA Phase assessed the potential impacts and provided recommendations to be included in the EMPr. The findings of this S&EIR process and associated Specialist studies conclude that there are no fatal flaws associated with the Proposed Project. Negative environmental impacts associated with the proposed Richbay Filling Plant can be mitigated to acceptable levels. It is therefore the opinion of the EAP that the project can proceed, and that all the listed mitigation measures and recommendations are considered by the GDARD.
Will the proposed activity or the land use associated with the activity being applied for, result in unacceptable opportunity costs?	No.
Will the proposed land use result in unacceptable cumulative impacts?	There will be no unacceptable cumulative impacts. Cumulative impacts have been assessed during the EIA Phase.

6 PROJECT DESCRIPTION

This section provides a description of the location of the project area and the details associated with each phase of the Proposed Project. The description encompasses the activities to be undertaken during the construction and operational phases as well as the consideration for site accessibility, water demand, supply, storage, and site waste management. This section also considers the need and desirability of the project in accordance with Appendix 1 of GNR 326.

6.1 LOCATION OF THE PROPOSED PROJECT

The site is located approximately 26 km Southeast of Johannesburg, between the N3 and the R103 roads, and can be accessed using the Waterlands Road that connects to the R103. It is on Portion 86 of Farm Vlakplaats 138/IR, Vosloorus, Gauteng Province. The locality of the site is depicted in **Figure 6-1.**

The site is surrounded by other industrial holdings including:

- A truck and heavy equipment business adjacent to the site; and
- A corrosion coating (painting, lining, coating etc.) business opposite the site.

Other industrial holdings around the area include scrap yards and salvage yards.

An open grassland is located south of the site, and the township of Vosloorus is located about 150m west of the site, across the N3 highway.

Table 6-1 below indicates the cadastral information of the site and **Table 6-2** includes the co-ordinates of the site.

Table 6-1 –Cadastral Information of the Site

Details required as per GNR 326 ANNEX 1 (3)	DETAIL
21 Digit Surveyor General Code of each Cadastral Land Parcel	T 0IR 0000 00000138 00086
Physical Address and Farm Name	Portion 86 of Farm Vlakplaats 138/IR
Land use Zoning	Industrial
Municipality	Ekurhuleni Metropolitan Municipality

Table 6-2 – Coordinate Points of the Cadastral Land Parcel

Point	Latitude	Longitude
		
Corner 1	26°21.460'S	28°14.046'E
Corner 2	26°21.456'S	28°14.286'E
Corner 3	26°21.579'S	28°14.277'E
Corner 4	26°21.580'S	28°14.057'E
Corner 5	26°21'33.42"S	28°14'3.33"E
Centre Point	26°21.517'S	28°14.170'E

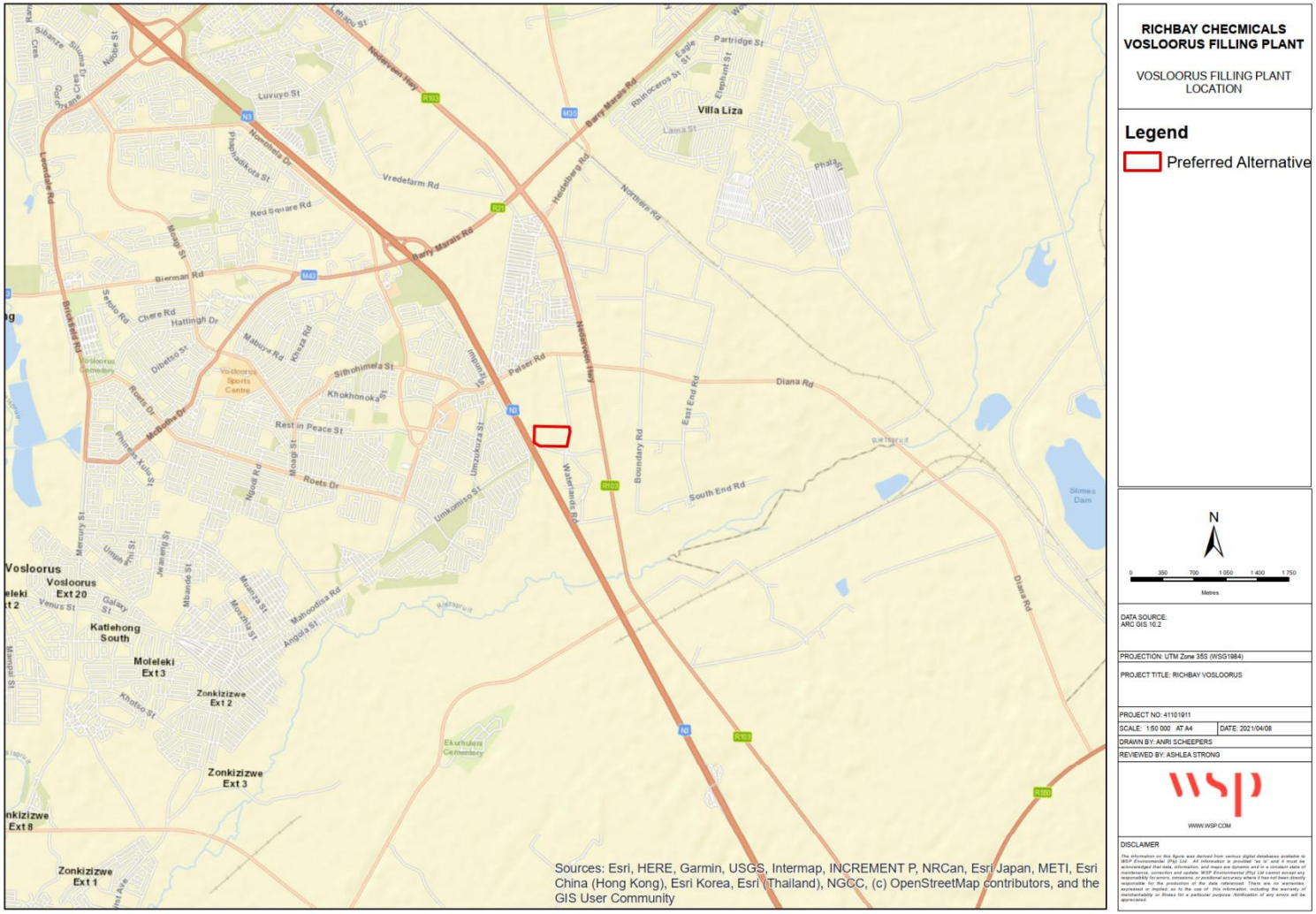

Figure 6-1 - Locality map of the Proposed Filling Plant

6.2 SITE STATUS

Historical Aerial Imagery of the Proposed Project site are provided in **Table 6-3** and site photographs are provided in **Table 6-4.**

Table 6-3 - Historical Aerial Imagery of the Proposed Project site

September 2003

September 2008

December 2010

June 2013

May 2014

September 2016

August 2019

June 2023

Table 6-4 – Site Photographs






6.3 PROPOSED PROJECT COMPONENTS AND PROCESSES

Richbay proposes to establish a Filling Plant in phases. Initially, the plant was to be commissioned in three stages during which the following operational activities will be undertaken, however Richbay proposes to only commission Phase 1 and Phase 3, the 2-phased development is therefore the preferred technology option whereas the 3 phased development inclusive of Phase 2, is the alternative.

6.3.1 PHASE 1: FILLING PLANT

Phase 1 of the development is the construction of the Filling Plant. No manufacturing will be undertaken during this phase. All chemicals will arrive with road tanker and offloaded into bulk storage tanks or medium bulk storage tanks.

At the Filling Plant, various chemicals will be decanted from bulk tankers to medium and small sized packages. The packed products will be transferred to the warehouse in preparation for distribution to customers. Palletizing strapping and partial dilutions might be required. Chemicals to be decanted in the Filling Plant are detailed in **Table 6-5.**

It is estimated that at full operational capacity, the Filling Plant will have a maximum of 1 551 m^3 total storage capacity.

There will be individual bunded areas per type of chemical to reduce interaction between different types of chemicals. The bunded areas will be on concreted and the tanks will be covered. Each bunded are will also have an effluent sump that will be linked to an

effluent treatment plant, of which the daily throughput will be less than 2 000 cubic metres (approximately 5 m^2). The effluent will be treated in order to be reused in the plant. A graphical representation of the proposed tanks is provided in **Figure 6-2**.

Table 6-5 - Filling Plant Chemicals

Chemicals	Quantity Tanks	Net Throughput per tank (m^3/yr)
Hydrochloric Acid (HCl)	6 x 55m^3	18,701.3
Sulphuric Acid (H_2SO_4)	3 x 33m^3	4,721.3
Ferric Chloride ($FeCl_3$)	2 x 33m^3	1,234.3
Sodium hypochlorite (NaOCl)	4 x 16.5m^3	7,140.5
Sodium chlorite liquid ($NaClO_2$)	2 x 16.5m^3	1,404.9
Sodium metabisulphite ($Na_2S_2O_5$);	2 x 16.5m^3	1,270.6
Nitric acid (HNO_3);	2 x 33m^3	3,200.0
Sodium laureth sulphate (SLES, $CH_3(CH_2)_{11}(OCH_2CH_2)_nOSO_3Na$) 70%;	2 x 33m^3	1,661.6
Linear alkyl benzene sulphonic acid (LABSA, $C_{18}H_{30}O_3S$)	2 x 33m^3	396
Caustic Soda Lye / Soda ash (Na_2CO_3) / Potassium hydroxide (NaOH) liquid	6 x 55m^3	11,520.0
Phosphoric acid (H_3PO_4).	2 x 33m^3	1,016.5

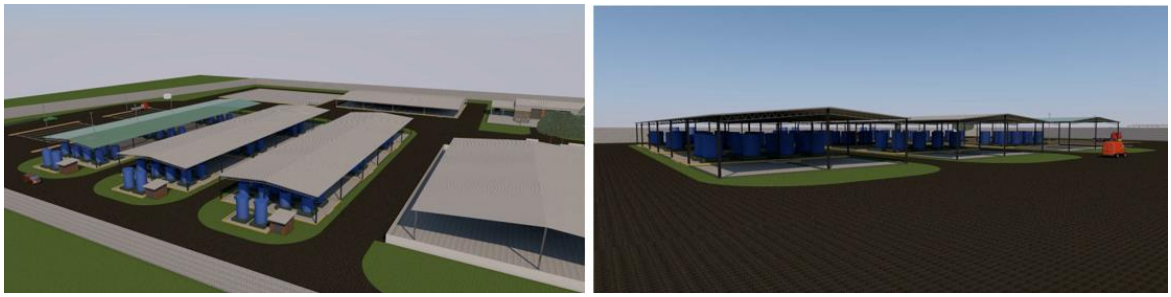

Figure 6-2 - Tank Graphical Representation (Architectural Design Studio)

6.3.2 INITIALLY PROPOSED PHASE 2 (NOW TECHNOLOGY ALTERNATIVE 1)

Initially proposed Phase 2 (now an alternative) included the construction of an Acid Regeneration Plant for the reprocessing of waste HCl into ferric chloride and a small portion of calcium chloride, the chemicals to be used in this process is indicated in **Table 6-6.** This process is detailed as follows:

- Spent acid will be received from galvanizing plants in the area and from other users and producers of acid;
- Waste acid will go through an iron exchange process and strengthened with HCl (from the Phase 1 Filling Plant);
- The mixture will then be put through an evaporation process (with the use of a paraffin fuelled boiler) to increase the percentage of $FeCl_3$ from approximately 30% to 40-44%;
- $FeCl_3$ will be stored in bulk tanks and then decanted into smaller pack sizes or bulk road tankers for distribution; and
- Waste zinc chloride ($ZnCl_2$) will be sold to the market as a dust suppressor or will be used in waste processes requiring Zinc Chloride.

The chlorine will be stored in a purpose-built building. The building will be fitted with a scrubbing system with the capacity to scrub the catastrophic release of a 1ton chlorine cylinder. The building will be fitted with sensors that will activate the scrubber automatically. There will be a total of 80x 1-ton chlorine cylinders stored on site.

Exhaust emissions from the evaporator will pass through a scrubber to remove HCl from flue gases prior to release. The acid regeneration process is illustrated in **Figure 6-3.**

Table 6-6 - Acid Regeneration Plant Chemicals

Chemicals	Quantity Tanks	Net Throughput per tank (m^3/yr)
Ferric Chloride (In Regeneration Plant)	3 x 33m^3	4,937.1
Paraffin	1 x 44m^3	264.0

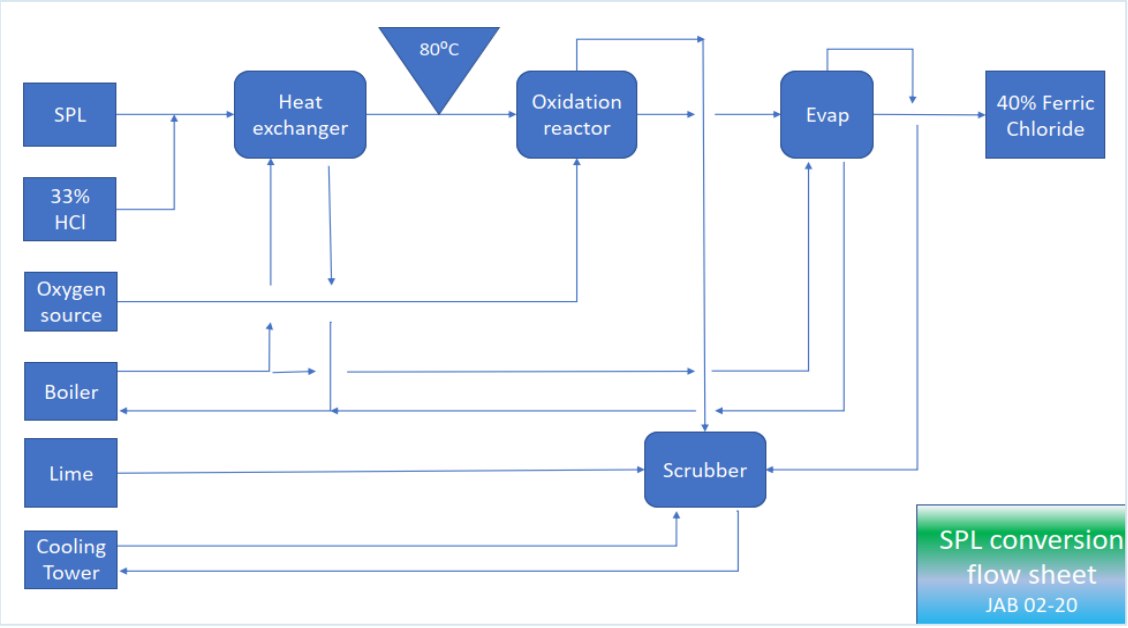

Figure 6-3 - Acid Regeneration Process Flow Diagram

6.3.3 PHASE 3: SOLVENT FILLING PLANT

Phase 3 includes the construction of a Solvent Filling Plant. Products will be decanted from bulk storage tanks to medium tanks and then smaller package sizes as required. The packed product is transferred to the warehouse for distribution. Palletizing and strapping might be required.

It is estimated that at full operational capacity, the Solvent Filling Plant will have a maximum of 352 m^3 total storage capacity. Solvent chemicals to be stored and decanted at the Solvent Filling Plant is outlined in **Table 6-7.**

It is proposed that each of the phases be operated on individual portions of the site, as such a large enough site is required.

Table 6-7 - Solvent Filling Plant Chemicals

Chemicals	Quantity Tanks	Net Throughput per tank (m^3/yr)
Methanol / ethanol	1 off 44 m^3	2,187.3
Thinners	1 off 44 m^3	1,986.2
Shelsol A	1 off 44 m^3	1,986.2
Paraffin	1 off 44 m^3	2,304.0
Benzine	1 off 44 m^3	2,032.9
Toluene	1 off 44 m^3	1,440.0
Acetone	1 off 44 m^3	2,187.3

Diesel	1 off 44 m^3	5,112.4

6.3.4 BULK INSTALLATIONS

There will be two tank farms at the site. The first tank farm will be for the storage of acids and inflammable products.

Tank Farm 1

There will be individual bunded areas per type of chemical to reduce interaction between different types of chemicals. The bunded areas will be on concreted and the tanks will be covered. All the tanks will be vertical.

Each bunded area will also have an effluent sump that will be linked to an effluent treatment plant, of which the daily throughput will be less than 2 000 cubic metres. The effluent will be treated to be reused in the plant.

Tank Farm 2

There will be individual bunded areas per type of solvent to reduce interaction between different types of solvents. All the tanks will be horizontal and located in concreted bunds. The site layout needs to be finalised and the tanker loading and offloading needs to be confirmed. For this Assessment the road tankers were located at the various tanks. Deliveries to be made 2-3 times per day per chemical.

6.3.5 ROADS

Access to the proposed site will be via the existing road network therefore no additional access roads are required. It is not envisaged that any roads upgrades will be required.

6.3.6 MUNICIPAL SERVICES

6.3.6.1 Wastewater

The only wastewater that will be generated should a spill occur inside the bunded area. Each bunded are will have an effluent sump that will be linked to an effluent treatment plant, of which the daily throughput will be less than 2 000 cubic metres. The effluent will be treated in order to be reused in the plant.

6.3.6.2 Solid waste

During construction an estimated 1 500 m^3 of solid waste will be generated. As far as possible non-hazardous construction waste will be used as backfill.

A waste contractor will collect and remove the remaining material from site taking into consideration the National Waste Information Regulations. All waste will be sorted at site and waste manifests will be obtained for the disposal thereof.

During the operational phase it is anticipated that minimal to no solid hazardous waste will be generated, and will consists of damaged containers only, which will be disposed at a licenced facility.

During the operational phase minimal general waste will be generated and will be linked to office activities, this waste will be disposed via the municipal waste collection system.

Sewerage

There are existing ablution facilities that is connected to a septic tank system, should there be capacity available the sewerage from the site will be connected to the nearest municipal sewer system point.

Water Usage

Potable Water usage will be minimal and will be used by the ablutions and offices. The Filling Plant itself will require little to no potable, excluding the fire water system. In order to reduce the use of potable water as far as possible, rainwater will be harvested for use as grey water.

6.3.7 STORMWATER MANAGEMENT

Attenuation has been provided based on the criteria of 350 m^3 of attenuation for every 1ha of hardscaped area. The hardened surface amounts to 48 982,72 m^2 which accounts for 60,6% of the site. The site currently has a workshop structure which will be demolished, and the proposed Filling Plant built on site.

All storm water run-off will be collected through grid inlets and kerb inlets and channelled by stormwater pipes and discharged into an attenuation pond structure.

Stormwater from building roofs will be collected via gutters and rainwater downpipes and discharged into 900 wide concrete V-drains and spread into the surrounding garden by means of multiple spreaders in as many places as possible, to prevent concentration, from where it will follow the natural lay of the land onto the undeveloped low-lying area which forms part of the natural watercourse.

Run-off from the roads and other hardscaped areas will likewise be collected through grid inlets and kerb inlets and conveyed by a network of sub-soil stormwater pipes and channelled towards a new attenuation pond structure located in the undeveloped low-lying area of the site. Roads and parking area will be graded to attain minimum falls towards outlets. **Figure 6-4** illustrates the SWMP for the site.

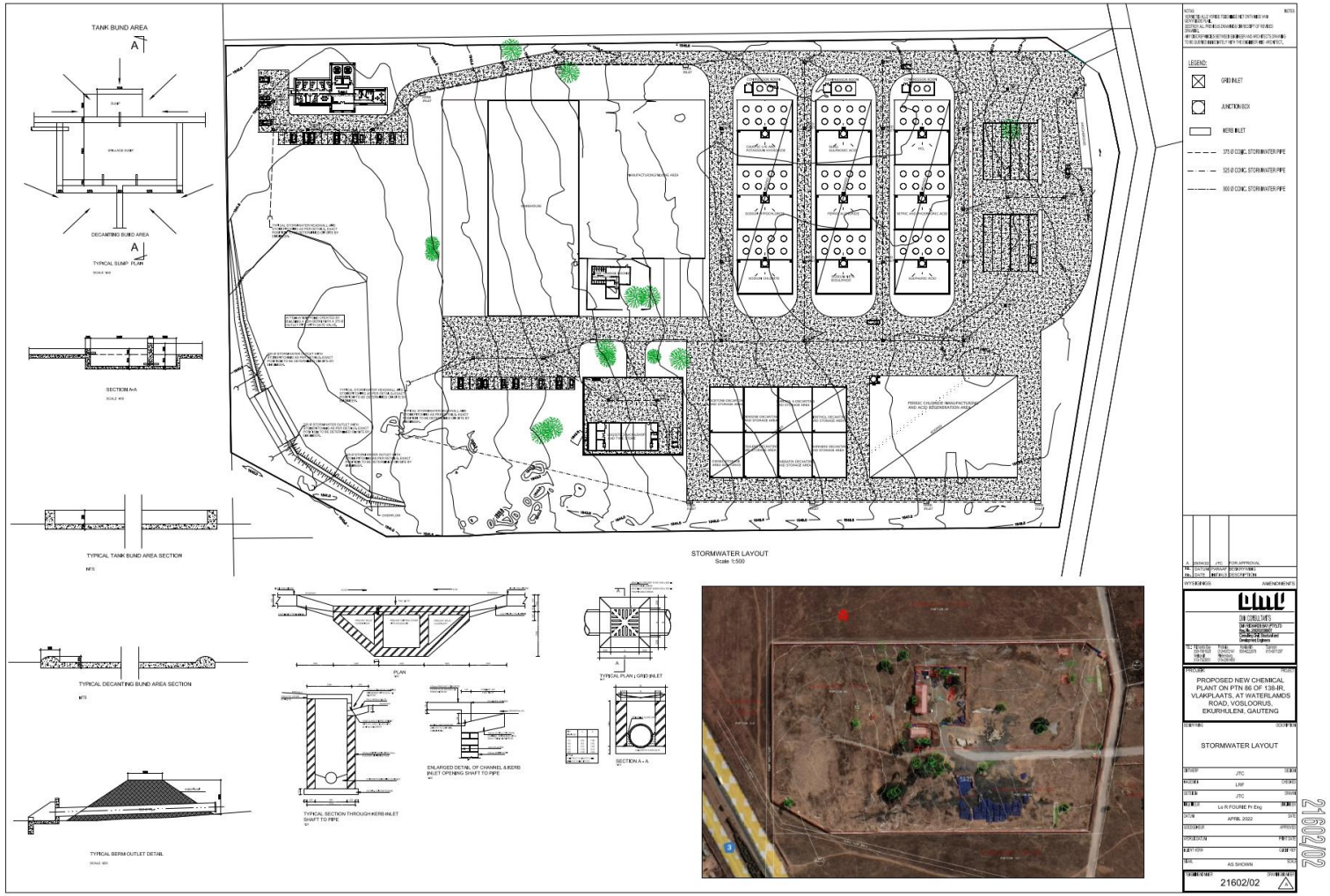

Figure 6-4 – SWMP Layout of the Proposed Site

6.4 PROPOSED PROJECT DEVELOPMENT ACTIVITIES

6.4.1 CONSTRUCTION PHASE

The construction process will follow industry standard methods and techniques. Key activities associated with the construction phase are described in **Table 6-8**.

Table 6-8 – Construction Activities

Activity	Description
Establishment of an access road	Access to the proposed site will be via the existing road network therefore no additional access roads are required.
Site preparation and establishment	Site establishment will include clearing of vegetation and any bulk earthworks that may be required.
Transport of components and equipment to site	All construction material, machinery and equipment (i.e. graders, excavators, trucks, cement mixers etc.) will be transported to site utilising the national, regional and local road network. Larger components (may be defined as abnormal loads in terms of the Road Traffic Act (No. 29 of 1989). In such cases a permit may be required for the transportation of these loads on public roads.
Establishment of a laydown area on site	Construction materials, machinery and equipment will be kept at relevant laydown and/or storage areas. Laydown areas (site camps) of approximately up to 0.25 ha have been proposed. The laydown area will limit potential environmental impacts associated with the construction phase by limiting the extent of the activities to one designated area.
Construction of the Filling Plant	The construction of the Filling Plant will consist of the following material: ▪ Steel strusses ▪ Roof Sheeting ▪ Cement ▪ Reinforced mat ▪ Tanks
Establishment of ancillary infrastructure	Ancillary infrastructure will include a workshop, storage areas, office, and a temporary laydown area for contractor's equipment.
Rehabilitation	Once all construction is completed on site and all equipment and machinery has been removed from the site, the site will be rehabilitated.

6.4.2 OPERATIONAL PHASE

During operation the key activities will include the storage and decanting of the chemicals at the Filling Plant. Key activities associated with the operational phase are described in **Table 6-9.**

Table 6-9 - Operational Phase Activities

Activity	Description
Transport of chemicals	Access to the proposed site will be via the existing road network therefore no additional access roads are required.

Activity	Description
	It is estimated that there will be 8 trucks a day and 15-30 light vehicles. The site has been used as an industrial facility for numerous years and this is not considered a significant increase.
Decanting of chemicals	At the Filling Plant, various chemicals will be decanted from bulk tankers to medium and small sized packages. The packed products will be transferred to the warehouse in preparation for distribution to customers. Palletizing strapping and partial dilutions might be required.

6.4.3 DECOMMISSIONING PHASE

The decommissioning phase will include activities similar to that of the construction phase as indicated in **Table 6-8**.

6.5 PROJECT ALTERNATIVES

The EIA Regulations of 2014 (as amended) require that the S&EIR process must identify and describe alternatives to the proposed activity that were considered, or motivation for not considering alternatives. Different types or categories of alternatives could be considered including different locations, technology types, and project layouts.

6.5.1 SITE ALTERNATIVES

There were three (3) site alternatives including the preferred alternative considered in the SR. Alternatives 1 and 2 were eliminated in the Scoping Phase on the basis of land use incompatibility and environmental constraints and only the preferred site as described in **Section 6.1** of this EIAR.

The preferred site is located approximately 26 km Southeast of Johannesburg, between the N3 and the R103 roads, and can be accessed using the Waterlands Road that connects to the R103. It is on Portion 86 of Farm Vlakplaats 138/IR, Vosloorus, Gauteng Province. The locality of the site is depicted in **Figure 6-1.**

The preferred site is situated on the main freight corridor between Durban and Johannesburg, including the N3 highway and Transnet's Natcor railway line, and are being proposed as a way of improving freight logistics in Gauteng and reducing road congestion in and around Johannesburg.

The site is adjacent to the proposed Distribution Junxion, Port of Gauteng. The Distribution Junxion Port of Gauteng is poised to become South Africa's most desired and optimally located inland port due to its superior location, topography and scale. Like a seaport, this inland port sits on the entry and exit points for imports into and exports out of Gauteng, Southern Africa.

The preferred location as described in **Section 6.1** was chosen based on the following factors:

- The surrounding area is classified as and suitable for industrial activity.
- Much of the site has already been transformed and is currently used for dangerous goods storage and previously as a sand blasting business. A very small portion of natural habitat will be impacted upon by the proposed development.
- The site is located a fair distance from the nearest river/stream, therefore the chances of affecting surface water resources are minor.
- The site is in close proximity to Vosloorus which is part of the integration zones of the Ekurhuleni Metropolitan Municipality.

- The site is situated in proximity to major export/import routes.

6.5.2 LAYOUT ALTERNATIVES

There were two (2) site layout alternatives considered in the Scoping Phase of the process. The initial proposed layout was revised to cater for stormwater management. The preferred alternative is based on initial site investigations and considered stormwater management and is indicated in **Figure 6-4.**

The initially proposed site layout was eliminated in the Scoping Phase as it did not consider stormwater management.

Figure 6-5 – Preferred Layout Alternative of the Proposed Site

6.5.3 PROCESS/TECHNOLOGY ALTERNATIVES

Richbay proposes to establish a Filling Plant in phases:

- Phase 1 for the construction of a Filling Plant;
- Phase 2 for the construction of an Acid Regeneration Plant; and
- Phase 3 for construction of a Solvent Filling Plant.

Initially, the plant was to be commissioned in three stages, however Richbay proposes to only commission Phase 1 and Phase 3 as described in **Section 6.3**. The 2-phased development excluding the Acid Regeneration Plant is therefore the preferred technology/process option, whereas the 3 phased development inclusive of Phase 2, is the Alternative 1.

6.5.4 NO-GO ALTERNATIVE

The no-go alternative is the option of not undertaking the proposed development and the continuation of the status quo. The following negative impacts would result:

- There will be no economic boost in the region which would have fed into the industrial sector; and
- The anticipated job and skills development opportunities and employment the project presents will not be generated.

Although the no-go alternative sees the continuation of the status quo and leads to missed opportunities, there are positive impacts it provides. These include:

- All negative impacts discussed in **Section 8** of this report are avoided;
- The air quality of the area will not be further affected; and
- There will be a potential to preserve any heritage and palaeontological resources in the area as the site is flagged as a high-risk area for palaeontological resources.

7 BASELINE ENVIRONMENT

The following chapter presents an overview of the biophysical and socio-economic environment in which the proposed project is located. It is important to gain an understanding of the project area and its surroundings, as it will provide for a better understanding of the receiving environment in which the project is being considered.

The description of the baseline environment is essential in that it represents the conditions of the environment before the construction of the Proposed Project (i.e., the current, or status quo, environment) against which environmental impacts of the proposed Project can be assessed and future changes monitored.

The area has previously been studied to some extent and is recorded in various sources. Consequently, some components of the baseline have been generated based on literature review. However, where appropriate, baseline information has been supplemented or generated by specialists appointed to undertake baseline and impact assessments for the proposed project.

The following characteristics of the receiving environment for the Proposed Project Area are described in the table below.

Table 7-1 – Characteristics of the receiving environment

Receiving Environment	Characteristics
Physical	▪ Climate ▪ Topography ▪ Geology ▪ Soils and Agricultural Potential ▪ Surface Water
Biological	▪ Vegetation ▪ Habitats ▪ Biodiversity Conservation Plans ▪ Plant Species ▪ Animal Species ▪ Avifauna
Social and Economic	▪ Heritage ▪ Palaeontology ▪ Land use ▪ Transport ▪ Socio-Economic
Health & Safety	▪ Chemicals or Hazards

7.1 PHYSICAL ENVIRONMENT

7.1.1 CLIMATE AND METEOROLOGY

The following is extracted from the Air Quality Impact Assessment compiled by WSP (September 2020) and included as ***Appendix G.7****.*

Temperature and Rainfall

Ambient air temperature influences plume buoyancy as the higher the plume temperature is above the ambient air temperature, the higher the plume will rise. Further, the rate of change of atmospheric temperature with height influences vertical stability (i.e. mixing or inversion layers). Rainfall is an effective removal mechanism of atmospheric pollutants and thus also relevant in the assessment of pollution potential.

Figure 7-1 presents average monthly temperature, rainfall and humidity. Seasonal trends of higher temperatures and rainfall during the summer months (December to February) with dry and cooler conditions during winter months (June to August) is evident. Summer temperatures for the region average at 21ºC while winter temperatures average at 10ºC. Vosloorus has an average humidity of 65% and is considered a high rainfall area receiving approximately 800 mm per annum. 57% of annual rainfall is received during the summer months.

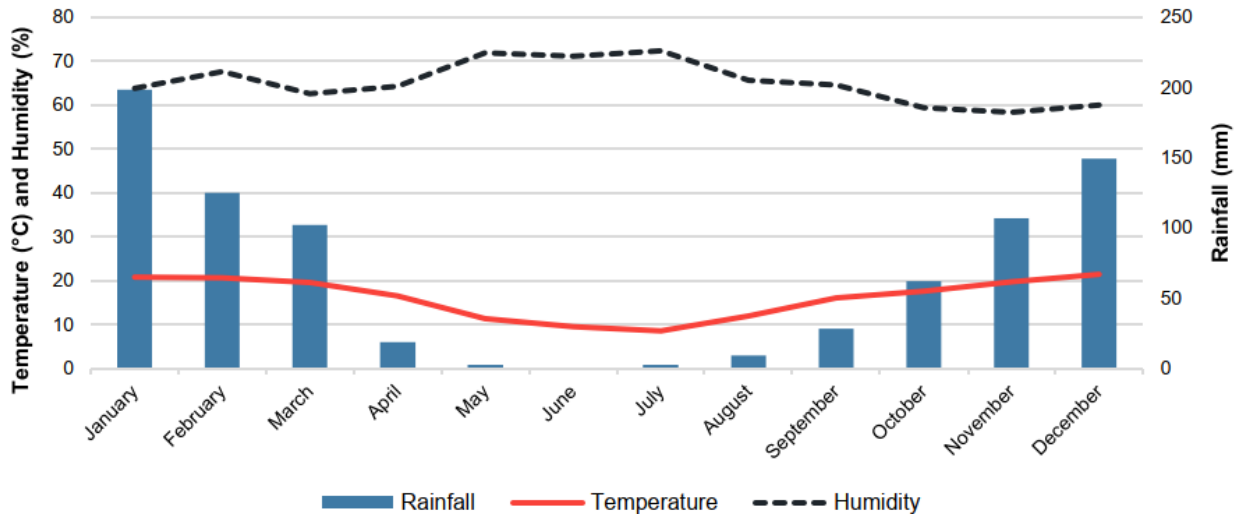

Figure 7-1 - Meteorological Summary

Local wind field

Wind roses (**Figure 7-2**) summarize wind speed and directional frequency at a location. Each directional branch on a wind rose represents wind originating from that direction. Each directional branch is divided into segments of colour, representative of different wind speeds.

Typical wind fields have been analysed using Lakes Environmental WRPlot Freeware version 7.0.0 for the full period (January 2016 – December 2018); diurnally for early morning (00h00 – 06h00), morning (06h00 – 12h00), afternoon (12h00 – 18h00) and night (18h00 – 00h00); and seasonally for summer (December, January and February), autumn (March, April and May), winter (June, July and August) and spring (September, October and November). Calm conditions were defined as wind speeds less than 1 m/s. Findings are as follows:

- Calm conditions (wind speeds <1.0 m/s) occurred 12.59% of the time; Gentle to moderate winds from the north, north-northeast and north-northwest prevailed in the region;
- Peak wind speeds occurred from the west and highest average wind speeds occurred from the north-northeast;
- Northerly winds prevailed in the morning;

- Winds prevailed from the north-northwest in the afternoon into the evening;
- Winds prevailed from the north-northeast during the early morning;
- Winds from the north and north-northeast prevailed during the spring and summer months;
- Winds from the north and north-northwest prevailed during the autumn and winter months;
- Higher directional variability in the wind field is observed during autumn and winter; and
- Highest average wind speeds occur in the morning and during spring.

Figure 7-2 – Local Wind Conditions at Vosloorus

7.1.2 TOPOGRAPHY

The study area forms part of the regional watershed between the rivers that drain west towards the Atlantic Ocean and those that drain east towards the Indian Ocean. The regional topography can generally be regarded as flat with few outstanding topographical features (EMF, 2008). The following topographical features occur:

- Plains with pans ;
- Undulating plains with pans ;
- Strongly undulating plains ;
- Superimposed river valley (Blesbok Spruit) on plains with pans ;and
- Ridges.

The site is generally categorised as flat and lies at about 1550 m above mean sea level. This is indicated in the topography map in **Figure 7-3** below.

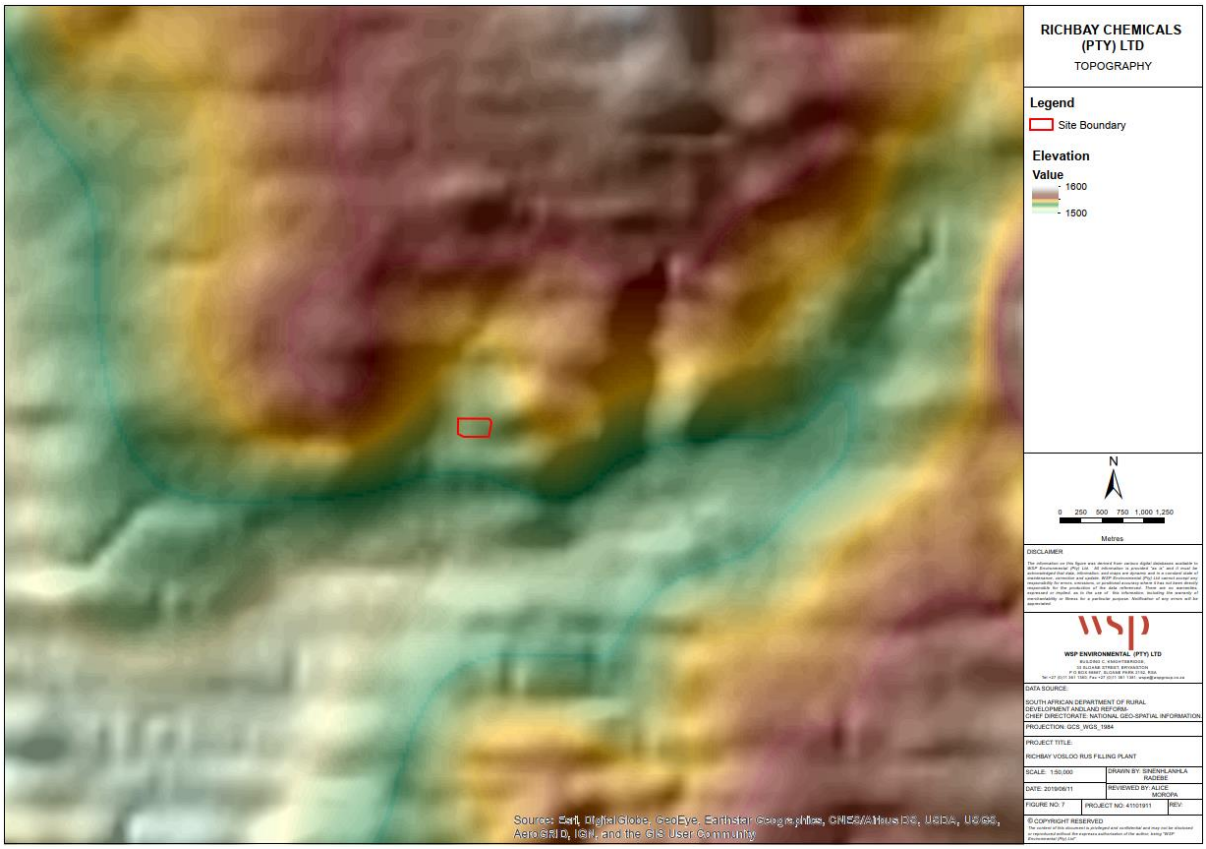

Figure 7-3 – Topographical Map of the Proposed Site

7.1.3 GEOLOGY

The following is extracted from the Desktop Geotechnical Assessment compiled by WSP (July 2021) and included as ***Appendix G.1.***

According to 1:250 000 (2628 East Rand), the site underlain by dolomite and chert of the Malmani Subgroup. Underlying dolomitic rocks are believed to be quartzites, conglomerates and shales belonging to the Black Reef Formation; these are observed along the edge of a basin dipping at 5° toward the 'centre' point. The eastern portion of the basin is intruded by dolerite (likely occurring as sills) and with closest mapped dolerite contact being approximately 800m east of the site.

An excerpt of the published geological map showing the Project area is presented the **Figure 7-4** below.

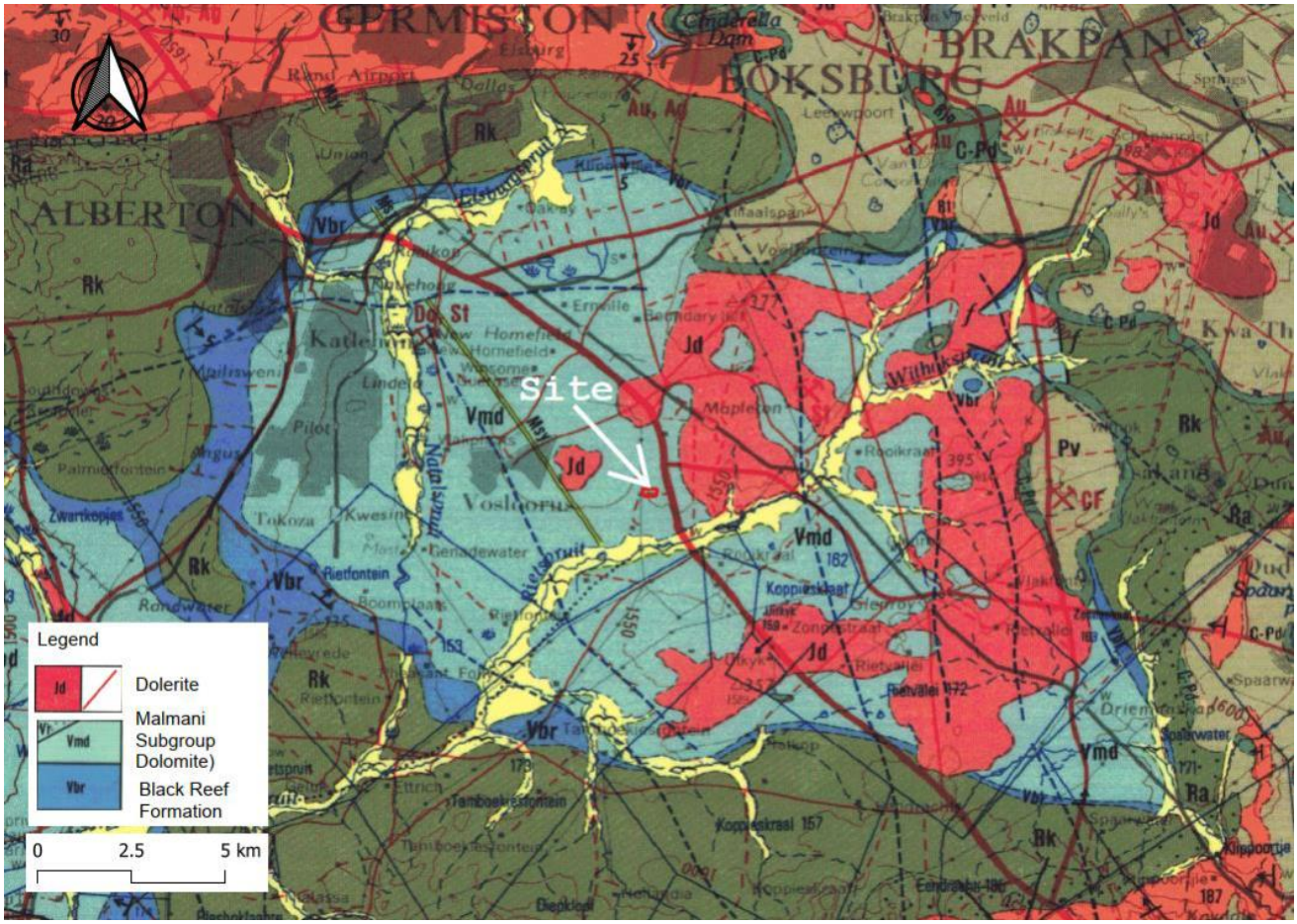

Figure 7-4 – Geological map of the Project area

7.1.3.1 Dolomite Stability

The following is extracted from the Feasibility Dolomite Stability and Geotechnical Assessment compiled by Knight Piesold (November 2021) and included as ***Appendix G.2.***

Shallow and deep soils investigations were carried out at the site, viz. geotechnical and dolomite stability investigation. Twelve test pits were excavated, and eleven percussion drilled boreholes were drilled to investigate the site. The site is underlain by dolomite, which has been intruded extensively by dolerite., providing a protective horizon above the dolomite bedrock for the majority of the site.

The test pits indicate thin overlying variable transported soils above the residual dolerite as fill, topsoil, hillwash and a pebble marker horizon. Based on these findings, recommendations were made, these are included in **Section 8** of this EIAR.

7.1.4 SOILS

The following is extracted from the Feasibility Dolomite Stability and Geotechnical Assessment compiled by Knight Piesold (November 2021) and included as ***Appendix G.2.***

Most of the site is blanketed by a generally thin fill of variable composition. This varies between 0,1 m and 0,8 m thick with the average thickness of 0,29 m. Typical descriptions for the thin occurrences of fill are greyish brown to black silty fine sand combined with coarse (27mm) dolomite and chert aggregate. Instances of fill thicker than 0,2 m are generally highly variable in description and

properties. Particularly thick layer of fill was encountered in test pit TP3 which comprises gravelly silty sand with minor cobbles. Additionally, spoil heaps of stockpiled fill materials are visible from surface in the areas between test pit TP3 and TP6 near the southern boundary of the site.

One instance of topsoil was encountered below the surface to a maximum depth of 0,4m. The topsoil has presumably been stripped in other areas across the site prior to use as laydown areas. This was noted as a dark brown silty fine gravely sand of dense consistency with abundant rootlets. The transported soil underlying the topsoil comprises hillwash, which is generally overlain by fill across most of the site.

7.1.5 HYDROLOGY

The project site is located within the Upper Vaal Water Management Area (WMA) within the C22C Quaternary drainage region.

The site is located approximately 1.5km north of the Rietspruit River that flows in a south-westerly direction into the Suikerbosrand Nature Reserve. No river or stream traverses the site and it is located about 1km north of the nearest wetland. Clean storm water from the site and its immediate surrounds drain into a culvert that is located less than a kilometre South West of the site (**Figure 7-5**).

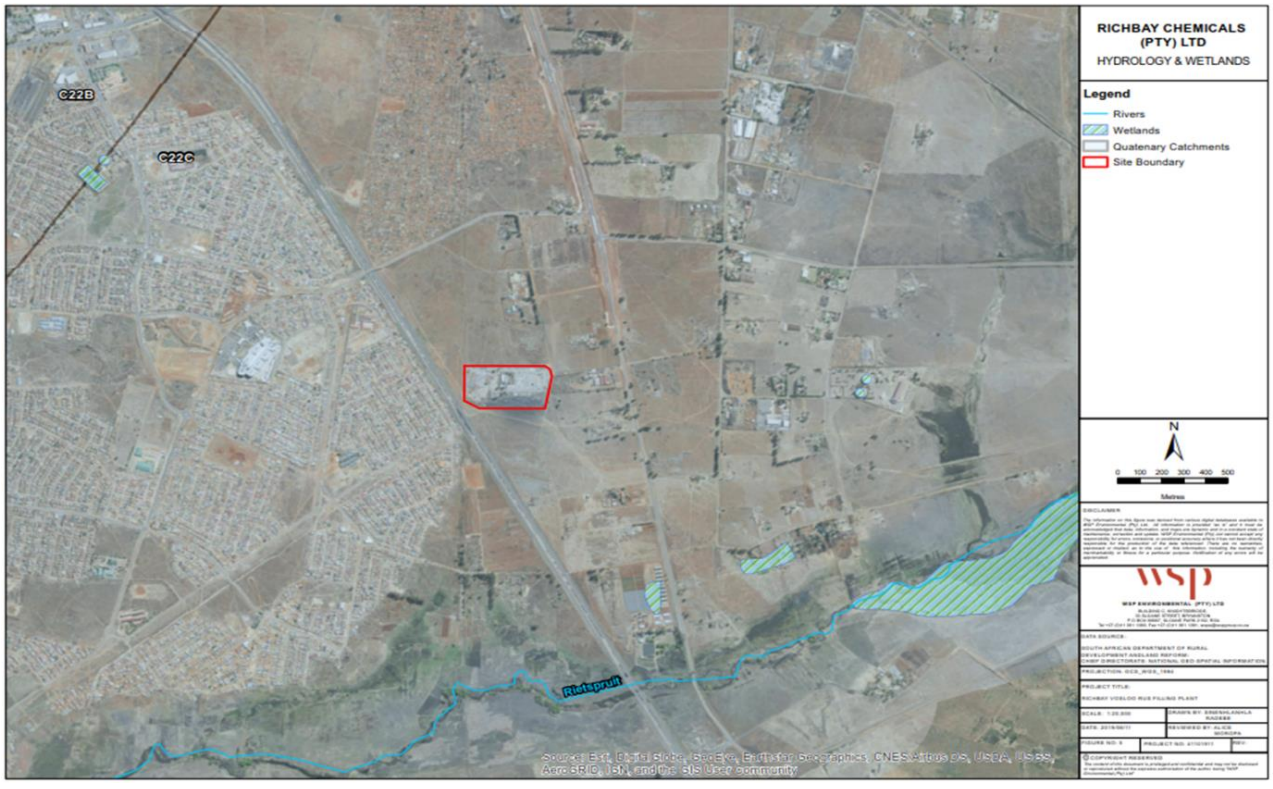

Figure 7-5 – Surface water and wetland surrounding the site

7.1.6 GROUNDWATER

The study area is dominated by dolomite of the Chuniespoort Group and tillites of the Dwyka group, both of which carry water. Dolomite rock possesses a system of discontinuities (fractures, joints and faults) which act as preferential solution passages for water ingress. The presence of various geological structures, such as faults, fissures, and fracture zones, as well as contact zones of intrusions such as dykes and sills, dictate the occurrence of groundwater (EMF, 2008). Karst Aquifers

are infiltrated by rainwater containing weak carbonic acid dissolves dolomites resulting in caves and cavities that may facilitate the formation of sinkholes, especially if the water from these cavities is extracted through boreholes.

Boreholes with the highest yield are found in the dolomites that occur from Wadeville to a point south of Vosloorus. This high recharge of underground water and significant underground flow results in low density surface drainage in dolomitic areas (EMF, 2008).

Groundwater quality in the study area is generally acceptable for any use. In some areas contamination with chlorides, sulphates and nitrates has been recorded and care should be taken with groundwater used for human consumption.

7.2 BIOLOGICAL ENVIRONMENT

7.2.1 TERRESTRIAL BIODIVERSITY

The following is extracted from the Terrestrial Biodiversity Assessment compiled by The Biodiversity Company (November 2019) and included as ***Appendix G.3.***

7.2.1.1 Regional Terrestrial Biodiversity Context

Vegetation Types and Threatened Ecosystems

The project area is situated within the grassland biome. This biome is centrally located in Southern Africa, and adjoins all except the desert, fynbos and succulent Karoo biomes (Mucina & Rutherford, 2006). The Savanna biome comprises of many different vegetation types. The Proposed Project area falls entirely within the Carletonville Dolomite Grassland vegetation type. This vegetation type occurs on slightly undulating plains dissected by prominent rocky chert ridges. Species-rich grasslands forming a complex mosaic pattern dominated by many species (Mucina & Rutherford, 2006). **Figure 7-6** indicates the Proposed Project Area in relation to the vegetation type.

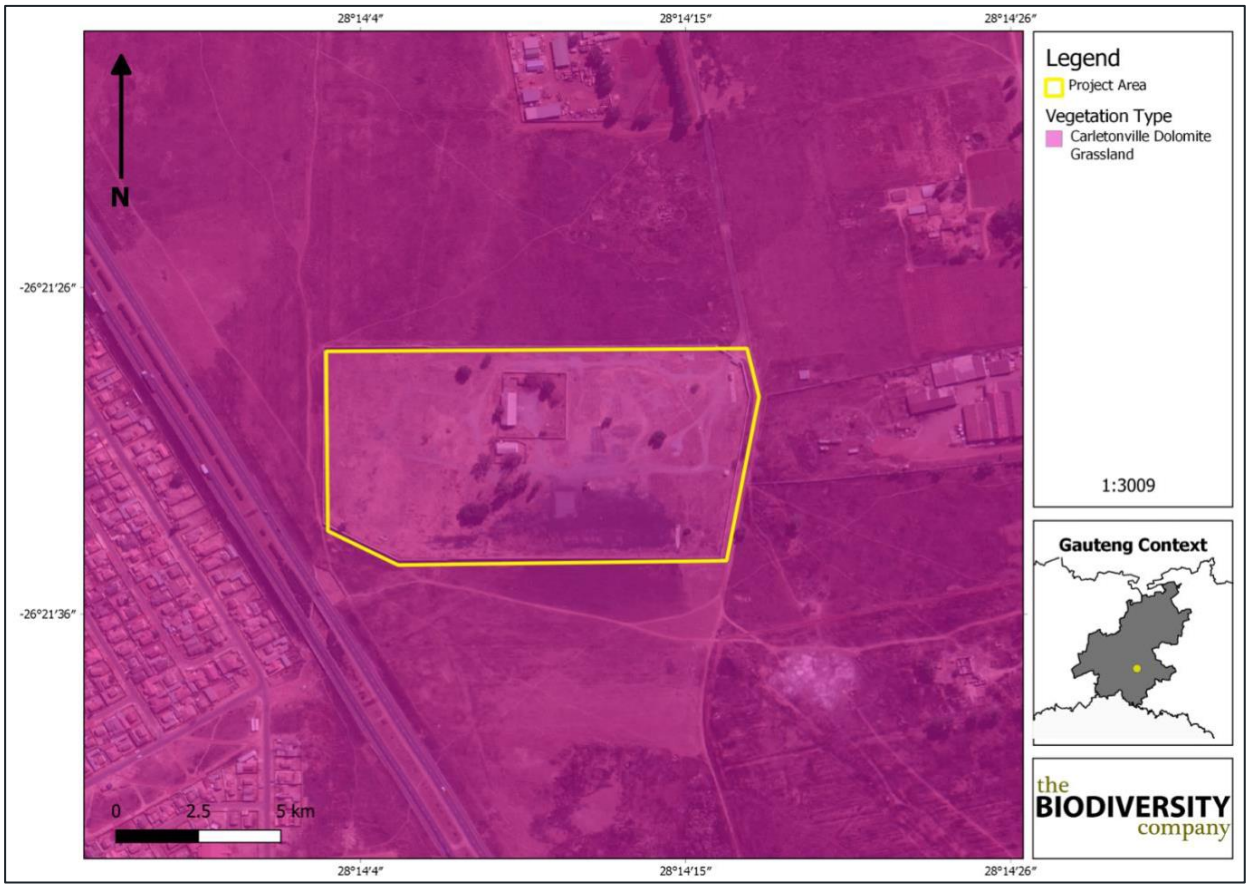

Figure 7-6 – The project area showing the vegetation type based on the Vegetation Map of South Africa, Lesotho & Swaziland (BGIS, 2018)

Ecosystem Threat Status

Ecosystem threat status outlines the degree to which ecosystems are still intact or alternatively losing vital aspects of their structure, function and composition, on which their ability to provide ecosystem services ultimately depends (Skowno et al., 2019). Ecosystem types are categorised as Critically Endangered (CR), Endangered (EN), Vulnerable (VU) or Least Threatened (LT), based on the proportion of each ecosystem type that remains in good ecological condition (Skowno et al., 2019).

The Proposed Project area was superimposed on the terrestrial ecosystem threat status (**Figure 7-7**). As seen in this figure the project area falls across one ecosystem, which is listed CR.

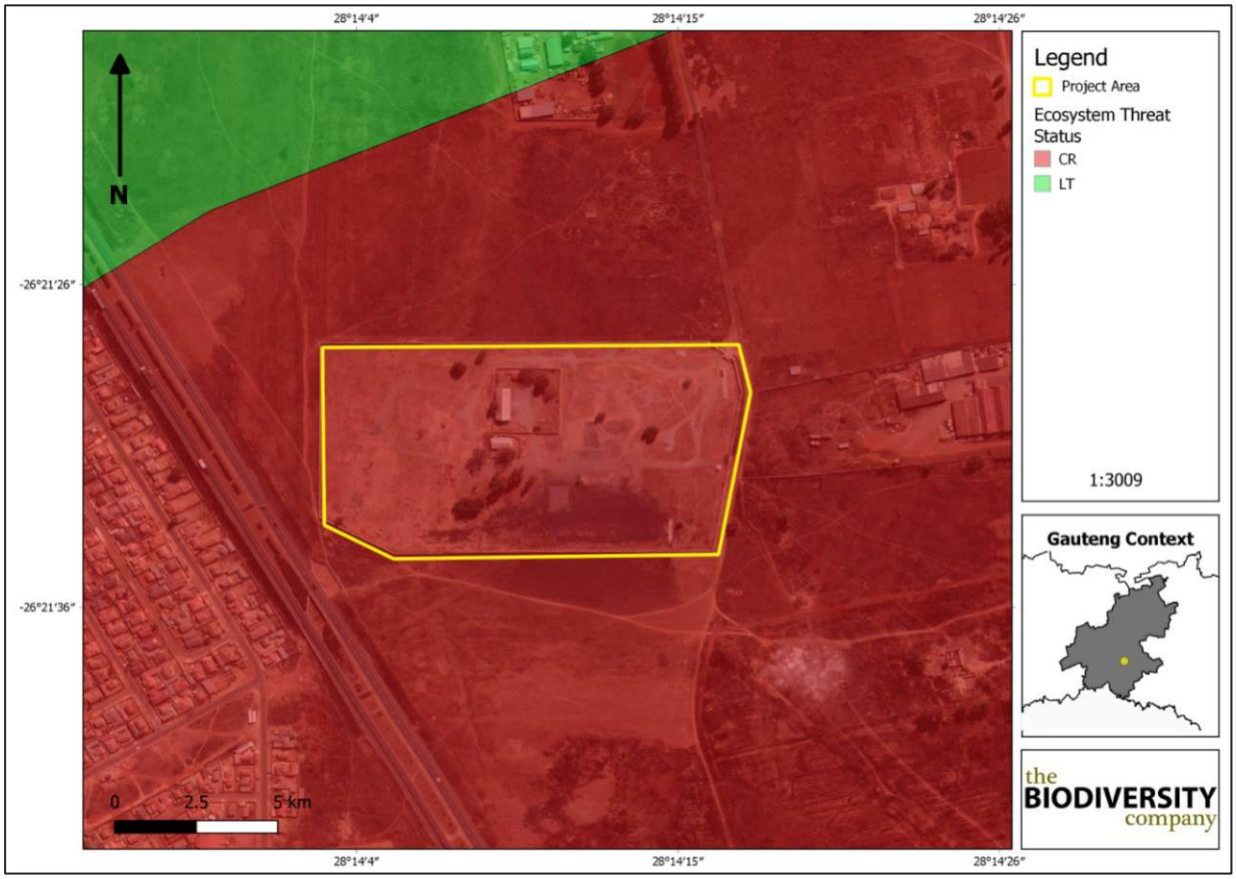

Figure 7-7 - The project area showing the ecosystem threat status of the associated terrestrial ecosystems (NBA, 2018)

Terrestrial Critical Biodiversity Areas

The Gauteng Conservation Plan (Version 3.3) (GDARD, 2014b) classified areas within the province on the basis of its contribution to reach the conservation targets within the province. These areas are classified as Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs) to ensure sustainability in the long term. The CBAs are classified as either 'Irreplaceable' (must be conserved), or 'Important'. CBAs are terrestrial and aquatic areas of the landscape that need to be maintained in a natural or near-natural state to ensure the continued existence and functioning of species and ecosystems and the delivery of ecosystem services. Thus, if these areas are not maintained in a natural or near natural state then biodiversity targets cannot be met.

According to the Gauteng Terrestrial CBA Plan (C-Plan) a portion of the project area falls in a CBA: Important area (**Figure 7-8**).

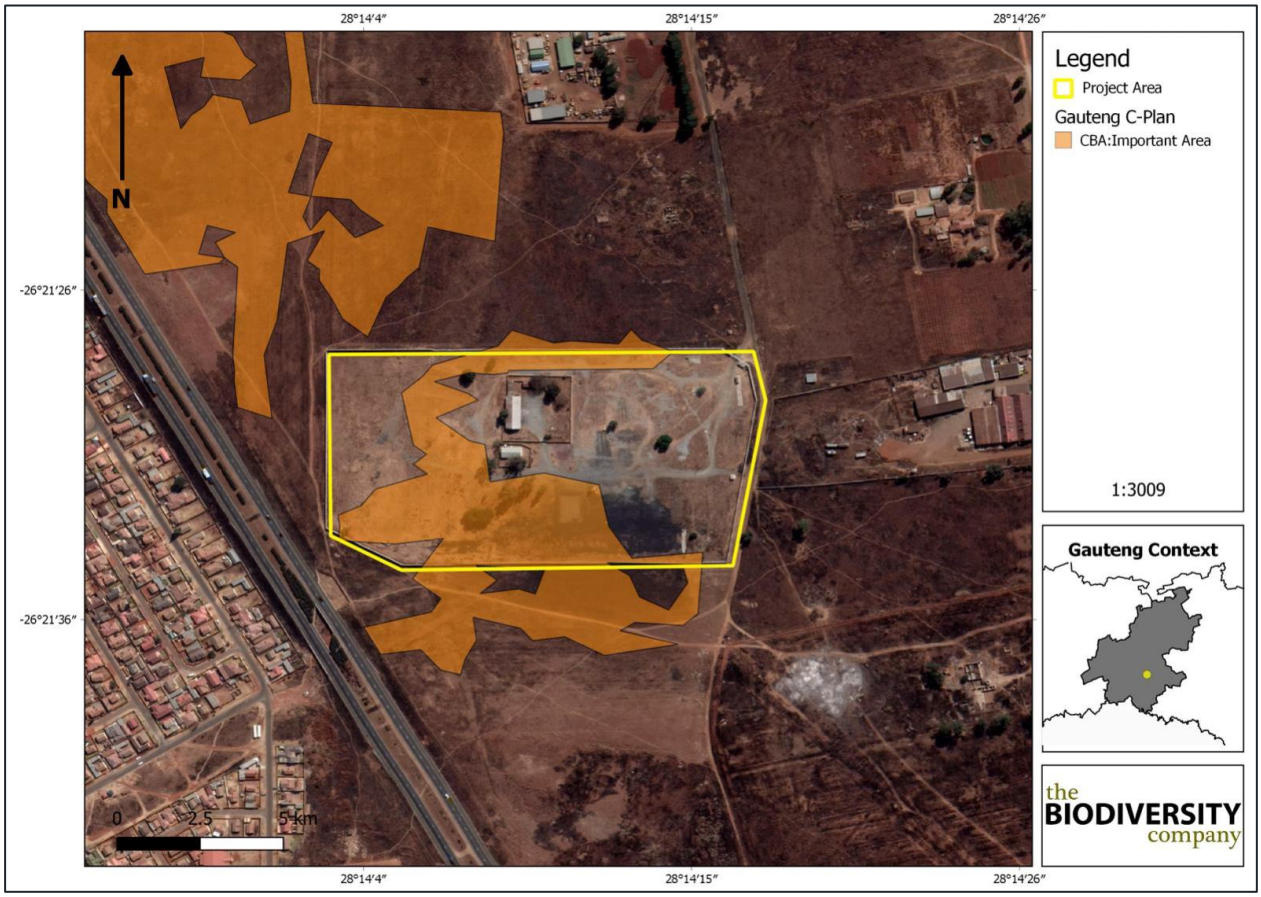

Figure 7-8 - Project area in relation to the Gauteng CBA dataset

7.2.1.2 Site Specific Terrestrial Biodiversity

Habitat Assessment

Habitats identified during the field visit can be seen in **Figure 7-9**. Two primary habitats were delineated for this assessment, namely: degraded grassland and transformed areas. The delineated areas are discussed below and visual representations from the field survey can be seen in **Figure 7-10.**

The degraded grasslands are the areas which were considered to have been altered from their natural state, sections of bare soil and low grass cover are visible due to a combination of over grazing and anthropogenic activities. This habitat has been degraded to a low ecological state.

Transformed areas have been historically and currently denuded of natural vegetation in order to construct building and other infrastructure. Portions of this habitat type are covered by the existing infrastructure within the project area which comprises of buildings, roads and a large wall. Sandblasting was the main activity taking place within the project area.

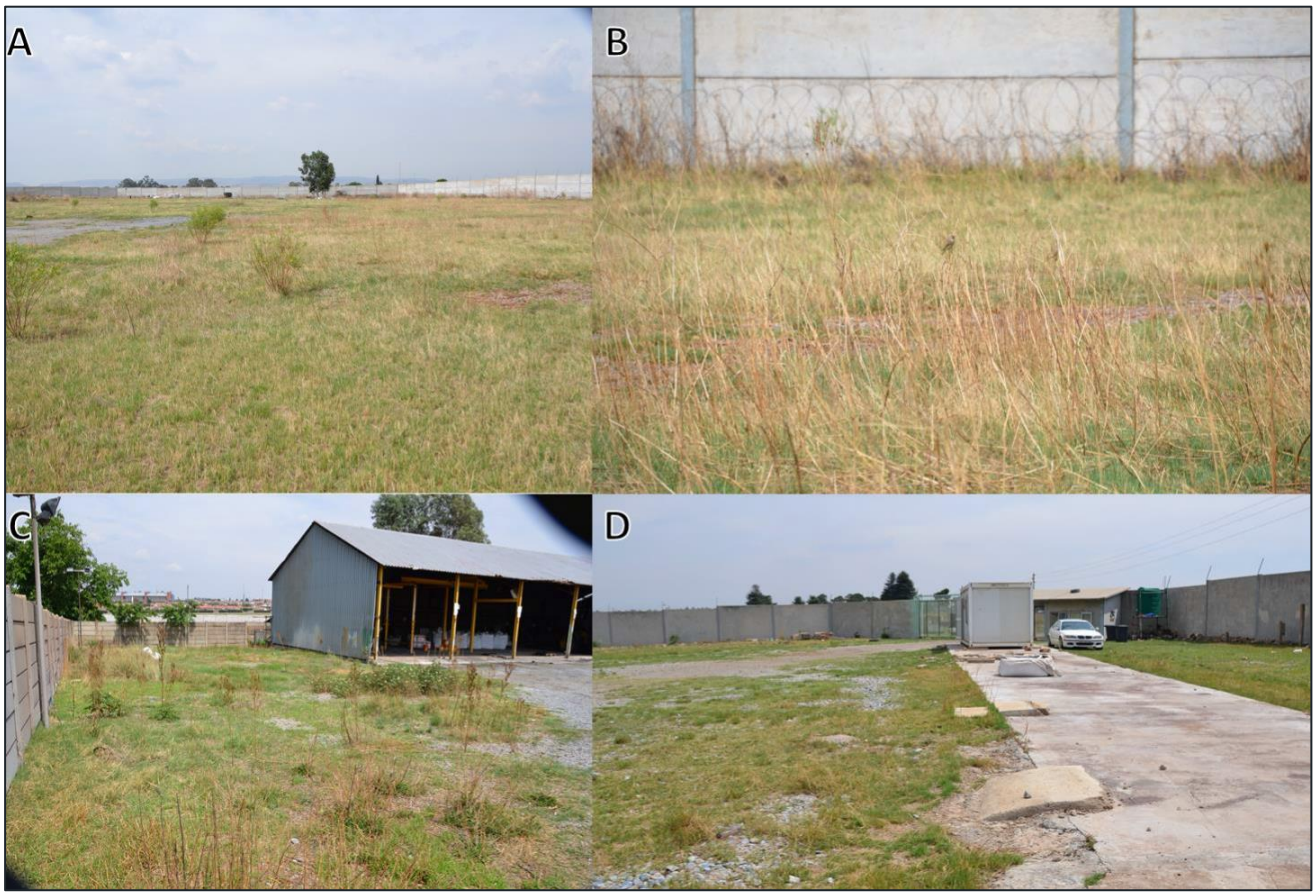

Figure 7-9 - Habitats within the project area; A & B) Degraded Grassland and C & D) Transformed Areas

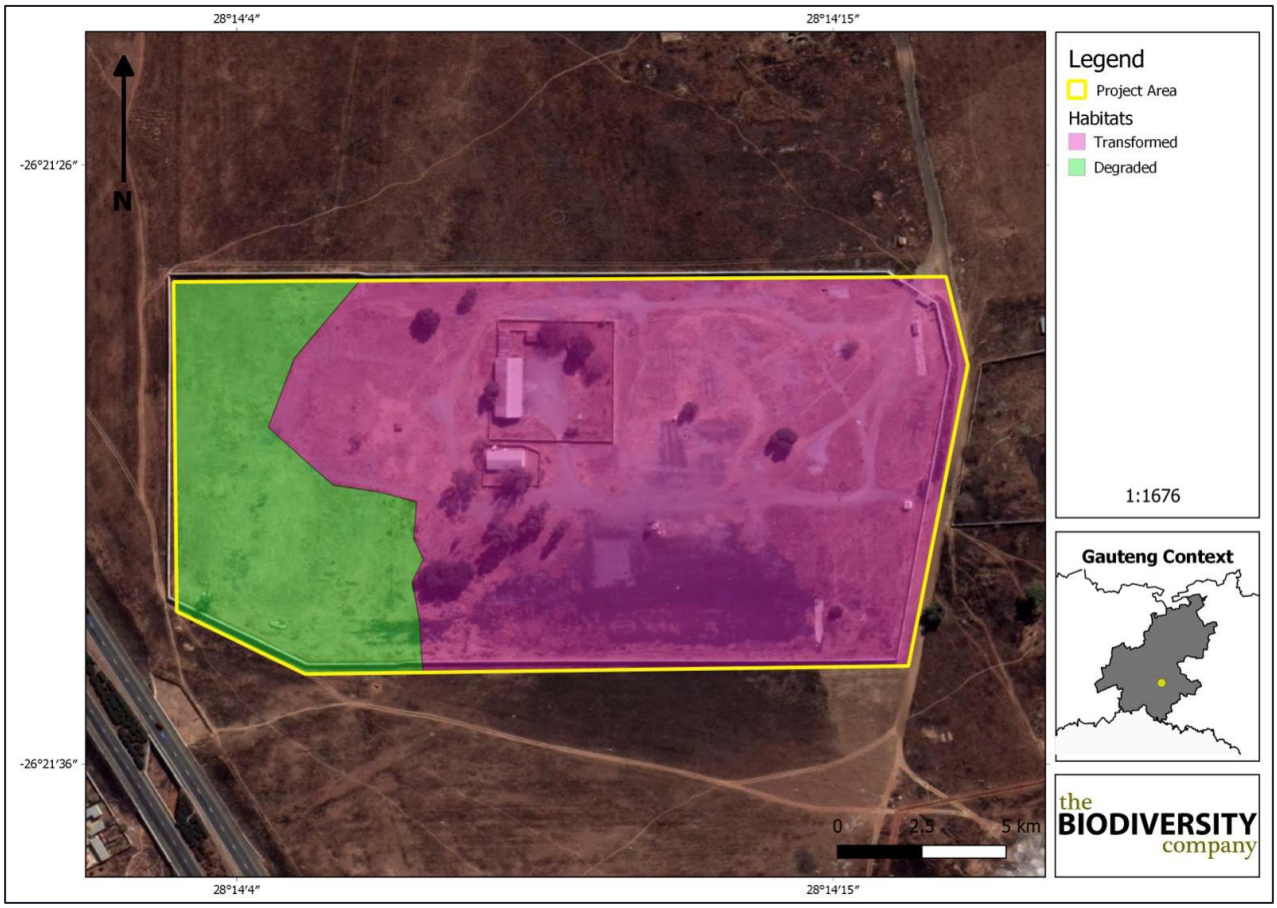

Figure 7-10 - Habitats identified in the Project Area

Vegetation and Flora

The vegetation assessment was conducted throughout the extent of the project area. A total of 46 tree, shrub and herbaceous plant species were recorded in the project area during the field assessment. Eleven (11) plants listed as Category 1 alien or invasive species under the NEMBA and fifteen (15) plants listed in Category 2 or as 'not indigenous' or 'naturalised' according to NEMBA were identified on site.

Figure 7-11 indicates a photographic record of some of the plant species recorded on the Project side.

Figure 7-11 - Plant species recorded in the project area

A) Eriospermum cooperi, B) Pachycarpus schinzianus, C) Erythrina zeyheri, D) Ledebouria revoluta, E) Heliotropium amplexicaule, and F) Acalypha angustata

Fauna

Twelve (12) bird species were recorded in the project area during the November 2019 survey based on either direct observations, vocalisations, or the presence of visual tracks & signs.

Mammals

No mammals were observed in the project area, this is ascribed to the disturbed nature of the project area along with a large number of impacts and human presence.

Herpetofauna

Two reptile species were recorded in the project area and the third species (Rinkhals) was confirmed based on communication with local people that are currently working on site. No amphibians were recorded, this is attributed to the lack of suitable wet areas in the project area.

Area Sensitivity

A least concerned sensitivity was given to those areas that have been impacted upon by the anthropogenic activities, such as buildings, sandblasting, paved areas, and roads. This area does not offer habitat for faunal or flora species.

The area given a low sensitivity are the degraded grassland that has been impacted and has been modified from its original condition, this area does however still offer habitat to more adaptable species.

It is important to note that this map (**Figure 7-12**) does not replace any local, provincial or government legislation relating to these areas or the land use capabilities or sensitivities of these environments.

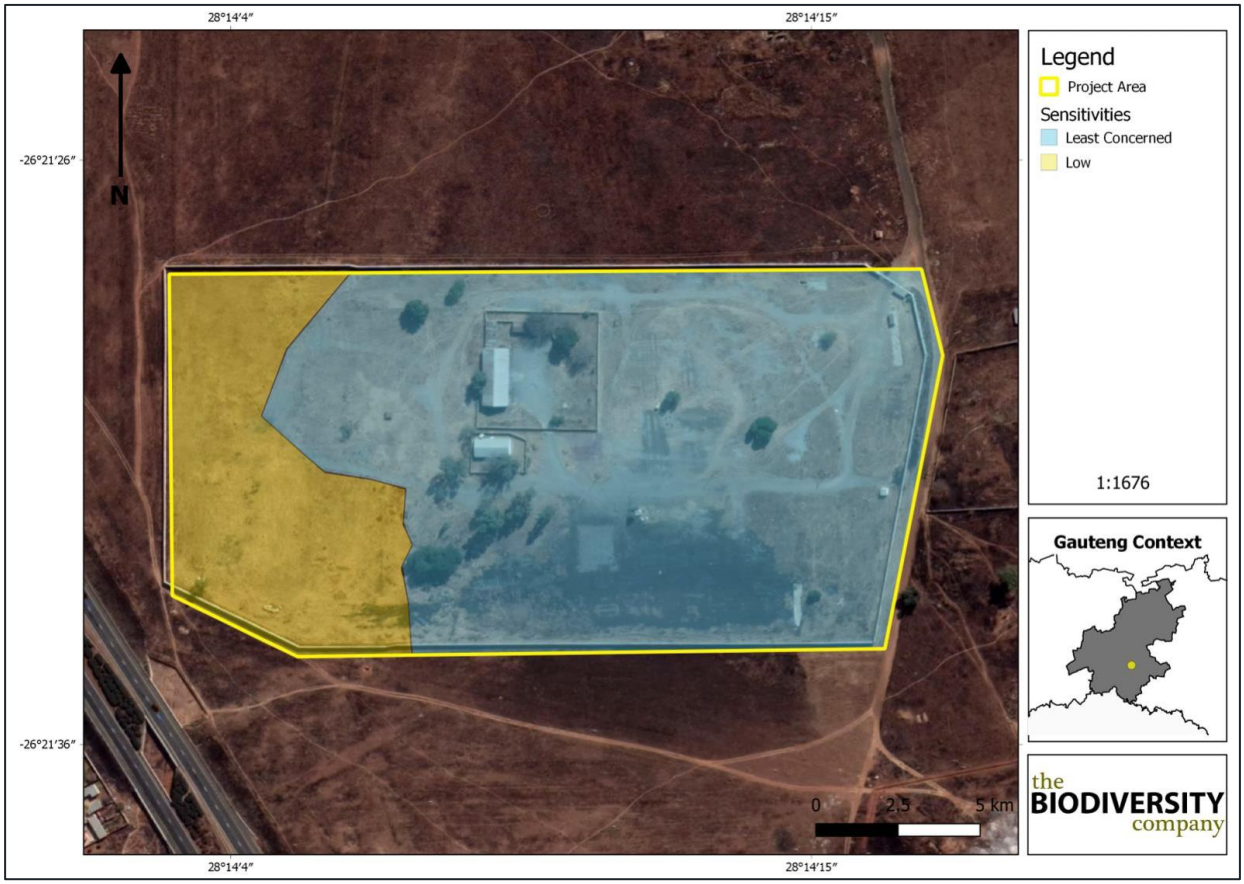

Figure 7-12 - Habitat sensitivity map of the Project area

7.3 SOCIAL AND ECONOMIC ENVIRONMENT

7.3.1 ARCHAEOLOGICAL AND CULTURAL HERITAGE

The following is extracted from the Archaeological and Cultural Assessment compiled by Archaetnos (November 2019) as ***Appendix G.4.***

All sites, objects, features and structures identified were documented according to the general minimum standards accepted by the archaeological profession. Co-ordinates of individual localities were determined by means of the Global Positioning System (GPS). The information was added to the description in order to facilitate the identification of each locality.

The study concluded that no sites of cultural and archaeological significance were identified therefore the proposed development can proceed from a heritage perspective.

7.3.2 PALAEONTOLOGY

The following is extracted from the Desktop Palaeontological Assessment compiled by Dr. H. Fourie (February 2020) as ***Appendix G.5.***

The project area lies on the East Rand of the Gauteng Province. The oldest rocks here known as the Witwatersrand Supergroup has examples of cyanobacteria. Stromatolites occur throughout the Transvaal Supergroup. Overlying the Transvaal Supergroup are the rocks of the Karoo Supergroup known for fossil plants, invertebrates and the trace fossils from the Ecca and Dwyka beds.

The Cenozoic Era, in which we are presently living, is popularly known as the 'Age of the Mammals'. Its fossils are preserved on the river gravel terraces (Cornelia), cave systems (Makapan), coastal plains (Langebaanweg), and basins. The Cenozoic Era of South Africa has been subdivided into six African Land Mammal Ages, namely, Recent, Florisian, Cornelian, Makapanian, Langebaanian, and Namibian (MacRae 1999).

A very wide range of possible fossil remains occur in the Cenozoic, though these are often sparse, such as: mammalian bones and teeth, tortoise remains, ostrich eggshells, non-marine mollusc shells, ostracods, diatoms, and other micro fossil groups, trace fossils (e.g. calcretised termitaria, rhizoliths, burrows, vertebrate tracks), freshwater stromatolites, plant material such as peats, foliage, wood, pollens, within calc tufa. Stromatolite structures range from a centimetre to several tens of metres in size. They are the result of algal growth in shallow water, indicating a very rich growth that would have caused enrichment in the amount of oxygen in the atmosphere (Groenewald and Groenewald 2014).

The Quaternary deposits are covered by the Heritage Impact Assessment and if fossils are present these should be studied by an archaeozoologist as they do faunal lists through identification of individual skeletal elements. Groenewald and Groenewald 2014 described these as alluvial deposits associated with recent water courses of main rivers and streams. These sediments are presently not well studied and records of fossil occurrences are mainly associated with archaeological reports. The floodplains are protected by the 1:100 and 1:50 year flood lines that cannot be intruded during construction, except for roads, services and parking areas.

Chemical sediments such as fine-grained limestone and dolomite is made up of deposits of organically derived carbonate shells, particles or precipitate. Dolomite is magnesium-rich limestone formed from algal beds and stromatolites. These Early Proterozoic Transvaal stromatolitic dolomites formed and released free oxygen at around 2900 – 2400 Ma. Stromatolites are common in the Malmani dolomites, accepted to be the fossil remnants of the simplest single-celled organisms. They are finely layered,

concentric, mound-like structures formed by microscopic algal organisms (Norman and Whitfield 2006). Chert may contain fossils such as echinoids or sponges if nodular, although not common and is rated unlikely.

Cyanobacteria have been described from the gold bearing conglomerates of the Witwatersrand Supergroup (MacRae 1999). These are significant recordings as it gives a possible indication of very early life forms, possibly ancient lichens that existed up to 2900 million years ago. These structures are for example associated with the Carbon Leader Seam in the Carletonville Goldfield, with native gold visible to the naked eye. Very large stromatolites can be found in the Campbell Rand Subgroup in the Northwest Province (Groenewald and Groenewald 2014).

The study concluded that the area is very disturbed, there are several chert piles stacked near the perimeter fence. The surface is covered with gravel and a house, and several other buildings are present. A sand-blasting industry is currently operative. Livestock are also present. Only chert can be found on the surface therefore there is no objection to the Proposed Project.

7.3.3 LAND USE

Land uses in the EMM include the following:

- Mining;
- Industry;
- Residential; and
- Agriculture.

The manufacturing industry is the primary economic activity of the municipality with a range of light and heavy industrial activity distributed across the Isando, Spartan and Jet park areas, west of the OR Tambo International Airport. The older, and heavier industrial area is located in the central part of the municipality, which comprises of Boksburg East, Anderbolt, Benoni South and Apex industrial areas. Further to the east are the smaller industrial areas, including Brakpan, Springs, Pretoriusstad and Prosperita (MSDF, 2015).

Agricultural activity in the municipality occurs mainly in the Bapsfontein area, where a large number of agricultural businesses have been established. Mining in the Germiston-Boksburg area, the Benoni-Brakpan-Springs area and the Spring-Nigel area has since declined and no longer makes a significant contribution to the economic activity in the municipality.

The site is surrounded by industrial holdings including:

- A truck and heavy equipment business adjacent to the site (north of the site);
- A corrosion coating (painting, lining, coating etc.) business opposite the site (east of the site);and
- Scrap yards and salvage yards.

An open grassland is located south of the site, and the township of Vosloorus is located about 150m west of the site, over the N3 highway.

The site was previously used for a sand blasting business and as such, much of it has been transformed. The property contains the following:

- A sand blast open space which has been completely transformed and contains no vegetation;
- Change rooms for workers on site;
- A security building;
- A workshop; and

- Patches of natural grassland

Figure 7-13 depicts the land cover in and around the Project site.

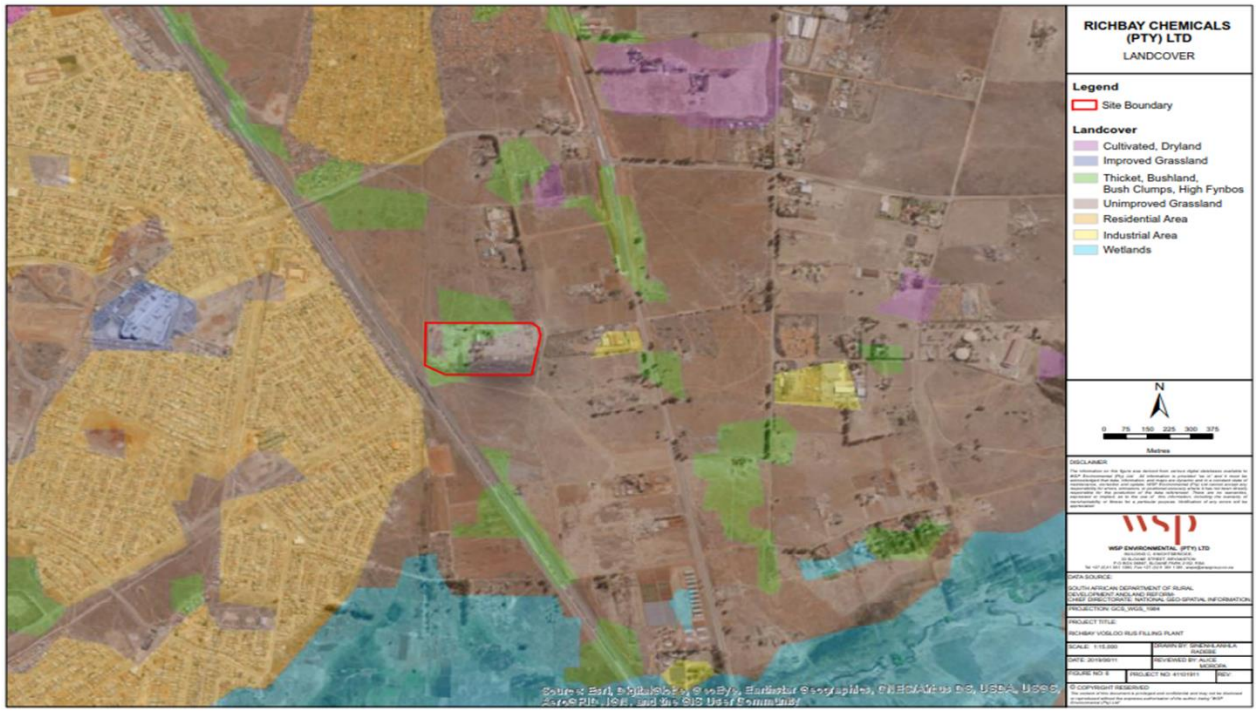

Figure 7-13 - Land Cover Map

7.3.4 SOCIO-ECONOMIC

7.3.4.1 Demographics

The City's population has grown exponentially from an estimated 2 368 283 in 2000 to 3 379 104 in 2016. The City's population growth rate is steady at 2.47% per annum, coming down from a high of 4% per annum in the period between 1996 and 2001. The current population represents over 6% of the total population of South Africa (Stats SA: 2017). An important feature of growth in the Ekurhuleni population is the net migration into the City. Ekurhuleni, with Tshwane and Johannesburg, are the largest recipients of in-migration in the country.

7.3.4.2 Population Structure

The City has a median age of 30. 66% of the population is between the ages of 18 and 64, 18% is below the age of 18 and 6% is above the age of 65. The City has a relatively young population, which is about the same rate as that of Gauteng. The African (black) population accounts for 80% of the population, followed by the white population at 14%, the Coloured population at 3% and the Indian population at 2%.

Males make up 51% of the population within the City and females account for 49%. Isizulu is the most widely spoken language at home at about 34%, followed by Sepedi at 12%, Sesotho at 11% and English at 10%. Generally, the population of the City speaks more than one official South African language and all 11 languages are spoken within the City. In addition, 95% of the inhabitants of the City are South African born, with 62% born in Gauteng, 10% born in Limpopo, 7% born in KwaZulu-

Natal, 5% born in the Eastern Cape, the remaining 10% born elsewhere in the country and 5% born outside South Africa.

Figure 7-14 illustrates the 2011 population pyramid of Ekurhuleni as embedded in the outline of that of South Africa. The pyramid shows that the population composition of Ekurhuleni is typical of that of the rest of South Africa. Firstly, it can be seen that the City is undergoing a demographic transition at the base of the pyramid, driven largely by declining fertility – observable for the whole of South Africa in general and secondly by the effect of in-migration of typically the 25- to– 64-year-olds in search of economic opportunities. Analysis of the 1996, 2001 and 2011 census data indicates that the transition of the pyramids is not yet stable.

Comparing the 2005 to the 2015 population pyramid for the City of Ekurhuleni, interesting differences are visible:

- In 2005, there was a larger share (albeit marginal) of young, working age people – aged 20 to 34 (30.7%) – compared to 2015 (29.6%).
- Fertility in 2005 was slightly lower compared to 2015.
- The share of children between the ages of 0 to 14 is slightly smaller in 2005 (25.4%), compared to 2015 (26.0%).
- Life expectancy appears to be increasing. This is broadly in line with national trends as revealed in the latest mortality rates and causes of death report, 2015 (released in February 2017). In terms of this report South Africa is experiencing fewer deaths in an increasing population and life expectancy is increasing in the country.

In 2015, the female population for the 20- to 34-year-old age group amounted to 14.6% of the total female population, while the male population group for the same age amounted to 16.0%. In 2005, the male working age population at 15.4% still exceeds that of the female population working age population at 14.2%.

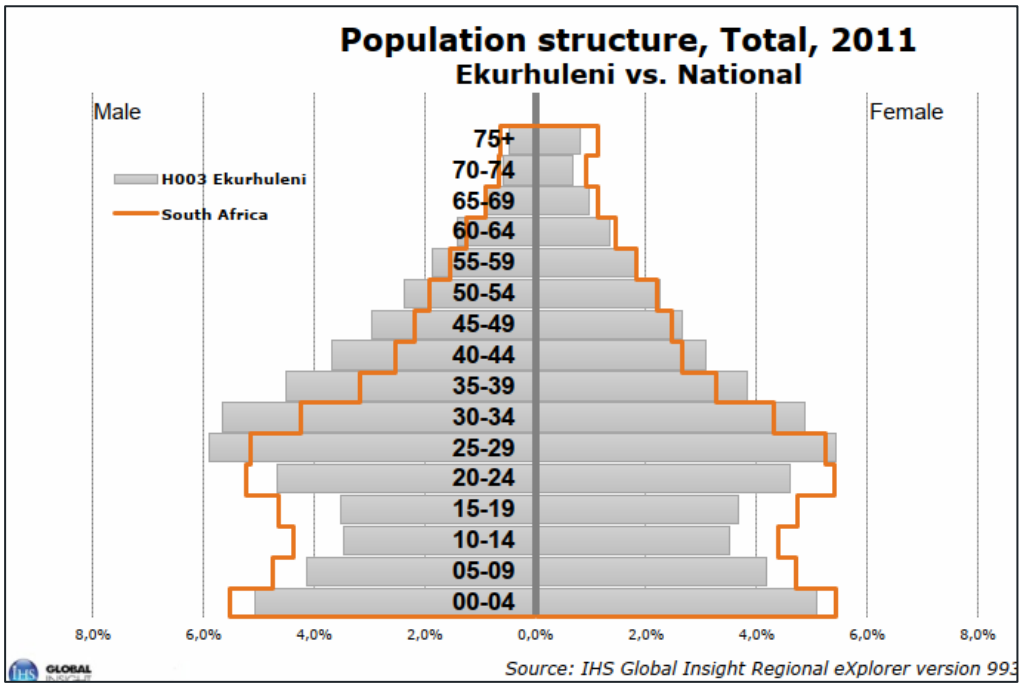

Figure 7-14 – Population Structure of the Ekurhuleni Municipality

7.3.4.3 Economic Profile

The City of Ekurhuleni (CoE) is a major economic and social role-player in South Africa by means of its strong industrial characteristics and contribution to the national economy, and the size and extent of the population that is contained within its administrative boundary. With a Gross Domestic Product (GDP) of R 334 billion in 2018 (up from R 160 billion in 2008), the CoE contributed 19.67% to the Gauteng GDP of R 1.7 trillion in 2018 increasing in the share of the Gauteng from 19.57% in 2008. The CoE contributed 6.85% to the GDP of South Africa which had R 4.87 trillion in 2018 (measured in current prices). In 2018, the CoE achieved an annual economic growth rate of 1.09% which is close to the Gauteng one of 1.12%, and higher than South Africa, whose growth rate was 0.79%. In 2018 the CoE ranked third relative to other regional economies to Gauteng Provincial GDP. This ranking remained the same since 2008 with its share, in 2018 (19.7%) comparable to what it was in 2008 (19.6%).

The working age population in Ekurhuleni in 2018 was 2.47 million, increasing at an average annual rate of 2.08% since 2008. For the same period the working age population for Gauteng Province increased at 2.26% annually, while that of South Africa increased at 1.50% annually.

In the first quarter of 2019, the unemployment rate in South Africa stood at 27,6% showing an increase of 0.5% compared to Q4:2018. The Gauteng unemployment rate remained above the national rate with a 0.1% decline to 28.9% from Q4:2018. The Ekurhuleni unemployment however remained above the national and provincial rates even though there was a 1.1% decline to 30.1% in Q1:2019 from 31.2% in Q4:2018. In the City of Ekurhuleni, approximately 26% of the labour force is considered skilled, while 47% is semi-skilled and 27% is low skilled. Unemployment remains a significant challenge, with Ekurhuleni's rate of joblessness exceeding the provincial average by more than 1%, at 30.1%. The municipality has consistently had higher unemployment rates than the provincial and national levels over the time span. The quarterly labour force participation rate for Ekurhuleni has remained above provincial and national levels for the period 2015 - 2019 maintaining rates above 70%.

7.3.5 HEALTH AND SAFETY

The following is extracted from the Major Hazard Installation Assessment compiled by MHR Consultants (February 2022) as ***Appendix G.6.***

The following sensitive areas are located close to the site:

- Rebontsheng Primary School – 360m Northwest
- Masithwalisane Secondary School – 560m Southeast

There are no known MHIs near the site.

7.3.6 AIR QUALITY

The following is extracted from the Air Quality Impact Assessment compiled by WSP (August 2020) as ***Appendix G.7.***

7.3.6.1 Sensitive Receptors

The west and north-western portion of the study area is characterised by high density housing, both formal and informal, interspersed by road networks. Numerous schools and medical facilities are located west of the proposed site. Open fields and smallholdings dominate the north, eastern and southern parts of the study area. Ten sensitive receptors (i.e., places where sensitive individuals may

be impacted, such as residences, schools and medical facilities) were selected for evaluation, providing for a range of activities and distances from the source along key wind trajectories.

Figure 7-15 is a map of the sensitive receptors surrounding the site.

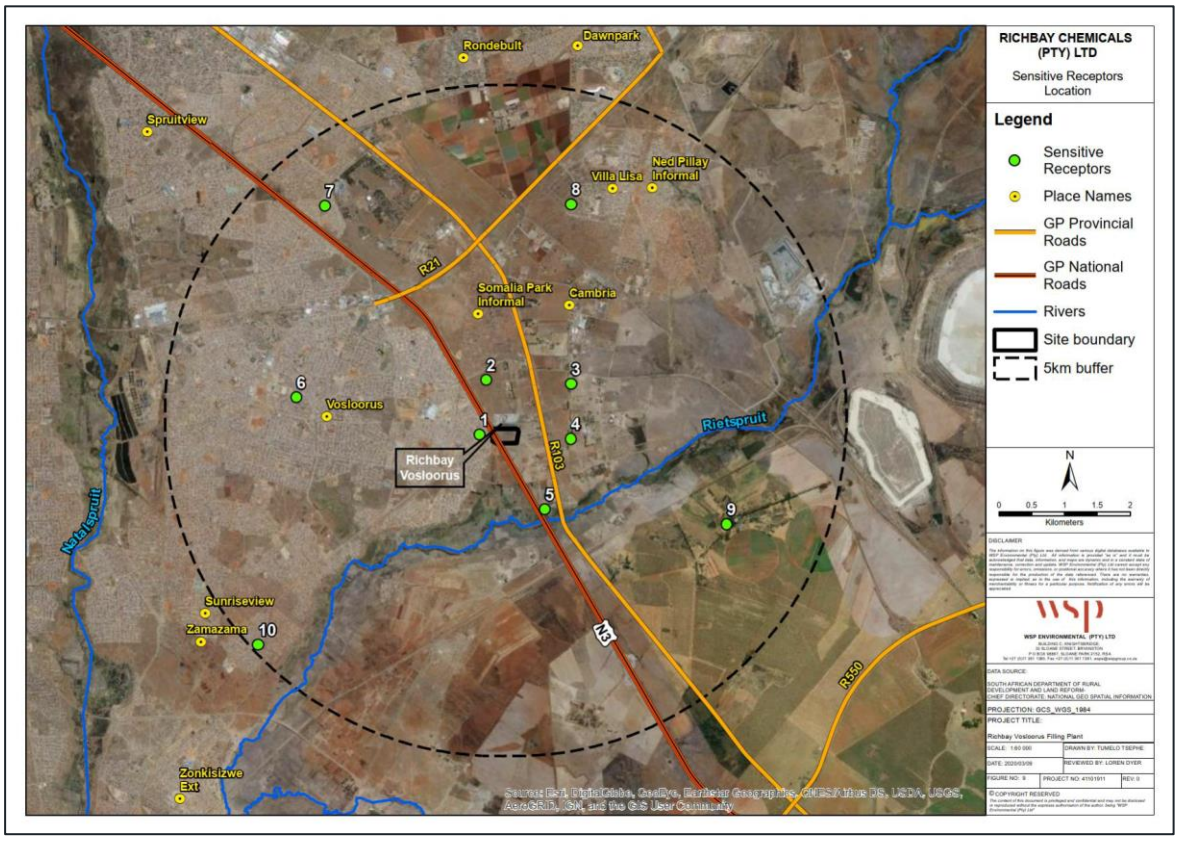

Figure 7-15 – Sensitive receptors

7.3.6.2 Ambient Air Quality

Ambient air quality monitoring data has been sourced from a monitoring station located approximately 9.9 km to the west-northwest of the proposed development site, namely Thokoza, located in the residential area of Thokoza.

This station is owned and managed by SAWS. Data was requested for the period January 2016 – December 2018 (three calendar years) and assessed for compliance with NAAQS. A minimum data recovery of 90% is required for assessing compliance with national standards17. Data recovery across the pollutant array measured failed to meet this requirement. Nonetheless, in the absence of any other ambient monitoring data, the available information has been used to provide insight into background NO_2, SO_2 and PM_{10} concentrations in the study area. Data recovery for other pollutants was insufficient to provide meaningful interpretation. The averages calculated and the assessment of exceedances must be considered in the context of low data recovery.

Nitrogen Dioxide

Hourly NO_2 concentrations measured at Thokoza for 2016, 2017 and 2018 (**Figure 7-16**) averaged below the annual NAAQS (40 µg/m^3) at 38.83 µg/m^3, 39.40 µg/m^3 and 36.78 µg/m^3 respectively. Ambient concentrations exceeded the 1-hour NAAQS (200 µg/m^3, 88 exceedances permitted per anum) once in 2017.

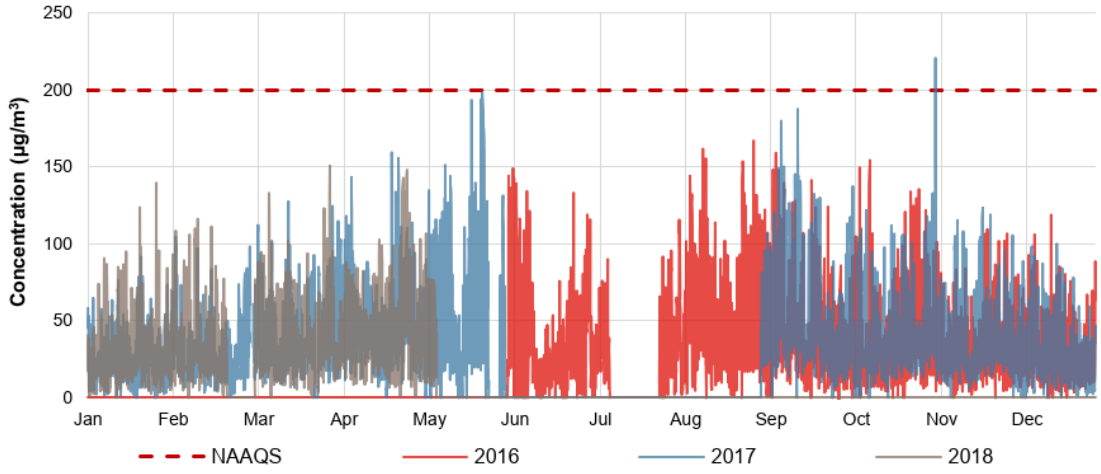

Figure 7-16 - Hourly nitrogen dioxide concentrations measured at Thokoza

Sulphur Dioxide

Hourly SO_2 concentrations measured at Thokoza for 2016, 2017 and 2018 (**Figure 7-17**) averaged below the annual NAAQS (50 µg/m^3) at 19.44 µg/m^3, 16.52 µg/m^3 and 14.42 µg/m^3 respectively. Ambient concentrations exceeded the 1-hour NAAQS (350 µg/m^3, 88 exceedences permitted per annum) once in 2016. No exceedances of the 24-hour (125 µg/m^3) NAAQS were measured between January 2016 and December 2018.

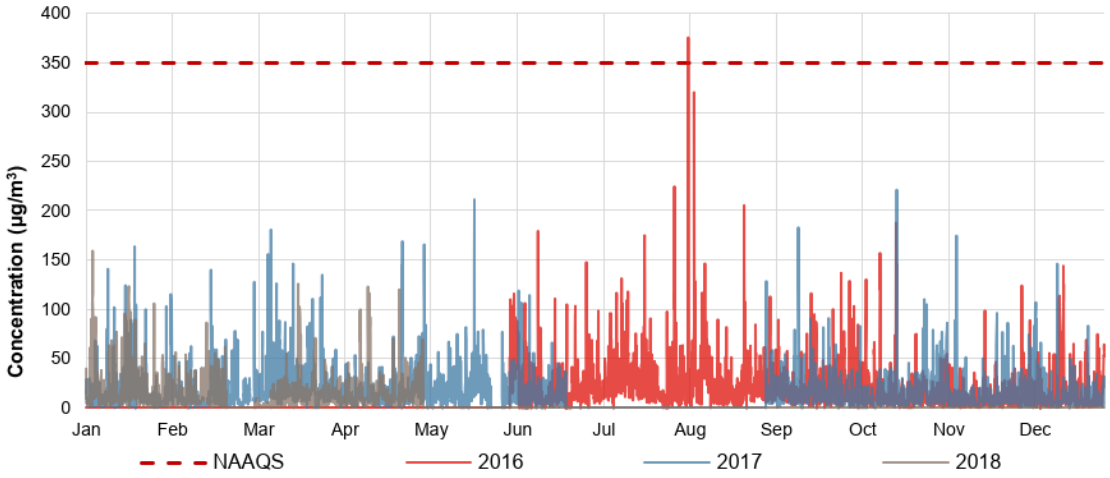

Figure 7-17 - Hourly sulphur dioxide concentrations measured at Thokoza

Particulate Matter less than 10 Micrometres in Diameter

The PM_{10} dataset for the Thokoza station is limited (12.2% data recovery) but available data indicates that concentrations are exceeding the NAAQS and thus has been included in this ambient air quality analysis. PM_{10} concentrations measured at Thokoza for 2016, 2017 and 2018 (**Figure 7-18**) exceeded the annual NAAQS (40 µg/m^3) in 2018 with an annual average of 49.76 µg/m^3. Ambient concentrations exceeded the 24-hour NAAQS (75 µg/m^3, four exceedances permitted per annum) 12 times in 2018. Data recovery for 2018 was 31.8%. No data is available for 2017. No exceedances of

the annual (40 µg/m^3) or 24-hour (75 µg/m^3) NAAQS were measured in 2017. Data recovery for 2017 was 4.8%.

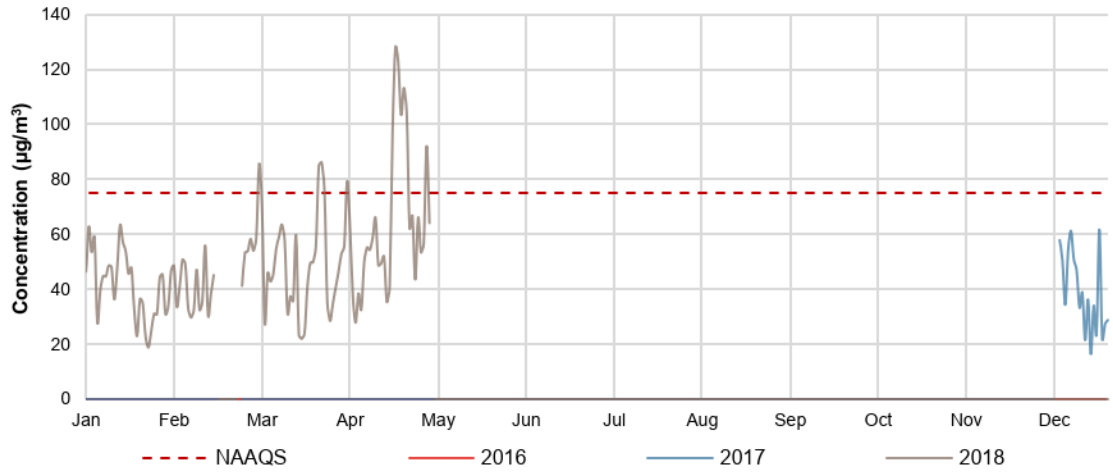

Figure 7-18 - Daily PM10 concentrations measured at Thokoza

8 ENVIRONMENTAL IMPACT ASSESSMENT

The EIA phase of the S&EIR process has determined potential impacts associated with the proposed Richbay Filling Plant. The anticipated environmental and social impacts have been identified and assessed by the various specialists according to the phases of the project's development. For the purpose of this Project, these phases have been generically defined below.

Construction Phase:

The construction phase includes the preparatory works/activities typically associated with the creation of surface infrastructure and structures. The activities most relevant to this phase include:

- Site clearance;
- Topsoil stripping;
- Cut and fill activities associated with site preparation (if required); and
- Construction of the surface infrastructure and structures.

Operational Phase:

- The operational phase includes the daily activities associated with the Filling Plant.

Decommissioning Phase:

- The decommissioning phase includes the activities associated with the removal/dismantling of machinery/equipment/infrastructure/structures no longer necessary to the operation.
- The impact assessment findings outlined in this section represent a summary of the detailed specialist findings/assessments contained in the relevant specialist reports (Appendix H).
- The impacts below have been assessed according to environmental categories.

It must be noted that this Impact Assessment is relevant to the Preferred Alternative (only Phase 1 and Phase 3 and excludes Phase 2 which is the Acid Regeneration Plant) and the Alternative 1 (Phase 1, Phase 2 and Phase 3).

Where impact calculations differ for the Preferred and Alternative 1, this will be indicated in the Section Heading.

8.1 AIR QUALITY

8.1.1 CONSTRUCTION PHASE

8.1.1.1 Air Quality Emissions

Emissions during construction are associated with land clearing, drilling, and blasting, ground excavation, cut and fill operations and the movement of construction vehicles. Pollutants associated with construction activities are typically Total Suspended Particulates (TSP), PM_{10} and $PM_{2.5}$ with lesser contributions of CO, NO_2, SO_2 and C_6H_6 from vehicle exhausts.

PM refers to solid or liquid particles suspended in the air. PM varies in size from particles that are only visible under an electron microscope to soot or smoke particles that are visible to the human eye. Particles can be classified by their aerodynamic properties into coarse particles, PM_{10} (particulate matter with an aerodynamic diameter of less than 10 µm) and fine particles, $PM_{2.5}$ (particulate matter with an aerodynamic diameter of less than 2.5 µm). In addition to reduced visibility, particulate air pollution poses health risks associated with the respiratory system.

Construction activity is a source of dust emissions that can have a significant but transient impact on local air quality. The amount of dust emitted from construction operations depends on the area of land being worked, the proportion of land lying exposed at any time, the clearing and dozing equipment used, the number and type of vehicles on temporary roads, and the duration of the construction phase.

Although the increased dust and emissions from construction activities may not significantly impact air quality, increased dust can be a nuisance to the nearby receptors and site workers. Considering the temporary nature of construction and the nature of the proposed activities, impact on air quality is anticipated to be moderate. With the implementation of appropriate control measures, the impact on sensitive receptors will be reduced to be low.

The potential impact on air quality for both alternatives during construction is indicated in **Table 8-1**.

Table 8-1 – Impact on ambient air quality during construction for the Preferred Alternative and Alternative 1

Potential Impact: Impact on air quality during construction	**Magnitude**	**Extent**	**Reversibility**	**Duration**	**Probability**	**Significance**		**Character**
Without Mitigation	2	2	1	2	5	**35**	**Moderate**	(-)
With Mitigation	1	2	1	2	5	**30**	**Low**	(-)
Mitigation and Management Measures	▪ Limit the duration of the construction phase to as short a timeframe as possible. ▪ Where possible, minimise the area under construction. ▪ Make use of wet suppression techniques to minimise dust entrainment during periods of high wind speeds. ▪ Where possible, minimise speed limits. ▪ Dust-reducing mitigation measures must be put in place and must be strictly adhered to, for all roads and soil/material stockpiles especially. This includes wetting of exposed soft soil surfaces and not conducting activities during high wind periods which will increase the likelihood of dust being generated; ▪ All stockpiles (if any) must be restricted to designated areas and may not exceed a height of two (2) metres. ▪ Ensure that all vehicles, machines and equipment are adequately maintained to minimise emissions. ▪ It is recommended that the clearing of vegetation from the site should be selective, be kept to the minimum feasible area, and be undertaken just before construction so as to minimise erosion and dust potential. ▪ All materials transported to, or from, site must be transported in such a manner that they do not fly or fall off the vehicle. This may necessitate covering or wetting friable materials. ▪ No burning of waste, such as plastic bags, cement bags and litter is permitted.							

	▪ Once construction is complete, initiate rehabilitation where possible (e.g., re-vegetation) procedures to reduce wind speed across exposed surfaces.

8.1.1.2 Carbon Footprint Emissions

During the construction of the Filling Plant, it is anticipated that the following carbon footprint emissions may take place:

- Scope 1 (Direct)
  - Based on current project information, the project will require approximately 1 or 2 trucks per day during the construction phase, none of these trucks will be company owned.
- Scope 2 (Indirect)
  - Richbay will purchase electricity for use at the site.
- Scope 3 (Indirect)
  - Construction material, including steel, glass, aluminium, cement and bricks will be used.
  - All trucks for construction will be contractor owned.

These impacts are however considered negligible and have not been further assessed.

8.1.2 OPERATIONAL PHASE

8.1.2.1 Air Quality Emissions

The AQIA assessed the potential impacts to ambient air quality associated with the proposed development using a Level 2 (AERMOD) dispersion modelling assessment. Impacts to ambient air quality for criteria pollutants, namely SO_2, NO_2, PM_{10}, $PM_{2.5}$, TVOC, CO, Pb and HCl were simulated.

An emissions inventory was developed using emission rate calculators (i.e., TANKS 4.0.9d) and emission factors developed by reputable international environmental bodies (e.g., Australian NPI) for input into the dispersion model. Quantified sources include bulk solvent or fuel oil based chemical storage tanks, the paraffin fired boiler and HCl scrubber. Simulated pollutant dispersion outputs were compared to NAAQS or international guidelines (in the absence of local standards) to assess the degree of impact. Key findings are as follows:

- SO_2 emissions do not result in exceedances of the ambient SO2 1-hour (350 µg/m^3), 24-hour (125 µg/m^3) or annual (50 µg/m^3) NAAQS at any sensitive receptors;
- NO_2 emissions do not result in exceedances of the ambient NO2 1-hour (200 µg/m^3) or annual (40 µg/m^3) NAAQS at any sensitive receptors;
- PM_{10} emissions do not result in exceedances of the ambient PM10 24-hour (75 µg/m^3) or annual (40 µg/m^3) NAAQS at any sensitive receptors;
- $PM_{2.5}$ emissions do not result in exceedances of the ambient $PM_{2.5}$ 24-hour (40 µg/m^3) or annual (20 µg/m^3) NAAQS at any sensitive receptors;
- TVOC emissions do not result in exceedances of the ambient benzene annual (0.5 µg/m^3) NAAQS at any sensitive receptors, however, exceedances of the benzene NAAQS beyond the site boundary are noted;
- The comparison of TVOC against the benzene NAAQS is considered conservative, as TVOCs comprise a vast array of compounds and the NAAQS is only applicable to the benzene proportion.

As such, the benzene NAAQS cannot be used in this instance to demonstrate compliance, however has been used here as a conservative reference threshold for assessing the degree of impact.

- CO emissions do not result in exceedances of the ambient CO 1-hour (30,000 µg/m^3) NAAQS at any sensitive receptors;
- Pb emissions do not result in exceedances of the ambient Pb annual (0.5 µg/m^3) NAAQS at any sensitive receptors;
- HCl emissions do not result in exceedances of the ambient HCl 1-hour (190 µg/m^3) or annual (7.9 µg/m^3) TCEQ guideline at any sensitive receptors; and
- Peak concentrations across all pollutants occur either within the site boundary or along the facility fencelike.

Alternative 1 includes Phase 2 which is the construction of an acid regeneration plant for the reprocessing of waste HCl into ferric chloride and a small portion of calcium chloride. This process is detailed as follows:

- Waste acid will go through an iron exchange process and strengthened with HCl (from the Phase 1 Filling Plant);
- The mixture will then be put through an evaporation process (with the use of a paraffin fuelled boiler) to increase the percentage of FeCl3 from approximately 30% to 40-44%;
- $FeCl_3$ will be stored in bulk tanks and then decanted into smaller pack sizes or bulk road tankers for distribution; and
- Waste zinc chloride ($ZnCl_2$) will be sold to the market as a dust suppressor.

Based on the findings of the AQIA, ground-level impacts associated with atmospheric emissions from the proposed development were assessed to be very low. There is a negligible difference in the impact significance between the preferred and alternative 1 as Alternative 1 will include exhaust emissions from the evaporator which will pass through a scrubber to remove HCl from flue gases prior to release which will not occur as part of the Preferred Alternative technology processes.

Table 8-2 – Impact on air quality during operation for Alternative 1

Potential Impact: Impact on air quality during operation	**Magnitude**	**Extent**	**Reversibility**	**Duration**	**Probability**	**Significance**		**Character**
Without Mitigation	1	1	1	4	4	**28**	**Low**	(-)
With Mitigation	2	1	1	4	2	**16**	**Low**	(-)
Mitigation and Management Measures	▪ A Leak detection and repair (LDAR) program be instituted to monitor fugitive emissions from the storage and handling of products with a vapour pressure greater than 14 kPa. ▪ Storage tanks holding products with a vapour pressure greater than 14 kPa must be fitted with pressure vacuum vents, at a minimum, to prevent breathing losses.							

	▪ Routine inspections conducted at a maximum of six-month intervals to assess the condition of any tank covers or seals. ▪ The unloading of liquid products received by road tanker be offloaded using bottom loading techniques. ▪ Regular servicing of combustion installations to maintain optimum operational efficiency. ▪ Undertake fenceline passive monitoring of HCl and VOCs, specifically the benzene, ethylbenzene, toluene and xylene range (i.e., BTEX).

Table 8-3 – Impact on air quality during operation for the Preferred Alternative

Potential Impact: Impact on air quality during operation	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	1	1	1	4	4	**28**	**Low**	(-)
With Mitigation	1	1	1	4	2	**14**	**Very Low**	(-)
Mitigation and Management Measures	▪ A LDAR program be instituted to monitor fugitive emissions from the storage and handling of products with a vapour pressure greater than 14 kPa. ▪ Storage tanks holding products with a vapour pressure greater than 14 kPa must be fitted with pressure vacuum vents, at a minimum, to prevent breathing losses. ▪ Routine inspections conducted at a maximum of six-month intervals to assess the condition of any tank covers or seals. ▪ The unloading of liquid products received by road tanker be offloaded using bottom loading techniques. ▪ Regular servicing of combustion installations to maintain optimum operational efficiency. ▪ Undertake fenceline passive monitoring of HCl and VOCs, specifically the benzene, ethylbenzene, toluene and xylene range (i.e., BTEX).							

8.1.2.2 Carbon Footprint Emissions

GHG emissions were calculated using the Technical Guidelines for monitoring, reporting and verification of Greenhouse Gases by Industry. This is a tier 2 methodology based on fuel combusted per annum and South Africa specific calorific values for paraffin and emission factors for source category 1A1a (Electricity and heat production).

Annual CO_2 contributions from the proposed Richbay Vosloorus facility to national GHG emissions are estimated at 0.67 Gg/annum CO_2-eq (i.e., 0.00067 Mt/annum CO_2-eq). As such, Richbay is not required to submit a Pollution Prevention Plan for the proposed facility.

8.1.3 DECOMMISSIONING PHASE

The impacts associated with the decommissioning phase will be the same as that of the construction phase.

8.2 NOISE AND VIBRATION

8.2.1 CONSTRUCTION PHASE

Various construction activities (construction of laydown areas, the hard standing areas, excavation and concreting of foundations and the erection of the Filling Plant and other infrastructure) taking place simultaneously during the day will likely increase ambient sound levels due to air-borne noises. It is proposed that construction activities will only take place during the day and no night time construction will take place.

Alternative 1 will have a 3-phased development in comparison to the 2-phased development of the Preferred Alternative, resulting in a longer construction period for Alternative 1, both Alternatives will have a score of 2 for duration i.e., short term construction between 0-5 years therefore the impact significance scores are the same.

Table 8-4 – Increase in daytime ambient sound levels for the Preferred Alternative and Alternative 1

Potential Impact: Impact on ambient sound levels during construction	**Magnitude**	**Extent**	**Reversibility**	**Duration**	**Probability**	**Significance**		**Character**
Without Mitigation	3	2	1	2	2	**16**	**Low**	(-)
With Mitigation	2	2	1	2	2	**16**	**Low**	(-)
Mitigation and Management Measures	▪ The significance of the noise impact is low for daytime construction activities and no additional mitigation is recommended.							

8.2.2 OPERATIONAL PHASE

The proposed activities at the Filling Plant will not contribute significantly to an increase in the ambient noise levels, the impact is expected to be negligible therefore operational phase noise and vibration impacts are not considered further.

8.2.3 DECOMMISSIONING PHASE

The impacts associated with the decommissioning phase will be the same as that of the construction phase.

8.3 SOIL AND AGRICULTURE

8.3.1 CONSTRUCTION PHASE

This phase refers to the period when the proposed infrastructure is built/installed. This phase has the largest direct impact on soils and land capability. This phase includes site preparation prior to construction activities, involving vehicular movement (transportation of construction materials) and the removal of vegetation within the development footprint and associated disturbances to soil, and access to the site. Site preparation is followed by installation of the Filling Plant and the building of a parking area, leading to stockpiling and exposure of loose soils, as well as movement of construction equipment and personnel within the project area.

The following potential impacts were considered on soils and land capability within the project area.

8.3.1.1 Soil erosion and sedimentation of the natural stormwater paths

Clearing of vegetation, movement of vehicles, mobile plant and equipment, as well as earthworks required for establishment of structures is very likely to result in increased loose material being exposed.

Although the magnitude and extent of erosion are likely to be limited if the recommended mitigation measures are properly implemented, some erosion is likely when clearing an area and erosion is not easily reversible. Mitigation should focus on limiting earthworks and vehicle movement to demarcated areas, as well as limiting the duration of the construction activities where possible.

Stormwater from building roofs will be collected via gutters and rainwater downpipes and discharged into 900 wide concrete V-drains and spread into the surrounding garden by means of multiple spreaders in as many places as possible, to prevent concentration, from where it will follow the natural lay of the land onto the undeveloped low-lying area which forms part of the natural watercourse.

Run-off from the roads and other hardscaped areas will likewise be collected through grid inlets and kerb inlets and conveyed by a network of sub-soil stormwater pipes and channelled towards a new attenuation pond structure located in the undeveloped low-lying area of the site which forms part of the natural watercourse. Roads and parking area will be graded to attain minimum falls towards outlets.

Table 8-5 – Soil erosion and sedimentation for the Preferred Alternative and Alternative 1

Potential Impact: Increased soil erosion and sedimentation	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	3	2	5	5	5	75	High	(-)
With Mitigation	1	1	3	2	3	21	Low	(-)
Mitigation and Management Measures	▪ Limit earthworks and vehicle movement to demarcated paths and areas.							

	▪ Limit the duration of construction activities where possible, especially those involving earthwork / excavations. ▪ Access roads associated with the development should have gradients or surface treatment to limit erosion, and road drainage systems should be accounted for. ▪ Removal of vegetation must be avoided until such time as soil stripping is required and similarly exposed surfaces and soil stockpiles should be re-vegetated or stabilised as soon as is practically possible. ▪ The storm water management plan designed for the site must be adhered-to. ▪ During periods of strong winds, stockpiles should be covered with appropriate material (e.g. cloth, tarpaulin). ▪ Soil stripping should be undertaken in the dry season and silt fences erected if unexpected weather washes loose soil into the relatively nearby watercourse. ▪ In order to prevent damage due to flooding and erosion as well as stormwater of questionable quality from entering the permeable soils of the natural stormwater system it is imperative that the detailed requirement as prescribed in the Environmental Management Plan (EMP). ▪ The use of Berms to avoid flooding, bunded areas to contain spillage from construction vehicles, bunded mixing areas for building materials, temporary berms to redirect stormwater from upstream site to prevent flooding and damage.

8.3.1.2 Change in land use

The site was previously used for a sand blasting business and as such, much of it has been transformed. Transformed areas have been historically and currently denuded of natural vegetation in order to construct building and other infrastructure. Portions of this habitat type are covered by the existing infrastructure within the project area which comprises of buildings, roads and a large wall. The site is zoned for industrial however a small component of the site will still be transformed as there are currently no activities taking place in the southern part of the site.

The significance of the impact associated with the change in land use is still considered moderate before mitigation as the impact duration is for the life of the project and the probability is definite for a change in land use. Since majority of the site will be developed for purposes of the Filling Plant and associated structures and infrastructure, the change in land use following mitigation will remain as moderate.

Table 8-6 – Change in land use for the Preferred Alternative and Alternative 1

Potential Impact: Change in land use	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	1	3	5	5	55	Moderate	(-)
With Mitigation	2	1	3	5	5	55	Moderate	(-)
Mitigation and Management Measures	▪ Limit earthworks and vehicle movement to demarcated paths and areas. ▪ Limit removal of vegetation to demarcated areas only. ▪ Rehabilitate disturbed areas around the Filling Plant as soon as practicable following disturbance thereof.							

8.3.1.3 Change in Land Capability

The movement of mobile plant / equipment is very likely to result in compaction, disturbance and possible sterilization of soils and associated change in land capability. The degree of alteration is however low (i.e., loss of land capability) to previous activities taking place at the site. The significance of the impact associated with the change in land capability is still considered moderate before mitigation as the impact duration is for the life of the project and the probability is definite for a change in land capability.

Table 8-7 – Change in land capability for the Preferred Alternative and Alternative 1

Potential Impact: Change in land capability	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	1	5	4	5	60	Moderate	(-)
With Mitigation	1	1	3	4	4	36	Moderate	(-)
Mitigation and Management Measures	▪ Limit earthworks and vehicle movement to demarcated paths and areas. ▪ Limit removal of vegetation to demarcated areas only. ▪ Avoid materials that sterilize the soil. ▪ Soil to be ripped and conditioned post-decommissioning.							

8.3.1.4 Soil Contamination

Movement of vehicles and plant / equipment on site could result in leaks, spills of hazardous materials, such as fuels, oils, chemicals, and so forth. Contaminated soil is expensive to rehabilitate and contamination entering the soils of the project area infiltrate into the ground as well as migrate from

site during rainfall events. With the implementation of mitigation measures, the probability and duration of the impact can be reduced, thereby reducing the potential impact from a 'moderate' negative to 'low'.

Table 8-8 – Soil contamination for the Preferred Alternative and Alternative 1

Potential Impact: Soil contamination	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	3	2	3	3	55	55	Moderate	(-)
With Mitigation	3	1	3	2	2	18	Low	(-)
Mitigation and Management Measures	▪ On-site vehicles should be well-maintained. ▪ Drip trays should be placed under stationary vehicles / plant. ▪ On-site pollutants/hazardous materials should be contained in a bunded area and on an impermeable surface. ▪ Ensure proper control of dangerous substances entering the site. ▪ Adequate disposal facilities should be provided. ▪ A non-polluting environment should be enforced.							

8.3.2 OPERATIONAL PHASE

This phase refers to the period of operation of the Filling Plant (i.e., following commissioning through project life). As indicated above, the identified impacts to soil take place during the construction phase but the impact is felt throughout the operation phase. The potential impacts to focus on during the operation phase are soil contamination and erosion.

8.3.2.1 Erosion and sedimentation of natural stormwater systems

Ongoing erosion and consequent sedimentation throughout the operational phase of the Project should be monitored and mitigated against. Mitigation should focus on erosion monitoring, vegetation of any bare areas on site, and correct implementation of an operational-phase Storm Water Management Plan.

Table 8-9 – Erosion and sedimentation for the Preferred Alternative and Alternative 1

Potential Impact: Soil erosion and sedimentation	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	2	5	5	5	70	High	(-)
With Mitigation	1	1	3	2	2	14	Very Low	(-)

Mitigation and Management Measures	▪ The site should be monitored for signs of erosion continually. ▪ Bare areas should be kept well vegetated. ▪ An operational-phase storm water management plan must be designed for the site and adhered-to.

8.3.2.2 Soil Contamination

Everyday movement of vehicles and employees once the development is operational will likely lead to some soil contamination. As the site will be a chemical Filling Plant, the likelihood of chemical spills is high. Again, the operational phase Storm Water Management Plan including the implementation of tank bunds, especially to prevent and contain chemical spills, and petrol and oil spills in the carpark area from entering the soils. With the implementation of mitigation measures, the probability and duration of the impact can be reduced, thereby reducing the potential impact from a 'high' negative to 'low'.

Table 8-10 – Soil contamination for the Preferred Alternative and Alternative 1

Potential Impact: Soil contamination	**Magnitude**	**Extent**	**Reversibility**	**Duration**	**Probability**	**Significance**		**Character**
Without Mitigation	4	2	3	3	5	**60**	**Moderate**	(-)
With Mitigation	3	1	3	2	3	**24**	**Low**	(-)
Mitigation and Management Measures	▪ Chemicals should be stored in fully enclosed areas with bunds and the car park area should be covered. Both should be onimpermeable hardstanding. ▪ Hardstanding should be monitored for cracks. ▪ If chemicals are kept outside of the enclosed area temporarily, this area should be on hardstanding and bunded. ▪ Ensure proper control of substances entering the site. ▪ Adequate disposal facilities should be provided, and ▪ A non-polluting environment should be enforced. ▪ A spill management plan must be compiled and implemented during the operation of the Filling Plant. ▪ The SWMP must be implemented and adhered to. ▪ Monitor erosion at stormwater spreaders/outlets as well as natural flow paths regularly (especially after heavy rains). ▪ If necessary, implement appropriate measures such as backfilling and planting of vegetation where required. Although the risk is low, monitor any possible contamination and take appropriate corrective action if and when required. ▪ This can be further minimized by keeping clean and sweeping the paved area periodically and disposing of any wastage such as plastic bags and papers etc.							

	▪ Ensure that the stormwater system remains fully functional by regular monitoring at fixed intervals. ▪ Effect any remedial measures before the rainy season.

8.3.3 DECOMMISSIONING PHASE

The decommissioning phase will be the same as the construction phase as large vehicles will be on site and earth will be moved. Erosion and soil contamination are the most likely negative impacts. If the site is decommissioned properly, the changes in surface profile, land use and land capability will be positive so as to return the land to vegetated open space.

Mitigation should focus again on limiting earthworks and vehicle movement to demarcated paths and areas, as well as limiting the duration of the construction activities where possible.

8.3.3.1 Land Use

Table 8-11 –Land Use for the Preferred Alternative and Alternative 1

Potential Impact: Land Use	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	3	1	3	4	2	**22**	Low	(+)
With Mitigation	3	1	3	4	5	**55**	Moderate	(+)
Mitigation and Management Measures	▪ Rehabilitation associated with the decommissioning of the Filling Plant will result in a positive impact with regards to land use as the land will be rehabilitated to mimic its natural state. ▪ Re-instatement of soil and vegetation. ▪ Prevent movement of vehicles on areas that have been rehabilitated. ▪ Monitoring of rehabilitated areas must be conducted. ▪ Any areas that were cleared of topsoil must be revegetated and the site left in a safe, stable and environmentally friendly condition. ▪ Soils should be replaced around excavated/disturbed areas in the correct order, i.e. subsoils at the bottom, top soils on the top. ▪ If any indigenous plant species were removed from the site prior to construction, these should be replanted, with locations for planting to be specified, and planting overseen by an ecologist or botanist. ▪ Any remaining areas of bare soils must be overseeded with an appropriate grass seed mix including a binding creeping grass and a nurse species selected for its rapid growth properties to provide stability to the disturbed soils. If necessary, seeded areas should be further stabilised with a biodegradable (jute) mesh that is pegged in place. The seed mixture should be manually sown over the prepared soils.							

8.4 TERRESTRIAL BIODIVERSITY

8.4.1 CONSTRUCTION PHASE

Two primary habitats were delineated for this assessment, namely: degraded grassland and transformed areas. The degraded grasslands are the areas which were considered to have been altered from their natural state, sections of bare soil and low grass cover are visible due to a combination of over grazing and anthropogenic activities. This habitat has been degraded to a low ecological state.

Transformed areas have been historically and currently denuded of natural vegetation in order to construct building and other infrastructure. Portions of this habitat type are covered by the existing infrastructure within the project area which comprises of buildings, roads and a large wall. Sandblasting was the main activity taking place within the project area.

The following potential impacts were considered on terrestrial vegetation communities. This phase refers to the period when construction of the proposed infrastructure is built/installed. This phase usually has the largest direct impact on biodiversity:

- Continued disturbance and degradation of the vegetation community and encroachment by alien invasive plant species;
- Displacement of faunal community due to habitat loss, direct mortalities and disturbance (noise, dust and vibration); and
- Continued displacement and fragmentation of the faunal community due to ongoing anthropogenic disturbances and habitat degradation (litter, road mortalities and/or poaching).

Table 8-12 –Continued disturbance and degradation of the vegetation community and encroachment by alien invasive plant species for the Preferred Alternative and Alternative 1

Potential Impact: Continued disturbance and degradation of the vegetation community and encroachment by alien invasive plant species	**Magnitude**	**Extent**	**Reversibility**	**Duration**	**Probability**	**Significance**		**Character**
Without Mitigation	2	2	3	2	3	**27**	**Low**	(-)
With Mitigation	1	1	2	2	1	**6**	**Very Low**	(-)
Mitigation and Management Measures	▪ Areas that were denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion during flood events. This will also reduce the likelihood of encroachment by alien invasive plant species. ▪ Waste management must be a priority, this of relevance during the construction phase when a construction camp will be set up. It is recommended that all waste be removed from site on a weekly basis to prevent rodents and pests entering the site.							

	▪ The storage of the construction material to be built are not to be stored for extended periods of time or on any other areas than the demarcated project area. ▪ The storage and decanting of chemicals must be in a bunded area with the required volume. ▪ A spill management plan must be put in place to ensure that should there be any chemical spill out or over that it does not run into the surrounding areas. ▪ Inspections and monitoring of the infrastructure for leaks must be done on a regular basis. ▪ Leaking equipment must be repaired immediately or be removed from site to facilitate repair. ▪ The contractors used for the construction should have spill kits available prior to construction to ensure that any fuel, oil or hazardous substance spills are cleaned-up and discarded correctly;

Table 8-13 – Displacement of faunal community due to habitat loss, direct mortalities and disturbance (noise, dust and vibration) for the Preferred Alternative and Alternative 1

Potential Impact: Displacement of faunal community due to habitat loss, direct mortalities and disturbance (noise, dust and vibration)	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	3	1	5	5	2	**28**	Low	(-)
With Mitigation	2	1	5	5	1	**13**	Very Low	(-)
Mitigation and Management Measures	▪ Employees and contractors should be made aware of the presence of, and rules regarding fauna through suitable induction training and on-site signage. ▪ Movement across the Project area should be facilitated by providing suitably sized gaps in fencing and/or culverts/passageways under roads for fauna. ▪ No trapping, killing or poisoning of any wildlife is to be allowed on site and within the surrounding area, including snakes, birds, lizards, frogs, insects or mammals. ▪ Staff should be educated about the sensitivity of faunal species and measures should be put in place to deal with any species that are encountered during the construction process. ▪ The duration of the construction should be minimized to as short term as possible, in order to reduce the period of disturbance on fauna and flora. ▪ An Environmental Compliance Officer (ECO) should be appointed to do weekly site visits to ensure that the above-mentioned mitigations are strictly adhered to. ▪ The area where storage tanks and filling are to take place needs to be lined with industry standard linings to							

	prevent spilling of the corrosive and toxic substances into the surrounding areas.

8.4.2 OPERATIONAL PHASE

The following potential impacts were considered on biodiversity (fauna and flora) during the operational phase. This phase refers to when construction has been completed and the proposed infrastructure has been built and is functional:

- Continued disturbance of vegetation communities and encroachment by alien invasive plant species;
- Ongoing displacement, direct mortalities and disturbance of faunal community due to habitat loss and disturbances (such as dust and noise mainly through the maintenance of the system); and
- Spilling of corrosive and toxic substances.

Table 8-14 – Continued disturbance of vegetation communities and encroachment by alien invasive plant species for the Preferred Alternative and Alternative 1

Potential Impact: Continued disturbance of vegetation communities and encroachment by alien invasive plant species	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	3	2	3	4	4	**48**	**Moderate**	(-)
With Mitigation	2	1	3	1	2	**14**	**Very Low**	(-)
Mitigation and Management Measures	▪ Areas that were denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion during flood events. This will also reduce the likelihood of encroachment by alien invasive plant species. ▪ Waste management must be a priority during operation. ▪ The storage and decanting of chemicals must be in a bunded area with the required volume. ▪ A spill management plan must be put in place to ensure that should there be any chemical spill out or over that it does not run into the surrounding areas. ▪ Inspections and monitoring of the infrastructure for leaks must be done on a regular basis. ▪ Leaking equipment must be repaired immediately or be removed from site to facilitate repair. ▪ Spill kits must be available on site at all times.							

Table 8-15 – Ongoing displacement, direct mortalities and disturbance of faunal community due to habitat loss and disturbances for the Preferred Alternative and Alternative 1

Potential Impact: Ongoing displacement, direct mortalities and disturbance of faunal community due to habitat loss and disturbances	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	3	2	3	4	3	**36**	**Moderate**	(-)
With Mitigation	2	1	3	1	2	**14**	**Very Low**	(-)
Mitigation and Management Measures	▪ Employees and should be made aware of the presence of, and rules regarding fauna through suitable induction training and on-site signage. ▪ Movement across the Project area should be facilitated by providing suitably sized gaps in fencing and/or culverts/passageways under roads for fauna. ▪ No trapping, killing or poisoning of any wildlife is to be allowed on site and within the surrounding area, including snakes, birds, lizards, frogs, insects or mammals. ▪ Staff should be educated about the sensitivity of faunal species and measures should be put in place to deal with any species that are encountered during the construction process. ▪ above-mentioned mitigations are strictly adhered to. ▪ The area where storage tanks and filling are to take place needs to be lined with industry standard linings to prevent spilling of the corrosive and toxic substances into the surrounding areas.							

8.4.3 DECOMMISSIONING PHASE

8.4.3.1 Spread of alien and invasive plant species

Site closure/rehabilitation activities as part of the decommissioning phase of the Project are likely to facilitate spread of invasive plant species, through frequent vehicular movements, earth moving works, and the creation of bare ground conditions ideal for the establishment of self-seeding, highly invasive plants.

The magnitude of the potential impacts is considered moderate, and the extent of impacts could be local as site closure/rehabilitation works could facilitate the spread of these species along the road network within the locality; spread of these species could also occur via wind and bird dispersal. The duration of the impact is considered permanent, resulting in an impact of Moderate significance prior to mitigation; however, the impact can be reduced to one of Low significance with the implementation of the specified mitigation measures.

Table 8-16 – Spread of alien and invasive plant species for the Preferred Alternative and Alternative 1

Potential Impact: Spread of alien and invasive plant species	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	3	2	3	4	3	36	Moderate	(-)
With Mitigation	2	1	3	4	3	30	Low	(-)
Mitigation and Management Measures	▪ An alien invasive species control programme must be developed, or any existing AIS management programmes expanded, to include the active control of alien invasive species that may establish/spread as a result of proposed Project activities. ▪ Alien and invasive species management to be prioritised for the following alien and invasive species control areas: • Areas where vegetation cover is disturbed. • Areas where soils imported from external sources are applied. • All rehabilitated areas. • Areas within the development area that are already invaded by alien species. • Road fringes.							

8.5 HERITAGE AND CULTURAL RESOURCES

Archaetnos undertook the HIA for the Proposed Project Site. The assessment concluded that no sites of archaeological nature or any historical buildings were found, the proposed development may continue. However, it should be noted that the subterranean presence of archaeological and/or historical sites, features or artifacts is always a distinct possibility. Care should therefore be taken when development commences that if any of these are discovered, a qualified archaeologist be called in to investigate the occurrence. Construction activities must cease and the SAHRA must be notified immediately.

8.5.1 CONSTRUCTION PHASE

Table 8-17 – Impacts to Heritage and Cultural Resources for the Preferred Alternative and Alternative 1

Potential Impact: Impacts to cultural and heritage resources	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	1	1	1	2	1	**5**	Very Low	(-)

With Mitigation	1	1	1	2	1	**5**	Very Low	(-)
Mitigation and Management Measures	▪ Upon unearthing or discovery of a resource of cultural or heritage significance, construction activities are to cease and SAHRA must be notified immediately.							

8.6 PALAEONTOLOGY

The area is very disturbed, there are several chert piles stacked near the perimeter fence. The surface is covered with gravel and a house, and several other buildings are present. A sand-blasting industry is currently operative. Livestock are also present. Only chert can be found on the surface therefore there is no objection to the Proposed Project.

The potential impact of the development on fossil heritage is considered high before mitigation, therefore a field survey or further mitigation or conservation measures were necessary for this project (according to SAHRA protocol). A Phase 2 PIA and or mitigation were recommended if fossils are found during construction or the Phase 1: Field Study.

8.6.1 CONSTRUCTION PHASE

Table 8-18 – Impacts to palaeontology for the Preferred Alternative and Alternative 1

Potential Impact: Impacts to palaeontology	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	4	1	5	5	5	**75**	**High**	(-)
With Mitigation	2	1	3	5	2	**22**	**Low**	(-)
Mitigation and Management Measures	▪ Upon unearthing or discovery of fossils, construction activities are to cease and SAHRA must be notified immediately. ▪ Care must be taken during the dolomite risk assessment according to SANS 1936-1 (2012) as stromatolites may be present.							

8.6.2 OPERATIONAL PHASE

The operational phase will not impact the palaeontology.

8.6.3 DECOMMISSIONING PHASE

The impacts associated with the decommissioning phase will be the same as that of the construction phase.

8.7 GEOTECHNICAL

The site is underlain by dolomite, which has been intruded extensively by dolerite, providing a protective horizon above the dolomite bedrock for the majority of the site. The site is considered to fall

within an IHC3 category, indicating that there is a medium potential for medium subsidence's to occur in the event that concentrated water ingress into the sub-strata takes place after dewatering occurs.

From a geotechnical perspective, the site is economically and practically developable provided that the recommendations contained within the Geotechnical Assessment are adhered to.

8.7.1 CONSTRUCTION PHASE

Table 8-19 – Impacts on Dolomite Stability for the Preferred Alternative and Alternative 1

Potential Impact: Impacts on dolomite stability	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	4	1	5	5	5	**75**	**High**	(-)
With Mitigation	2	1	3	5	2	**22**	**Low**	(-)
Mitigation and Management Measures	▪ Special foundation precautionary measures are recommended due to the medium potential for expansiveness and the dolomite classification. Total potential heave for the thick residual dolerite soil profiles encountered varies between 20 mm to 25 mm. ▪ Founding options for the structures include either stiffened or cellular rafts, or split construction with proper site drainage and plumbing requirements. Since the site must adhere to dolomite requirements in terms of SANS1936-3, drainage and plumbing precautions will in any event be required. Given the dolomite requirement stipulated SANS 1936-3 that 5m loss of support must be accommodated, raft foundation solution is proposed. This will override any small geotechnical problems that might be associated with the site. Structure specific geotechnical conditions are to be confirmed in the design level geotechnical investigation which will include footprint drilling for the relevant structures. ▪ Old trenches are to be excavated, backfilled and recompacted to limit any differential settlements of foundations at these positions. ▪ D3 measures as outlined in SANS1936-3 should be adopted with respect to the prevention of water ingress into the soil. In this respect care should be taken to landscape the site so that water does not pond and all service trenches must be properly backfilled. ▪ All stormwater should be effectively captured and led off the site.							

	▪ A one metre wide concrete apron should be constructed around buildings which is designed to shed stormwater away from the structure. ▪ No ponding of water should be allowed in this area, both during and after construction. ▪ All courses in the plinth wall should be reinforced with brickforce. Brickforce should be incorporated in every fourth course thereafter and in at least three courses above all openings such as doors and windows. ▪ Construction joints, to allow relative movement, should be incorporated at intervals of not more than 5 m in linear walls or at points to be determined by the structural engineer. ▪ All yard walls, steps and similar structures should be isolated from the main structure. ▪ Flexibility should be incorporated into wet services where they enter or leave buildings in order to ensure that relative movement does not result in leaking pipes. ▪ A Dolomite Risk Management Plan (DRMP) must be created for the development and construction supervision of foundations must be carried out by a competent person (engineer or geo-professional).

8.7.2 OPERATIONAL PHASE

The operational phase will not impact the geotechnical stability of the site if the necessary mitigation measures are implemented during the pre-construction and construction phases.

8.7.3 DECOMMISSIONING PHASE

The impacts associated with the decommissioning phase will be the same as that of the construction phase.

8.8 TRAFFIC

8.8.1 CONSTRUCTION PHASE

Due to the proposed location and nature of the Project, the traffic related impacts are already being experienced in the vicinity of the site. The Project will require approximately 1 or 2 trucks per day during the construction phase.

The following impacts were identified associated with the construction phase:

- Road Degradation
  - The impact of increased traffic volumes on the public roads will increase the potential for localised road network degradation within the study area (**Table 8-20**).
- Dust
  - The larger the vehicle, the more dust is likely to be generated. This dust hinders the drivers wishing to over-take without a clear view for over-taking, resulting in drivers taking unnecessary chances, which could result in unfavourable consequences. The impact of increased traffic volumes on the unpaved public roads will generate dust (**Table 8-21**).

- Intersection Safety
  - The impact due to the increased traffic volumes at intersections will increase the potential risk of accidents at the intersections, resulting in serious injuries or even fatalities, especially at the intersection on the main roads, when vehicles from the site needing to cross over oncoming traffic (**Table 8-22**).

Table 8-20 – Impact of road degradation during the construction phase for the Preferred Alternative and Alternative 1

Potential Impact: Road degradation	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	3	1	1	2	**14**	Very Low	(-)
With Mitigation	1	2	1	1	2	**10**	Very Low	(-)
Mitigation and Management Measures	▪ Richbay Chemicals will ensure that all transportation is undertaken in terms of the requirements of the National Road Traffic Act, 93 of 1996 (NRTA) and applicable South African National Standards (SANS). ▪ A photographic record of the road condition should be maintained throughout the various phases of the development/s. This provides an objective assessment and mitigates any subjective views from road users. ▪ Ensure that the roads are left in the same or better condition, post-construction. ▪ All remedial work or modifications to any of the public roads shall be done in consultation with and have the approval of the local road's authority (as is standard practice, this will be finalised during and be a requirement of the municipal planning approval process. ▪ The developer shall ensure that the condition of the roads impacted by construction of the development is left in a similar or better state once the construction phase is complete.							

Table 8-21 – Impact of dust during the construction phase for the Preferred Alternative and Alternative 1

Potential Impact: Dust	Magnitude	Extent	Reversibilit	Duration	Probability	Significance		Character
Without Mitigation	2	3	1	1	3	**21**	Low	(-)
With Mitigation	1	2	1	1	3	**15**	Very Low	(-)

Mitigation and Management Measures	▪ Reduce travel speed for construction vehicles on the gravel road to reduce dust. ▪ Dust suppression of the roads in the immediate vicinity of the site where feasible. ▪ No non-environmentally friendly suppressants may be used as this could result in the pollution of water sources.

Table 8-22 – Impact of intersection safety during the construction phase for the Preferred Alternative and Alternative 1

Potential Impact: Intersection safety	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	3	1	1	3	**21**	Low	(-)
With Mitigation	1	2	1	1	3	**15**	Very Low	(-)
Mitigation and Management Measures	▪ Compile a Traffic Management Plan. ▪ Reduce speed at intersections and use appropriate traffic warning signs. ▪ Identify alternative routes where possible. ▪ Request the assistance of local law enforcement. ▪ Ensure that all construction vehicles are roadworthy, visible, adequately marked, and operated by an appropriately licenced operator. ▪ Richbay will develop procedures for the transportation of all dangerous goods. ▪ Richbay Chemicals will ensure that all transportation is undertaken in terms of the requirements of the National Road Traffic Act, 93 of 1996 (NRTA) and applicable South African National Standards (SANS).							

8.8.2 OPERATIONAL PHASE

It is anticipated that there will be approximately 8 trucks a day and 15-30 light vehicles. The site has been used as an industrial facility for numerous years and this is not considered a significant increase. Based on the Municipal Spatial Development Framework, the major road networks are in close proximity to the site and is ideal to provide opportunities for industrial development.

Given the industrial nature of the site, it is likely that the impact on traffic during operation will be negligible therefore operational phase impacts associated with traffic have not been further assessed.

8.8.3 DECOMMISSIONING PHASE

The impacts associated with the decommissioning phase will be the same as that of the construction phase.

8.9 SOCIAL IMPACT ASSESSMENT

8.9.1 CONSTRUCTION PHASE

The construction phase of the project will extend over a period of approximately 12 months and create in the region of 50 employment opportunities (10 new skilled and 40 new unskilled). Members from the local communities in the area, would be in a position to qualify for most of the low skilled and semi-skilled employment opportunities. Most of these employment opportunities will accrue to Historically Disadvantaged (HD) members of the community.

Table 8-23 – Impact on regional employment and household income during the construction phase for the Preferred Alternative and Alternative 1

Potential Impact: Regional employment and household income	**Magnitude**	**Extent**	**Reversibility**	**Duration**	**Probability**	**Significance**		**Character**
Without Mitigation	2	2	2	2	3	24	Low	(+)
With Mitigation	3	2	2	2	5	45	Moderate	(+)
Mitigation and Management Measures	▪ Using local sub-contractors where possible and requiring that contractors from outside the local area that tender also meet targets for how many locals are given employment. ▪ Where feasible, efforts should be made to employ local contactors that are compliant with Broad Based Black Economic Empowerment (BBBEE) criteria. ▪ The local authorities, community representatives, and organisations on the interested and affected party database should be informed of the final decision regarding the project and the potential job opportunities for locals and the employment procedures that the proponent intends following for the construction phase of the project. ▪ Where feasible, training and skills development programmes for locals should be initiated prior to the initiation of the construction phase. ▪ The recruitment selection process should seek to promote gender equality and the employment of women wherever possible.							

Table 8-24 – Impact of influx of people during the construction phase for the Preferred Alternative and Alternative 1

Potential Impact: Influx of people	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	1	3	1	2	4	28	Low	(-)
With Mitigation	1	2	1	2	3	18	Low	(-)
Mitigation and Management Measures	▪ A 'locals first' policy with regard to construction and operational labour needs. ▪ The community and surrounding businesses should be able to contact the site manager or his/her representative to report any issues which they may have. The site manager and his/her representative should be stationed within the area and should therefore be available on hand to deal with and address any concerns which may be raised. ▪ A complaints register should be available on site to any individual who may have a particular complaint with regards to the construction or operations processes. ▪ The applicant and the contractors should develop a Code of Conduct for the project. The code should identify what types of behaviour and activities by workers are not permitted in agreement with surrounding landowners and land managers. For example, access to land that is not part of the development will not be allowed.							

Table 8-25 – Impact on surrounding landowners during the construction phase for the Preferred Alternative and Alternative 1

Potential Impact: Surrounding landowners	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	1	3	1	2	4	28	Low	(-)
With Mitigation	1	2	1	2	3	18	Low	(-)
Mitigation and Management Measures	▪ No construction workers, with the exception of security personnel, should be allowed to stay on the site overnight. ▪ The surrounding landowners should be able to contact the site manager to report any issues which they may have. The site manager should be stationed within the							

	area and should therefore be available on hand to deal with and address any concerns which may be raised. ▪ A complaints register should be available on site to any individual who may have a particular complaint with regards to the construction or operations processes. ▪ The applicant should develop a Code of Conduct for the project. The Code should identify what types of behaviour and activities by workers are not permitted in agreement with surrounding landowners and land managers. ▪ The movement of workers on and off the site should be closely managed and monitored by the contractors. In this regard the contractors should be responsible for making the necessary arrangements for transporting workers to and from site on a daily basis. ▪ The applicant should implement measures to assist and, if needed, fairly compensate affected surrounding landowners whereby damages to property as a result of construction activities.

8.9.2 OPERATIONAL PHASE

During the operational phase, in the region of 45 employment opportunities (10 new skilled and 35 new unskilled). There will only be day shift operations. Members from the local communities in the area, would be in a position to qualify for most of the low skilled and semi-skilled employment opportunities. Most of these employment opportunities will accrue to Historically Disadvantaged (HD) members of the community.

The following impacts have been identified for the operational phase, as relevant for assessment based on the guidelines for socio-economic specialist inputs, the nature of the project, stakeholder inputs and the receiving environment:

- Impacts from expenditure on the operation of the project (**Table 8-26**).
- Impacts on surrounding landowners and communities (**Table 8-27**).
- Local benefit of cross border supply of products from the Filling Plant (**Table 8-28**).

Table 8-26 – Impact on regional employment and household income during the operational phase for the Preferred Alternative and Alternative 1

Potential Impact: Regional employment and household income	**Magnitude**	**Extent**	**Reversibility**	**Duration**	**Probability**	**Significance**		**Character**
Without Mitigation	1	1	1	4	3	21	Low	(+)
With Mitigation	2	1	1	4	3	24	Low	(+)
Mitigation and Management Measures	▪ Using local sub-contractors where possible and requiring that contractors from outside the local area that tender also meet targets for how many locals are given employment.							

	▪ Exploring ways to enhance local community benefits with a focus on broad-based BEE and preferential procurement.

Table 8-27 – Impact on surrounding landowners during the operational phase for the Preferred Alternative and Alternative 1

Potential Impact: Surrounding landowners and communities	**Magnitude**	**Extent**	**Reversibility**	**Duration**	**Probability**	**Significance**		**Character**
Without Mitigation	1	3	1	2	4	**28**	Low	(-)
With Mitigation	1	2	1	2	3	**18**	Low	(-)
Mitigation and Management Measures	▪ A complaints register should be available on site to any individual who may have a particular complaint with regards to the construction or operational processes. ▪ These are to be investigated and rectified in accordance with the appropriate operational policies associated with the proposed Filling Plant.							

Currently, one company in the country produces and supplies Ferric Chloride to South Africa and other neighbouring countries. This serves as a motivation for Richbay to increase the supply of the product, particularly to the neighbouring countries located further north of the country and a great distance away from the existing supplier. This therefore entails that the Filling Plant located in Vosloorus, will have a competitive advantage owing to the shorter distance to be travelled to transport the product to these neighbouring countries and hence, enhance the economic benefits locally.

Local benefits of the proposed development include benefits to the local economy through possible job creation and local supplier procurement during the construction phase as well as during the operational phase of the development.

Table 8-28 – Impact of cross border supply of products for the Preferred Alternative and Alternative 1

Potential Impact: Cross border supply of products stimulating international trade relations	**Magnitude**	**Extent**	**Reversibility**	**Duration**	**Probability**	**Significance**		**Character**
Without Mitigation	2	5	1	4	5	**60**	**Moderate**	(+)
With Mitigation	▪ N/A							
Mitigation and Management Measures	▪ N/A							

8.9.3 DECOMMISSIONING PHASE

Typically, the major social impacts associated with the decommissioning phase are linked to the loss of jobs and associated income. This has implications for the households who are directly affected, the communities within which they live, and the relevant local authorities. However, in the case of the Proposed Project, the decommissioning phase is likely to involve the disassembly and replacement of the existing structure if required. This is likely to take place in the 20 - 25 years post commissioning. The decommissioning phase is therefore likely to create additional, construction type jobs, as opposed to the jobs losses typically associated with decommissioning.

Table 8-29 – Impact on regional employment and household income during the decommissioning phase for the Preferred Alternative and Alternative 1

Potential Impact: Regional employment and household income	**Magnitude**	**Extent**	**Reversibility**	**Duration**	**Probability**	**Significance**		**Character**
Without Mitigation	1	1	1	4	3	21	Low	(+)
With Mitigation	2	1	1	4	3	24	Low	(+)
Mitigation and Management Measures	▪ Using local sub-contractors where possible and requiring that contractors from outside the local area that tender also meet targets for how many locals are given employment. ▪ Exploring ways to enhance local community benefits with a focus on broad-based BEE and preferential procurement.							

8.10 HAZARDOUS SUBSTANCES AND POLLUTANTS

8.10.1 CONSTRUCTION PHASE

Potential exists for soil, groundwater and surface water contamination associated with potential releases of environmental contaminants and hazardous substances. Sources of pollutants and release mechanisms include:

- Leakages of hydrocarbons (diesel and oil) from construction vehicles and heavy machinery (e.g., excavators and bulldozers).
- Loss of containment and accidental spillage associated with storage and handling of hydrocarbons, chemicals, and concrete.

Runoff creates a preferential pathway and exposure of the above contaminants into the subsurface and water resources leading to a deterioration in water quality and secondary health impacts on aquatic ecosystems and water users.

Table 8-30 – Construction Impact of contaminants on soil, groundwater and surface water for the Preferred Alternative and Alternative 1

Potential Impact: Impacts of contaminants on soil, groundwater and surface water	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	3	2	3	2	3	**30**	**Low**	(-)
With Mitigation	3	2	3	2	2	**20**	**Low**	(-)
Mitigation and Management Measures	▪ Avoid identified sensitive areas (watercourses and associated buffers) as far as possible. ▪ Chemicals, hydrocarbon materials and hazardous substances maintained onsite must be managed in accordance with the Hazardous Substances Act (No. 15 of 1973) and its relevant regulations. ▪ All machinery and equipment should be inspected regularly for faults and possible leaks; these should be serviced off-site or in appropriately bunded areas. ▪ Drip trays or any form of oil absorbent material must be placed underneath vehicles/machinery and ▪ equipment when not in use. ▪ All contaminated soil shall be treated in situ or removed and be placed in containers. ▪ Provide secure storage for fuel, oil, chemicals and other waste materials to prevent contamination of stormwater runoff. ▪ Spill kits must be available at all locations where hazardous substances are stored, handled or used, and spills must be cleaned up immediately in accordance with an established protocol applicable to the material.							

8.10.2 OPERATIONAL PHASE

8.10.2.1 Impacts of contaminants on soil, groundwater and surface water

Potential exists for soil, groundwater and surface water contamination associated with potential releases of small quantities of environmental contaminants and dangerous goods. Sources of pollutants and release mechanisms include:

- Leakages of hydrocarbons (diesel and oil) from construction vehicles and heavy machinery (e.g., excavators and bulldozers).
- Loss of containment and accidental spillage associated with storage and handling of hydrocarbons, chemicals, and concrete.

Runoff creates a preferential pathway and exposure of the above contaminants into the subsurface and natural stormwater channels.

The chemicals to be stored at site will include:

- HCl
- H_2SO_4

- $FeCl_3$
- NaOCl
- $NaClO_2$
- $Na_2S_2O_5$
- HNO_3
- SLES, $CH_3(CH_2)_{11}(OCH_2CH_2)_nOSO_3Na$) 70%
- LABSA, $C_{18}H_{30}O_3S$
- Caustic Soda Lye / Na_2CO_3 / NaOH liquid
- H_3PO_4.
- Methanol / ethanol
- Thinners
- Shelsol A
- Paraffin
- Benzine
- Toluene
- Acetone

Table 8-31 – Impact of contaminants on soil, groundwater and surface water for the Preferred Alternative and Alternative 1

Potential Impact: Impacts of contaminants on soil, groundwater and surface water	**Magnitude**	**Extent**	**Reversibility**	**Duration**	**Probability**	**Significance**		**Character**
Without Mitigation	3	2	3	2	3	**30**	**Low**	(-)
With Mitigation	3	2	3	2	2	**20**	**Low**	(-)
Mitigation and Management Measures	▪ Avoid identified sensitive areas as far as possible. ▪ Chemicals, hydrocarbon materials and hazardous substances maintained onsite must be managed in accordance with the Hazardous Substances Act (No. 15 of 1973) and its relevant regulations. ▪ All machinery and equipment should be inspected regularly for faults and possible leaks; these should be serviced off-site or in appropriately bunded areas. ▪ Drip trays or any form of oil absorbent material must be placed underneath vehicles/machinery and ▪ equipment when not in use. ▪ All contaminated soil shall be treated in situ or removed and be placed in containers. ▪ Provide secure storage for fuel, oil, chemicals and other waste materials to prevent contamination of stormwater runoff. ▪ Spill kits must be available at all locations where hazardous substances are stored, handled or used, and spills must be cleaned up immediately in accordance with an established protocol applicable to the material.							

8.10.2.2 Health and Safety

A Major Hazard Installation Report has been compiled by MHR Consultants. The MHI Assessment considered a 3-phased development which is now technology Alternative 1. The preferred technology alternative only consists of Phase 1 and Phase 3 with the exclusion of Phase 2.

This Risk Assessment has modelled the effects of the flammable installations. The results are as follows:

- The 1.0e-5 (one-in-a-hundred thousand) orange contour, is confined to the chlorine installation (Phase 2).
- The 1.0e-6 (one-in-a-million) yellow contour, extends 8m past the southern boundary at the solvents tank farm. The contour extends for about 29m past the northern boundary at the chlorine installation (Phase 2).
- The 3.0e-7 (one-in-thirty million) green contour, extends 32m past the southern boundary at the solvents tank farm. The contour extends for about 90m past the northern boundary at the chlorine installation (Phase 2).

It should be noted that all contours related to chlorine will only be appliable to Phase 2 (Alternative 1).

The contours do not reach any residential areas. The risk contours are acceptable for this site.

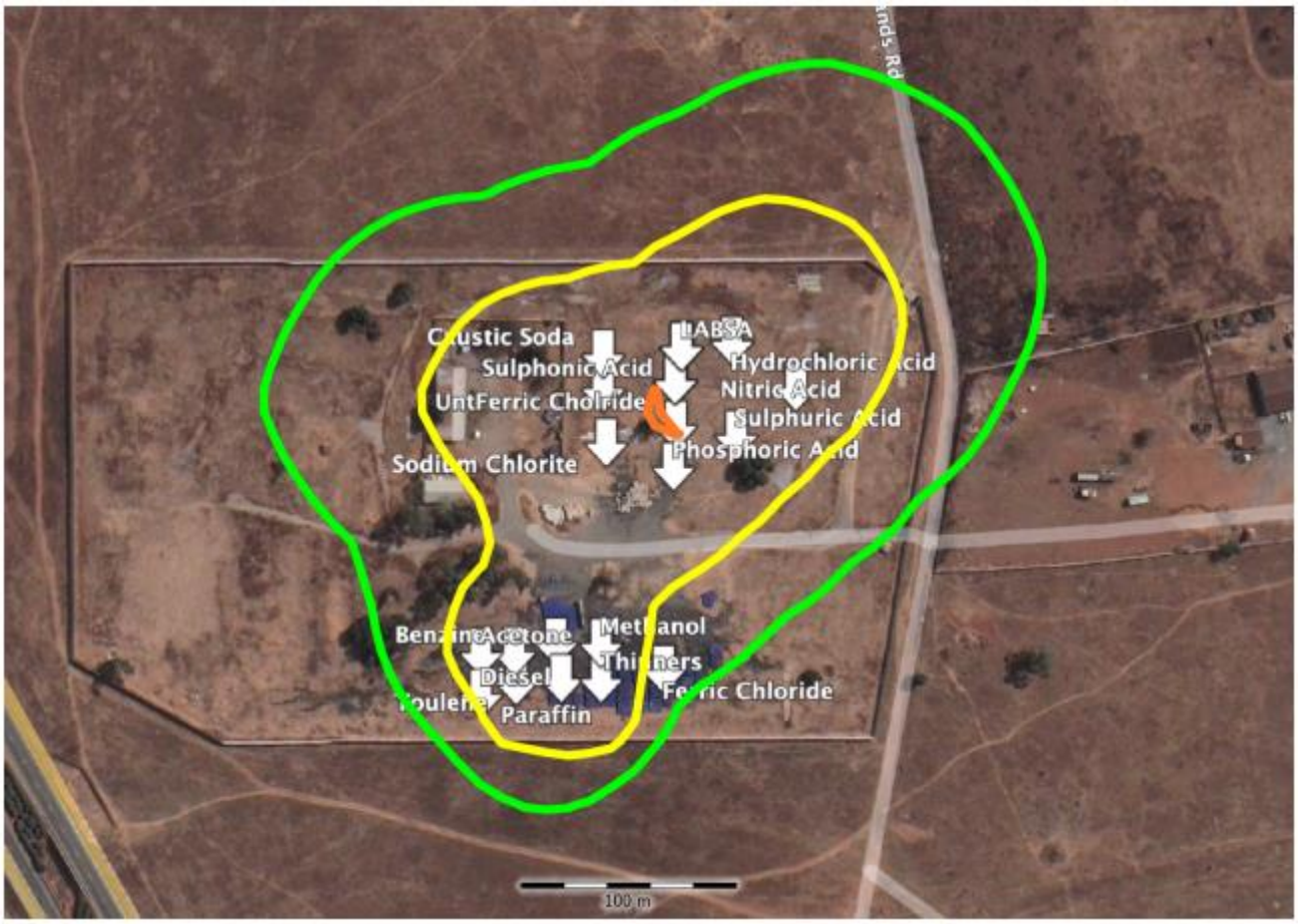

Figure 8-1 - Individual Risk

As part of the risk assessment a hazard analysis breakdown was undertaken as illustrated in **Table 8-32**.

Table 8-32 - Hazard Analysis Breakdown

Flammable and Toxic Installation					
Equipment	**Failures and Causes**	**Preventative Measures**	**Hazardous Event**	**Protective Measures**	**Final Consequence**
Solvent Tank	- Leak - Catastrophic Rupture	- Solvent tanks will be installed in a bunded area - Suitably qualified companies to do maintenance and repairs	- Pipe leak/ rupture resulting in a pool fire - Tank leak/ rupture resulting in a pool fire	- Fire-fighting equipment to be installed - Tanks will be installed in a bunded area to contain spills - Emergency Plan will be implemented - Regular maintenance to be done as per manufacturer requirements	- Possible employee injuries or fatalities - Possible public injuries or fatalities Possible domino effect on diesel road tanker causing pool fire or catastrophic failure
Solvent Road Tanker	- Hose Leak - Hose Rupture - Catastrophic Rupture	- Installation will comply with relevant SANS standards - Only trained staff and driver to exercise offloading procedures	- Hose leak/ rupture resulting in a pool fire - Road Tanker leak resulting in a pool fire	- Fire-fighting equipment to be installed - Emergency Plan will be implemented - Driver to be suitably trained in off loading procedure and emergency procedure - Tanker to be earthed prior and during off loading operation	- Possible employee injuries or fatalities - Possible public injuries or fatalities - Possible domino effect on diesel tanks causing pool fire or catastrophic failure
Chlorine Cylinder	- Valve Leak - Catastrophic Failure	- Only trained staff to handle Chlorine cylinders	- Valve leak can lead to toxic release - Catastrophic failure can lead to toxic release	- Fire-fighting equipment to be installed - Emergency Plan must be implemented - All employees handling Chlorine must receive suitable training - Emergency equipment must be available and maintained as required	- Possible employee injuries or fatalities - Possible public injuries or fatalities

Pool Fires

On ignition of a flammable pool, the fire would extend to the limit of the pool but would shrink rapidly as the fuel within the pool is consumed.

The solvent tanks at the facility are stored as flammable liquids under atmospheric temperatures and pressures. A loss of containment at the tanks would result in a pool. The pool will be contained within the bunded area or until the liquid finds a natural barrier. A leak from the loading hose or road tanker will cause the pool to expand until it reaches a natural barrier.

On ignition of a contained flammable pool, the fire would extend to the limit of the pool but would shrink rapidly as the fuel within the pool is consumed. The tanks are installed in bunded areas to mitigate the consequence of pool fires.

Table 8-33 – Pipe leaks or ruptures resulting in pool fires for the Preferred Alternative and Alternative 1

Potential Impact: Pool fires	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	4	2	5	5	3	**51**	**Moderate**	(-)
With Mitigation	2	1	3	2	2	**16**	**Low**	(-)
Mitigation and Management Measures	▪ Installation must comply with local by-laws and applicable SANS 10087 Codes.							

	▪ It is recommended that an Emergency Plan be compiled, and the following adhered to: • Must comply with SANS 1514 Codes; • Must comply with the MHI Regulations; • Must be accepted and signed by management and the Local Authority. Solvent Tanks: ▪ Solvent tanks will be installed in a bunded area. ▪ Suitably qualified companies to do maintenance and repairs. ▪ Fire-fighting equipment to be installed. ▪ Tanks will be installed in a bunded area to contain spills. ▪ Emergency Plan will be implemented. ▪ Regular maintenance to be done as per manufacturer requirements. Solvent Tankers: ▪ Installation will comply with relevant SANS standards. ▪ Only trained staff and driver to exercise offloading procedures. ▪ Fire-fighting equipment to be installed. ▪ Emergency Plan will be implemented. ▪ Driver to be suitably trained in offloading procedure and emergency procedure. ▪ Tanker to be earthed prior and during offloading operation. Chlorine Cylinder: ▪ Only trained staff to handle Chlorine cylinders. ▪ Fire-fighting equipment to be installed. ▪ Emergency Plan must be implemented. ▪ All employees handling Chlorine must receive suitable training. ▪ Emergency equipment must be available and maintained as required. ▪ Good housekeeping must always be observed on site. ▪ Emergency Plan must be compiled for the site and the risks identified in this report must be addressed. ▪ Venting on solvent tanks to be designed by an engineer. ▪ Installations to comply with the applicable SANS standards and Municipal Bylaws. ▪ Fire protection for storage, manufacturing and decanting area to be designed by suitably qualified and experienced organisations. ▪ Staff to be trained in the safe handling of the various chemicals on site. ▪ Once the design of the facility has been completed the MHI Risk Assessment needs to be reviewed in order to incorporate the manufacturing, decanting areas as well as the safety systems to reduce the risks of the various installations. ▪ Chlorine installation to be designed as to comply with international best practices. ▪ Strict access control to be implemented on site. ▪ Maintenance on the equipment to be done as per the manufacturers requirements.

	▪ Emergency Plan must comply with the MHI Regulations. ▪ Emergency Plan must comply with SANS 1514 Codes. ▪ The MHI report must be distributed to Local, Provincial and National Government as per the MHI Regulations.

Toxic Vapour Clouds – Phase 2 (Alternative 1 only)

Vapour clouds originating from a toxic release can have far-reaching effects on communities or sensitive areas. There are various types of toxic vapour releases. These are as follows:

- Release of toxic gas from pressure cylinder or system;
- Spill of toxic liquid;
- Combustion of various materials;
- Various reactions between two or more chemicals.

There are various reasons for a release of chlorine. These include the following:

- Cylinder failure;
- Pipeline rupture;
- Pipeline leak;
- Valve failure;
- Valve leak.
- The chlorine installation is indoors.

The worst-case weather conditions considered for a chlorine release at night. The low temperature will cause the chlorine to stay relatively low and the wind will cause the cloud to move without dispersing the chlorine. In the event of a catastrophic cylinder failure the chlorine cloud could reach the surrounding residential areas to the east and the south.

In the following figures, the Emergency Response Planning Guidelines (ERPG 3) (purple contour) and 1% fatality (blue contour) contours are shown. The solid contour is in the predominant wind direction and the broken contour is in all wind directions.

Should Phase 2 (Alternative 1) not proceed this impact will not be applicable.

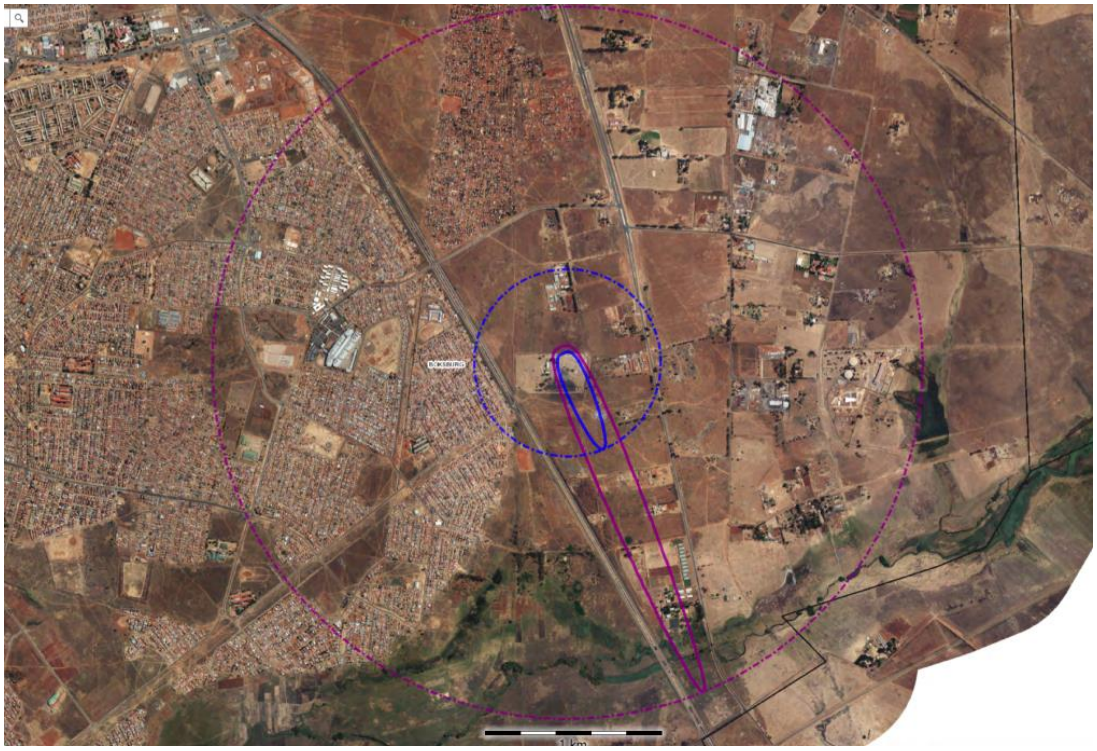

Figure 8-2 – Catastrophic Chlorine Cylinder Failure

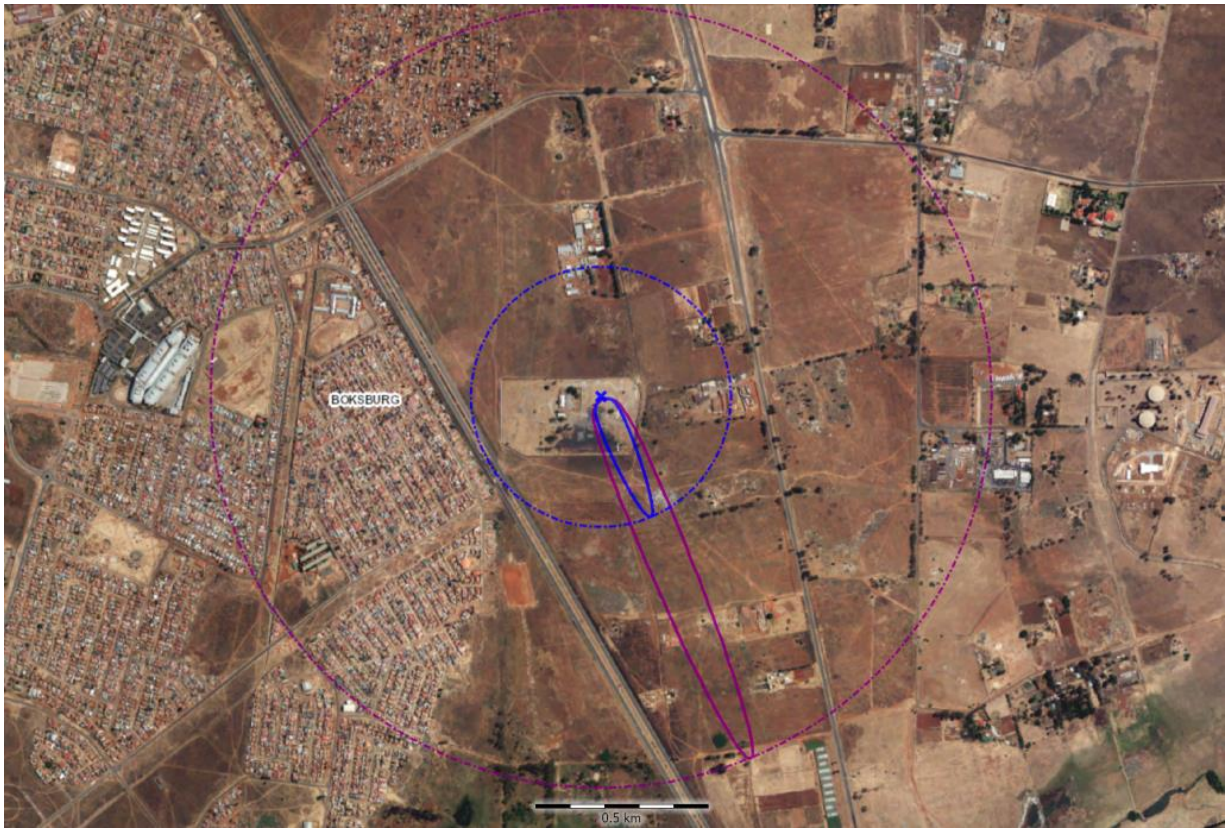

Figure 8-3 – Chlorine Valve Leak

Table 8-34 – Toxic chlorine release for Alternative 1 only

Potential Impact: Toxic chlorine release	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	5	3	5	5	4	72	High	(-)
With Mitigation	5	1	5	5	1	16	Low	(-)
Mitigation and Management Measures	▪ Installation must comply with local by-laws and applicable SANS 10087 Codes. ▪ It is recommended that an Emergency Plan be compiled, and the following adhered to: • Must comply with SANS 1514 Codes; • Must comply with the MHI Regulations; • Must be accepted and signed by management and the Local Authority. Chlorine Cylinder: ▪ Only trained staff to handle Chlorine cylinders. ▪ Fire-fighting equipment to be installed. ▪ Emergency Plan must be implemented. ▪ All employees handling Chlorine must receive suitable training. ▪ Emergency equipment must be available and maintained as required.							

8.10.3 DECOMMISSIONING PHASE

The impacts associated with the decommissioning phase will be the same as that of the construction phase.

8.11 WASTE MANAGEMENT

8.11.1 CONSTRUCTION PHASE

The presence of construction workers has the potential to increase litter on site in the absence of adequate waste receptacles. This results in an unsightly working environment and possible entry into surrounding environment. Furthermore, waste materials may attract pest species / vectors into working areas leading to potential health implications for construction staff and community members.

Spoil material unsuitable for reuse as backfill and bedding material has the potential to disrupt land use and habitats if inappropriately manage or disposed illegally.

Waste generation (domestic waste, mixed industrial and metal waste) and a lack of appropriate separation, temporary storage and recycling (i.e., not aligned with the Waste Hierarchy) has the potential to result in unnecessary waste material to landfill.

Hazardous waste generation and inappropriate management and disposal has the potential to lead to contamination of soil and groundwater.

Table 8-35 – Impact of improper waste management during construction for the Preferred Alternative and Alternative 1

Potential Impact: Improper waste management during construction	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	3	3	3	2	4	**44**	Moderate	(-)
With Mitigation	2	2	2	2	2	**16**	Low	(-)
Mitigation and Management Measures	▪ Despite the modest volumes of waste anticipated to be generated by the project, recycling opportunities should be sought in order to reduce the volume of waste to landfill and harness commercial benefits for both the project team and local community. ▪ General waste (i.e., construction waste, building rubble, plastic, metal, excavated material, packaging material, paper and domestic waste etc.) generated during the construction phase should be stored in a designated area within suitable waste collection bins and skips (or similar). ▪ Provisions of suitable waste receptacles for temporary storage of hazardous waste (in compliance with Material Safety Data Sheets). ▪ Collection and disposal of hazardous waste at appropriately licences landfills and proof of disposal to be retained by contractors and facility operators. ▪ Bins/skips must be emptied regularly and collected by a licensed contractor for disposal at an appropriate, licensed facility. Bins/skips must not be allowed to overflow. ▪ Solid waste must be managed to avoid risk to local fauna and to avoid attracting animals to the site and to ensure containment and regular collection for disposal at a licenced landfill site. ▪ Maintain good housekeeping on site and minimise the generation of waste.							

Sanitation services are required to accommodate workers on site, contractor's yard and at site camps. Temporary ablution facilities (chemical toilets) are proposed to appropriately contain and treat waste for offsite disposal. The incorrect siting of chemical toilets (i.e., within close proximity to a watercourse or stream) and loss of containment could lead to pollution of the receiving environment (soil, groundwater and surface water), leading to secondary health impact to ecosystems and communities (ground and surface water users).

Sanitary waste, if not correctly contained, has the potential to enter surface water via runoff and increase organic matter loading in water systems.

Table 8-36 – Improper disposal of sanitation waste for the Preferred Alternative and Alternative 1

Potential Impact: Improper disposal of sanitation waste	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	3	3	3	2	4	**44**	Moderate	(-)
With Mitigation	2	2	2	2	2	**16**	Low	(-)
Mitigation and Management Measures	▪ Chemical toilet facilities are to be supplied and serviced by an approved contractor. ▪ Ablution facilities must be located in a specific area agreed to by the ECO prior to placement and must be located away from sensitive environments. ▪ Spillages must be prevented during cleaning or servicing. ▪ Ablution facilities must be effectively secured to prevent toppling or being wind-blown. ▪ Ablution facilities must be maintained in a hygienic state and serviced regularly.							

8.11.2 OPERATIONAL PHASE

Table 8-37 – Impact of improper waste management during operation for the Preferred Alternative and Alternative 1

Potential Impact: Improper waste management during operation	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	2	3	4	4	**44**	Moderate	(-)
With Mitigation	1	2	3	4	2	**20**	Low	(-)
Mitigation and Management Measures	▪ Despite the modest volumes of waste anticipated to be generated by the project, recycling opportunities should be sought in order to reduce the volume of waste to landfill and harness commercial benefits for both the project team and local community. ▪ General waste generated during the operational phase should be stored in a designated area within suitable waste collection bins and skips (or similar). ▪ Provisions of suitable waste receptacles for storage of hazardous waste (in compliance with Material Safety Data Sheets). ▪ Collection and disposal of hazardous waste at appropriately licences landfills and proof of disposal to be retained by facility operators. ▪ Bins/skips must be emptied regularly and collected by a licensed contractor for disposal at an appropriate,							

	licensed facility. Bins/skips must not be allowed to overflow.

8.11.3 DECOMMISSIONING PHASE

The impacts associated with the decommissioning phase will be the same as that of the construction phase.

9 CUMULATIVE IMPACT ASSESSMENT

Although the objective of the S&EIR process is to undertake an impact and risk assessment process, inclusive of cumulative impacts, which is essential to assessing and managing the environmental and social impacts of projects, it may be insufficient for identifying and managing the incremental impacts on areas or resources used or directly affected by a given development from other existing, planned, or reasonably defined developments at the time the risks and impacts are identified.

IFC PS 1 recognizes that, in some instances, cumulative effects need to be considered in the identification and management of environmental and social impacts and risks. For private sector management of cumulative impacts, IFC considers good practice to be two pronged:

- Effective application of and adherence to the mitigation hierarchy in environmental and social management of the specific contributions by the project to the expected cumulative impacts; and
- Best efforts to engage in, enhance, and/or contribute to a multi-stakeholder, collaborative approach to implementing management actions that are beyond the capacity of an individual project proponent.

Even though Performance Standard 1 does not expressly require, or put the sole onus on, private sector clients to undertake a cumulative impact assessment (CIA), in paragraph 11 it states that the impact and risk identification process "*will take into account the findings and conclusions of related and applicable plans, studies, or assessments prepared by relevant government authorities or other parties that are directly related to the project and its area of influence" including "master economic development plans, country or regional plans, feasibility studies, alternatives analyses, and cumulative, regional, sectoral, or strategic environmental assessments where relevant*."

Cumulative impacts are those that result from the successive, incremental, and/or combined effects of an action, project, or activity when added to other existing, planned, and/or reasonably anticipated future ones. For practical reasons, the identification and management of cumulative impacts are limited to those effects generally recognized as important on the basis of scientific concerns and/or concerns of affected communities (IFC GPH).

Evaluation of potential cumulative impacts is an integral element of an impact assessment. In reference to the scope for an impact assessment, IFC's Performance Standards specify that "*Risks and impacts will be analysed in the context of the project's area of influence. This area of influence encompasses…areas potentially impacted by cumulative impacts from further planned development of the project, any existing project or condition, and other project-related developments that are realistically defined at the time the Social and Environmental Assessment is undertaken; and (iv) areas potentially affected by impacts from unplanned but predictable developments caused by the project that may occur later or at a different location.*" (IFC 2006).

A cumulative impact assessment is the process of (a) analysing the potential impacts and risks of proposed developments in the context of the potential effects of other human activities and natural environmental and social external drivers on the chosen Valued Environmental and Social Components (VECs) over time, and (b) proposing concrete measures to avoid, reduce, or mitigate such cumulative impacts and risk to the extent possible (IFC GPH).

Cumulative impacts with existing and planned facilities may occur during construction and operation of the proposed project. While one project may not have a significant negative impact on sensitive

resources or receptors, the collective impact of the projects may increase the severity of the potential impacts.

9.1 AIR QUALITY

Although the increased dust and emissions from construction activities may not significantly impact air quality, increased dust can be a nuisance to the nearby receptors and site workers. Considering the temporary nature of construction and the nature of the proposed activities, cumulative impact on air quality is anticipated to be low and of short duration. With the implementation of appropriate control measures, the impact on neighbouring sensitive receptors will be reduced further but is still assessed to be low.

The potential impact on air quality during construction is indicated in **Table 9-1.**

Table 9-1 – Cumulative Impact on ambient air quality for the Preferred Alternative and Alternative 1

Potential Impact: Impact on air quality during construction	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	2	1	2	5	**35**	**Moderate**	(-)
With Mitigation	1	2	1	2	5	**30**	**Low**	(-)
Mitigation and Management Measures	▪ All mitigation measures presented within the impact assessment section of this report must be implemented for the impact significance to be reduced to low for cumulative impacts.							

9.2 TERRESTRIAL BIODIVERSITY

Permanent loss of degraded grassland habitat as a result of the proposed development will contribute to cumulative impacts of loss in this locality considered to be a CBA: Important Area, given the widespread transformation of the area the cumulative additional impact will be low.

Table 9-2 – Cumulative Impact on Terrestrial Biodiversity

Potential Impact: Cumulative Impact on Terrestrial Biodiversity	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	2	3	2	3	**27**	**Low**	(-)
With Mitigation	1	1	2	2	1	**6**	**Very Low**	(-)

Mitigation and Management Measures	▪ All mitigation measures presented within the impact assessment section of this report must be implemented for the impact significance to be reduced to low for cumulative impacts.

9.3 HERITAGE AND PALAEONTOLOGY

Cumulative impacts would occur through the construction, operation and decommissioning of many projects in the same area.

Table 9-3 – Cumulative impact to archaeological resources during the construction, operation and decommissioning phases

Potential Impact: Archaeological resources	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	1	5	5	1	13	Very Low	(-)
With Mitigation	1	1	5	5	1	12	Very Low	(-)
Mitigation and Management Measures	▪ Implement the Chance Finds Protocol. ▪ Construction activities must cease upon discovery of any heritage or cultural resources. The heritage authority must be contacted immediately.							

9.4 SOCIAL

Assessment of cumulative impacts considered are:

- Impacts on regional employment and household income associated with project activities and expenditure (**Table 9-4**):
- Impacts associated primarily with the influx of people (**Table 9-5**):
- Impacts on surrounding landowners (**Table 9-6**):

Table 9-4 – Cumulative impact on regional employment and household income

Potential Impact: Regional employment and household income	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	2	2	2	4	3	30	Low	(+)
With Mitigation	3	2	2	4	5	55	Moderate	(+)
Mitigation and Management Measures	▪ Setting targets for how much local labour should be used based on the needs of the applicant and the							

	availability of existing skills and people that are willing to undergo training. Opportunities for the training of unskilled and skilled workers from local communities should be maximized, including those from adjacent farms who have indicated that they would like to benefit from the proposed project and its related opportunities. ▪ Using local sub-contractors where possible and requiring that contractors from outside the local area that tender also meet targets for how many locals are given employment. ▪ Exploring ways to enhance local community benefits with a focus on broad-based BEE and preferential procurement.

Table 9-5 – Cumulative impact of influx of people

Potential Impact: Influx of people	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	1	3	1	2	4	**28**	**Low**	(-)
With Mitigation	1	2	1	2	3	**18**	**Low**	(-)
Mitigation and Management Measures	▪ A 'locals first' policy with regard to construction and operational labour needs. ▪ A complaints register should be available on site to any individual who may have a particular complaint with regards to the construction or operations processes. ▪ Close coordination with the municipality is required, including regular meetings.							

Table 9-6 – Cumulative impact of surrounding landowners

Potential Impact: Surrounding landowners and communities	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	1	3	1	2	4	**28**	**Low**	(-)
With Mitigation	1	2	1	2	3	**18**	**Low**	(-)
Mitigation and Management Measures	▪ A complaints register should be available on site to any individual who may have a particular complaint with regards to the construction or operations processes.							

Table 9-7 – Cumulative impact on stimulating foreign trade

Potential Impact: Stimulation of foreign trade	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	3	2	2	4	5	55	Moderate	(+)
With Mitigation	N/A							
Mitigation and Management Measures	N/A							

9.5 HAZARDOUS SUBSTANCES

Domino effects occur when the failure/leak of one installation causes a catastrophic failure of another. Domino effects are considered where the consequence of a scenario exceeding 35kPa overpressure or 37kW/m2 reaches an adjacent Major Hazard Installation.

The solvent road tankers can impact on the adjacent solvent tanks and vice versa. The risks of these domino effects have been included in the risk calculations. The societal risk is less than 1.e-05 of one fatality, which is acceptable.

Fires on site could cause failure of adjacent drums with toxic chemicals, which could escalate the event. Toxic events alone do not normally lead to direct domino failures. There are no known MHIs near the proposed site.

Table 9-8 – Worst Case Incident

Potential Impact: Worst Case Incident	Magnitude	Extent	Reversibility	Duration	Probability	Significance		Character
Without Mitigation	5	3	5	5	4	54	Moderate	(-)
With Mitigation	5	1	5	5	1	16	Low	(-)
Mitigation and Management Measures	▪ An Emergency Plan must be compiled and implemented. ▪ Richbay properties should have segregation of incompatible materials for any accidental mixes and a natural ventilation system in place. ▪ Caution must be exercised when decanting at the Filling Plant, and this reduces the chances of having incompatible materials mixing. ▪ Town Planning should be made aware of which areas could be affected, in order to manage the approval of new developments in the vicinity of this MHI.							

	▪ The bunding must be inspected annually and maintained. ▪ A person must be appointed as responsible for the MHI. ▪ A copy of the risk assessment should be available on the site at all times for inspection by the authorities. ▪ Prior to commencement of construction, the relevant authorities (i.e., local Fire and Emergency services, Provincial Department of Employment and Labour and National Department of Labour) should be notified as per the requirements of regulation 4 of the MHI Regulations of 2022. Richbay should retain proof of notifications. ▪ Prior to commencement of construction, public notifications should be undertaken as per the requirements of Regulation 4 of the MHI Regs of 2022. R should retain proof of notifications. ▪ Richbay Pietermaritzburg should confirm that the local emergency services have an off-site emergency plan in place. ▪ This MHI facility should be reassessed 5-yearly, or earlier if major modifications are made, the installations are expanded, or a major incident occurs.

10 ENVIRONMENTAL IMPACT STATEMENT

The essence of any impact assessment process is aimed at ensuring informed decision-making, environmental accountability, and to assist in achieving environmentally sound and sustainable development. In terms of NEMA, the commitment to sustainable development is evident in the provision that "development must be socially, environmentally and economically sustainable…. and requires the consideration of all relevant factors…". The NEMA also imposes a duty of care, which places an obligation on any person who has caused, is causing, or is likely to cause damage to the environment to take reasonable steps to prevent such damage. In terms of NEMA's preventative principle, potentially negative impacts on the environment and on people's environmental rights (in terms of the Constitution of the Republic of South Africa, Act No. 108 of 1996) should be anticipated and prevented, and where they cannot be prevented altogether, they must be minimised and remedied in terms of "reasonable measures".

In assessing the environmental feasibility of the proposed construction of the Proposed Project, the requirements of all relevant legislation have been considered. The identification and development of appropriate mitigation measures that should be implemented to minimise potentially significant impacts associated with the project, has been informed by best practice principles, past experience, and the relevant legislation (where applicable).

The conclusions of this EIAR are the result of comprehensive assessments. These assessments were based on issues identified through the S&EIR process and public participation undertaken to date. The EIAR will be subject to public review, which will be undertaken according to the requirements of NEMA with every effort made to include representatives of all stakeholders within the process. The EIAR will be updated and finalised taking into consideration all comments received during the public review period before being submitted to the CA for consideration.

10.1 IMPACT SUMMARY

All impacts associated with the proposed project can be reduced to a medium to low significance with the implementation of recommended mitigation measures as presented within this EIAR and the associated specialist studies.

The table below is a summary of the impacts associated with the Proposed Project.

Table 10-1 – Summary of Impacts associated with the Proposed Project

Aspect	Impact Description	Character	Without Mitigation	With Mitigation
Construction Phase				
Air Quality	Impact on air quality during construction	Negative	**Moderate**	**Low**
Noise and Vibration	Impact on ambient sound levels during construction	Negative	**Low**	**Low**
Soil	Increased erosion and sedimentation	Negative	**High**	**Low**
	Change in land use (alternative system)	Negative	**Moderate**	**Moderate**

Aspect	Impact Description	Character	Without Mitigation	With Mitigation
	Change in land capability	Negative	Moderate	Moderate
	Soil Contamination	Negative	Moderate	Low
Terrestrial Biodiversity	Continued disturbance and degradation of the vegetation community and encroachment by alien invasive plant species	Negative	Low	Very Low
	Displacement of faunal communities	Negative	Low	Very Low
Heritage and Cultural Resources	Impacts to cultural and heritage resources	Negative	Very Low	Very Low
Palaeontology	Impacts to palaeontology	Negative	High	Low
Geotechnical	Impacts on dolomite stability	Negative	High	Low
Traffic	Road degradation	Negative	Very Low	Very Low
	Dust	Negative	Low	Very Low
	Intersection safety	Negative	Low	Very Low
Social Impacts	Regional employment and household income	Positive	Low	Moderate
	Influx of people	Negative	Low	Low
	Surrounding landowners	Negative	Low	Low
Hazardous Substances and Pollutants	Impacts of contaminants on soil, groundwater and surface water	Negative	Low	Low
Waste Management	Improper waste management during construction	Negative	Moderate	Low
	Improper disposal of sanitation waste	Negative	Moderate	Low
Operational Phase				
Air Quality	Impact on air quality (Alternative 1)	Negative	Low	Low
Air Quality	Impact on air quality (Preferred Alternative)	Negative	Low	Very Low
Soil	Soil erosion and sedimentation	Negative	High	Very Low
	Soil contamination	Negative	Moderate	Low

Aspect	Impact Description	Character	Without Mitigation	With Mitigation
Terrestrial Biodiversity	Continued disturbance and degradation of the vegetation community and alien species encroachment	Negative	Moderate	Very Low
	Ongoing displacement of the faunal community due to habitat loss, direct mortality and disturbance	Negative	Moderate	Very Low
Social Impacts	Regional employment and household income	Positive	Low	Low
	Surrounding landowners	Negative	Low	Low
	Stimulation of cross border trade	Positive	Moderate	
Hazardous Substances and Pollutants	Impacts of contaminants on soil, groundwater and surface water	Negative	Low	Low
	Pipe leaks or ruptures resulting pool fires	Negative	Moderate	Low
	Toxic chlorine releases	Negative	High	Low
Waste Management	Improper waste management during construction	Negative	Moderate	Low
Decommissioning Phase				
Air Quality	Impact on air quality during decommissioning	Negative	Moderate	Low
Noise and Vibration	Increase in daytime ambient sound levels		Low	Low
Soil	Soil erosion and sedimentation	Negative	High	Low
	Soil contamination	Negative	High	Low
Land use	Change in land use	Positive	Low	Moderate
Terrestrial Biodiversity	Spread of alien and invasive plant species	Negative	Moderate	Low
Social Impacts	Regional employment and household income	Positive	Low	Low
Hazardous Substances and Pollutants	Impacts of contaminants on soil, groundwater and surface water	Negative	Low	Low
Traffic	Road degradation	Negative	Very Low	Very Low
	Dust	Negative	Low	Very Low
	Intersection safety	Negative	Low	Very Low

Aspect	Impact Description	Character	Without Mitigation	With Mitigation
Waste Management	Improper waste management during construction	Negative	**Moderate**	**Low**
	Improper disposal of sanitation waste	Negative	**Moderate**	**Low**

10.2 SITE SENSITIVITY

Table 10-2 illustrates the overall sensitivity of the site in relation to the proposed project, there were no no-go areas identified on the proposed site.

Table 10-2 - Environmental Sensitivities identified by specialists

Specialist study	Sensitivity Rating/Fatal Flaw Analysis
Air Quality	Richbay Chemicals is proposing to establish a chemical Filling Plant in Vosloorus, near Johannesburg and have initiated the EIA process required for environmental authorisation. The proposed activity falls under Category 6: Organic Chemicals Industry, and Subcategory 7.2: Production of Acids of the Listed Activities34, promulgated in line with Section 21 of NEM:AQA. As such, an AQIA is required as part of the EIA process to support the application for an AEL. This study assessed the potential impacts to ambient air quality associated with the proposed development using a Level 2 (AERMOD) dispersion modelling assessment. Impacts to ambient air quality for criteria pollutants, namely SO_2, NO_2, PM_{10}, $PM_{2.5}$, TVOC, CO, Pb and HCl were simulated. Based on the findings of the AQIA, ground-level impacts associated with atmospheric emissions from the proposed development are assessed to be very low.
Terrestrial Ecology	The Biodiversity Assessment concluded that from the regional ecological overview, as well as the baseline data collected to date that much of the project area has been extensively altered, both historically and at present due to the sandblasting business and associated disturbances, with little natural or pristine vegetation remaining. The main impact expected to influence the fauna and flora is the spilling of the corrosive and toxic substances that will be stored and decanted on site, through the implementation of a spill management plan as well as lining of the area this impact can be mitigated. Considering the findings of the respective studies, no fatal flaws were identified for the proposed project.

Specialist study	Sensitivity Rating/Fatal Flaw Analysis
	Should the avoidance and mitigation measures prescribed be implemented, the significance of the considered impacts for all aspects is expected to be low. It is thus the opinion of the specialists that the project can proceed, but only if the prescribed mitigation measures and recommendations are implemented.
Heritage	The HIA concluded that since no sites of archaeological nature or any historical buildings were found, the proposed development may continue.
Palaeontology	The Phase 1 Palaeontology Assessment concluded that there is no objection to the development, but it was necessary to request a Phase 1 Palaeontological Impact Assessment: Field Study as fossils may be present as the palaeontological sensitivity is HIGH. If any palaeontological material is exposed during digging, excavating, drilling or blasting SAHRA must be notified. All construction activities must be stopped, a 30 m no-go barrier constructed, and a palaeontologist should be called in to determine proper mitigation measures. A palaeontologist should visit the site once the excavations are done to inspect site, material excavated should not be removed (hard rock) from site.
MHI	This Assessment established that an incident involving the proposed installations at the premises of Richbay in Vosloorus could impact past the boundaries. The risks associated with this MHI were found to be acceptable. A site is deemed to be an MHI if more than the prescribed quantity is stored as per the General Machinery Act or if a product is stored, handled or produced which has the potential to cause a major incident as per the Operational Health and Safety Act.
Geotechnical	Twelve test pits were excavated, and eleven percussion drilled boreholes were drilled to investigate the site. The site is underlain by dolomite, which has been intruded extensively by dolerite., providing a protective horizon above the dolomite bedrock for the majority of the site. The test pits indicate thin overlying variable transported soils above the residual dolerite as fill, topsoil, hillwash and a pebble marker horizon. The site is considered to fall within an IHC3 category, indicating that there is a medium potential for medium subsidence's to occur in the event that concentrated water ingress into the sub-strata takes place after dewatering occurs.

Specialist study	Sensitivity Rating/Fatal Flaw Analysis
	The study concluded that from a geotechnical perspective, the site is considered to be economically and practically developable provided that the recommendations stated above, are adhered to.
Stormwater	The SWMP for the Chemical Plant Development includes both the construction phase as well as operational phase. The objectives of the SWMP are; ▪ Protection of Water Sources from pollution. ▪ Mitigating damage of land due to erosion. ▪ Preserving the Natural Environment. ▪ Maintain water quality. ▪ The stormwater drainage network system is separate from the sewer effluent system. ▪ The stormwater drainage system is designed to convey drainage and run-off in a controlled manner by stormwater pipes and that stormwater of a suitable quality will be discharged on site through spreaders/outlets. ▪ The site will be graded to ensure free flow of runoff and to prevent ponding of water in areas where grading of natural ground is necessary, which will be achieved by following the natural ground slope. ▪ Drainage will be controlled to ensure that runoff from the site will not culminate in off-site pollution or cause water damage to properties adjacent to the site. This is done by natural free surface drainage that will slow down flow, allowing runoff to follow the natural watercourse.

10.3 SPECIALIST CONCLUSIONS

10.3.1 TERRESTRIAL BIODIVERSITY

The site is located within a CBA: Important Area however two primary habitats were delineated for this assessment, namely: degraded grassland and transformed areas.

The degraded grasslands are the areas which were considered to have been altered from their natural state, sections of bare soil and low grass cover are visible due to a combination of over grazing and anthropogenic activities. This habitat has been degraded to a low ecological state.

Transformed areas have been historically and currently denuded of natural vegetation in order to construct building and other infrastructure. Portions of this habitat type are covered by the existing infrastructure within the project area which comprises of buildings, roads and a large wall. Sandblasting was the main activity taking place within the project area.

The Biodiversity Assessment concluded that from the regional ecological overview, as well as the baseline data collected to date that much of the project area has been extensively altered, both historically and at present due to the sandblasting business and associated disturbances, with little natural or pristine vegetation remaining.

10.3.2 HERITAGE

The HIA concluded that since no sites of archaeological nature or any historical buildings were found, the proposed development may continue.

10.3.3 PALAEONTOLOGY

The Phase 1 Palaeontology Assessment concluded that there is no objection to the development, but it was necessary to request a Phase 1 Palaeontological Impact Assessment: Field Study as fossils may be present as the palaeontological sensitivity is HIGH.

If any palaeontological material is exposed during digging, excavating, drilling or blasting SAHRA must be notified. All construction activities must be stopped, a 30 m no-go barrier constructed, and a palaeontologist should be called in to determine proper mitigation measures. A palaeontologist should visit the site once the excavations are done to inspect site, material excavated should not be removed (hard rock) from site.

10.3.4 MHI ASSESSMENT

This Assessment established that an incident involving the proposed installations at the premises of Richbay in Vosloorus could impact past the boundaries. The risks associated with this MHI were found to be acceptable.

10.3.5 GEOTECHNICAL ASSESSMENT

The study concluded that from a geotechnical perspective, the site is considered to be economically and practically developable provided that the recommendations stated above, are adhered to.

10.3.6 AIR QUALITY

This study assessed the potential impacts to ambient air quality associated with the proposed development using a Level 2 (AERMOD) dispersion modelling assessment. Impacts to ambient air

quality for criteria pollutants, namely SO2, NO2, PM10, PM2.5, TVOC, CO, Pb and HCl were simulated.

Based on the findings of the AQIA, ground-level impacts associated with atmospheric emissions from the proposed development are assessed to be very low.

10.4 RECOMMENDATIONS

The following key aspects are recommended to be included as conditions of authorisation:

- The mitigation measures included in the EMPr must be adhered to.
- The final EMPr must form part of all contractual documents with contractors during construction and operational phases of the project. Furthermore, a dedicated Environmental Control Officer (ECO) must be appointed to ensure compliance to all EA conditions and EMPr commitments throughout the construction phase.
- Appropriate permits, if required, in terms of the NEM:BA must be obtained before commencement of construction.
- The Stormwater Management Plan must be submitted to the EMM for approval.
- Building plans must be submitted, prior to any construction, for approval to the EMM.
- The incorporation of green technologies need to be investigated and implemented where feasible.
- An Environmental Compliance Officer (ECO) must be appointed for the development.
- Should rezoning be required, this needs to be undertaken prior to commencement with construction.
- Special foundation precautionary measures are recommended due to the medium potential for expansiveness and the dolomite classification. Total potential heave for the thick residual dolerite soil profiles encountered varies between 20 mm to 25 mm.
- Founding options for the structures include either stiffened or cellular rafts, or split construction with proper site drainage and plumbing requirements.
- The site must adhere to dolomite requirements in terms of SANS1936-3.
- Structure specific geotechnical conditions are to be confirmed in the design level geotechnical investigation which will include footprint drilling for the relevant structures.
- Where necessary, additional drilling including FPI's, should be conducted for any new structures and the results thereof, be submitted to the Council for Geoscience (CGS) for final comments.
- A certified site development plan should be submitted to the CGS for co-signing
- All foundations should be suitably designed to span at least 5 m loss of support due to sinkhole or subsidence formation and these must adhere to SANS 10400-H requirements.
- A site specific Dolomite Risk Management Plan in accordance with SANS 1936-4:2012 must be compiled and implemented for the site. The owners/responsible persons must be made aware of the risks involved in building on dolomite, and be informed about how to be vigilant and act pro-actively by applying sound water management principles.
- The builder must inform the professional team when the service/foundation trenches are open for inspection to takes place. The results of these inspections and quality controls must be recorded in a construction report (copy to the Local Authority and the CGS).
- The professional team involved, shall carefully consider the appropriate water precautionary measures and then ensure and finally certify that these have been implemented.
- Wet services should be laid exactly where indicated on the drawings presented to the Local Authority, and to the CGS. Wet services may not be laid below structures. The Builder or his

appointed professional team should certify that they have been placed as indicated. The proponent must also have a copy of the exact plan presented to the CGS.

- General precautionary measures as set out in SANS 1936 Part 3: Design and construction of buildings, structures and infrastructure, must be studied and implemented for a D3 site.
- Old trenches are to be excavated, backfilled and recompacted to limit any differential settlements of foundations at these positions.
- All stormwater should be effectively captured and led off the site.
- A one metre wide concrete apron should be constructed around buildings which is designed to shed stormwater away from the structure.
- All courses in the plinth wall should be reinforced with brickforce. Brickforce should be incorporated in every fourth course thereafter and in at least three courses above all openings such as doors and windows.
- Construction joints, to allow relative movement, should be incorporated at intervals of not more than 5 m in linear walls or at points to be determined by the structural engineer.
- All yard walls, steps and similar structures should be isolated from the main structure.
- Flexibility should be incorporated into wet services where they enter or leave buildings in order to ensure that relative movement does not result in leaking pipes.
- The development must fulfil the general precautionary measures prescribed by SANS1936-3 for a D3 site. A Dolomite Risk Management Plan (DRMP) must be created for the development and construction supervision of foundations must be carried out by a competent person (engineer or geo-professional).
- The EMM Roads & Stormwater Department must be notified of or provided with the following:
    - When the project is about to commence
    - Agenda of progress meetings when the representative is invited to the said meetings.
    - Detailed drawings of the project.
- The EMM Roads & Stormwater Department must be provided with the following:
    - Asbuilt-drawings [One sepia or plastic copy and in electronic format(dwg/pdf)] and one paper copy of the layout plans indicating the extent of the infrastructure provided.
    - Completion certificate, certifying that the work was completed under your supervision, in terms of the approved design and specification.
    - A copy of the Bill of Quantities, showing all information required to capitalize the infrastructure built in terms of the Engineering Services Agreements or in terms of any other requirement or agreement.
    - A completed Asset capitalization certificate.
    - Quality data packs for Roads and Storm water
    - Project Information required for the project (as and when required).
- Installation must comply with local by-laws and applicable SANS 10087 Codes;
- The MHI report must be distributed to Local, Provincial and National Government as per MHI Regulations.
- An Emergency Plan must be compiled, and the following adhered to:
    - Must comply with SANS 1514 Codes;
    - Must comply with the MHI Regulations;
    - Must be accepted and signed by management and the Local Authority

- Risk reduction programmes should continually be investigated to reduce the impact from accidental fires and explosions on surrounding communities.
- The HIA must be submitted to the relevant heritage authority for comments. Only after receiving these, the proposed development may continue.
- If any palaeontological material is exposed during digging, excavating, drilling or blasting, SAHRA must be notified. All development activities must be stopped, a 30 m no-go barrier constructed and a palaeontologist should be called in to determine proper mitigation measures, especially for shallow caves.

10.5 IMPACT STATEMENT

The overall objective of the EIAR is to provide sufficient information to enable informed decision-making by the authorities. This was undertaken through consideration of the proposed project components, identification of the aspects and sources of potential impacts and subsequent provision of mitigation measures.

In assessing the environmental feasibility of the Richbay Filling Plant, the requirements of all relevant legislation have been considered. The identification and development of appropriate management and mitigation measures that should be implemented in order to minimise potentially significant impacts associated with the project, has been informed by best practice principles, past experience and the relevant legislation (where applicable).

The EIA process has found that the Proposed Project will involve activities which will lead to a number of direct and indirect negative impacts on the biophysical and socio-economic environment. These impacts were found to vary in terms of their consequence and probability. Positive impacts are limited to the creation of employment opportunities and stimulation of cross border trade.

Mitigation measures have been developed where applicable for the above aspects and are presented within the EMPr (**Appendix H**). The mitigation measures are necessary to ensure that the project is planned, constructed and operated in an environmentally responsible manner. It is imperative that all impact mitigation recommendations contained in the EMPr, of which the environmental impact assessment took cognisance, are legally enforced.

It is the opinion of WSP that the information contained in this document (read in conjunction with the EMPr) is sufficient for the GDARD to make an informed decision for the environmental authorisation being applied for in respect of this project. The findings of this S&EIR process and associated Specialist studies conclude that there are no fatal flaws associated with the proposed development. Negative environmental impacts associated with the proposed Richbay Filling Plant can be mitigated to acceptable levels. It is therefore the opinion of the EAP that the project can proceed, and that all the listed mitigation measures and recommendations are considered by the GDARD.

Due to the potential risks associated with the chlorine tanks associated with Phase 2 (Alternative 1), Richbay are proposing to only proceed with the Preferred Alternative (Phase 1 and Phase 3). In addition Alternative 1 is not being pursued further, due to the calcium chloride, that is part of Phase 2, that is potentially considered noxious.

11 CONCLUSION

The overall objective of the EIA is to provide sufficient information to enable informed decision-making by the authorities. This was undertaken through consideration of the proposed project components, identification of the aspects and sources of potential impacts and subsequent provision of mitigation measures.

It is the opinion of WSP that the information contained in this document (read in conjunction the EMPr) is sufficient for the GDARD to make an informed decision for the environmental authorisation being applied for in respect of the proposed Filling Plant.

Mitigation measures have been developed, where applicable, for the above aspects and are presented within the EMPr. It is imperative that all impact mitigation recommendations contained in the EMPr, of which the environmental impact assessment took cognisance, are legally enforced.

Considering the findings of the respective studies, no fatal flaws were identified for the proposed Project. Should the avoidance and mitigation measures prescribed be implemented, the significance of the considered impacts for all negative aspects pertaining to the environmental aspects is expected to be acceptable. It is thus the opinion of the EAP that the project can proceed, and that all the prescribed mitigation measures and recommendations are considered by the issuing authority.

The Draft EIAR (this report) will be made available for public review from 15 September 2023 to 16 October 2023. All I&APs on the database (included in the SER (**Appendix D** of the EIR) will be notified of the release of the Draft EIR, EMPr and specialist reports for a period of 30 days.

All issues and comments submitted to WSP during the public review period of the Draft EIR will be incorporated in the CRR (**Appendix D** of the EIR (i.e. SER)). The Final EIR will be submitted to the GDARD, as the competent authority, for decision-making.

If you have any further enquiries, please feel free to contact:

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